Exhibit C.1
Amendment 17
September 2003

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

AUG 19 2003

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AUG 21 2003
PFMC

Mr. Donald Hansen, Chair
Pacific Fishery Management Council
7700 NE Ambassador Place
Portland, OR 97220

Dear Mr ~~Hansen~~: Don

By this letter, I am approving Amendment 17 to the Pacific Coast Groundfish Fishery Management Plan (FMP). As you know, Amendment 17 revises the Pacific Fishery Management Council's (Council's) annual groundfish management process so that it becomes a biennial process with time for notice and comment rulemaking to implement the biennial specifications and management measures. Amendment 17 is intended to ensure that the specifications and management measures process responds to a court ruling in Natural Resources Defense Council, Inc. v. Evans, 316 F.3d 904 (9th Cir. 2002,) to make the Council's development process for specifications and management measures more efficient in order to allow time for other management activities, and to streamline the NMFS regulatory process for implementing the specifications and management measures. A proposed rule to implement Amendment 17 was published on June 13, 2003 (68 FR 35354), and we expect to have the final rule effective by October 31, 2003. Because Amendment 17 primarily addressed the Council process, the primary effect of the final rule to implement Amendment 17 will be to revise regulatory references to the annual groundfish management process.

Under the biennial management process introduced by Amendment 17, the groundfish specifications and management measures would be developed and recommended by the Council through a three-meeting process, usually November-April-June meetings. The Council's November 2003 meeting will mark the start of the Council process for developing 2005-2006 harvest specifications and management measures. You may recall that, when the Council adopted Amendment 17, it asked its Groundfish Management Team (GMT) to develop a process that would give the Council a mid-biennium checkpoint "to ensure that those harvest levels set in [the] earlier management process are adequately conservative to meet overfished species protection and conservation requirements." NMFS would be pleased to work with the Council in developing this checkpoint process for overfished species rebuilding.

NMFS appreciates the Council's efforts to improve the efficiencies of its management processes, particularly to accommodate NMFS's needs for providing an expanded notice and comment rulemaking for the groundfish specifications and management measures.

Sincerely,

William L Robinson

for D. Robert Lohn
Regional Administrator

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NATIONAL MARINE FISHERIES SERVICE REPORT ON GROUNDFISH MANAGEMENT

Situation: The National Marine Fisheries Service (NMFS) will report on its regulatory activities and developments relevant to groundfish fisheries. Specific items for discussion include approval of Amendment 17, an update on 2003 regulations, progress on implementation of a Vessel Monitoring System, the Northwest Region's participation in NMFS' national efforts to create regional bycatch plans and other issues of interest to the Council.

Council Task:

1. Discussion.

Reference Materials:

1. Exhibit C.1.a, Amendment 17, letter to Mr. Donald Hansen from Mr. Robert Lohn.

Agenda Order:

a. Regulatory Matters — Bill Robinson
b. Reports and Comments of Advisory Bodies
c. Public Comment
d. Council Discussion

PFMC
08/22/03

Exhibit C.1
Supplemental NMFS Report
September 2003

NMFS REPORT ON NATIONAL BYCATCH PLAN

In June, NMFS reported to the Council that the agency is looking nationally at the issue of bycatch through a National Bycatch Strategy, which is comprised of the following six components:

1. Assess progress toward meeting the national bycatch goal, its supporting objectives and strategies, and regional recommendations (as set forth in *Managing the Nation's Bycatch*), which includes meeting the bycatch reduction requirements of relevant statutes, including National Standard 9 of the Magnuson-Stevens Act, Section 118 of the Marine Mammal Protection Act, and the take prohibitions of the Endangered Species Act. Internal assessment to be completed by July 31, 2003.

2. Develop a national approach to a standardized bycatch reporting methodology. Internal draft to be completed by June 30, 2003. Available for Council review in autumn 2003.

3. Implement the national bycatch goal through regional implementation plans. Internal drafts to be completed by September 30, 2003. Available for Council review in winter 2003/2004.

4. Undertake education and outreach involving cooperative efforts, at the regional level (and other levels as appropriate), by fishery managers, scientists, fishermen, and other stakeholders to develop effective and efficient methods for reducing bycatch.

5. Use existing partnerships and develop new international approaches to reducing bycatch of living marine resources including fish stocks, sea turtles, marine mammals, and migratory birds, where appropriate.

6. Identify new funding requirements to effectively support the NMFS National Bycatch Strategy on an ongoing basis. Funding requirements will be identified and incorporated into agency recommendations for the agency's 5-year plan, *NOAA Fisheries' Requirements for Improved and Integrated Conservation of Fisheries, Protected Resources, and Habitat*.

NMFS has completed the first component in internal review documents and has drafted a national approach to standardizing bycatch reporting methodologies. This report focuses on the scientific monitoring of bycatch and how the agency coulc improve its monitoring programs, as opposed to managing or reducing bycatch and will be available for review later this fall.

Each of the NMFS Regions/Centers is now addressing the third component of this strategy by drafting regional bycatch plans. NMFS Northwest is responsible for addressing groundfish, salmon, and halibut fisheries. NMFS Southwest is responsible for addressing coastal pelagic species fisheries and those highly migratory species fisheries that NMFS now regulates. Regional plans are to have the following core elements:

- A discussion of regional bycatch reporting methodologies that describes and prioritizes scientific initiatives for improving monitoring.
- A prioritization of bycatch-related research needs, such as gear modification research, fish behavior research, monitoring technologies, etc.
- A discussion of potential bycatch management/reduction measures for each federal fishery
- Ideas for enhancing education and outreach efforts on both bycatch monitoring and bycatch management in the fisheries, including setting up partnerships for researching fisheries gear/technology that will reduce bycatch.

The Regions are expected to submit their draft plans to NMFS headquarters by September 30th, with Council review of the draft regional plans to occur this coming winter.

REPORT TO THE PACIFIC FISHERY MANAGEMENT COUNCIL, ON BYCATCH MODELING AND OBSERVER DATA DEVELOPMENTS between February and August, 2003

Prepared by Dr. Elizabeth Clarke, Dr. James Hastie, and Jonathan Cusick, Fishery Resource Analysis and Monitoring (FRAM) Division Northwest Fisheries Science Center (NWFSC), NOAA Fisheries
August 2003

Implementation of recommendations from the Bycatch Review Panel Workshop

In January 2003, The Council's Scientific and Statistical Committee (SSC) convened a workshop to review the methodology employed in the existing model for estimating bycatch of overfished species. The workshop report contains several recommendations that have been incorporated into model improvements and implementation over the past six months.

Recommendation 1: Use the current model for 2003 management, possibly updating historical vessel landings or bycatch rates following SSC review.
Action: Alternative approaches for incorporating the new observer data, including a summary of associated bycatch rate variances, were presented to the SSC in March. Subsequently, new bycatch rates were reviewed by the SSC in April, and were incorporated into the analysis of inseason progress and management recommendations at the April and June Council meetings. Following the April Council meeting, historical vessel participation in the model was updated with more recent fish ticket and logbook data. These revisions were also incorporated into inseason recommendations at the June Council meeting.

Recommendation 2: For 2004 and beyond, replace existing bycatch rates used in the model with rates derived from the observer program, in accordance with SSC guidance.
Action: Alternative approaches for incorporating the new observer data were discussed with the SSC in March. New bycatch rates were reviewed by the SSC in April, and were incorporated into the preliminary analysis of 2003 management measures prepared for the June Council meeting and in the broader suite of management alternatives prepared for final 2004 decisions in September.

Recommendation 3: For 2004 and beyond, base the target fishery assignments for modeled landings on the most recent years of logbook data.
Action: Following discussions with the SSC in March regarding stratification options for incorporating the new bycatch data into the model, it was determined the target fishery approach that was used previously in applying bycatch rates could not be employed successfully with the amount of data available from the first year of the observer program. This decision will be re-evaluated as more data become available.

Recommendation 4: For 2004 and beyond, base the estimates of the depth distribution of target species catch on the most recent years of logbook data available.
Action: Following the April Council meeting, logbook data from 1999, which were previously used to estimate fishing depth distributions, were replaced by logbook data from 2000-2002. These data were weighted to emphasize the most recent catch of each vessel.

Recommendation 5: In order to better estimate effort redistribution associated with closing depth ranges to fishing, fish ticket-adjusted logbooks should be available by April 2004 and incorporated into modeling of options for 2005-2006.
Action: Logbook programs are administered by State fishery agencies. NMFS has emphasized the importance of logbook availability to the Council and state representatives on the Groundfish Management Team.

Recommendation 6: Following updates to the model, projections using 2003 management parameters should be compared to actual 2003 landings and appropriate calibration adjustments made before modeling 2004 management alternatives.
Action: Prior to the June Council meeting, baseline vessel participation was updated to include 2002 fish ticket

data, and then was adjusted in order to better align 2003 projections with preliminary landings data for the first four months of 2003. These adjustments were incorporated in all subsequent modeling of 2003 and 2004 management options.

Recommendation 7: The choice of bycatch rates is a technical, not a policy, decision that should be made by the GMT, consulting with the Groundfish Advisory Subpanel, with review and approval by the SSC.
Action: Bycatch rates based on the first year of observer data were presented to the GMT, SSC, and GAP at the April Council meeting. The new rates formed the basis of GMT recommendations at that meeting and in June. The GMT did not provide the Council with alternative bycatch rate scenarios from which to choose.

Additional bycatch modeling developments

At the June Council meeting NMFS initiated Council discussion of incorporating discard rates for target species, based on the new observer data, into the modeling of management options for 2004. Following the meeting, the bycatch model was modified in order to estimate total catches of target species, using depth-based discard rates calculated from observer data. In developing analysis of management alternatives for the 2004 fishery, trip limits have been modeled so that the estimated total catches of target species do not exceed the OYs available to the trawl fishery.

NMFS Observer Program Developments between February and August, 2003

Data adjustments

Following the review of the bycatch model in January, observer data were matched with fish tickets, in order to adjust vessels' estimated ("hailed") weights (reported by the observers on their data sheets) to reflect amounts of poundage recorded at the time of landing. Since the bycatch model is only intended to capture trawl activity directed towards federally managed groundfish species, observed trips targeting other species, such as California halibut, were filtered from the data set.

Bycatch rates and variances

After making these adjustments to the observer data set, average rates and variances for bycatch of overfished species in target trawl fisheries were calculated and evaluated between February and March. Alternative methods of applying rates to target fisheries were examined. These included approaches in which bycatch rates were allowed to vary with dimensions such as depth, latitude, season, and target fishery. A summary of these results was presented to the Scientific and Statistical Committee at the Council's March meeting. Due to the limited number of observations in some strata when several of these dimensions are used concurrently, a simple approach using only depth and latitude is being used until additional data has been gathered and analyzed.

Representativeness of the data

Prior to the April Council meeting, the representativeness of observer data to the entire trawl fleet was examined using fish tickets for observed and unobserved trips. The review covered three broad aspects of representativeness: similarity of average landings per trip and per vessel-period between observed and unobserved vessels, at several levels of geographic stratification; similarity between the observed and unobserved landings of each vessel; and the similarity in shares of species-group landings associated with observed and unobserved vessels, among subregions of the coast. In each of these aspects, observed vessel activity was found to be similar to that of the unobserved fleet.

Following the June Council meeting, for the portion of observed trips that could be successfully matched to logbook records, additional analysis was conducted on the representativeness of observer data, with respect to depth and smaller scale fishing locations. This evaluation also supported the conclusion that the data collected during the first year of the observer program is drawn from a representative sample of groundfish trawling on the west coast.

Observer Coverage during 2003

During the first two years (8/01-8/03) the West Coast Groundfish Observer Program (WCGOP) amassed more than 4,700 days at sea. From January 1, 2003 through July 31, 2003 the program accumulated 1,836 days at sea. During the same period in 2002 only 1,451 days were spent at sea. A summary of these data are presented in the tables below and are also available on the WCGOP website (http://www.nwfsc.noaa.gov/research/divisions/fram/Observer/Summary.cfm). The flow of data from observers to the central database has been streamlined in 2003, with the addition of a web-based data entry application that observers access via the internet upon completion of each trip.

Observer days at sea from August, 2001 through July 31, 2003

State	Total Sea	Trawl	Longline	Pot	Open Access
California	1,847	1,362	191	20	274
Oregon	2,084	1,699	159	144	82
Washington	814	594	189	27	4
Totals	4,745	3,655	539	191	360
Percent of sea days, by fleet		77.0%	11.4%	4.0%	7.6%

Observer days at sea from January to July 31, 2002

State	Total Sea Days	Trawl	Longline	Pot	Open Access
California	570	484	17	6	63
Oregon	615	523	19	31	42
Washington	264	233	31	0	0
Totals	1,449	1,240	67	37	105
Percent of sea days, by fleet		85.6%	4.6%	2.6%	7.2%

Observer days at sea from January to July 31, 2003

State	Total Sea Days	Trawl	Longline	Pot	Open Access
California	713	417	141	4	151
Oregon	862	752	51	59	0
Washington	261	182	63	16	0
Totals	1,836	1,351	255	79	151
Percent of sea days, by fleet		73.6%	13.9%	4.3%	8.2%

A summary of the percentages of landed groundfish tonnage and revenue associated with observed trips through the first five months of 2003 is shown in the table below, with the same period in 2002 provided for comparison. Despite the fact that many more sea days were logged in the first five months of 2003 than the preceding year, the percentage of tonnage and revenue that was observed declined in some segments of the fleet. This is primarily due to the lower catches attained by selected vessels. The limited-entry fixed-gear fleet in Oregon provides an example. The number of days that longline and pot vessels were observed more than doubled (from 50 to 118). However, the percentage of tonnage that was observed dropped from 14.4% to 5.4%.

This case illustrates the sensitivity of coverage statistics to factors such as: which particular vessels from a diverse fleet are sampled and what amounts of fish do they catch, as well as the timing with which sampling occurs, relative to seasonal opportunities. The primary sablefish season begins in April, but continues through October, so a relatively small portion of the period in which tier limits may be fished is reflected in this table. Furthermore, random selection of a Tier-1 vessel might yield coverage of one 50,000 lb trip of sablefish, while selection of a vessel without a sablefish endorsement could yield coverage of eight 300 lb trips in a 2-month period. The drop in Washington trawl coverage was due to the Period-1 selection of vessels that departed for Alaska without conducting west coast trips they declared they would make.

Percentages of landed tonnage and revenue covered by NMFS observers during the first 5 months of 2002 and 2003.

State	Sector	Gear	2002		2003	
			% observed		% observed	
			mts	revenue	mts	revenue
WA						
	LE					
		Trawl	19.2%	21.4%	8.2%	10.1%
		Fixed	2.2%	1.1%	2.4%	5.2%
		Other	0.0%	0.0%	0.0%	0.0%
	OA					
		Trawl	0.0%	0.0%	0.0%	0.0%
		Fixed	0.0%	0.0%	0.0%	0.0%
		Other	0.0%	0.0%	0.0%	0.0%
OR						
	LE					
		Trawl	15.6%	15.6%	16.1%	16.0%
		Fixed	14.4%	11.6%	5.4%	5.4%
		Other	0.0%	0.0%	0.0%	0.0%
	OA					
		Trawl	0.0%	0.0%	0.0%	0.0%
		Fixed	0.0%	0.0%	0.0%	0.0%
		Other	0.0%	0.0%	0.0%	0.0%
CA						
	LE					
		Trawl	13.0%	12.2%	10.7%	10.7%
		Fixed	1.6%	1.5%	2.3%	3.2%
		Other	0.0%	0.0%	0.0%	0.0%
	OA					
		Trawl	0.0%	0.0%	1.3%	1.1%
		Fixed	0.1%	0.0%	6.6%	5.2%
		Other	0.0%	0.0%	0.0%	0.0%
Total			13.7%	11.6%	11.7%	10.6%

Participation in testing of gear designed to reduce bycatch

In addition to normal randomly selected observer coverage of the groundfish fleets, the observer program has been actively involved in providing guidance for the development Oregon's selective trawl gear Experimental Fishing Permit (EFP) and in providing observers to monitor fishing activity under the EFP. This EFP, which runs from May through October 2003, is collecting data that will be used to evaluate whether trawl gear modifications can reduce bycatch of rockfish species while maintaining flatfish catch rates. If use of this gear achieves its objectives, further bycatch reduction may be facilitated while addressing the lost revenue and management complications embodied by the Council's current approach to bycatch reduction.

Workshop on observers on small boats

On March 18-20, 2003, the NWFSC and the Alaska Fisheries Science Center co-convened a workshop on how to improve sampling on small boats nationwide. A report containing recommendations from the workshop and is expected in Fall 2003.

Observer Coverage Workshop

On July 29-31, 2003, the NMFS National Observer Program convened a workshop to discuss the appropriate sample sizes that should be obtained by U.S. observer programs. A report of the recommendations from this workshop is also expected in Fall 2003.

OBSERVER DATA IMPLEMENTATION STATUS

Situation: At the April Meeting, the Council considered the use of new information becoming available from the Observer Program. In general, the preliminary observer-based bycatch rate information showed significantly higher estimated bycatch of certain overfished species than had been previously assumed. The Council adopted the following motion:

> For the remainder of the 2003 season, as soon as feasible, replace the bycatch rate estimates used in the model with the rates from information from the observer program; these rates are to be used for GMT modeling purposes towards preliminary indicators of the magnitude of adjustments needed for 2003 inseason management.

Application of the observer-based bycatch rates in April led the Council to adopt extensive inseason changes to commercial trawl fisheries, including modifying the configuration of Rockfish Conservation Areas, limiting nearshore open periods, and altering trip limits.

At the June Council meeting, the preliminary observer-based trawl bycatch rates adopted in April were confirmed, but no new data was presented for inseason management. The Council requested, for discussion at the November Council Meeting, presentation of a long-term schedule showing when new observer data will be processed and presented to the Council for decision-making during the multi-year management cycle.

Today, Dr. Elizabeth Clarke will summarize findings from analysis of the observer data and any resulting changes made to the trawl bycatch model since June. New information to be presented includes the status of incorporating observer-based discard rates for trawl target species in modeling capabilities (in April only information on non-target, overfished species was presented to the Council), as well as preliminary thoughts on when additional observer data will be available for modeling and management decision making over course of the next several Council Meetings. The preliminary observer-based discard rates for trawl target species are being used in modeling and analysis of the 2004 annual specifications alternatives.

A status report as of the Briefing Book deadline is provided as Exhibit C.2, Attachment 1.

Council Task:

1. **Review status of new information from the Groundfish Observer Program and provide guidance regarding implementation.**

Reference Materials:

1. Exhibit C.2, Attachment 1 (Observer Data Analysis and Bycatch Modeling Status Report, September 2003, NWFSC).

Agenda Order:

a. Agendum Overview Ed Waters
b. NMFS Report Elizabeth Clarke
c. Reports and Comments of Advisory Bodies
d. Public Comment
e. **Council Action:** Provide guidance on the use of observer data for in-season and long-term fisheries management.

PFMC
08/25/03

TABLE 1. Pacific Fishery Management Council-recommended alternatives for acceptable biological catches (ABCs) and total catch optimum yields (OYs) (mt) for 2004. (Overfished stocks in CAPS).

Stock	2003 ABCs/OYs		2004 ABC and OY Alternatives							
			Low OY		Med OY		High OY		Council OY a/	
	ABC	OY	ABC	OY	ABC	OY	ABC	OY	ABC	OY
LINGCOD	841	651			1,385	735			1,385	735
Pacific Cod	3,200	3,200			3,200	3,200			3,200	3,200
PACIFIC WHITING (Coastwide)	188,000	148,200	94,000	74,100	188,000	148,200	325,000	250,000	Decision deferred until March 2004	
Sablefish (Coastwide) b/	8,460	6,794	8,487	4,812	8,487	7,786	8,487	8,423	8,487	7,786
North of Conception			8,185	4,641	8,185	7,510	8,185	8,124	8,185	7,510
Conception area			302	171	302	276	302	299	302	276
PACIFIC OCEAN PERCH	689	377	980	318	980	444	980	555	980	444
Shortbelly Rockfish	13,900	13,900			13,900	13,900			13,900	13,900
WIDOW ROCKFISH	3,871	832	3076	181	3,460	284	3,908	501	3,460	284
CANARY ROCKFISH c/	256	44	256	42	256	46	256	46	256	
Chilipepper Rockfish	2,700	2,000			2,700	2,000			2,700	2,000
BOCACCIO	198	≤20	400	199	501	306	660	526	400	250
Splitnose Rockfish	615	461			615	461			615	461
Yellowtail Rockfish	3,146	3,146			4,320	4,320			4,320	4,320
Shortspine Thornyhead	1,004	955			1,030	983			1,030	983
Longspine Thornyhead	2,461	2,461			2,461	2,461			2,461	2,461
S. of Pt. Conception	390	195			390	195			390	195
COWCOD (S. Concep)	5	2.4			5	2.4			5	2.4
N. Concep & Monterey	19	2.4			19	2.4			19	2.4
DARKBLOTCHED	205	172	217	172	240	272	247	364	240	240
YELLOWEYE	52	22			53	22			53	22
Nearshore Species										
Black WA	1,115	835			540	540			540	540
Black OR-CA			729	729	775	775	861	861	775	775
Minor Rockfish North	4,795	3,115			4,795	3,115			4,795	3,115
Remaining Rockfish North	2,727	2,081			1,612	1,216			1,612	1,216
Bocaccio	318	239			318	239			318	239
Chilipepper - Eureka	32	32			32	32			32	32
Redstripe	576	432			576	432			576	432
Sharpchin	307	230			307	230			307	230
Silvergrey	38	29			38	29			38	29
Splitnose	242	182			242	182			242	182
Yellowmouth	99	74			99	74			99	74
Other Rockfish North	2,068	1,034			2,068	1,034			2,068	1,034
Minor Rockfish South	3,506	2,015			3,506	2,015			3,506	2,015
Remaining Rockfish South	854	689			854	689			854	689
Bank	350	263			350	263			350	263
Blackgill	343	306			343	306			343	306
Sharpchin	45	34			45	34			45	34
Yellowtail	116	87			116	87			116	87
Other Rockfish South	2,652	1,326			2,558	1,279			2,558	1,279
Dover Sole	8,510	7,440			8,510	7,440			8,510	7,440
English Sole	3,100	3,100			3,100	3,100			3,100	3,100
Petrale Sole	2,762	2,762			2,762	2,762			2,762	2,762
Arrowtooth Flounder	5,800	5,800			5,800	5,800			5,800	5,800
Other Flatfish	7,700	7,700			7,700	7,700			7,700	7,700
Other Fish	14,700	14,700			14,700	14,700			14,700	14,700

a/ Council OY is the Council's preferred harvest alternative for 2004. Those stocks without a specified Council OY will be so specified in September when the Council decides final harvest levels.

b/ The coastwide sablefish ABCs and OYs are projected from the most recent assessment (Schirripa 2002). A mistake was discovered in the specifications adopted in the last two years. The 2003 coastwide ABC and OY depicted in this table are corrected from those adopted in federal regulations (see section 2.1.1.8). The alternative 2004 coastwide specifications were apportioned to the north of Conception and Conception areas by applying the average proportion of landings north and south of the Conception-Monterey INPFC area boundary during 1998-2002 (see section 2.1.2.5).

c/ The canary rockfish ABC and OY are based on the Council's adopted rebuilding strategy that has a PMAX (probability of successful rebuilding within the maximum allowable time period) of 60%. The OY varies by the commercial:recreational catch share due to the fact that the recreational fishery takes smaller fish and therefore has a greater "per ton" impact than the commercial fishery. The canary stock was not assessed in 2003.

FINAL HARVEST LEVELS FOR 2004

Situation: Each year the Council recommends groundfish harvest specifications for the upcoming year. The fishery management plan (FMP) requires the Council to establish reference points for each major species or species complex: an acceptable biological catch (ABC), a total catch optimum yield (OY), and an overfishing threshold. Additionally, OYs for some species are allocated between the open access, limited entry, tribal, and recreational fisheries. The Council adopted a preliminary range of groundfish harvest levels (OYs) for consideration and analysis at the June meeting (Exhibit C.3, Attachment 1). The *Draft Proposed Acceptable Biological Catch and Optimum Yield Specifications and Management Measures For The 2004 Pacific Coast Groundfish Fishery* (Annual Specifications EIS; Exhibit C.6, Attachment 1) provides analyses of the potential consequences of management measures estimated to conform to this range of harvest levels. These harvest levels will determine the types of management measures available for Council consideration in 2004. The Council is tasked with adopting final recommendations for 2004 groundfish harvest levels at this September meeting.

The Council reviewed and adopted new stock assessments for Pacific ocean perch, widow rockfish, bocaccio, black rockfish, cowcod (rebuilding review), darkblotched rockfish, and yellowtail rockfish; and rebuilding analyses for Pacific ocean perch, widow rockfish, bocaccio, and darkblotched rockfish at the June 2003 meeting. These analyses provided the scientific basis for the range of harvest levels considered for these species and adopted in June.

A range of sablefish harvest levels has been proposed by the Groundfish Management Team (GMT) because of the importance of that stock in the West Coast groundfish fishery. However, an error was recently discovered in the range of sablefish harvest levels adopted by the Council in June. The magnitude of the error amounts to about a 5% reduction from the values adopted at the June Council meeting. The basis of the error is as follows:

> Past sablefish assessments assessed only the portion of the stock occurring north of Pt. Conception at 34°27' N latitude. A separate sablefish allocation was made for Conception area fishers since the trawl/non-trawl/tribal sablefish allocation is specified in the FMP only for the Monterey area north (north of 36° N latitude). Therefore, the GMT had made an adjustment to sablefish specifications in the past to calculate the OY for the portion of the stock in the assessed area between 34°27' N latitude and 36° N latitude (the "Conception wedge"). This amount of available harvest was then added to the rest of the Conception area (south of Pt. Conception) ABC and OY, which was based on the proportion of recent coastwide landings made south of Pt. Conception. The north of Conception OY was reduced accordingly to represent the OY for the Monterey, Eureka, Columbia, and U.S.-Vancouver International North Pacific Fishery Commission areas. This adjustment was made to the 2003 sablefish specifications without realizing that the most recent assessment (Schirripa 2002) determined coastwide stock status and ABCs/OYs.

The 2003 and 2004 coastwide ABCs and OYs depicted in Table 2.1.1-1 are the correct specifications projected in the most recent assessment. As per the normal protocol, the 2004 specifications were stratified for the Conception and north of Conception areas by apportioning the coastwide ABCs and OYs based on average sablefish landings north and south of 36° N latitude during 1998-2002.

Another noteworthy update regarding the harvest levels adopted at the June Council meeting involves darkblotched rockfish. At the June meeting, only alternative 2004 OYs were shown for consideration. Subsequent calculations of the ABCs shows that the darkblotched rockfish OY is greater than the ABC under the *Medium OY* and *High OY* alternatives. Rebuilding results were sensitive to the high 2000 and 2001 recruitment estimates and including them allowed much greater 2004 OYs, because those recruits enter the fishery and help rebuild the stock before the maximum allowable year (2028). The ABCs, on the other hand, were calculated by applying the proxy $F_{50\%}$ harvest rate to the estimated exploitable biomass which is not yet affected by the strong 2000 and 2001 recruitments. This led to 2004 OY estimates which were higher than the ABC. This effectively limits the available darkblotched rockfish harvest to the ABC for these two alternatives since the ABC cannot be exceeded in federal regulations.

The canary rockfish OY varies dependent on commercial and recreational catch sharing due to differences in size selectivity in these fisheries. The Council may want to defer choosing a final canary rockfish OY until initial adoption of management measures, including the commercial:recreational catch shares, occurs under agendum C.6, scheduled for Wednesday afternoon..

Council Action:

1. Adopt final 2004 groundfish harvest specifications.

Reference Materials:

1. Exhibit C.3, Attachment 1, TABLE 2.1.1-1. Pacific Fishery Management Council-recommended alternatives for ABCs and total catch OYs (mt) for 2004.
2. Exhibit C.6, Attachment 1, The Draft Proposed ABC and OY Specifications and Management Measures For The 2004 Pacific Coast Groundfish Fishery.

Agenda Order:

a. Agendum Overview — John DeVore
b. Groundfish Management Team (GMT) Report on Estimates of Acceptable Biological Catch and Optimum Yield — Michele Robinson
c. Recommendations of the States, Tribes, and Federal Agencies
d. Reports and Comments of Advisory Bodies
e. Public Comment
f. **Council Action:** Adopt Final Harvest Levels for 2004 Management

PFMC
08/22/03

STATUS OF GROUNDFISH FISHERIES AND INSEASON ADJUSTMENTS

Situation: In the current groundfish management program, the Council sets annual harvest targets (optimum yield [OY] levels) and various management measures, with the understanding these management measures will likely need to be adjusted periodically through the year in order to attain, but not exceed, the OYs.

The Groundfish Management Team (GMT) will present information on the status of ongoing fisheries, and any need for adjustments in typical management measures, such as trip limits and seasons. The Council is scheduled to hear an update on the analysis of data from the Groundfish Observer Program and any resulting changes made to the trawl bycatch model since the June Council meeting under agenda item C.2, Observer Data Implementation Status. Also under agenda item C.2, the Council is tasked with providing guidance on implementation of observer data into fishery management, including inseason adjustments for 2003 fisheries.

The Council is to consider advice from Advisory Bodies and the public on the status of ongoing fisheries and recommended inseason adjustments and adopt changes as necessary. Consideration of inseason adjustments to groundfish fisheries has been arranged under two agenda items in previous meetings, but is scheduled to be completed under this single agenda item at this meeting. The intent is to finalize inseason adjustments early in the week thereby maximizing time for other groundfish business, principally, the adoption of 2004 management measures.

Council Action:

1. **Consider information on the status of ongoing fisheries.**
2. **Consider and adopt inseason adjustments, if necessary.**

Reference Materials:

None.

Agenda Order:

a.	Agendum Overview	Mike Burner
b.	GMT Report	Michele Robinson
c.	Reports and Comments of Advisory Bodies	
d.	Public Comment	
e.	**Council Action:** Consider and Adopt Inseason Adjustments as needed.	

PFMC
08/19/03

FINAL CRITERIA FOR EXEMPTED FISHING PERMITS AND CONSIDERATION OF PROPOSALS FOR THE 2004 SEASON

Situation: Exempted fishing permits (EFPs) allow fishing activities that would otherwise be prohibited. As an example, EFPs provide a process for testing innovative fishing gears and strategies to substantiate methods for prosecuting sustainable and risk-averse fishing opportunities. The Council has signaled its intent to make greater use of EFPs in the new groundfish management regime of depth restrictions and widespread area closures to reduce harvest of overfished species. However, there are potential drawbacks to significant EFP proliferation. Low optimum yields (OYs) for overfished species force hard allocation decisions between allowing immediate fleet-wide fishing opportunities in directed and incidental groundfish fisheries versus the longer term potential benefits ascribed to gaining new information from EFPs. Additionally, concerns were expressed about the need to manage the EFP approval process in a more timely manner and based on more explicit scientific criteria. For these reasons, the Council tasked the Groundfish Management Team (GMT) with recommending standards and criteria for approving EFPs.

The GMT recommended a draft Council Operating Procedure (COP) that prescribes a set schedule and other protocols for Council consideration in approving EFP applications at the April meeting. The Council approved the new COP but asked the GMT to reconsider a recommended timeline for reviewing and recommending EFPs that would better synchronize with the new Council process for setting specifications and management measures under multi-year management. At the June meeting, the Council approved the new timeline as presented by the GMT and requested the GMT refine the draft COP to enhance the requisite EFP report contents, provide further detail on the process of releasing EFP set-asides, and clarify the stated objectives and timeline in EFP proposals. The GMT has complied with the Council request and offers a Revised Proposed Council Process for Consideration of Exempted Fishing Permits for Multi-Year Management (Exhibit C.5.b, GMT Attachment 1) and a Revised Proposed Council Operating Procedure: Protocol for Council Consideration of Exempted Fishing Permits for Pacific Coast Groundfish Fisheries (Exhibit C.5.b, GMT Attachment 2).

The costs and benefits of allocating available harvest to EFPs and directed fisheries needs to be considered coincidentally. This agendum provides the opportunity for Council, state, and agency representatives to report on past or ongoing EFPs as well as review and discuss plans and draft applications for 2004 EFPs. These discussions could serve to refine and coordinate contemplated EFPs prior to final approval of 2004 management specifications under agenda item C.6 and final approval of 2004 EFPs at the November Council meeting.

The Council task at this meeting is to (1) consider GMT recommendations for the EFP approval process and approve a new COP outlining a protocol for Council consideration of EFPs and (2) establish harvest set-aside needs for 2004 EFP proposals.

<u>Council Action</u>:

1. Adopt final criteria and standards for approving EFPs and establish harvest set-aside needs for EFP proposals.

<u>Reference Materials</u>:

1. Exhibit C.5.b, GMT Attachment 1 (Revised Proposed Council Process for Consideration of Exempted Fishing Permits for Multi-Year Management).
2. Exhibit C.5.b, GMT Attachment 2 (Revised Proposed Council Operating Procedure: Protocol for Council Consideration of Exempted Fishing Permits for Pacific Coast Groundfish Fisheries).
3. Exhibit C.5.c, CDFG Report 1 (Application for Issuance of an Exempted Fishing Permit for the sport harvest of rockfish from partyboats is waters deeper than 20 fathoms off the south central coast to duplicate the sampling program conducted by the Department of Fish and Game from 1988-1998).
4. Exhibit C.5.c, CDFG Report 2 (Application for Issuance of an Exempted Fishing Permit to Test a Selective Flatfish Trawl [including Scottish Seine] in and area otherwise closed to fishing, 2004).
5. Exhibit C.5.c, WDFW Report 1 (Application for Issuance of an Exempted [Experimental] Fishing Permit for Arrowtooth Flounder).
6. Exhibit C.5.c, WDFW Report 2 (Application for Issuance of an Exempted [Experimental] Fishing Permit for Nearshore Flatfish).
7. Exhibit C.5.c, WDFW Report 3 (Application for Issuance of an Exempted [Experimental] Fishing Permit for Pollock).
8. Exhibit C.5.c, WDFW Report 4 (Application for Issuance of an Exempted [Experimental] Fishing Permit for Spiny Dogfish).
9. Exhibit C.5.c, ODFW Report (Oregon Department of Fish and Wildlife Memorandum: Flatfish Trawl EFP Bycatch Data for May-June Period).

<u>Agenda Order</u>:

a. Agendum Overview — Mike Burner
b. GMT Report on Criteria and Standards for Approving EFPs
c. State EFP Proposals for 2004 — State Representatives
d. Reports and Comments of Advisory Bodies
e. Public Comment
f. **Council Action:** Adopt Final Criteria and Standards for Approving EFPs and Establish Harvest Set-Aside Needs for EFP Proposals

PFMC
08/25/03

REVISED PROPOSED COUNCIL PROCESS FOR CONSIDERATION OF EXEMPTED FISHING PERMITS FOR MULTI-YEAR MANAGEMENT

Year 1 (2003)

Nov

Preliminary ABCs/OYs for Years 3 and 4 (2005 & 2006)

Year 2 (2004)

April

Preliminary EFP Concepts for Year 3 (2005)
Preliminary EFP OY "set asides" for Years 3 and 4 (2005 & 2006)
Preliminary Management Measures for Years 3 and 4 (2005 & 2006)
Update bycatch scorecard catch projections for 2004 and consider release of EFP set asides for inseason action

June

Draft EFP Applications for Year 3 (2005)
EFP Application review by GMT, GAP and SSC
Council consider approving for public review
Adopt final EFP OY "set asides" for Years 3 and 4 (2005 & 2006)
Final Management Measures for Years 3 and 4 (2005 & 2006)
Update bycatch scorecard catch projections for 2004 and consider release of EFP set asides for inseason action

Sept

Update bycatch scorecard catch projections for 2004 and consider release of EFP set asides for inseason action

Nov

Final EFP Applications for Year 3 (2005)
EFP Application review (if revised) by GMT, GAP and SSC
Council consider recommending approval to NMFS

Year 3 (2005)

April

Preliminary EFP Concepts for Year 4 (2006)
Preliminary report on EFPs conducted in Year 2 (2004)
Update bycatch scorecard catch projections for 2005 and consider release of EFP set asides for inseason action

June

Draft EFP Applications for Year 4 (2006)
EFP Application review by GMT, GAP and SSC
Council consider approving for public review
Update bycatch scorecard catch projections for 2005 and consider release of EFP set asides for inseason action

Year 3 (2005) *continued*

Sept

Final written report on EFPs conducted in Year 2 (2004)
Update bycatch scorecard catch projections for 2005 and consider release of EFP set asides for inseason action

Nov

Final EFP Applications for Year 4 (2006)
EFP Application review (if revised) by GMT, GAP and SSC
Council consider recommending approval to NMFS

Exhibit C.5.b
GMT Attachment 2
September 2003

REVISED PROPOSED

COUNCIL OPERATING PROCEDURE: PROTOCOL FOR COUNCIL CONSIDERATION OF EXEMPTED FISHING PERMITS FOR PACIFIC COAST GROUNDFISH FISHERIES

DEFINITION

An exempted fishing permit (EFP) is a federal permit, issued by the National Marine Fisheries Service, which authorizes a vessel to engage in an activity that is otherwise prohibited by the Magnuson-Stevens Fishery Conservation and Management Act or other fishery regulations for the purpose of collecting limited experimental data. EFPs can be issued to federal or state agencies, marine fish commissions, or other entities, including individuals. An EFP applicant need not be the owner or operator of the vessel(s) for the EFP is requested.

PURPOSE

The specific objectives of a proposed exempted fishery may vary. The Pacific Fishery Management Council's fishery management plan (FMP) for West Coast groundfish stocks provides for EFPs to promote increased utilization of underutilized species, realize the expansion potential of the domestic groundfish fishery, and increase the harvest efficiency of the fishery consistent with the Magnuson-Stevens Act and the management goals of the FMP. However, EFPs are commonly used to explore ways to reduce effort on depressed stocks, encourage innovation and efficiency in the fisheries, provide access to constrained stocks while directly measuring the bycatch associated with those fishing strategies, and to evaluate current and proposed management measures.

PROTOCOL

Submission

The Pacific Fishery Management Council and its advisory bodies [Groundfish Management Team (GMT) and Scientific and Statistical Committee (SSC)] should review EFP proposals prior to issuance; the GMT and SSC may provide comment on methodology and relevance to management data needs and make recommendations to the Council accordingly. The Groundfish Advisory Subpanel and the public may also comment on EFP proposals. Completed applications for EFPs from individuals or non-government agencies for Council consideration must be received by the Council for review, at least two weeks prior to the June Council meeting. Applications for EFPs from federal or state agencies must meet the briefing book deadline for the June Council meeting.

Proposal Contents

EFP proposals must contain sufficient information for the Council to determine:

- There is adequate justification for an exemption to the regulations;

- The potential impacts of the exempted activity have been adequately identified; and
- The exempted activity would be expected to provide information useful to management and use of groundfish fishery resources.

Therefore, applicants must submit a completed application in writing that includes, but is not limited to, the following information:

- Date of application
- Applicant's names, mailing addresses, and telephone numbers
- A statement of the purpose and goals of the experiment for which an EFP is needed, including a general description of the arrangements for the disposition of all species harvested under the EFP
- Valid justification explaining why issuance of an EFP is warranted
- A statement of whether the proposed experimental fishing has broader significance than the applicant's individual goals
- **<u>An expected total duration of the EFP (i.e., number of years proposed to conduct exempted fishing activities)</u>**
- Number of vessels covered under the EFP
- A description of the species (target and incidental) to be harvested under the EFP and the amount(s) of such harvest necessary to conduct the experiment; this description should include harvest estimates of overfished species
- A description of a mechanism, such as at-sea fishery monitoring, to ensure that the harvest limits for targeted and incidental species are not exceeded and are accurately accounted for
- A description of the proposed data collection and analysis methodology
- For each vessel covered by the EFP, the approximate time(s) and place(s) fishing will take place, and the type, size, and amount of gear to be used
- The signature of the applicant

NOTE: The GMT, SSC, and/or Council may request additional information necessary for their consideration.

<u>Review and Approval</u>

The GMT and SSC will review EFP proposals in **June** and make recommendations to the Council for action; the Council will consider those proposals for preliminary action. Final action on EFPs will occur at the November Council meeting. Only those EFP applications that were considered in **June** may be considered in November; EFP applications received after the **June** Council meeting for the following calendar year will not be considered.

EFP proposals must contain a mechanism, such as at-sea fishery monitoring, to ensure that the harvest limits for targeted and incidental species are not exceeded and are accurately accounted for. Also, EFP proposals must include a description of the proposed data collection and analysis methodology used to measure whether the EFP objectives will be met.

The Council will give priority consideration to those EFP applications that:

- Emphasize resource conservation and management with a focus on bycatch reduction **<u>(highest priority)</u>**
- Encourage full retention of fishery mortalities
- Involve data collection on fisheries stocks and/or habitat
- Encourage innovative gear modifications **<u>and fishing strategies to reduce bycatch</u>**
- **<u>Encourage the development of new market opportunities</u>**

In its review, the GMT review will consider the following questions:
- Is the application complete?
- Is the EFP proposal consistent with the goals and objectives of the West Coast Groundfish FMP?
- Does the EFP account for fishery mortalities, by species?
- Are the harvest estimates of overfished species within the amounts set aside for EFP activities?
- Does the EFP meet one or more of the Council's priorities listed above?
- Is the EFP proposal compatible with the federal observer program effort?
- What infrastructure is in place to monitor, process data, and administer the EFP?
- How will achievement of the EFP objectives be measured?
- **<u>Is the data ready to be applied? If so, should it be used, or rejected? If not, when will sufficient data be collected to determine whether the data can be applied?</u>**
- **<u>What are the benefits to the fisheries management process to continue an EFP that began the previous year?</u>**
- **<u>If propose integrating data into management, what is the appropriate process?</u>**
- What is the funding source for at-sea monitoring?
- Has there been coordination with appropriate state and federal enforcement, management and science staff?

SSC Review:
- All EFP applications should first be evaluated by the GMT for consistency with the goals and objectives of the groundfish FMP and the Council's strategic plan for groundfish.
- When a proposal is submitted to the GMT that includes a significant scientific component that would benefit from SSC review, the GMT can refer the application to the SSC's groundfish subcommittee for comment.
- In such instances, the groundfish subcommittee will evaluate the scientific merits of the application and will specifically evaluate the application's (a) problem statement; (b) data collection methodology; (c) proposed analytical and statistical treatment of the data; and (d) the generality of the inferences that could be drawn from the study.

Other considerations:
- EFP candidates or participants may be denied future EFP permits under the following circumstances:

  If the applicant/participant (fisher/processor) has violated past EFP provisions; or has been convicted of a crime related to commercial fishing regulations punishable by a maximum penalty range exceeding $1,000 within the last three years; or within the last three years assessed a civil penalty related to violations of commercial fishing regulations in an amount greater than $5,000; or, has been convicted of any violation involving the falsification of fish receiving tickets including, but not limited to, mis-reporting or under-reporting of groundfish. Documented fish receiving tickets indicating mis-reporting or under-reporting of groundfish will not qualify for consideration when fish reporting documents are used as part of the qualifying criteria for EFPs.

Report Contents

The EFP applicant must present a preliminary report on the results of the EFP and the data collected (including catch data) to the GMT at the April Council meeting of the following year. A final written report on the results of the EFP and the data collected must be presented to the GMT, SSC, and the Council at the September Council meeting. This final report should include a summary of the work completed, an analysis of the data collected, and conclusions and/or recommendations. Timely presentation of results is required to determine whether future EFPs will be recommended.

Application for Issuance of an Exempted Fishing Permit for the sport harvest of rockfish from partyboats in waters deeper than 20 fathoms off the south central coast to duplicate the sampling program conducted by the Department of Fish and Game from 1988-1998.

A Date of application: August 20, 2003

B. Applicant Contact

John S. Stephens, Jr. PhD
Adjunct Professor, Cal Poly University, San Luis Obispo
2550 Nightshade Place,
Arroyo Grande, CA 93420
(805) 546 8310

C. Statement of purpose and goals of the study for which the EFP is needed

The purpose of the study is to determine trends in rockfish populations in the south central coast, an area currently poorly sampled by existing fishery sampling.

The Specific Goals of the Study:

Sampling data from partyboats (known technically as commercial passenger fishing vessels or CPFVs) is the only data that has shown site-specific trends in rockfish species on the central coast. A California Department of Fish and Game (Department) unpublished partyboat sampling study, was conducted between 1988 and 1998, and effectively sampled some rockfish assemblages on a site-specific basis. The Department has provided us with the unpublished data for our area and, this summer, we plan to begin a long-term sampling program as a cooperative effort between California Polytechnic University, San Luis Obispo (Cal Poly) and local partyboat fishers, following the Department's protocol.

Current federal regulations prohibit sport fishing outside of 20 fm. However, the original Department study included areas well outside the 20 fm depth. Without an EFP, our sampling will not be comparable to that of the ten-year study, as fishing may only occur in nearshore waters shallower than 20 fathoms. This restriction would bias our data to the shallowest species only. Further, without some level of sampling from these depths, little knowledge of the closure's effects will be available for analysis. We request that this exemption apply to only two trips per week during the months of August through November, 2004.

We also intend to conduct a sampling program using 4.9-m or 7.6-m biological trawls to determine the abundance of YOY rockfish at depths to 200 fathoms. These small meshed nets are used for biological sampling in southern California but have not been used north of Point Conception. The use of these nets following the

SCWRRP, southern California Bight protocol will allow comparison of fish assemblage data around this major faunal break.

Disposition of the species harvested under the EFP will be as follows:

Samples by partyboats, except for closed species, will be the property of the recreational fishers. We will retain all rockfish not desired by the recreational fishers or closed species for laboratory work (otoliths, fecundity, gut samples, etc and genetic sampling. Trawled samples will be deposited in the Cal Poly Biological Science Museum.

D. Valid justification for issuance of the EFP

The PMFC has recognized that rockfish stocks are heavily impacted, and has closed or severely restricted fishing on many stocks. Stocks, however, must be monitored for continuing updates. This study will provide updated information on species of concern. Further, the region between Pt. Conception and Point Mendicino is not uniform, as the south central coast (Pt. Sal to San Simeon) has the most southern influence as well as the lowest fishing pressure. Many rockfish species may not have reproduced or recruited successfully south of Point Conception since the initiation of the warm PDO in 1977. If, in fact, the PDO is presently changing again, this southern section will be key to population enhancement. It is important to measure YOY availability as well as recruitment and stock enhancement from this area. Limited sampling from closure areas is needed to complement other data we will collect, including nearshore partyboat observations and trawl samples, as well as diver recruitment observations and SMURF deployment for larval settlement. We also are committed to doing some genetic sampling from these stocks for NMFS studies, which is being coordinated with Steve Ralston of NMFS. We intend for this study to be renewed annually and continue for at least ten years to enhance the regional data base for marine fish species.

E. A statement of whether the proposal has broader significance than the applicant's individual goals.

The applicant believes that these data collected from this area of the south central coast of California, has broad implications for rockfish populations throughout California and the west coast.

The study will produce data not available from any other source.

We will be monitoring YOY and larval settlement as well as size and numbers of adult rockfish caught by partyboat anglers both in the open nearshore environment(<20fm) and in the deeper area of closure.

The limited trawl data will compliment the bightwide regional study (SCCWRP, 2003) for the southern California bight.

F. Vessels covered under the EFP.

Vessels covered under this EFP will be vessel from Port San Luis and Morro Bay participating in the partyboat fishery.
Patriot Sports Fishing: F/V *Patriot* and/or F/V *Mallard.*
Virg's Sports Fishing: F/V *Pathfinder* and/or F/V *Lotafun*

No more than 2 trips per week will fish in the closure zone.
Trawling will be conducted from the F/V *Suzanne* owned by Guy Grundmeier.

G. Species targeted a numbers.

Because entry into the closure area will be closely monitored and limited to two trips per week (August –November) excessive harvest is not likely. All rockfish caught, both retained and discarded, will be recorded by observers on partyboats entering the closure zone. Eighteen species of rockfish were recorded by the Department from the southern study area during the 1995-1996 observer program. These were, in order of abundance, *Sebastes mystinus, S. flavidus, S. miniatus, S. rosaceous, S. entomelas, S. carnatus, S. constellatus, S. serranoides, S. paucispinnis, S. caurinus, S. auriculatus, S. pinniger, S. melanops, S. chlorostichus, S. nebulosus, S. elongatus, S. ruberrimus,* and *S. goodei.* The other primary species targeted in this fishery is the lingcod *Ophiodon elongatus.*

Observer data from the Department's CPFV observer program in the San Luis Obispo port complex from 1988-1998 were used to estimate the average mortality per trip for overfished rockfish species. Therefore, the total estimated fish mortality for overfished rockfish species is as follows:

Species/Species Group	Avg. weight per fish (lbs)	Avg. # fish per trip	Total EFP trips	Total Estimated Catch (lbs)	Total Estimated Catch (mt)
Bocaccio Rockfish	2.41	65.0	44	6892.60	3.13
Canary Rockfish	1.47	84.0	44	5433.12	2.46
Cowcod Rockfish	11.29	1.4	44	695.46	0.32
Yelloweye Rockfish	2.53	28	44	3116.96	1.41

* There are 2 trips per week scheduled during the 4-month EFP period, for a total of 44 trips.

H. For each vessel covered by the EFP, the approximate time(s) and place(s) fishing will take place.

The study will begin August 1, 2004 and continue until November 30, 2004.

The EFP will be valid in closed waters between Pt. Conception and Piedras Blancas. The maximum depth of the rockfish study will be 100 fm while the larval trawl survey may reach 200 fm.

I. All vessels under the authority of the EFP:

- Must carry trained observers
- Must land all fish caught under the authority of the EFP into the State of California.
- Must sign a contract with the Applicant detailing the vessel's responsibility to the EFP fishery. Failure to abide by conditions in the contract or to follow provisions in the EFP will result in revocation of the contract and the EFP for the year.

J. Signature of the applicant

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John S. Stephens, Jr. PhD. Adjunct Professor

California Polytechnic University, San Luis Obispo;
Executive Director, *Vantuna Research Group*: and
James Irvine Professor of Environmental Biology Emeritus,
Occidental College, Los Angeles.

I

Application for Issuance of an Exempted Fishing Permit Test a Selective Flatfish Trawl (including Scottish Seine) in an area otherwise closed to fishing, 2004

A. **Date of application:** August 20, 2003

B. **Applicant Contact**

California Department of Fish and Game
350 Harbor Blvd.
Belmont, CA 94002

Contact: Susan Ashcraft (650) 631-6786

C. **Statement of purpose and goals of the experiment, for which an EFP is needed, including a general description of the arrangements for the disposition of all species harvested under the EFP:**

The purpose of the experiment is to determine whether a shelf flatfish fishery can be prosecuted in an otherwise closed area using modified trawl gear designed to minimize the bycatch of overfished rockfish species. The first year of this study was initiated in 2003, due to be completed in November 2003. A second year of study is necessary to draw conclusive results to demonstrate its applicability to other geographic regions.

Pacific Coast groundfish are managed by the Pacific Fishery Management Council (PFMC) under a federal fishery management plan (FMP) for the west coast. The management goals of the FMP are to:

- Prevent overfishing by managing for appropriate harvest levels and prevent any net loss of the habitat of living marine resources.
- Maximize the value of the groundfish resource as a whole.
- Achieve the maximum biological yield of the overall groundfish fishery, promote year-round availability of quality seafood to the consumer, and promote recreational fishing opportunities.

The experiment conducted through an EFP will assist the PFMC in achieving the goals set forth in the FMP while collecting bycatch data on overfished stocks and evaluating the effectiveness of trawl gear modifications in avoiding bycatch of overfished stocks.

The specific goals of the experiment are:

- To evaluate the effectiveness of modified trawl gear to catch shelf flatfish while minimizing take of overfished rockfish species.

- To measure bycatch rates of bocaccio and other rockfish species that may be associated with the small footrope trawl shelf flatfish fishery between 60 fm (shoreward boundary of the trawl RCA) and 100 fm through an at-sea observer program.

- To provide fishermen with an incentive to modify their gear by giving them the opportunity to take shelf flatfish in areas that are otherwise closed.

Disposition of the species harvested under the EFP will be as follows:

- Species caught within the normal current trip limits may be retained and sold by the vessel.

- All rockfish caught while targeting shelf flatfish during the EFP must be retained and offloaded. Overages of rockfish must be surrendered and proceeds from these species in excess of trip limits will be forfeited to the State of California.

D. **Valid justification explaining why issuance of an EFP is warranted:**

Since 1998, the PFMC has initiated rebuilding plans for several species, including bocaccio rockfish. Conservation areas have since been established and closed to groundfish fishing in order to prevent harvest of the overfished stocks in multi-species fisheries. Critical to these rebuilding plans and to the overall improvement of groundfish management, is the need for more and better scientific data. There are 82 species covered under the FMP, and at present, there is little or no data on a large number of these species. There is a need for comprehensive, timely, and credible data for priority species to aid in the conservation and rebuilding efforts for these stocks.

The shelf flatfish are an extremely important group of groundfish in the California groundfish fisheries. These stocks are believed to be healthy, and California fishers and processors have worked aggressively to develop strong markets for these species. A component of the California trawl fleet and processors are heavily dependent upon these flatfish.

A depth closure was enacted from July 1 to December 31, 2002 to prohibit landing of all shelf groundfish, including vessels using small footrope trawl gear to target flatfish. An EFP was approved for use in the shelf flatfish trawl fishery during this closed period. Results from the 2002 EFP indicated that the incidental take of bocaccio and other sensitive rockfish species was minimal in depths from 3 miles to 70 fm using conventional flatfish trawl gear.

In 2003, a new EFP was issued to conduct a follow-up fishery experiment in deeper water, where the likelihood of incidental take of bocaccio increases. An important condition added under this EFP was a requirement to use a modified trawl design to determine if bocaccio and other shelf rockfish catch is kept to a minimum using the modified trawl gear. The 2003 EFP is not complete at the time of this application. However, a second year of study is necessary to draw conclusive results to demonstrate its applicability to other geographic regions.

E. **A statement of whether the proposed experimental fishing has broader significance than the applicant's individual goals.**

The applicant of this EFP believes that the information collected during this experiment will have significance, broader than the applicant's individual goals, applicable to fisheries throughout California and the West Coast.

- The experiment will produce data on the amount and location of any bocaccio and other depleted rockfish bycatch in the shelf flatfish fishery using this trawl.

- Results indicating that rockfish bycatch rates are minimized while using this modified trawl could lead to a management tool that allows the Council to maximize sustainable access to healthy shelf flatfish stocks while depleted rockfish stocks are rebuilt.

- This EFP complements an EFP experiment that was conducted off the coast of Oregon in 2003, in slope habitat to avoid catch of overfished darkblotched rockfish, and a previous EFP experiment conducted in 2002 in shelf habitat, to avoid catch of overfished canary rockfish. An experiment off the coast of California in shelf habitat to evaluate ability to avoid overfished bocaccio rockfish was designed increase validity and applicability of the use of the modified trawl design in other geographic regions.

F. **Vessels covered under the EFP:**

Vessels covered under the EFP will include those which have historically participated in the targeted shelf flatfish fishery off California according to criteria used in the 2002 and 2003 flatfish EFP:

- Vessels must have landed into California ports at least 10,000 pounds of shelf flatfish (California halibut, Pacific sanddab, English sole, sand and rock sole, starry flounder, and unspecified flatfishes) taken with trawl gear in each of two years during 1998 to 2000.
- Vessels must have a valid California delivery permit.

Vessels identified as qualifiers in the 2003 EFP process will qualify for this pool of applicants.

A letter of inquiry will be sent to the owners of each of the qualifying vessels requesting a statement of interest to be returned by a specified closing date.

A maximum of **six** vessels will be selected to participate throughout the EFP fishing period, with a goal of issuing permits to two vessels per California port group between Pt. Conception and Pt. Mendocino. Potential port complexes are Morro Bay/Avila, Monterey/Moss Landing, and Half Moon Bay/San Francisco/Bodega Bay.

Applications received will be selected at random following the closing date if more vessels apply than can be accommodated by observers.

Any EFP may be canceled and made available to another vessel if the permitted vessel: 1) does not follow the terms and conditions of the permit; 2) fails to follow federal or State fishing regulations; 3) does not prosecute shelf flatfish using small footrope trawl gear as provided in the EFP; or 4) does not reasonable accommodate the observer or cooperate with the applicant.

A permitted vessel may withdraw once from the EFP program and resume participation the following month.

G. **A description of the species (target and incidental) to be harvested under the EFP and the amount(s) of such harvest necessary to conduct the experiment:**

The target species are collectively referred to as *shelf flatfish* and include California halibut, Pacific sanddab, English sole, rock and sand sole, and unspecified flatfish. The maximum expected catch per vessel for all species will be the normal trip limits in place in Period 3. That allowable trip limit for other flatfish is 70,000 pounds per two months of which no more than 20,000 pounds may be petrale sole. EFP participants will be exempted from any closures or reductions in allowable trip limits during the EFP study period. Trip limits for EFP participants will be increased to match any increases in federal trip limits resulting from in-season adjustments. Note that California halibut is not included in the trip limit and is estimated later in this section. Total harvest of target species for the EFP fishery is anticipated to be the same as in the 2003 EFP and will therefore be:

Species/Species Group	Vessels * no. periods in EFP[1]	Maximum allowable catch (lbs)
Other flatfish	6*2=12	840,000 of which no more than 120,000 is Petrale sole

[1] There are 6 vessels that will be operating for the entire EFP period, encompassing 2 periods of cumulative trip limits.

All rockfish species will be landed to enhance biological sampling and to document the actual rockfish mortality, with catch thresholds in place for overfished rockfish species to ensure that take remains below allocated bycatch caps. The EFP thresholds for incidental take of bocaccio, cowcod, canary, and yelloweye rockfish will be applied as follows:

- Monthly per species threshold: An individual vessel will be constrained to a maximum of 100 pounds each of bocaccio, canary, and yelloweye rockfish per fishing month. Additionally, an individual vessel will be constrained to a maximum of 50 pounds of cowcod rockfish per fishing month. If that amount is exceeded for any of the four species, then all fishing by that vessel will be terminated for the balance of the month, but may resume for the following month.

- Monthly cumulative threshold: The cumulative amount of bocaccio, canary, or yelloweye rockfish harvested by all vessels fishing under the EFP must not exceed 500 pounds in a fishing month. Additionally, the cumulative amount of cowcod rockfish must not exceed 100 pounds. If that amount is exceeded for any of the four species by all vessels combined, then all EFP fishing will be terminated for the remainder of the month, but may resume for the following month.

- EFP threshold: The cumulative amount of bocaccio, canary, or yelloweye rockfish harvested by all vessels fishing under the EFP must not exceed 1,000 pounds at any time. Additionally, the cumulative amount of cowcod rockfish must not exceed 250 pounds at any time. If the cumulative EFP threshold amount is exceeded for any of the four species, then all EFP fishing will be terminated for the remainder of the year.

  Data from the 2003 EFP using modified shelf flatfish trawl gear is not available at the time of this application; the 2003 EFP study will not be completed until November 30, 2003. We have therefore based estimates of expected fishing mortality on estimates included in the 2003 EFP study application, which used bycatch rates from our 2002 EFP experiment, except that estimated take of overfished rockfish species is based on the EFP species thresholds contained in this proposal. Actual bycatch rates of these overfished rockfish species during the 2002 EFP fm were well below these thresholds, with bycatch rates of 0.01% for bocaccio, 0.02% for cowcod rockfish, and 0% for canary and yelloweye rockfish. Although 2002 NMFS observer data indicates that from 70 fm to the 100 fm depth proposed in this study, the probability of bocaccio catch increases significantly when using unmodified conventional flatfish trawl gear, it is anticipated that the use of the selective flatfish trawl during this EFP period will significantly reduce the probable take of overfished rockfish, including bocaccio. However, some bycatch is likely to occur. Therefore, the total estimated fish mortality for overfished rockfish species provided is the species thresholds for this EFP, as follows:

Species/Species Group	EFP Threshold (lbs)	Total Estimated Catch (lbs)
Bocaccio Rockfish	1,000	1,000
Canary Rockfish	1,000	1,000
Cowcod Rockfish	250	250
Yelloweye Rockfish	1,000	1,000

Based on bycatch information from our EFP program in 2002, the following catches would be expected in addition to target flatfish and overfished rockfish species, if the bycatch rates were the same as in 2002:

Species/Species Group	Bycatch Rate[1] (2002)	Expected Bycatch[2] (lbs)
Other Flatfish	2.67	22,455
California Halibut	8.02	67,332
Nearshore Rockfish	0.14	1,183
Shelf Rockfish	2.86	24,042
Lingcod	0.56	4,699
Sablefish	0.44	3,678
Sharks	1.23	10,367
Skates	5.87	49,295
Crab, Dungeness and misc.	7.02	59,000
King Salmon	0.09	774
Green Sturgeon	0.06	465
Misc. Fish[3]	4.74	39,820
Nominal Bycatch Species[4]	0.16	1,334

1 Bycatch is defined as the total landed and discarded pounds of a species relative to the total landed target species group (i.e., the trip limit). An estimate of discarded 'other flatfish' is included in this table as discards of target species may occur due to size, market, etc.

2 There are six vessels that will be operating for the entire 4 months of the EFP, encompassing 2 periods of cumulative trip limits. Expected bycatch is bycatch rate*70,000(2-month trip limit)*6*2.

3 Miscellaneous fish includes white croaker, squid, hake, ratfish, sculpin, and shad, and other misc. fish.

4 Nominal bycatch includes species with *individual bycatch rates* of <0.05% in 2002, and includes the following species: slope rockfish, white seabass, striped bass, cabezon, surfperch, greenlings, midshipman, and surfperch.

H. **For each vessel covered by the EFP, the approximate time(s) and place(s) fishing will take place:**

- The test fishery will be conducted from September through November 2004.

- The EFP will be valid in those Pacific Ocean waters adjacent to California coastwide between 3 miles and a maximum depth of 100 fm. While this depth exceeds the inner boundary for the trawl RCA (up to 80 fm during the proposed study period), this depth is necessary to test the modified trawl gear in areas with a history of bocaccio catches.

I. All participating vessels under the authority of the EFP:

- Must exclusively employ legal small footrope trawl as defined in current federal regulation, except that modification is required to create a severely cut-back top section, which allows roundfishes to "rise" out of the trawl while flatfish, which remain near the bottom, are captured.

- Must apply and submit a net plan for approval. Net plans must meet specifications utilized by the 2003 Oregon Flatfish EFP, and by the 2003 California Flatfish EFP, which specified that:

  - *"The trawl must have a headrope to footrope ratio of at least 1.30 (i.e., 30% longer footrope).*

  - *The trawl must have a maximum rise of 5 ft at the center of the headrope.*

  - *There must be no floats along the middle 33% of the headrope",* except for Scottish seine, for which there must be no floats along the middle 25% of the headrope.

  - *The headrope must be wide in the center, not a narrow V-shape that creates shoulders that would trap ascending fish.*

- Must carry a National Marine Fisheries Service-trained observer onboard all trips using the selective flatfish net in the NTZ. A total of three observers is necessary to execute the EFP. Vessels participating in the program must share observer time.

- Must land all fish caught under the authority of the EFP into the State of California.

- Must sign a contract with the State of California detailing the vessel's responsibility for the EFP fishery. Failure to abide by the conditions in the contract or to follow provisions in the EFP will result in revocation of the contract and of the EFP for the year.

J. Signature of the applicant:

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California Department of Fish and Game

MEMORANDUM

OREGON DEPARTMENT OF FISH AND WILDLIFE

DATE: July 11, 2003

TO: Mark Saelens, Patty Burke

FROM: Bob Hannah, Steve Parker

SUBJ: Flatfish Trawl EFP Bycatch Data for May-June Period

This is a summary of the bycatch rate estimates generated from the selective flatfish trawl EFP to date. The time period covered is the complete May-June trawl period. In the May-June period, 34 EFP trips (5 large footrope trips outside 200 fathoms were excluded) were completed by 8 vessels landing into 3 ports. Of the 34 trips, 32 were observed. The EFP incorporates two fishing strategies, with somewhat different limits and rules. Five of the vessels are in the “Mixed Shelf Flatfish” (MSF) strategy and 3 are in the “Beach” (B) strategy. Of the 34 trips, 22 (20 observed) were in the MSF strategy and 12 (all observed) were in the B strategy. The B strategy is confined to inside of 100 fathoms, while the MSF strategy is confined to within 150 fathoms (generally 50 to 150 fathoms; all logbooks have not been collected yet).

In compiling this summary, we have excluded fishing trips targeting longspine thornyheads outside 200 fathoms and the 2 unobserved trips. We have utilized primarily fish ticket data to generate the table, however, for the total catch of the 4 overfished rockfish species, observer weights were used, not ticket weights. The denominator, “All Target”, includes all non-overfished species landed (including lingcod). The second column (Shelf Flatfish) uses the sum of petrale sole, English sole, Dover sole and other flatfish (essentially all flatfish except arrowtooth flounder) in the denominator.

The market categories included in “All Target” were Dover sole, English sole, petrale sole, arrowtooth flounder, skates, lingcod, yellowtail rockfish, Pacific cod, sand sole, sanddabs, Bellingham sole, curlfin sole, starry flounder, rex sole, shortspine thornyhead, shelf rockfish, slope rockfish, longspine thornyhead and nearshore rockfish.

Strategy	Overfished Species	Bycatch Rate All Target	Bycatch Rate Shelf Flatfish
Mixed Shelf Flatfish	Canary Rockfish	0.001352	0.002710
	Darkblotched Rockfish	0.003660	0.007338
	Yelloweye Rockfish	0.000037	0.000075
	Widow Rockfish	0.000000	0.000000
Beach	Canary Rockfish	0.000031	0.000045
	Darkblotched Rockfish	0.000044	0.000065
	Yelloweye Rockfish	0.000000	0.000000
	Widow Rockfish	0.000000	0.000000

ODFW Selective Flatfish Trawl

Concept

- Develop a bottom trawl that could more efficiently harvest bottom-tending flatfish while excluding "roundfishes" that tend to rise as they encounter the trawl.

Experimental Design

- Aimed at shelf flatfish fishery in depth range of 50 – 180 ftm – Figure 1.
- Randomized block, alternate haul design, 64 pairs of tows.
- Half field work conducted in 2001, half in 2002.
- Field work was designed to occur where flatfish occur, but also where rockfish bycatch may be higher to discern any selection effect.
- Compared catch, catch rates, and fish length to vessel's normal small footrope flatfish trawl.

Net Design Comparison

	Control	Experimental
Trawl type	4-seam WA 4A (400)	2-seam Eastern 400
Footrope Length (m)	20	31.2
Headrope Length (m)	17.3	40.3
Spread (m)	14.6	20.1
Rise (m)	2.4 – 2.7	1.2 – 1.5
Headrope cutback (m)	+5.2	-6.4

Experimental Results

- Catch table – Table 1
  - In general:
    - Flatfish catch increases because of wider spread and herding.
    - Mobile fish which have good swimming abilities are able to rise above the headrope and escape capture (*e.g.* hake).
    - We categorized *a priori* some rockfishes into large (>10") and small categories to test for a size effect.
    - Data for some species limited by sample size (*e.g.* large darkblotched and yelloweye rockfish).
- Catch rates – Table 2
  - In general:
    - For species encountered often, significant reductions in rate were observed.
    - Sample size too low for large darkblotched and yelloweye rockfishes, likely no effect with small darkblotched.
- Size Selectivity – Table 3
  - Generally, experimental net catches:
    - Smaller Dover
    - Smaller halibut
    - Smaller sablefish

- Hint at Darkblotched effect

Fishery-level Test – Disaster Relief

- Create an EFP authorized fishery to allow several vessels to try the net in the shelf summer flatfish fishery coastwide.
- Data collection would occur through a federal observer requirement.
- Gear is currently "legal" gear, but would need an incentive for fishermen to either switch gear or buy a new net.
- EFP Development
  - Test should provide coastwide information on bycatch in this fishery, should be at federal level.
  - ODFW does not have funds or staff necessary for this coastwide program. It would be necessary for NMFS to administer the EFP.
  - Must be desirable for fishermen. We plan to sponsor a meeting with industry to develop a framework for the EFP.
    - Include in EFP development meeting in August (piggyback on port meetings?)
    - Summer flatfish fishermen
    - GMT representative(s)
    - State managers
      WOC
      Technical advisors-ODFW
    - NMFS
      Technical advisors-Craig Rose
      Observer coordinator
      EFP Administration
  - Identify entity responsible for proposal development
  - Generate a proposal for discussion at the September PFMC meeting.
- Action Items
  - ID GMT Rep(s) to attend industry planning meeting.
  - Confirm GMT willingness to provide additional harvest as incentive to participate in EFP fishery.

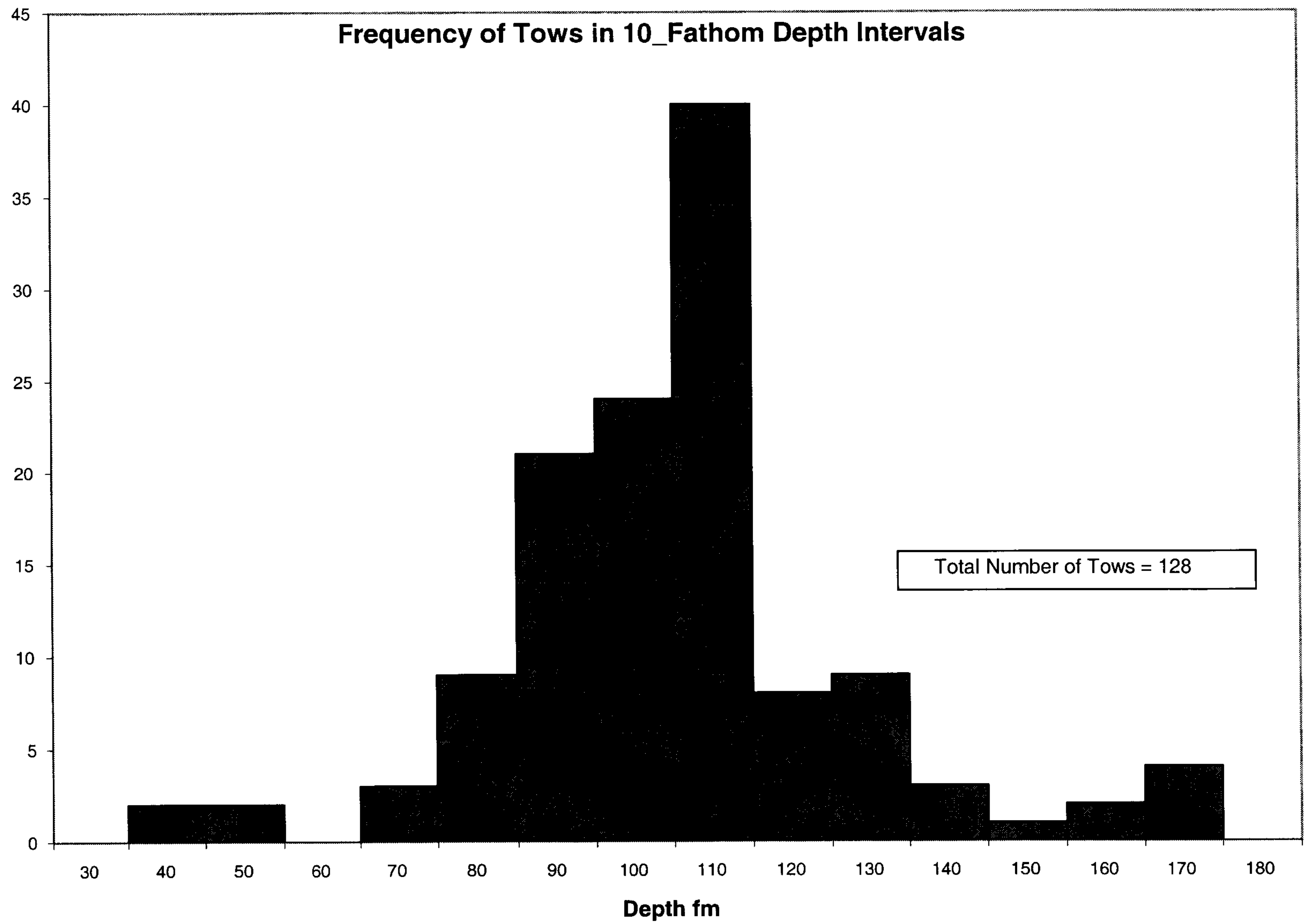

Figure 1. Frequency distribution of depths trawled in the selective flatfish trawl experiment.

Table 1. Comparison of catch data for control and experimental trawls.

Species Name	Mean Control Catch	Mean Experimental Catch	Mean % Reduction (ratio of geometric means)	p-value (2-factor ANOVA)	p-value (Wilcoxon signed-pair test)	n
Arrowtooth Flounder	128.79	190.09	-(16)%	0.2996	0.6964	64
Canary Rockfish - Large	6.77	1.65	61%	0.0233	0.0454	32
Darkblotch Rockfish – Large	0.64	1.24	-(28)%	0.6017	0.4321	12
Darkblotch Rockfish – Small	0.78	0.47	-(25)%	0.4910	0.3788	32
Dover Sole	86.82	137.90	-(66)%	0.0001	<0.0001	64
English Sole	3.37	4.58	-(33)%	0.0263	0.0387	37
Flathead Sole	12.76	10.91	17%	0.0177	0.0132	32
Greenstripe Rockfish - Large	22.29	24.61	-(16)%	0.3827	0.3970	52
Greenstripe Rockfish – Small	6.80	5.36	-(13)%	0.4661	0.2580	46
Pacific Halibut	41.26	29.27	44%	0.0972	0.0585	29
Ling Cod	70.01	122.06	-(24)%	0.2811	0.3010	60
Longnose Skate	75.96	157.32	-(132)%	0.0001	<0.0001	61
Pacific Cod	2.61	1.57	11%	0.7476	0.7532	13
Pacific Hake	156.53	3.92	88%	0.0001	<0.0001	50
Petrale Sole	15.19	23.33	-(54)%	0.0055	0.0196	34
Ratfish	20.33	18.59	-(69)%	0.0092	0.0316	48
Redbanded Rockfish – Large	0.99	1.24	-(40)%	0.2704	0.5943	23
Redbanded Rockfish – Small	0.18	0.28	-(46)%	0.3102	0.4457	18
Redstripe Rockfish - Large	7.63	1.10	63%	0.0272	0.0052	13
Rex Sole	8.54	10.70	-(38)%	0.0033	0.0463	64
Rosethorn Rockfish – Large	0.35	0.13	-(64)%	0.3211	0.6151	14
Rosethorn Rockfish - Small	0.48	1.21	-(79)%	0.0405	0.0331	17
Sablefish	118.13	129.34	-(29)%	0.0648	0.0178	63
Sandpaper Skate	1.43	3.45	-(147)%	0.0001	0.0001	52
Sharpchin Rockfish – Large	2.55	1.34	27%	0.3457	0.4348	17
Sharpchin Rockfish - Small	2.13	1.41	-(18)%	0.5148	0.8647	15
Shortspine Thornyhead - Large	6.13	4.07	22%	0.0940	0.0230	17

Shortspine Thornyhead – Small	1.43	1.93	8%	0.6079	0.6888	11
Slender Sole	1.06	6.69	-(304)%	0.0001	<0.0001	34
Spiny Dogfish	4.52	3.28	31%	0.1027	0.2089	34
Splitnose Rockfish - Small	0.50	0.34	29%	0.2850	0.5406	10
Stripetail Rockfish - Large	2.04	3.38	1%	0.9734	0.3627	14
Stripetail Rockfish - Small	0.82	1.77	-(15)%	0.5579	0.6357	17
Threadfin Sculpin	3.48	5.52	-(37)%	0.0161	0.0840	34
Yelloweye Rockfish – Large	0.73	0.95	-(89)%	0.3402	0.6121	7
Yellowtail Rockfish - Large	0.60	0.49	3%	0.9461	0.8125	9

The n column refers to the number of blocks in which the species was caught.

Table 2. Comparison of bycatch rates for overfished species and species of concern in the control and experimental trawls.

Species	Control Mean Bycatch Rate [1](Ratio of Means)	Experimental Mean Bycatch Rate (Ratio of Means)	Mean % Reduction	p-value (Wilcoxon Signed-Rank Test)	[2]n
Canary Rockfish	0.066697	0.010408	84.4%	0.0225	32
Darkblotch Rockfish Lg.	0.006328	0.007806	-23.4%	0.8139	12
Darkblotch Rockfish Sm.	0.007667	0.002986	61.1%	0.7364	32
Ling Cod	0.689885	0.769931	-11.6%	0.2302	60
Pacific Hake	1.542433	0.024698	98.4%	<0.0001	50
Pacific Halibut	0.406559	0.184615	54.6%	0.0004	30
Shortspine Thornyhead Lg.	0.060431	0.025674	57.5%	0.0552	17
Shortspine Thornyhead Sm.	0.014072	0.012142	13.7%	0.9292	11
Yelloweye Rockfish	0.007236	0.005992	17.2%	0.6121	7
Yelloweye (Excl. block 37)	0.007236	0.002769	61.7%	0.9165	6

[1] The ratio of means was employed for calculating bycatch rate. The mean bycatch rate is defined as follows: $\mu = \sum_{i=1}^{n} b_i / \sum_{i=1}^{n} f_i$,

where b_i= bycatch catch (lb) and f_i=Dover Sole + Petrale Sole + English Sole catch (lb)

[2] n refers to the number of paired tows (blocks) in which the species was caught.

[3]

n n

Table 3. Comparison of mean length of fish captured in the control and experimental trawl.

Species Name	Mean Control Length (cm)	Mean Experimental Length (cm)	p-value (Kolmogorov-Smirnov Test)	n
Arrowtooth Flounder	36.4	36.6	<0.0001	1639
Canary Rockfish	43.7	43.6	0.6964	114
Darkblotch Rockfish	21.9	20.8	0.0494	232
Dover Sole	40.4	38.5	<0.0001	1073
English Sole	31.7	32.4	0.0124	580
Flathead Sole	26.8	26.8	>0.9999	1254
Greenstripe Rockfish	27.3	27.5	0.1954	3216
Halibut	91.3	81.8	0.0394	69
Pacific Hake	46.5	47.3	0.5499	147
Petrale Sole	34.9	34.6	0.5938	929
POP Rockfish	30.5	25.3	0.1623	25
Redbanded Rockfish	27.0	26.9	0.4182	153
Redstripe Rockfish	31.7	31.0	0.5883	636
Rex Sole	27.9	27.2	0.0041	1161
Rosethorn Rockfish	23.2	23.2	0.8110	302
Rougheye Rockfish	34.8	34.0	0.3900	31
Sablefish	47.8	49.2	0.0152	1544
Sharpchin Rockfish	24.8	24.5	0.8128	695
Shortspine Thornyhead	27.0	27.1	0.7340	444
Slender Sole	20.0	19.8	0.7994	490
Stripetail Rockfish	24.9	24.3	0.0838	867
Yelloweye Rockfish	39.3	42.0	0.9828	19
Yellowtail Rockfish	45.2	42.2	>0.9999	14

[3] 29 July 2002 11:30 AM

Application for Exempted Fishing Permit to Test a Reduced-Discard Strategy for The Deepwater Complex Fishery

A. Application Date

September 1, 2003

B. Applicant Contact

Oregon Department of Fish and Wildlife
2040 SE Marine Science Drive
Newport, OR 97365

Phone: 541 867-4741
FAX: 541 867-0311
Contacts: Dr. Patricia Burke

C. Statement of Purpose and Goal

The purpose of this EFP is to test a discard reduction strategy for the deepwater complex trawl fishery for Dover sole, shortspine thornyhead and sablefish (DTS). The strategy uses written vessel-processor, state-vessel and state-processor agreements to reduce economic incentives for discarding, mandate more complete or possibly full retention of DTS species, and create modest incentives for retention of DTS. The incentives created promote reduced discard, fewer tows, higher economic efficiency, and may be scalable to the West Coast fishery as a whole.

D. Justification

Reduced catch limits in recent years and size-related prices in the DTS fishery have created strong incentives for vessels to high-grade their catch to maximize income obtained from the reduced limits (Table 1). At the same time, any mismatch between the ratio of Dover sole, shortspine thornyhead (SST) and sablefish in the catch and the ratio of the respective limits, can create very high “regulatory” discard. These two factors, in combination, can result in very high discard rates in this fishery. Typically, low harvest limits for SST, followed by sablefish, result in high discard of these species while targeting Dover sole.

Comments from fishermen and research trawl data from the May-June period of 2003 can be used to illustrate the extent of this problem. All values presented are based on simulation modeling conducted by ODFW using actual catch data from research fishing conducted off Newport, Oregon with normal trawl gear in May 2003 in the deepwater complex fishery. Accordingly, the simulation data are considered reasonably representative of catches in the actual trawl fishery in that area at that time. Table 1 shows that to maximize ex-vessel value from the limits that were in place, a vessel can high-grade sablefish and thornyheads to land a combined catch with an ex-vessel value of about $31,400 (Table 1). Simulations with more realistic retention of all medium and large sablefish and thornyheads produced an average ex-vessel value of about $30,000 for this "high-grading" scenario. These simulations suggested however, that with this realistic "high-grading" scenario, combined DTS discard rates averaged 69% of the DTS brought aboard (43,800 lbs retained, 99,000 lbs discarded). In the simulations modeled, about 80-90 tows were required to catch all limits (a short tow duration was standardized across all simulations only for comparative purposes; the number of tows would be less if longer duration was modeled).

Table 1. Example DTS limits and prices, by size grade from May-June 2003.

Species	Size	Price/lb	Catch Limit	Maximum Value
Dover Sole	All Marketable	$0.33	31,000 lbs	$10,230
SST	Over 16"	$1.12	2,800 lbs	$3,136
	10-15"	$0.79		
	8.5-10"	$0.42		
Sablefish	Large	$1.80	10,000 lbs	$18,000
	Medium	$1.61		
	Small	$1.48		
	Extra Small	$0.98		
Total				$31,366

Table 2 shows an example of how vessel-processor agreements could be used to redefine the market categories, prices, and limits to reduce discard incentives. In this example, the fish grades that are likely to be high-graded for are lumped under the existing limits for that species; in this case medium and large sablefish under the "high-value sablefish" limit, and medium and large SST under the "high-value SST" limit. The species that are likely to be graded out and discarded, but are still marketable are combined under one market category named "Low-value DTS complex" (LVDTS), which is sold at a single price (how this will work is described below under "EFP Structure"). As can be seen from Table 2, the total maximum ex-vessel value obtained from catching all of the redefined limits goes up, however this depends on the actual negotiated ex-vessel price for low-value DTS complex, which is impossible to predict (we used $0.42/lb only for illustration, although a price somewhere between the Dover sole price and the small SST price is anticipated). More importantly though, simulation modeling shows that if the redefined limits are combined with a requirement that the vessel cease fishing for DTS when any 2 of the 3 redefined limits in Table 2 are met, discard falls to only about 11% of the DTS brought on board

(42,300 lbs retained, 5,400 lbs discarded), all of which is fish that are below the minimum marketable size. In essence, with this limit structure, "regulatory discard" of DTS is brought to zero lbs. If this approach is combined with full retention requirements for DTS, then DTS discard can be brought completely to zero, however the sub-marketable fish would likely be thrown away after landing.

The other important result from the simulation modeling is that using the redefined limits, the vessel quits fishing after only 25-30 tows, versus 80-90 tows for the "high-grading' scenario. If we assume complete mortality for discarded DTS, the population impacts on DTS species and on all other incidental species would be greatly reduced under the "redefined limits". A side benefit of a reduced number of tows needed to reach redefined DTS limits would be reduced bycatch of other species, such as darkblotched rockfish.

Table 2. Example of redefined DTS limits and prices, based on this EFP.

Market Category	Species	Grade	Price/lb	Catch Limit	Maximum Value
Low-value DTS Complex			$0.42	31,000 lbs	$13,020
	Dover sole	All Marketable			
	SST	8.5-10"			
	Sablefish	Small			
	Sablefish	Extra Small			
High-value SST	SST	Over 16"	$1.12	2,800 lbs	$3,136
	SST	10-15"	$0.79		
High Value Sablefish		Large	$1.80	10,000 lbs	$18,000
		Medium	$1.61		
Total					$34,156

E. Significance of Results

The information collected will have a broad and timely significance for fishery management on the West Coast, and potentially in other regions because it will provide information on the feasibility and scalability of a discard reduction strategy based on altering vessel incentives for discarding fish without increasing the total mortality imposed on any stock. Reduced discard could ultimately allow for higher directed fishing limits for DTS species, and because of reduced waste, could increase economic yield from this and possibly other mixed stock fisheries where high-grading occurs.

F. EFP Structure

This EFP is a small-scale test to judge the feasibility of potential expansion to the coast-wide DTS fishery. Therefore, only one vessel in each of three ports will participate, and this test will be conducted in the March-April and May-June trip limit periods. The three test ports will be Astoria, Newport, and Charleston.

Observer Coverage
The Northwest Fisheries Science Center's Observer Program would need to provide the chosen vessels with observer coverage for all trips within the two periods. If supplied, and an observer is not available, the vessel must wait for an observer to become available. The two trip limit periods will not count towards normal observer coverage requirements. Observer coverage will be coordinated through the Observer Program.

The observer will have two tasks. First, the observer will document discard of any species, estimating weight and number discarded, as normal. Second, the observer will sample the discarded Dover sole, shortspine and longspine thornyheads, and sablefish to document size selectivity. This data will serve as a check to ensure vessels are retaining all marketable DTS species. Following the end of the field test, observer data will be error checked and provided to the Oregon Department of Fish and Wildlife for analysis.

Processor Participation

Processors will be enter into written agreements with the State of Oregon, and with the test vessel. Processors and vessel owners will be required to negotiate a single price to be paid for the LVDTS market category. The "low-value DTS complex" market category price may be re-negotiated during the EFP period, provided new written copies of the vessel–processor agreement are provided to the state. The low-value DTS category must include at least one grade of both SST and sablefish. Processors must also agree not to set separate market limits on LVDTS component species and agree to accept landings of all rockfish and DTS retained by the vessel. The ex-vessel value of catches of high-value sablefish and SST or LVDTS in excess of redefined limits will be forfeited to the state of Oregon as a legal overage.

G. Vessel Obligations

Vessels will be identified through an application process beginning in January 2004. The applicant must be the registered owner of the vessel named in the application. A total of 3 vessels will be selected to participate in the EFP fishery. The EFP fishery will be conducted from March 1 through June, 2004.

All fishing and processor activities under this EFP will be conducted subject to written agreements with ODFW, and authorization to participate in this EFP can be revoked by ODFW at any time. After a vessel is selected for the EFP program, agreements between the state and vessel owner and between the state and processor will be completed. All marketable DTS will be retained, as well as all rockfish captured (excluding longspine and shortspine thornyheads). At the sole option of ODFW, vessel and processor agreements can require full retention of all DTS.

The vessel must agree to take an observer for all trips during the trip limit period so that data can be collected on any discard that occurs. We expect that through cooperation with the West Coast Groundfish Observer Program, we will be able to provide 100% coverage for three vessels. If the vessel operator chooses to fish without an observer, the contract with the ODFW will be terminated, and the vessel can return to fishing under normal trip limit regulations.

Vessels operating under this EFP must agree to abide by the terms and conditions of the EFP. Each participating vessel will also have a contract with the ODFW detailing the vessel's responsibilities for the EFP fishery. Failure to abide by the conditions in the contract or to follow provisions in the EFP will result in revocation of the contract and of the EFP for the year.

Vessels must retain all catch of marketable DTS and all Sebastes. If the "full retention" option is specified by ODFW, the vessel must retain all DTS captured, including all longspine and shortspine thornyheads. The vessel must agree to cease fishing as soon as any 2 of the 3 "redefined" DTS limits illustrated by example in Table 2 are met (actual limits will depend on PFMC specified limits for DTS for March-June 2004). The vessel will not be allowed to fish for groundfish for the remainder of the trip limit period. The vessel owner will be responsible (via the vessel operator) to ensure that all trip period limits are observed and tracked so that when 2 of the 3 redefined DTS limits are reached, the vessel will stop fishing and return to port. All other trip period limits remain in effect during the fishery.

H. Bycatch Limits

No increased take of any overfished rockfish species is anticipated as a result of this EFP program. In fact, due to a reduced number of hauls needed to reach redefined DTS limits, reduced bycatch of rockfish is anticipated under this EFP program.

I. Incentives

The incentive to participate in this EFP program is a modest increase in modeled revenue to the vessel and a decrease in vessel operation costs. Costs to vessels are minimal, consisting mostly of forfeited incidental catch of other species such as arrowtooth flounder and skate which would normally accumulate during the additional tows. Benefits to processors include access to more sablefish and SST catch, and the opportunity to participate in a discard reduction program.

J. Signature of Applicant

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Oregon Department of Fish and Wildlife

Dr. Patricia M. Burke, Manager

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APPLICATION FOR ISSUANCE OF AN EXEMPTED (EXPERIMENTAL) FISHING PERMIT FOR ARROWTOOTH FLOUNDER

A. Date of application: August 19, 2003

B. Applicant's names, mailing addresses, and telephone numbers:

Washington Department of Fish and Wildlife
600 Capitol Way North, Olympia, WA 98501-1091
Contacts: Philip Anderson (360) 902-2720
Brian Culver (360) 249-1205
Michele Robinson (360) 249-1211

C. A statement of the purpose and goals of the experiment for which an EFP is needed, including a general description of the arrangements for the disposition of all species harvested under the EFP.

Pacific Coast groundfish are managed by the Pacific Fishery Management Council under a federal fishery management plan (FMP). The management goals of the FMP are to:

1. Prevent overfishing by managing for appropriate harvest levels and prevent any net loss of the habitat of living marine resources.
2. Maximize the value of the groundfish resource as a whole.
3. Achieve the maximum biological yield of the overall groundfish fishery, promote year-round availability of quality seafood to the consumer, and promote recreational fishing opportunities.

The purpose of the experiment is to assist the Pacific Fishery Management Council in achieving the goals of the FMP by collecting bycatch data on overfished stocks to allow for informed management decisions in setting appropriate trip limits to maximize safe harvest levels of healthy stocks.

Specifically, the goals of the experiment are to:

- Measure bycatch rates for canary and other rockfish associated with the arrowtooth flounder fishery through an at-sea observer program,
- Test specific selective flatfish gear off northern Washington, and
- Collect data that could be used to augment the National Marine Fisheries Service groundfish observer program.

With regard to the disposition of the species harvested under the EFP:
- Species caught within current trip limits as published in the Federal Register, may be retained by the vessel.
- Species caught in excess of current trip limits, but permitted within the EFP (i.e.,

arrowtooth flounder, petrale sole), will be retained by the vessel.

- Rockfish caught in excess of current trip limits, but required to be retained under the EFP, will be sold at fair market value and the revenue will be forfeited to the state.

D. Valid justification explaining why issuance of an EFP is warranted:

Since 1998, the Pacific Council has initiated rebuilding plans for several species, including canary rockfish and widow rockfish. Critical to these rebuilding plans and to the overall improvement of groundfish management is the need for more and better scientific data. Fishery dependent data that is needed includes amount of total catch and catch location, as well as biological data (e.g., age and sex). There are 82 species covered under the Pacific coast groundfish FMP, and at present, there is little or no biological data on a large number of these species. There is a need for comprehensive, timely and credible data for priority species to aid in the conservation and rebuilding efforts for these stocks. The data collected under this EFP will include total catch (amount and species composition) data, catch location, bycatch data on associated species, and biological data.

Arrowtooth flounder are an extremely important species in Washington groundfish fisheries. The stock is healthy and Washington fishers and processors have worked aggressively to develop strong markets for this species. A large component of the Washington trawl fleet, and at least two major processors, are heavily dependent upon arrowtooth flounder. Fishers targeting arrowtooth are currently constrained by their limit of canary rockfish. The current flatfish trip limit is based upon the assumed bycatch rate of canary rockfish. Fishers who have historically targeted arrowtooth have indicated that under this monthly trip limit, targeting arrowtooth will not be economically feasible. Further, these fishers believe that they can prosecute an arrowtooth fishery with a much lower canary bycatch rate, thereby allowing a higher arrowtooth catch.

This EFP is expected to provide much needed information that can be used to assess bycatch rates in the directed arrowtooth fishery which in turn may be used to establish trip limits in the future that maximize fishing opportunities on healthy stocks while meeting conservation goals for depleted stocks.

Without this EFP vessels would not be allowed to fish for arrowtooth flounder and petrale sole the Trawl Rockfish Conservation Area. According to some Washington fishermen, the majority of the arrowtooth flounder catch occurs inside this closed area.

E. A statement of whether the proposed experimental fishing has broader significance than the applicant’s individual goals.

The applicant of this EFP believes that the information collected during this experiment will have broader significance than the applicant’s individual goals by:

· Producing data on the amount and location of canary rockfish bycatch in the arrowtooth flounder fishery, which can be used to set appropriate management measures in the future (e.g., trip limits, area closures)

- Providing valuable and accurate data on the catch composition by species of the trawl flatfish fishery off the Washington coast,
- Providing a pilot program for assessing the feasibility of the retention of rockfish overages, and
- Providing a pilot program for experimenting with gear modifications to selectively fish for flatfish.
- Age and sex data may also be collected to aid in future groundfish stock assessments.

These data could allow the Council to establish trip limits in the future that maximize fishing opportunities on healthy stocks while meeting conservation goals for depleted stocks.

F. Vessels covered under the EFP:

Fishers covered under the EFP will include those who have historically participated in the targeted arrowtooth fishery off Washington. These fishers must:

- Have a 3-year cumulative total of at least 400,000 lbs of arrowtooth flounder landed into Washington in the following calendar years: 1998, 1999, and 2000,
- Have landed of arrowtooth flounder into Washington in all three consecutive years (1998, 1999, and 2000), and
- Be a Washington resident and have a valid Washington delivery permit

There are six vessels that meet this criteria. This EFP may include up to a total of eight vessels; therefore, the Department may issue up to two additional permits by designating additional criteria or by random drawing. A list of the fishers (and their designated vessels) that meet these criteria are attached.

G. A description of the species (target and incidental) to be harvested under the EFP and the amount(s) of such harvest necessary to conduct the experiment:

The targeted species is arrowtooth flounder which would not be subject to a monthly trip limit, but which would be constrained by the measured bycatch allowance of canary rockfish for the flatfish fishery. Fishers are currently allowed 300 lbs per month of canary rockfish with an assumed 16% discard rate (when applied, this equals 348 lbs total). Under the EFP, the bycatch allowance for canary rockfish would be divided as follows:

- Individual vessels would be limited to 175 lbs/month of canary rockfish for tows that are identified as directed arrowtooth tows by the skipper of the vessel (in advance) and all tows within the federal groundfish conservation area (GCA) for trawl. Once the 175 lbs of canary rockfish are caught, and if the vessel has already reached the current monthly trip limits for arrowtooth and petrale sole published in the Federal Register, then the vessel cannot have any directed arrowtooth tows for the rest of the month and cannot retain any more arrowtooth or petrale.

- Once 175 lbs/month of canary rockfish are caught, and if the vessel has **not** reached the current monthly trip limits for arrowtooth and petrale sole published in the Federal Register, then the vessel can continue to conduct directed arrowtooth tows until the current monthly trip limits for arrowtooth and petrale have been reached. Once those trip limits have been reached, the vessel cannot have any directed arrowtooth tows for the rest of the month and cannot retain any more arrowtooth or petrale.

- The balance of the canary rockfish would be used to accommodate the bycatch of canary while targeting other groundfish species.

- An individual bycatch cap of 700 lbs. of canary rockfish will also apply to each vessel. Once this cap has been reached by an individual vessel in directed tows, the vessel will not be allowed to continue to fish under the EFP.

- All tows conducted within the federal rockfish conservation area (RCA) for trawl will be considered "directed" tows.

- For all fishing under the EFP overall bycatch amounts would be as follows:
  Canary rockfish - 2.5 mt
  Darkblotched rockfish - 3.0 mt
  Widow rockfish - 3.0 mt
  POP - 18.0 mt
  Yelloweye rockfish - 0.5 mt

  Once one or more of these bycatch caps has been reached, the EFP will be terminated.

- Petrale sole caught in a directed arrowtooth tow would not be subject to a monthly trip limit.

- Other species could be landed under current trip limit levels and fishers could land up to the current limit of other flatfish in addition to their arrowtooth flounder landings. There is not expected to be any interactions with protected species (e.g., seabirds), ESA-listed species, nor marine mammals.

- Based upon the EFP programs conducted in 2001 and 2002, expected amounts of targeted species taken above trip limits in the arrowtooth EFP are:

Arrowtooth Flounder - 455 mt
Petrale sole - 36 mt

In addition, rockfish species taken in directed EFP tows and forfeited to the state as required (above trip limit or non-market size) are anticipated as follows:

Slope rockfish - 2.3 mt
Shelf rockfish - 2.7 mt
Yellowtail rockfish - 3.6 mt
S.spine thornyhead - 1.8 mt

Fish above trip limits taken in non-EFP tows would be consistent with fishing activities of the fleet at large and will be estimated separately.

General

- Incidental catches of rockfish in excess of the trip limit must be retained.

H. For each vessel covered by the EFP, the approximate time(s) and place(s) fishing will take place, and the type, size, and amount of gear to be used:

The EFP will be valid in Pacific Ocean waters adjacent to Washington, outside three miles. Vessels must fish north of 46°16'00" north latitude for all of their fishing strategies during the months of the EFP. ***The area open to the EFP will be further specified in the final EFP application.***

Approximate time for the experimental fishery is May 1-August 31, 2004.
Total estimated duration of the EFP: This is year 4 of 4 (final year).

Vessels covered by the EFP can use large footrope for directed arrowtooth tows on the slope only. Slope tows must be conducted entirely in depths greater than 120 fathoms. If a vessel uses small footrope while fishing in the RCA, the vessel may still retain and sell up to the higher trip limits for sablefish, Dover sole, arrowtooth, petrale, and other flatfish (large footrope only limits) for the duration of the EFP.
Vessels are allowed to have more than one type of gear onboard (large footrope, small footrope, and midwater gear).

All vessels fishing under the authority of the EFP must:

- Carry a Washington Department of Fish and Wildlife-provided observer or a federal observer onboard all fishing trips. State-sponsored observers must successfully complete an observer training course that prepares them for collecting data with sampling protocols as defined in the NMFS West Coast Groundfish Observer Program manual. In addition, NMFS observer coverage requirements at 50 CFR 660.360 are independent of EFP observer requirements, so vessels that carry state-sponsored observers may also be required to carry a

NMFS observer.

- Employ legal trawl gear as defined in current federal regulations. Vessels fishing under the EFP must experiment with flatfish selective gears (including excluders), including large footrope gears. ***Parameters for legal gear to be used under the EFP will be specified in the final EFP application.***

- Land all fish caught under the authority of the EFP into the State of Washington to a processor designated to participate in this program by the Washington Department of Fish and Wildlife. In order for a processor to be able to participate in this program, it must hold a contract with the Washington Department of Fish and Wildlife and abide by the conditions listed in the contract. Failure to abide by the conditions in the contract will result in revocation of the contract by the Director of the Washington Department of Fish and Wildlife.

- Hold a contract with the Washington Department of Fish and Wildlife and abide by the conditions listed in the contract. Failure to abide by the conditions in the contract and/or to follow the provisions in the EFP will result in revocation of the contract by the Director of the Department of Fish and Wildlife. The Director of the Department of Fish and Wildlife may modify the terms of the contract based on the status of the stocks which are caught incidentally in the experimental fishery.

I. The signature of the applicant:

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Washington Department of Fish and Wildlife

APPLICATION FOR ISSUANCE OF AN EXEMPTED (EXPERIMENTAL) FISHING PERMIT FOR NEARSHORE FLATFISH

A. Date of application: August 19, 2003

B. Applicant's names, mailing addresses, and telephone numbers:

Washington Department of Fish and Wildlife
600 Capitol Way North, Olympia, WA 98501-1091
Contacts: Philip Anderson (360) 902-2720
Brian Culver (360) 249-1205
Michele Robinson (360) 249-1211

C. A statement of the purpose and goals of the experiment for which an EFP is needed, including a general description of the arrangements for the disposition of all species harvested under the EFP.

Pacific Coast groundfish are managed by the Pacific Fishery Management Council under a federal fishery management plan (FMP). The management goals of the FMP are to:

1. Prevent overfishing by managing for appropriate harvest levels and prevent any net loss of the habitat of living marine resources.
2. Maximize the value of the groundfish resource as a whole.
3. Achieve the maximum biological yield of the overall groundfish fishery, promote year-round availability of quality seafood to the consumer, and promote recreational fishing opportunities.

The purpose of the experiment is to assist the Pacific Fishery Management Council in achieving the goals of the FMP by collecting bycatch data on overfished stocks to allow for informed management decisions in setting appropriate trip limits to maximize safe harvest levels of healthy stocks.

Specifically, the goals of the experiment are to:

- Measure bycatch rates for canary and other rockfish associated with the nearshore flatfish fishery through an at-sea observer program,
- Test selective flatfish gear off northern Washington in nearshore areas (< 150 fms), and
- Collect data that could be used to augment the National Marine Fisheries Service groundfish observer program.

With regard to the disposition of the species harvested under the EFP:

- Species caught within current trip limits as published in the Federal Register, may be retained by the vessel.

- Species caught in excess of current trip limits, but permitted within the EFP (i.e., English, rex, and Dover sole), will be retained by the vessel.
- Rockfish caught in excess of current trip limits, but required to be retained under the EFP, will be sold at fair market value and the revenue will be forfeited to the state.

· Valid justification explaining why issuance of an EFP is warranted:

Since 1998, the Pacific Council has initiated rebuilding plans for several species, including canary rockfish and widow rockfish. Critical to these rebuilding plans and to the overall improvement of groundfish management is the need for more and better scientific data. Fishery dependent data that is needed includes amount of total catch and catch location, as well as biological data (e.g., age and sex). There are 82 species covered under the Pacific coast groundfish FMP, and at present, there is little or no biological data on a large number of these species. There is a need for comprehensive, timely and credible data for priority species to aid in the conservation and rebuilding efforts for these stocks. The data collected under this EFP will include total catch (amount and species composition) data, catch location, bycatch data on associated species, and biological data.

Nearshore flatfish are an extremely important species in Washington groundfish fisheries. The stocks are healthy and Washington fishers and processors have worked aggressively to develop strong markets for these species. A large component of the Washington trawl fleet, and at least two major processors, are heavily dependent upon nearshore flatfish. Fishers targeting nearshore flatfish are currently constrained by their limit of canary rockfish. The current flatfish trip limit is based upon the assumed bycatch rate of canary rockfish. Fishers who have historically targeted flatfish have indicated that under this monthly trip limit, targeting flatfish will not be economically feasible. Further, these fishers believe that they can prosecute a nearshore flatfish fishery with a much lower canary bycatch rate, thereby allowing a higher flatfish catch.

This EFP is expected to provide much needed information that can be used to assess bycatch rates in the directed nearshore flatfish fishery which in turn may be used to establish trip limits in the future that maximize fishing opportunities on healthy stocks while meeting conservation goals for depleted stocks.

· A statement of whether the proposed experimental fishing has broader significance than the applicant's individual goals.

The applicant of this EFP believes that the information collected during this experiment will have broader significance than the applicant's individual goals by:

· Producing data on the amount and location of canary rockfish bycatch in the nearshore flatfish fishery, which can be used to set appropriate management measures in the future (e.g., trip limits, area closures)

- Providing valuable and accurate data on the catch composition by species of the trawl flatfish fishery off the Washington coast,
- Providing a pilot program for assessing the feasibility of the retention of rockfish overages, and
- Providing a pilot program for experimenting with gear modifications to selectively fish for flatfish.
- Age and sex data may also be collected to aid in future groundfish stock assessments.

These data could allow the Council to establish trip limits in the future that maximize fishing opportunities on healthy stocks while meeting conservation goals for depleted stocks.

F. Vessels covered under the EFP:

Fishers covered under the EFP will include those who have historically participated in the targeted nearshore flatfish fishery off Washington. These fishers must:

- Have a cumulative total of at least XXX lbs of nearshore flatfish landed into Washington in the following calendar years: ____________, and
- Be a Washington resident and have a valid Washington delivery permit

This EFP may include up to a total of six vessels; therefore, the Department may issue up to six permits by designating additional criteria or by random drawing. A list of the fishers (and their designated vessels) that meet these criteria are attached.

G. A description of the species (target and incidental) to be harvested under the EFP and the amount(s) of such harvest necessary to conduct the experiment:

The targeted species is nearshore flatfish which would not be subject to a monthly trip limit, but which would be constrained by the measured bycatch allowance of canary rockfish for the flatfish fishery. Under the EFP, the bycatch allowance for canary rockfish would be divided as follows:

- Individual vessels would be limited to 95 lbs/month of canary rockfish for tows that are identified as directed nearshore flatfish tows by the skipper of the vessel (in advance) and all tows within the federal rockfish conservation area (RCA) for trawl. Once the 95 lbs of canary rockfish are caught, and if the vessel has already reached the current monthly trip limits for nearshore flatfish species published in the Federal Register, then the vessel cannot have any directed nearshore flatfish tows for the rest of the month and cannot retain any more nearshore flatfish.

- Once 95 lbs/month of canary rockfish are caught, and if the vessel has **not** reached the current monthly trip limits for nearshore flatfish published in the Federal Register, then the vessel can continue to conduct directed nearshore flatfish tows until the current monthly trip limits for nearshore flatfish have been reached. Once those trip limits have been reached, the vessel cannot have any directed nearshore flatfish tows for the rest of the month and cannot retain any more nearshore flatfish.

- The balance of the canary rockfish would be used to accommodate the bycatch of canary while targeting other groundfish species.

- An individual bycatch cap of 380 lbs. of canary rockfish will also apply to each vessel. Once this cap has been reached by an individual vessel in directed tows, the vessel will not be allowed to continue to fish under the EFP.

- All tows conducted within the federal rockfish conservation area (RCA) for trawl will be considered "directed" tows.

- For all fishing under the EFP overall bycatch amounts would be as follows:
  Canary rockfish - 1.0 mt
  Widow rockfish - 1.0 mt
  Yelloweye rockfish - 0.1 mt

  Once one or more of these bycatch caps has been reached, the EFP will be terminated.

- Other species could be landed under current trip limit levels. There is not expected to be any interactions with protected species (e.g., seabirds), ESA-listed species, nor marine mammals.

- The expected amounts of targeted species taken above trip limits in the nearshore flatfish EFP are:
  XXX

In addition, rockfish species taken in directed EFP tows and forfeited to the state as required (above trip limit or non-market size) are anticipated as follows:

Slope rockfish - 0
Shelf rockfish - 1.0 mt
Yellowtail rockfish - 3.0 mt
S.spine thornyhead - 0 mt

Fish above trip limits taken in non-EFP tows would be consistent with fishing activities of the fleet at large and will be estimated separately.

<u>General</u>

- Incidental catches of rockfish in excess of the trip limit must be retained.

H. For each vessel covered by the EFP, the approximate time(s) and place(s) fishing will take place, and the type, size, and amount of gear to be used:

The EFP will be valid in Pacific Ocean waters adjacent to Washington, outside three miles. Vessels must fish north of Destruction Island and in waters shallower than 150 fms for all of their fishing strategies during the months of the EFP. ***The area open to the EFP will be further specified in the final EFP application.***

Approximate time for the experimental fishery is March 1-June 30, 2004.
Total estimated duration of the EFP: This is year 1 of 2.

Vessels covered by the EFP must use small footrope for directed nearshore flatfish tows and while fishing in the RCA.

All vessels fishing under the authority of the EFP must:

- Carry a Washington Department of Fish and Wildlife-provided observer or a federal observer onboard all fishing trips. State-sponsored observers must successfully complete an observer training course that prepares them for collecting data with sampling protocols as defined in the NMFS West Coast Groundfish Observer Program manual. In addition, NMFS observer coverage requirements at 50 CFR 660.360 are independent of EFP observer requirements, so vessels that carry state-sponsored observers may also be required to carry a NMFS observer.

- Employ legal trawl gear as defined in current federal regulations. Vessels fishing under the EFP must experiment with flatfish selective gears (including excluders). ***Parameters for legal gear to be used under the EFP will be specified in the final EFP application.***

- Land all fish caught under the authority of the EFP into the State of Washington to a processor designated to participate in this program by the Washington Department of Fish and Wildlife. In order for a processor to be able to participate in this program, it must hold a contract with the Washington Department of Fish and Wildlife and abide by the conditions listed in the contract. Failure to abide by the conditions in the contract will result in revocation of the contract by the Director of the Washington Department of Fish and Wildlife.

- Hold a contract with the Washington Department of Fish and Wildlife and abide by the conditions listed in the contract. Failure to abide by the conditions in the contract and/or to follow the provisions in the EFP will result in revocation of the contract by the Director of the Department of Fish and Wildlife. The Director of the Department of Fish and Wildlife may modify the terms of the contract based on the status of the stocks which are caught incidentally in the experimental fishery.

I. The signature of the applicant:

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Washington Department of Fish and Wildlife

APPLICATION FOR ISSUANCE OF AN EXEMPTED (EXPERIMENTAL) FISHING PERMIT FOR POLLOCK

A. Date of application: August 19, 2003

B. Applicant's names, mailing addresses, and telephone numbers:

Washington Department of Fish and Wildlife
600 Capitol Way North, Olympia, WA 98501-1091
Contacts: Philip Anderson (360) 902-2720
Brian Culver (360) 249-1205
Michele Robinson (360) 249-1211

C. A statement of the purpose and goals of the experiment for which an EFP is needed, including a general description of the arrangements for the disposition of all species harvested under the EFP.

Pollock are not part of the Pacific Fishery Management Council's groundfish fishery management plan (FMP); however, the State of Washington plans to pursue including pollock in the FMP in the near future. In the interim, the purpose of the experiment is to assist the Pacific Fishery Management Council and the State of Washington in achieving the goals of the FMP which are to:

1. Prevent overfishing by managing for appropriate harvest levels and prevent any net loss of the habitat of living marine resources.
2. Maximize the value of the groundfish resource as a whole.
3. Achieve the maximum biological yield of the overall groundfish fishery, promote year-round availability of quality seafood to the consumer, and promote recreational fishing opportunities.

by collecting bycatch data on overfished stocks and other species of fish to allow for informed management decisions in setting appropriate trip limits to maximize safe harvest levels of healthy stocks.

Specifically, the goals of the experiment are to:

- Measure bycatch rates for rockfish, whiting, and prohibited species associated with the midwater trawl pollock fishery through an at-sea observer program, and
- To allow participating fishers to land unsorted groundfish catches.

With regard to the disposition of the species harvested under the EFP:

- Species caught within current trip limits as published in the Federal Register, may be retained by the vessel.

- Groundfish caught in excess of current trip limits, but required to be retained under the EFP, will be sold at fair market value and the revenue will be forfeited to the state.

D. Valid justification explaining why issuance of an EFP is warranted:

In July 2002, there were three midwater trawl vessels who participated in the coastal whiting fishery that discovered harvestable quantities of pollock off the northern coast of Washington. This stock is primarily located off the West Coast of Vancouver Island, and occasionally moves south to be available off Washington approximately every five to seven years. The length of time that they are available south of the U.S./Canada border is unknown.

The nature of the midwater pollock fishery is similar to the whiting fishery in that sorting catches at sea is difficult, at best. While fishers are targeting pollock (state managed species), there are encounters with non-target species, such as yellowtail rockfish and whiting (federally managed species). One of the primary problems associated with these incidental catches is that the federal species are, at times, either prohibited or subject to a trip limit. Because the nature of the fishery makes it difficult to comply with these federal regulations, the Washington Department of Fish and Wildlife adopted an emergency regulation in September 2002 to close the state pollock fishery. Therefore, while the pollock resource is available off the Washington coast, fishers are not able to target them and economically profit from the opportunity.

Additionally, the State of Washington is pursuing adding pollock to the list of management unit species under the West Coast groundfish fishery management plan. If this occurs over the long-term, then the EFP would have allowed us to collect much-needed bycatch data on this fishery prior to it becoming federally managed. Fishery dependent data that is needed includes amount of total catch and catch location, as well as biological data (e.g., age and sex). The data collected under this EFP will include total catch (amount and species composition) data, catch location, bycatch data on associated species, and biological data. These data can then be used to assess bycatch rates in the directed pollock fishery which in turn may be used to establish trip limits in the future that maximize fishing opportunities on healthy stocks while meeting conservation goals for depleted stocks.

Without this EFP vessels would not be allowed to fish for pollock, as the sorting requirements would not be feasible.

E. A statement of whether the proposed experimental fishing has broader significance than the applicant's individual goals.

The applicant of this EFP believes that the information collected during this experiment will have broader significance than the applicant's individual goals by:

· Producing data on the amount and location of rockfish and whiting bycatch in the midwater trawl pollock fishery, which can be used to set appropriate management measures in the future (e.g., trip limits, area closures)

- Providing valuable and accurate data catch composition by species of the midwater trawl pollock fishery off the Washington coast, and
- Provide a pilot program for assessing the feasibility of the retention of groundfish overages.
- Age and sex data may also be collected to aid in future groundfish stock assessments.

These data could allow the Council to establish trip limits in the future that maximize fishing opportunities on healthy stocks while meeting conservation goals for depleted stocks.

F. Vessels covered under the EFP:

Fishers covered under the EFP will include those who have historically participated in the targeted pollock fishery off Washington. These fishers must:

- Have landed pollock from directed midwater trips into Washington in 2002; and
- Have a valid Washington delivery permit

There are three vessels that meet this criteria. A list of the fishers (and their designated vessels) that meet these criteria are attached.

G. A description of the species (target and incidental) to be harvested under the EFP and the amount(s) of such harvest necessary to conduct the experiment:

The targeted species is pollock which would not be subject to a monthly trip limit, but which would be constrained by the measured bycatch allowance of canary and widow rockfish. Under the EFP, the bycatch allowances for canary and widow rockfish would be divided as follows:

- Individual vessels would be limited to 500 lbs/month of widow rockfish for tows that are identified as directed pollock tows by the skipper of the vessel (in advance) and all tows within the federal rockfish conservation area (RCA) for trawl. Once the 500 lbs of widow rockfish are caught, the vessel cannot have any directed pollock tows for the rest of the month.

- An individual bycatch cap of 200 lbs. of canary rockfish will also apply to each vessel. Once this cap has been reached by an individual vessel in directed tows, the vessel will not be allowed to continue to fish under the EFP.

- All tows conducted within the federal RCA for trawl will be considered “directed” tows.

- For all fishing under the EFP overall bycatch amounts would be as follows:
  Canary rockfish - 0.1 mt
  Widow rockfish - 3.0 mt
  Yelloweye rockfish - 0.1 mt
  Pacific whiting - 1,000 mt

  Once one or more of these bycatch caps has been reached, the EFP will be terminated.

- Expected amounts of targeted species taken in the pollock EFP are:
  Pollock - 9,000 mt

In addition, rockfish species taken in directed EFP tows and forfeited to the state as required (above trip limit or non-market size) are anticipated as follows:
Yellowtail rockfish - 5.0 mt

Fish above trip limits taken in non-EFP tows would be consistent with fishing activities of the fleet at large and will be estimated separately.

- Other species could be landed under current trip limit levels; however, it is not anticipated that the participating vessels will fish for groundfish other than pollock for the duration of the EFP. There is not expected to be any interactions with protected species (e.g., seabirds), ESA-listed species, nor marine mammals.

General

- Incidental catches of all groundfish (except spiny dogfish) in excess of the trip limit must be retained.

H. For each vessel covered by the EFP, the approximate time(s) and place(s) fishing will take place, and the type, size, and amount of gear to be used:

The EFP will be valid in Pacific Ocean waters adjacent to Washington, outside three miles. Vessels must fish north of 46°16'00" north latitude for all of their fishing strategies during the months of the EFP.

Approximate time for the experimental fishery is August 1-October 31, 2004.
Total estimated duration of the EFP: This is year 2 of 2 (final year).

All vessels fishing under the authority of the EFP must:

- Carry a Washington Department of Fish and Wildlife-provided observer or a federal observer onboard all fishing trips. State-sponsored observers must successfully complete an observer training course that prepares them for collecting data with sampling protocols as defined in the NMFS West Coast Groundfish Observer Program manual. In addition, NMFS observer coverage requirements at 50 CFR 660.360 are independent of EFP observer requirements, so vessels that carry state-sponsored observers may also be required to carry a NMFS observer.

- Employ legal midwater trawl gear as defined in current federal regulations.

- Land all fish caught under the authority of the EFP into the State of Washington to a processor designated to participate in this program by the Washington Department of Fish and Wildlife. In order for a processor to be able to participate in this program, it must hold a contract with the Washington Department of Fish and Wildlife and abide by the conditions listed in the contract. Failure to abide by the conditions in the contract will result in revocation of the contract by the Director of the Washington Department of Fish and Wildlife.

- Hold a contract with the Washington Department of Fish and Wildlife and abide by the conditions listed in the contract. Failure to abide by the conditions in the contract and/or to follow the provisions in the EFP will result in revocation of the contract by the Director of the Department of Fish and Wildlife. The Director of the Department of Fish and Wildlife may modify the terms of the contract based on the status of the stocks which are caught incidentally in the experimental fishery.

I. The signature of the applicant:

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Washington Department of Fish and Wildlife

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APPLICATION FOR ISSUANCE OF AN EXEMPTED (EXPERIMENTAL) FISHING PERMIT FOR SPINY DOGFISH

A. Date of application: August 19, 2003

B. Applicant's names, mailing addresses, and telephone numbers:

Washington Department of Fish and Wildlife
600 Capitol Way North, Olympia, WA 98501-1091
Contacts: Philip Anderson (360) 902-2720
Brian Culver (360) 249-1205
Michele Robinson (360) 249-1211

C. A statement of the purpose and goals of the experiment for which an EFP is needed, including a general description of the arrangements for the disposition of all species harvested under the EFP.

Pacific Coast groundfish are managed by the Pacific Fishery Management Council under a federal fishery management plan (FMP). The management goals of the FMP are to:

1. Prevent overfishing by managing for appropriate harvest levels and prevent any net loss of the habitat of living marine resources.
2. Maximize the value of the groundfish resource as a whole.
3. Achieve the maximum biological yield of the overall groundfish fishery, promote year-round availability of quality seafood to the consumer, and promote recreational fishing opportunities.

The purpose of the experiment is to assist the Pacific Fishery Management Council in achieving the goals of the FMP by collecting bycatch data on overfished stocks to allow for informed management decisions in setting appropriate trip limits to maximize safe harvest levels of healthy stocks.

Specifically, the goals of the experiment are to:

- Measure bycatch rates for canary, yelloweye and other rockfish associated with the longline dogfish fishery through an at-sea observer program, and
- Collect data that could be used to augment the National Marine Fisheries Service groundfish observer program.

With regard to the disposition of the species harvested under the EFP:

- Species caught within current trip limits, as published in the Federal Register, may be retained by the vessel.
- Groundfish caught in excess of current trip limits, but required to be retained under

the EFP, will be sold at fair market value and the revenue will be forfeited to the state

D. Valid justification explaining why issuance of an EFP is warranted:

Since 1998, the PFMC has initiated rebuilding plans for several species including canary and yelloweye rockfish. Critical to these rebuilding plans and to the overall improvement of the ground fish management, is the need for more and better scientific data. Fishery dependent data that is needed includes amount of total catch and catch location, as well as biological data (e.g., age and sex). There are 82 species covered under the Pacific Coast groundfish FMP, and at present, there is little or no biological data on a large number of these species. There is a need for comprehensive, timely and credible data for priority species to aid in the conservation and rebuilding efforts for these stocks. The data collected under this EFP will include total catch (amount and species composition) data, catch location, bycatch data on associated species, and biological data.

Spiny dogfish is an extremely important species in Washington groundfish fisheries. The stock is healthy, and Washington fishermen and processors have worked aggressively to develop and maintain strong markets for this species. A number of Washington groundfish longline fishers and at least one major processor are heavily dependent upon spiny dogfish. Fishermen targeting dogfish are currently constrained by their limit of yelloweye and canary rockfish. In 2002, dogfish were prohibited for fixed gear due to the associated bycatch of yelloweye rockfish. Fishermen who have historically targeted dogfish have indicated that under without a bycatch allowance of yelloweye and canary rockfish, the dogfish fishery cannot be pursued. Further, these fishermen believe that they can pursue a dogfish fishery with a much lower yelloweye and canary bycatch rate than data indicates, thereby allowing a dogfish fishery to continue. This EFP is expected to provide much needed information that can be used to assess bycatch rates in the directed dogfish fishery which in turn may be used to establish trip limits in the future that maximize fishing opportunities on healthy stocks while meeting conservation goals for depleted stocks.

Without this EFP vessels would not be allowed to fish for dogfish and other groundfish within the Non-Trawl Groundfish Conservation Area (< 100 fms north of 40°10'N latitude). According to some Washington longline dogfish fishermen, the majority of the dogfish catch occurs inside this closed area.

E. A statement of whether the proposed experimental fishing has broader significance than the applicant’s individual goals.

The applicant of this EFP believes that the information collected during this experiment will have broader significance than the applicant’s individual goals by:

- Producing data on the amount and location of rockfish bycatch in the longline dogfish fishery; which can be used to set appropriate management measures in the future (e.g., trip limits, area closures)

- Providing valuable and accurate data on the catch composition by species in the longline dogfish fishery off the Washington coast, and
- Providing a pilot program for assessing the feasibility of the retention of groundfish overages.
- Age and sex data may also be collected to aid in future groundfish stock assessments

These data could allow the Council to establish trip limits in the future that maximize fishing opportunities on healthy stocks while meeting conservation goals for depleted stocks.

F. Vessels covered under the EFP:

Fishers covered under the EFP will include those who have historically participated in the targeted arrowtooth fishery off Washington. These fishers must:

- Have a 3-year cumulative total of at least 300,000 lbs of spiny dogfish landed into Washington in the following calendar years: 2000, 2001, and 2002 with longline gear,
- Have landed spiny dogfish with longline gear into Washington in all three consecutive years (2000, 2001, and 2002), and
- Be a Washington resident and have a valid Washington delivery permit

There are three vessels that meet this criteria; however, since two of the three qualifying vessels will not be participating, the Department may issue up to two replacement permits by designating additional criteria or by random drawing. A list of the fishers (and their designated vessels) that meet these criteria are attached.

G. A description of the species (target and incidental) to be harvested under the EFP and the amount(s) of such harvest necessary to conduct the experiment:

The targeted species is spiny dogfish which would not be subject to a monthly trip limit, but which would be constrained by the measured bycatch allowance of canary and yelloweye rockfish. Under the EFP, the bycatch allowances for canary and yelloweye rockfish would be divided as follows:

- Individual vessels would be limited to 75 lbs of canary rockfish and 185 lbs/month of yelloweye rockfish for sets within the federal rockfish conservation area (RCA) for longline (< 100 fms north of 40°10'). Once the 185 lbs of yelloweye rockfish are caught, the vessel cannot fish in the RCA for the rest of the month. Once the 75 lbs of canary rockfish are caught, the vessel can no longer participate in the EFP.

- For all fishing under the EFP overall bycatch amounts would be as follows:

Canary rockfish - 0.1 mt
Yelloweye rockfish - 1.0 mt
Widow rockfish - 0.5 mt
Darkblotched rockfish - 0.5 mt
Pacific ocean perch - 0.5 mt
Lingcod - 2.0 mt
Once one or more of these bycatch caps has been reached, the EFP will be terminated.

- Other species could be landed under current trip limit levels, however, it is not anticipated that the participating vessels will fish for groundfish other than dogfish for the duration of the EFP. There is not expected to be any interactions with protected species (e.g., seabirds), ESA-listed species, nor marine mammals.

- Expected amounts of targeted species taken in the dogfish EFP are:
  Spiny dogfish - 300 mt

Fish above trip limits taken in non-EFP sets would be consistent with fishing activities of the fleet at large and will be estimated separately.

General

- Incidental catches of all groundfish in excess of the trip limit must be retained.

H. For each vessel covered by the EFP, the approximate time(s) and place(s) fishing will take place, and the type, size, and amount of gear to be used:

The EFP will be valid in Pacific Ocean waters adjacent to Washington, outside three miles. Vessels must fish north of 46°16'00" north latitude for all of their fishing strategies during the months of the EFP. ***The area open to the EFP will be further specified in the final EFP application.***

Approximate time for the experimental fishery is February 1-May 31, 2004.
Total estimated duration of the EFP: This is year 2 of 2 (final year).

All vessels fishing under the authority of the EFP must:

- Carry a Washington Department of Fish and Wildlife-provided observer or a federal observer onboard all fishing trips. State-sponsored observers must successfully complete an observer training course that prepares them for collecting data with sampling protocols as defined in the NMFS West Coast Groundfish Observer Program manual. In addition, NMFS observer coverage requirements at 50 CFR 660.360 are independent of EFP observer requirements, so vessels that carry state-sponsored observers may also be required to carry a NMFS observer.

- Employ legal longline gear as defined in current federal regulations.

- Land all fish caught under the authority of the EFP into the State of Washington to a processor designated to participate in this program by the Washington Department of Fish and Wildlife. In order for a processor to be able to participate in this program, it must hold a contract with the Washington Department of Fish and Wildlife and abide by the conditions listed in the contract. Failure to abide by the conditions in the contract will result in revocation of the contract by the Director of the Washington Department of Fish and Wildlife.

- Hold a contract with the Washington Department of Fish and Wildlife and abide by the conditions listed in the contract. Failure to abide by the conditions in the contract and/or to follow the provisions in the EFP will result in revocation of the contract by the Director of the Department of Fish and Wildlife. The Director of the Department of Fish and Wildlife may modify the terms of the contract based on the status of the stocks which are caught incidentally in the experimental fishery.

I. The signature of the applicant:

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Washington Department of Fish and Wildlife

Exhibit C.6
Attachment 1
September 2003

DRAFT

PROPOSED ACCEPTABLE BIOLOGICAL CATCH AND OPTIMUM YIELD SPECIFICATIONS AND MANAGEMENT MEASURES

FOR THE

2004 PACIFIC COAST GROUNDFISH FISHERY

CONSISTENT WITH THE MAGNUSON-STEVENS ACT, NATIONAL ENVIRONMENTAL POLICY ACT, AND OTHER LEGAL MANDATES

PREPARED BY
THE PACIFIC FISHERY MANAGEMENT COUNCIL
7700 NE AMBASSADOR PLACE, SUITE 200
PORTLAND, OR 97220
(503) 820-2280
WWW.PCOUNCIL.ORG

IN COOPERATION WITH THE

NATIONAL MARINE FISHERIES SERVICE

SEPTEMBER 2003

TABLE OF CONTENTS

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1.0 INTRODUCTION

1.1 How This Document is Organized

This document provides background information about, and analysis of, harvest specifications and management measures for fisheries covered by the *Pacific Coast Groundfish Fishery Management Plan* (FMP) and developed by the Pacific Fishery Management Council (hereafter, the Council). These measures must conform to the Magnuson-Stevens Fishery Conservation and Management Act (MSA), the principal legal basis for fishery management within the Exclusive Economic Zone (EEZ), which extends from the outer boundary of the territorial sea to a distance of 200 nautical miles from shore. In addition to addressing MSA mandates, this document is organized so that it contains the analyses required under the National Environmental Policy Act (NEPA), the Regulatory Flexibility Act (RFA), and Executive Order (EO) 12866, which mandates an analysis similar to the RFA. For the sake of brevity, this document is referred to as an Environmental Impact Statement (EIS), although it address the mandates just mentioned and may also be considered an Initial Regulatory Flexibility Analysis (IRFA) pursuant to the RFA and a Regulatory Impact Review (RIR) pursuant to EO 12866.

This EIS is divided into the following eight chapters:

The rest of this chapter discusses why the Council must establish management measures for fisheries anticipated to catch groundfish in 2004 and the process that has been used to develop these measures. This description of ***purpose and need*** defines the need for, and goals and objectives of, the proposed action, which also defines the scope of the subsequent analysis. Chapter 1 also describes the scoping process by which Council and NMFS staff identified the range of alternatives and the potentially significant environmental impacts to be analyzed in this document.

Chapter 2 outlines different ***alternatives*** the Council considered to address the purpose and need. One of these alternatives is chosen by the Council as its preferred alternative, representing the harvest specifications and management measures that could be applied in 2004. Each alternative has two components. One is a specification of an optimum yield (OY) for each species or species complex managed under the groundfish FMP. These OYs represent the total fishing mortality (which includes bycatch mortality) that stocks can safely sustain. Each alternative also contains a suite of management measures that can be periodically implemented through the management framework described in the FMP. These measures include gear restrictions, limits on how many fish a vessel can catch in a specified time period (referred to as trip limits), closed areas, and for recreational fisheries, bag limits and seasons. The allocation of fishing opportunity between fishery sectors and the states (usually expressed as percentage shares of a species' OY) is another important component of each alternative. The suite of management measures in each alternative is crafted so as to constrain total fishing mortality, across all fishery sectors, to a level at or below the OY for each identified species or species complex.

Chapter 3 describes the ***affected environment***, or baseline environmental and social conditions as they exist before implementation of the proposed action.

Chapter 4 assesses the potential ***environmental and socioeconomic impacts*** of the alternatives outlined in Chapter 2. This analysis compares and contrasts the alternatives and evaluates how the human environment will be changed by the proposed action in comparison to the baseline conditions described in Chapter 3.

Chapter 5 explains how these management measures are consistent with the groundfish FMP and 10 National Standards set forth in the MSA (§301(a)) and governing plans, plan amendments, and pursuant regulations.

Chapter 6 describes how this EIS addresses relevant laws and EOs, other than the MSA. As appropriate, it also includes additional information and determinations required by these mandates.

Chapters 7 and 8 provide background information on the staff who prepared this document and its distribution to other agencies and interested parties.

1.2 Purpose and Need for the Proposed Action

The proposed action falls within the management framework described in the groundfish FMP, which enumerates 18 objectives that management measures must satisfy (organized under three broad goals), describes more specific criteria for determining the level of harvest that will provide the greatest overall benefit to the Nation (defined as optimum yield), and authorizes the range and type of measures that may be used to achieve optimum yield. The management regime described in the groundfish FMP is itself consistent with 10 National Standards described in the MSA. Harvest specifications (OYs) and management measures must be consistent with the goals, objectives, and management framework described in the groundfish FMP.

1.2.1 The Proposed Action

The Council's *proposed action*, evaluated in this document, is to specify acceptable biological catch (ABC) and OY values for species and species complexes in the fishery management unit and establish management measures to constrain total fishing mortality to these specifications. These specifications and management measures will be established for calendar year 2004, although they are considered within the context of past management and long-term sustainability of managed fish stocks. Harvest specifications for 2004 include new harvest levels for species withe new stock assessments and re-established harvest levels for species with stock assessments completed in prior years. Long-term management programs, such as capacity reduction programs, are not developed as part of the annual management process, but in separate Council deliberations. Management measures may be modified in 2004 so that total fishing mortality is at the OYs identified in the preferred alternative. The environmental impact of any such changes in management measures is expected to fall within the range of impacts evaluated in this EIS. Federally-managed Pacific groundfish fisheries occurring off the coasts of Washington, Oregon, and California (WOC) establish the geographic context for the proposed action.

1.2.2 Need (Problems for Resolution)

The proposed action is needed to constrain commercial and recreational harvests in 2004 to levels that will ensure groundfish stocks are maintained at, or restored to, sizes and structures that will produce the highest net benefit to the nation, while balancing environmental and social values.

1.2.3 Purpose of the Proposed action

The purpose of this action is to ensure that Pacific Coast groundfish subject to federal management are harvested at OY during 2004 and in a manner consistent with the aforementioned groundfish FMP and National Standards Guidelines (50 CFR 600 Subpart D), using routine management tools available to the specifications and management measures process (FMP at 6.2.1, 50 CFR 660.323(b)). Chapter 5 of this EIS describes how the proposed action (preferred alternative) is consistent with the FMP and MSA.

1.3 Background

1.3.1 Background to Purpose and Need

Marine fish are "common pool" resources with access and use stemming from the public trust doctrine. It is difficult to exclude people from using a common pool resource, because of the physical characteristics of these resources (Ostrom 1990). (Fish are a relatively mobile, "fugitive" resource, making it impossible for any one individual to precisely know their location or control their distribution.) A fish stock is also "subtractable," meaning that exploitation by any one person diminishes the total amount available to others. Under the common law public trust doctrine, resources in ocean areas under U.S. jurisdiction are believed to be held in trust by government to satisfy a broadly-defined public interest (Committee to Review Individual Fishing Quotas 1999). This doctrine also makes a legally defensible exclusive property right to fishery resources difficult or impossible (at least before fish are harvested). The MSA, originally enacted in 1976 as part of the extension of jurisdiction to the 200-mile EEZ (and most recently amended in 1996), establishes the goals, standards, responsibilities, and processes needed to address the characteristics of the fishery resource. A paramount purpose is to "conserve and manage the fishery resources found off the coasts of the United States" (§2(b)(1)). This Act delegates management responsibility to the U.S. Secretary of Commerce (Secretary) who, with the aid of eight regional fishery management councils and through the National Marine Fisheries Service (NMFS), implements measures to ensure the conservation and management goals of the MSA and fulfills the trust responsibility. Councils develop FMPs describing how particular species and fisheries will be managed. The Pacific Fishery Management Council was assigned stewardship responsibilities for the fish resources in the EEZ off the Pacific Coast (see Figure 1.4-1) and first approved the groundfish FMP in 1982.[1]

Chapter 6 in the groundfish FMP describes the management measures the Council may recommend NMFS use and the process of establishing and adjusting such measures. Various biological reference points and information on fishery performance are used to determine, on an annual basis, the OY for particular species or species groups. (See Section 3.2. for a description of these reference points.) The groundfish FMP also describes "points of concern" and socioeconomic frameworks, which help managers determine whether and what types of management measures are needed. Section 6.2 of the groundfish FMP describes the deliberative process the Council must follow and the parallel process NMFS uses to translate Council recommendations into regulations. NEPA-mandated environmental impact assessment is a central component of this process. (Due to recent litigation, *Natural Resources Defense Council* v. *Evans* discussed below, the current process differs somewhat from what is described in the groundfish FMP. The NEPA analysis has gained greater prominence, and there is more opportunity for public notice and comment during rulemaking.)

1.3.2 Background to Groundfish Management and the Annual Specifications Process

The groundfish FMP lists three overall goals to guide the management process:

1. Conservation - prevent overfishing by managing for appropriate harvest levels and prevent any net loss of habitat of living marine resources.
2. Economics - maximize the value of the groundfish resource as a whole.

1/ The groundfish FMP has been amended 13 times to date.

3. Utilization - achieve the maximum biological yield of the overall groundfish fishery, promote year-round availability of quality seafood to the consumer, and promote recreational fishing opportunities.

A variety of management measures have been employed to achieve these goals, including gear restrictions, a license limitation program, time/area closures, the specification of OYs or other harvest limitations for some species, seasons, and trip/cumulative landing limits, which are limitations on the amount of certain species that may be caught, retained, and landed by any vessel. The groundfish FMP allows harvest guidelines and quotas to be re-specified on a periodic basis. Harvest guidelines are specified numerical harvest objectives which are treated as targets but not absolute limitations. Therefore, a fishery does not have to be closed if its harvest guideline is reached, although the Council may choose to do so. All recent numerical harvest specifications, including OY values, have been harvest guidelines. A quota is defined as a specified numerical harvest objective, the attainment (or expected attainment) of which causes closure of the fishery for that species or species group. The main use of harvest guidelines and quotas recently has been to designate allocations and sub-components of a specified OY.

In accordance with the groundfish FMP, since 1990 the Council has annually set Pacific Coast groundfish harvest specifications (acceptable and sustainable harvest amounts) and management measures designed to achieve those harvest specifications. Of the more than 80 groundfish species managed under the FMP, only about 20 are assessed for stock size and status on a regular basis. As a general principal, assessments are scheduled for stocks on a three-year rotating basis, although the actual schedule can vary due to the availability of scientists to conduct the assessments and the role a stock plays in structuring management measures. Thus, when the Council recommends a new set of harvest specifications in a given year, normally only specifications for those species with new assessments, or past assessments containing an OY projection for the coming year, are changed from the previous year's value. In addition, nine groundfish species have been declared overfished by the Secretary of Commerce, pursuant to provisions in the MSA.[2] Based on stock assessments, scientists have conducted rebuilding analyses for these species in order to determine suitable harvest levels consistent with the rebuilding framework established by the MSA and the groundfish FMP.[3] For these species, the rebuilding analysis represents an additional analytical step used to determine an OY. OYs for unassessed stocks are based on more limited data, such as catch history, and are not usually changed year to year.

Proposed 2004 OYs differ from 2003 values for 12 stocks (see Table 2.x-x). Five of these are based on data from new stock assessments conducted in 2003, and in the case of overfished species, updated rebuilding analyses using the new assessment information.[4] Of the remaining seven stocks, new values for all but Pacific whiting are based on projections contained in assessments conducted in earlier years. In the case of Pacific whiting a new assessment will be completed by March 2004, in time for the May 1 start of this fishery. The range of whiting OYs evaluated in this EIS captures the range of potential values expected from that assessment. In summary, the alternatives described in Chapter 2 are structured around different OY

2/ Table 3.2-2 lists the overfished species and associated rebuilding parameters. The species are: bocaccio (*Sebastes levis*), cowcod (*S. levis*), canary rockfish (*S. pinninger*), darkblotched rockfish (*S. crameri*), Pacific ocean perch (*S. alutus*), widow rockfish (*S. entomalas*), yelloweye rockfish (*S. ruberimus*), lingcod (*Ophidon elongates*), and Pacific whiting (*Merluccius productus*).

3/ Amendment 16-1 to the groundfish FMP, establishing a framework for rebuilding overfished stocks, is currently under NMFS review.

4/ These are: bocaccio, Pacific ocean perch, and widow rockfish, which have been declared overfished; and black rockfish (*Sebastes melanops*) and yellowtail rockfish (*S. flavidus*), which are considered healthy stocks.

values for a limited number of stocks. However, the different management measures needed to achieve these OYs can limit catches of other species, resulting in large differences among the alternatives in terms of actual landings.

In order to rebuild overfished groundfish species while satisfying the groundfish FMP's resource utilization goal, Council policy is to use management measures that discourage or prevent targeting of these species. The Council has also recommended management policies to reduce the incidental catch of overfished species taken in fisheries targeting healthier stocks. In 2002 the Council began using an analysis of the incidental catch rates of particular overfished species taken in trawl fisheries targeting healthy stocks.[5] Then, in setting management measures for the year, the Council recommended trip limit combinations that allowed higher landings of healthy stocks in months and seasons when those healthy stocks co-occur less frequently with overfished stocks. Since that time a "trawl bycatch model" has been developed by NMFS (Hastie 2001; Hastie [2003]), which is used to project total fishing mortality in the limited entry groundfish trawl fishery for key species, based on a given set of management measures.[6] In late 2002 the Council also implemented large closed areas for commercial groundfish fisheries, which are intended to prohibit fishing in depth ranges where certain overfished species are most abundant. These "Rockfish Conservation Areas" were a key feature of 2003 management. Observer data from the first year of the West Coast groundfish observer program (August 2001 through August 2002) also became available in early 2003. Although still relatively limited, the Council directed that these data should be used to estimate total fishing mortality beginning in mid-2003. The trawl bycatch model has been continually updated, both to evaluate the effect of different closed area configurations on total fishing mortality and to incorporate new bycatch rates based on observer data (Hastie 2003).

The main issues considered in 2003 play a role in the development of management measures for 2004: key overfished species will continue to constrain harvest opportunities for healthier stocks. In response, various combinations of sector-specific trip limits and closed area configurations will be a central management feature. Finally, the availability of a second year's worth of observer data (September 2002 through August 2003), available in early 2004, could lead to adjustments in the bycatch rates used in modeling projected total fishing mortality. This could require inseason changes in management measures, as occurred in 2003. In addition, sufficient data may be available to extend model-based bycatch projections to other fishery sectors in addition to limited entry trawl.

In summary, in addition to a general need to manage fisheries for sustainable harvests, the proposed action satisfies several objectives. Management is based on "the best available science," the second National Standard enumerated in the MSA. Regular stock assessments for target species in groundfish fisheries, whenever possible, are an example of the application of this requirement. Managers are improving the quality of data and analysis; this supports assessment and catch accounting. Because of the decline in several groundfish stocks revealed by these assessments, preventing overfishing and rebuilding overfished stocks is a paramount concern. However, the ability of fishers to access healthy stocks is also considered, because

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5/ Incidental catch includes retained catch of non-target species and discards. The MSA defines bycatch as "fish which are harvested in a fishery, but which are not sold or kept for personal use . . ." Bycatch, under the MSA definition, accords with discards, as the term is used here.

6/ The number of trawl vessels targeting Pacific Coast groundfish is limited by a licensing program established in the groundfish FMP. Although only one of several fishery sectors catching groundfish, a large proportion of total groundfish landings is attributable to this sector. Accurately predicting total catch mortality in this sector is, therefore, crucial in determining how well a given set of management measures will constrain fishing to OYs.

a competing goal in the groundfish FMP is to maximize the value of the groundfish resource. Striking this balance between conservation of and direct social benefit from groundfish is another way to understand the purpose of this action.

1.3.3 Changes to the FMP Affecting Annual Management

Although the groundfish FMP was first implemented 20 years ago, changes in the fishery and the MSA have resulted in substantial modification through plan amendments. Three recent amendments (numbered 11 through 13), which in part respond to new requirements imposed by the 1996 Sustainable Fisheries Act (SFA) reauthorizing and amending the MSA, have affected the framework for specifying harvest levels and management measures. Amendments 11 and 12 were adopted in order to make the groundfish FMP consistent with MSA National Standard 1: *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*.

Approved in 1999, Amendment 11 establishes a default OY policy that reduces the numerical OY of any stock believed to be below its precautionary threshold, which is defined as smaller than 40% of its pristine (unfished) abundance (denoted B_0) unless better information is available.[7] A groundfish stock is defined as overfished if its abundance is less than 25% of its unfished abundance ($B_{25\%}$). The procedures and criteria for determining OYs for Pacific groundfish are detailed in Section 3.2.

Amendment 12, although subsequently remanded in part, by court order, establishes procedures to rebuild overfished stocks. In response to the remand, the Council is developing Amendment 16, which is being adopted in several different parts. Amendment 16-1 establishes a framework for adopting and reviewing rebuilding plans for overfished species. Under this framework key targets that will guide the rebuilding process will be specified in the FMP and federal regulations. If these target values need to be changed, new values would be published in regulations. Amendment 16-2 adopts rebuilding plans for four species: darkblotched rockfish, Pacific ocean perch, canary rockfish, and lingcod. A third amendment will adopt rebuilding plans for the remaining overfished species. Amendment 16-1 and 16-2 have been submitted for Secretarial review; decisions on both amendments (approval, partial approval, or disapproval) should be rendered by early 2004. Adoption of rebuilding plans will have a modest effect on the harvest specifications and management process. The Council has managed overfished stocks under interim rebuilding plans and chose the targets from these plans for the four species covered by Amendment 16-2. Adoption and approval of the amendment obligates the Council to manage to these targets.

Amendment 13 was developed in response to SFA requirements to address bycatch and bycatch accounting. (It also added to the list of routine management measures that are part of the groundfish FMP framework. This allows more effective management of overfished species and bycatch.) This amendment addresses MSA National Standard 9: *Conservation and management measures shall, to the extent practicable (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize mortality of such bycatch*. Bycatch (fish discarded at sea for regulatory or economic reasons) has emerged as a difficult problem in groundfish management. In order to manage for overfished stocks, it is necessary to estimate total catch, rather than only the catch landed at the dock. At the same time, reductions in cumulative landing limits can increase the amount of fish discarded, since these limits are based on landed catch rather than total catch.

7/ Sometimes spawning stock biomass is used instead of total stock biomass, and sometimes spawning potential is used. Where there is insufficient information to develop a numerical OY, the groundfish FMP still allows establishment of a non-numerical OY.

(Until the recent development of an observer program, it has been difficult to effectively monitor discards, confounding the ability to accurately estimate total catch.) NMFS has been developing a programmatic EIS (PEIS) for the groundfish FMP, which would evaluate strategic goals and the overall management framework. In May 2003 NMFS announced they will re-scope this EIS in order to focus exclusively on bycatch-related issues. A draft EIS will be published in early 2004.

Although the groundfish FMP states that all specifications will remain in effect until changed, they are announced annually on or about January 1. These management specifications are developed by the Council, based on a review of available stock status information, over the course of several meetings. Until 2002, this occurred at the September meeting, when the Council would adopt a range of alternatives representing preliminary harvest specifications (the ABC and OY for species or species groups) and management measures intended to limit catches to those targets. At its November meeting, the Council would then choose a preferred alternative, representing final harvest specifications and management measures. However, the court ruling in *Natural Resources Defense Council* v. *Evans*, 2001 168 F. Supp. 2d 1149 (N.D. Cal. 2001) found that NMFS was not allowing sufficient time for public notice and comment on the regulations before they were implemented at the beginning of the new year. Now, in order to allow enough time for the required comment period and still implement management measures early in the year, the Council must make its final decision at its September meeting, with the development of alternatives pushed back to the June meeting.[8]

Amendment 17, currently under Secretarial review, implements a biennial management cycle. Assuming it is approved, 2004 will be the last year managed under an annual cycle, with biennial management beginning in 2005–2006. Under the biennial management cycle harvest specifications and management measures will be established for the two-year period in advance of the period (as is the case with annual management). Council decision making will occur over three meetings, culminating in June of the year preceding the biennium. In addition to allowing more careful consideration of management proposals, promulgation of an emergency rule to cover management at the beginning of the cycle (as described in footnote #8 for annual management) will no longer be necessary.

1.4 Scoping Summary

1.4.1 Background to Scoping

According to the National Environmental Policy Act of 1969 (NEPA) the public and other agencies must be involved in the decision-making process. “Scoping” is an important part of this process. Scoping is designed to provide interested citizens, government officials, and tribes an opportunity to help define the range of issues and alternatives that should be evaluated in the environmental impact statement (EIS). NEPA regulations stress that agencies should provide public notice of NEPA-related proceedings and hold public hearings whenever appropriate during EIS development (40 CFR 1506.6).

The scoping process is designed to ensure all significant issues are properly identified and fully addressed during the course of the EIS process. The main objectives of the scoping process are to provide stakeholders

8/ Even with the earlier decision-making framework, regulations cannot be promulgated by January 1. Therefore, NMFS must promulgate emergency regulations, which are exempt from regular rulemaking procedures, for January and February, with the full rulemaking procedure applying to regulations implemented March 1. (This EIS covers the March 1 regulations; an environmental assessment is prepared for the regulations covering January and February.)

with a basic understanding of the proposed action; explain where to find additional information about the project; provide a framework for the public to ask questions, raise concerns, identify issues, and recommend options other than those being considered by the agency conducting the scoping; and ensure that those concerns are included within the scope of the EIS.

1.4.2 Council and Agency NEPA Scoping

On June 5, 2003, NMFS and the Council published a Notice of Intent (NOI) in the *Federal Register* announcing their intent to prepare an EIS in accordance with the NEPA for the 2004 acceptable biological catch and optimum yield specifications and management measures for the Pacific Coast groundfish fishery. The NOI described the proposed action and the way in which alternatives to be analyzed in the EIS would be formulated; it also enumerated a preliminary list of potentially significant impacts that could result from implementing the proposed action. A public scoping period, ending on July 7, 2003, was announced in the NOI. Two opportunities for the public to comment orally on the scope of the EIS occurred on June 17, 2003 and June 20, 2003 as part of the regular agenda of a Council meeting. In addition, written comments were accepted through the end of the scoping period.

In addition to the formally announced public scoping period, the Council process, which is based on stakeholder involvement, allows for public participation and public comment on fishery management proposals during Council, subcommittee, and advisory body meetings. The advisory bodies involved in groundfish management include the Groundfish Management Team (GMT), with representation from state, federal, and tribal fishery scientists; and the Groundfish Advisory Subpanel (GAP), whose members are drawn from the commercial and recreational fishery, processing, and conservation sectors. The Ad Hoc Allocation Committee, a subpanel of the whole Council, provides advice on allocating harvest opportunity among the various fishery sectors. These opportunities all constitute the broadly defined Council scoping process, not all of which focuses on the scope and content of NEPA analysis.

The Council and its advisory bodies considered 2004 specifications and management measures at several meetings. The Ad Hoc Allocation Subcommittee of the Council met on June 10 and 11 and reviewed new stock assessments and rebuilding analyses, which apply to overfished groundfish species; and considered the types of management measures that might be used in 2004. During its June 2003 meeting the Council identified three sets of harvest specifications for managed groundfish species or species groups, representing limits on total fishing mortality. These form the basis of alternatives that will be analyzed in the EIS: a low OY alternative, medium OY alternative, and high OY alternative. They also identified a preliminary range of management measures that could be used to constrain fishing mortality to these different OY levels. The GMT met July 14-18, 2003, to further develop the range of management measures incorporated into the alternatives. The Council and their advisory bodies meet in September 2003 to finalize the management measures included in the alternatives. The Council will also choose a preferred alternative, which could be one of three alternatives identified, or a new alternative based on the range of OYs and management measures included in these alternatives.

In addition, although not part of the formal scoping process, both the Oregon and California state fish and game departments held public hearings to solicit input on the formulation of management measures. Comments made at these hearings are summarized and made available to the Council in advance of their September 2003 meeting, when they identify their preferred alternative.

1.4.3 Summary of Comments Received

The Council received two letters with written comments on the scope of EIS, one from the Natural Resources Defense Council (NRDC) and the second from The Ocean Conservancy, which are conservation organizations. Nine people spoke during the public comment periods at the June 2003 Council meeting. Four were representatives of conservation groups, three represented commercial fishing (as an individual or member of an industry group), and two represented sports fishing (one as an individual and one as a member of an industry group). As discussed below, not all comments bear directly on the scope of the EIS, and some recommendations were outside the scope of the proposed action (actions requiring an FMP amendment, for example). These comments are categorized by different components of the EIS, such as the range of alternatives, description of the affected environment, and potentially significant impacts that should be analyzed. Commenters often raised the same, or a closely related, issue. These comments have been combined in the summary below. The number of times an issue is raised during the scoping process provides an indication of the issues that commenters are most concerned about. Scoping also helps agencies eliminate from detailed study issues that are not significant (40 CFR 1501.4(g)).

1.4.3.1 The Range of Harvest Specifications (OYs) For Overfished Species

- Evaluate time periods for rebuilding overfished species that are as short as possible.

- Evaluate alternatives that include a 90% probability of recovery of overfished stocks in the maximum allowable time under National Standard Guidelines ($T_{MAX)}$.

- Include a target time period that is the mid-point between T_{MIN} and T_{MAX}, which serves as the upper bounds of the rebuilding time frame.

- Present a full range of rebuilding time period alternatives for each overfished species.

- Consider zero mortality levels for cowcod, bocaccio, and canary rockfish.

The choice of target rebuilding time period helps determine annual OYs. Although the 2003 groundfish harvest specifications EIS evaluated a range of OYs based on different rebuilding periods (expressed in terms of the relate rebuilding probability), in this EIS these rebuilding targets are less of an issue for several reasons. Foremost, the Council recently adopted formal rebuilding plans for four of the overfished groundfish species, and these rebuilding periods are used in determining OYs in the alternatives. (Other sources of uncertainty in the stock assessment modeling process are the basis for the range of possible OYs that could be adopted for these species.) For the remaining overfished species, interim targets were used, if available, although in some cases an evaluation of different rebuilding probabilities may be one among several factors used in formulating a range of OYs. NMFS is currently reviewing two groundfish FMP amendments establishing a framework for overfished species rebuilding plans and the initial set of plans mentioned above. One or more additional amendments will adopt rebuilding plans for the remaining overfished species. These EISs evaluate the environmental impacts of managing to different target years and associated rebuilding probabilities. Section 2.1.1 provides further rationale for the range of OYs used in the alternatives.

1.4.3.2 *Management Measures and the Range of Alternatives*

Overfished Species

- Explore a full range of management measures to successfully rebuild overfished species within the rebuilding target time.

Bycatch Reduction

- Analyze available bycatch reduction techniques.

- Consider "hard" bycatch caps for limiting total allowable fishing mortality including fleet-wide, sector-wide, and vessel-by-vessel caps. A pilot program for sector-wide hard bycatch caps should be implemented as part of the 2004 harvest specifications. Under such a program managers would estimate the date by which total mortality will be attained for each overfished species within a particular sector allocation. Once the hard bycatch cap is reached, fishing would cease. Caps would apply on a quarterly basis or some other increment of the fishing year.

- Consider management measures that reduce bycatch of both managed and prey species.

Closed Areas, Marine Protected Areas

- Discuss the value of area closures for protecting groundfish and their habitat and consider a range of area closure alternatives.

- To reduce bycatch, consider no-take marine protected areas.

- Consider management measures to reduce impacts to marine habitats, including marine protected areas, gear modifications and prohibitions, and area closures by gear type.

- Closed area boundaries should be implemented on a regional basis.

Other Management Measures

- Consider capacity reduction as a management measure.

- To reduce bycatch, consider gear modifications.

- Provide a range of options for managing groundfish at OY with varying probability of success.

- Do not include within the range of alternatives zero retention of cabezon. If this is included in the range of alternatives, make it apply to both commercial and recreational fisheries.

- The FMP should be amended to allow limited entry trawl vessels to fish with fixed gear.

- Do not eliminate the "B platoon" in the limited entry trawl fishery. Many fishermen and processors favor this measure.

- Individual transferrable fishing quotas (ITQs) should be implemented in the groundfish fishery as soon as possible.

Many of the recommendations summarized above have been incorporated into the alternatives. Those that were not were either outside the scope of the proposed action or eliminated from further detailed study as part of the process of screening alternatives. Implementation of permanent marine protected areas (including no-take marine reserves), implementing a capacity reduction program (reducing the number of vessels participating in the fishery), allowing trawl vessels with limited entry permits to use fixed gear, and establishing an ITQ program cannot be implemented through the harvest specification process and are thus outside the scope of the proposed action. However, it should be noted that NMFS has implemented a capacity reduction program, and the Council is considering separate initiatives addressing these other recommendations. Implementing a "hard" bycatch caps pilot program was considered but eliminated from further detailed study for reasons of feasibility. Section 2.2.6 discusses the reasons for its elimination. OYs do represent a total mortality cap in that both projected landings and bycatch are estimated when formulating management measures and evaluating their impacts. In addition, NMFS is preparing a separate EIS evaluating bycatch reduction measures; it includes the use of bycatch caps in the range of alternatives.

1.4.3.3 Allocation of Harvest Opportunity

- The allocation of overfished species among states and fishery sectors should be based on catch histories in the period shortly before they were declared overfished. The FMP establishes a process for changing allocations, and this process should be followed if they are to be changed.

- An alternative should be considered under which the allocation of black rockfish between California and Oregon is based on the total amount of nearshore habitat along each state's shoreline.

These recommendations have been incorporated into the alternatives.

1.4.3.4 Description of the Baseline Affected Environment

Overfished Species

- Describe the current status of different managed groundfish species.

- Discuss whether actual mortality levels have exceeded OY in past years.

- Discuss the ability of current management measures to constrain fishing mortality within OYs.

Bycatch

- Discuss bycatch issues, including the amount and types of bycatch, effects of bycatch on overfished species, and the effect of current management techniques on bycatch.

These issues will be discussed in Chapter 3.0, describing the affected environment.

1.4.3.5 Evaluation of Impacts

- Evaluate the environmental impact of using small trip limits.

- Evaluate the environmental impacts of different fishing gears and techniques.

- Comprehensively discuss cumulative impacts.

- Discuss the impact of non-groundfish fisheries on groundfish.

- Analyze the past, present, and reasonably foreseeable adverse impacts of fishing and non-fishing activities on overfished groundfish species' habitats.

- Analyze the effect of closed-area-related fishing effort shifts on essential fish habitat.

The kinds of impacts described in these comments are evaluated in Chapter 4 of the EIS. Section 1.4.4, below, discusses the way in which the EIS evaluates these potential impacts.

1.4.3.6 Monitoring and Evaluation of Management Program, Adequacy of Data, Enforcement of Management Measures

- Are the catch-by-depth data accurate enough to analyze different closed area configurations whose boundaries vary in 10-fathom increments?

- Evaluate the adequacy of observer coverage for assessing bycatch and administering management measures and catch limits.

- Discuss NMFS's ability to enforce harvest limits.

- Analyze the current data collection systems for assessing bycatch and establish a system that accurately measures landed catch and bycatch.

- Establish a monitoring system that measures the depths at which species are caught.

- Adequately enforce areas closed to certain gear types or fishing methods.

Section 4.4 evaluates institutional capability to monitor total fishing mortality and the resulting risk that OYs could be exceeded. The feasibility of enforcing proposed management measures under each alternative is also assessed.

1.4.3.7 Other Issues

- Evaluate the objective of a year-round groundfish fishery and alternatives to a year-round fishery.

1.4.4 Potentially Significant Environmental Impacts Identified Through Scoping and Criteria Used to Evaluate Them

Chapter 4 is organized around different components of the human environment that could be significantly affected by the proposed action. The alternatives are evaluated in terms of the ways in which they may affect these environmental components. The nature and intensity of these effects constitute evaluation criteria used to determine the effect of the alternatives. Evaluation criteria are summarized below under headings for the different environmental components, which mirror the headings in Chapter 4. (Chapter 3, describing the affected environment, is similarly organized.)

1.4.4.1 Habitat and Ecosystem

Essential fish habitat may be damaged by both fishing and non-fishing activities. Marine ecosystems may be affected by removal of biomass at different trophic levels that results in long-term changes in ecosystem structure. Direct and indirect effects of the proposed action result from the location and intensity of fishing activity as authorized under each alternative. Cumulative effects stem from the proposed action when combined with past fishing authorized under the groundfish FMP, fishing in the future, and non-fishing impacts. Currently, the location and intensity of fishing effort cannot be directly predicted. Instead, it is inferred from the harvest levels established under the different alternatives and the types of management measures. The proposed action would have a significant impact on essential habitat or fishery ecosystems if it resulted in a measurable change in the productivity of managed stocks equivalent to or greater than productivity changes due to natural fluctuations in environmental conditions.

1.4.4.2 The Fishery Management Unit

The fishery management unit (stocks managed under the FMP) my be subdivided into three categories for the purposes of evaluating impacts: overfished species, species subject to precautionary management, and species believed to be at or above B_{MSY}. A goal of the management framework is to maintain stocks at B_{MSY}; for stocks below that size harvests must be limited in order to allow the stock, over time, to reach that size. The management framework takes a precautionary approach by requiring increasing reductions in harvest levels the more stock size falls below B_{MSY}. If a stock falls below the minimum stock size threshold (MSST) defining an overfished stock (which for groundfish is 25% of unfished biomass) a still more stringent framework applies: for a given harvest rate managers identify a time frame for recovery and assess the likelihood of recovery during that time period. Fishing mortality, or the removal of stock biomass, in 2004 is the direct effect of the proposed action. From the standpoint of impact assessment this has relatively little utility; fishery management depends on the cumulative effects of past management (which partly determines current biomass) and focuses on the future effect of current fishing mortality. One criterion for evaluating alternatives, therefore, is their likelihood of satisfying the B_{MSY} management goal. The framework for overfished species provides a quantification of this likelihood, the probability of stock recovery within a given time period. For stocks above MSST the evaluation must rely on a more qualitative discussion of the types of risk associated with a given harvest level. Any harvest level that constitutes overfishing, a rate that exceeds F_{MSY} or its proxy, represents a clear threshold for significance. (F_{MSY} is shorthand for the fishing mortality rate that will maintain the stock at maximum sustainable yield [MSY] biomass. The true value for this rate is not known for groundfish species. Instead, proxy values are used.) The MSA does not allow the Council to knowingly authorize overfishing (that is, a harvest rate that keeps stock size below B_{MSY}). Therefore, the alternatives must be assessed for overfishing risk—failing to maintain stocks at B_{MSY} over the long term and on a continuing basis—which would represent a significant impact.

Once a range of OYs has been identified, the Council formulates a suite of management measures and estimates the resulting projected catch (or total fishing mortality, including bycatch). The management measures must constrain total fishing mortality of each stock or stock complex to a level at or below the OYs in a given alternative; if they don't, further adjustments are made until projected catch of each stock or stock complex falls below the OYs for that alternative. Thus, the impact of management measures represents another level of the same analytical question: what is the likelihood that *actual* harvests (as opposed to the potential harvest levels represented by OYs) will satisfy the goal of maintaining stocks at B_{MSY}? Because the intent is to manage within OYs, the likelihood that management measures will not sufficiently constrain fishing mortality represents the impact to be evaluated. However, this risk remains unquantified and must be evaluated qualitatively. The level of bycatch resulting from a given suite of management measures is an important aspect of this evaluation. From a biological perspective the amount of bycatch is immaterial as long as total fishing mortality is sufficiently constrained (assuming that discarding fish into the marine environment does not by itself result in significant impacts).[9] However, bycatch mortality is much more difficult to monitor and assess than landed catch mortality. Thus, as bycatch increases there is a greater risk that total fishing mortality will be under-estimated. As harvest limits for certain species are reduced, there is greater incentive for fishermen to discard fish so that they may continue fishing for other species with higher limits. Alternatives, therefore, must be evaluated for their bycatch-producing effect.

1.4.4.3 Protected Species

A range of species other than federally-managed fish, are protected under the Endangered Species Act, Marine Mammal Protection Act, and the Migratory Bird Treaty Act. Groundfish fisheries may interact with these species, causing mortality or otherwise harming them. Although data on these interactions are limited, impact may be evaluated using a similar framework as described for habitat and ecosystem impacts. The relative level of fishing effort is assumed to correlate with projected catch and also increase the likelihood of interactions with protected species. Significant impacts would occur if standards established pursuant to the relevant laws were exceeded.

1.4.4.4 Monitoring and Enforcement

Management measures included in the alternatives affect the ability of government agencies to enforce management regulations. The cost and feasibility of enforcing these measures is evaluated qualitatively.

Determining total catch mortality, both in advance of and during the fishing year, is also needed for effective management. Landed catch is relatively easily monitored at dockside. However, fish are also discarded at sea for economic or regulatory reasons; and these are most often overfished species, which have low harvest limits. The cost and feasibility of monitoring catch is evaluated for each alternative.

1.4.4.5 Socioeconomic Impacts

The socioeconomic environment is divided into five categories for the purposes of analysis: fisheries, buyers and processors, markets, fishing communities, and the general public. Fisheries are categorized for the purpose of analysis; the broadest categories are commercial, recreational, and tribal fisheries. There are further subdivisions of the commercial fishery based on regulatory category and fishing strategies, as discussed in Section 3.5. In order to account for total fishing mortality to fishery management unit species, groundfish fisheries are defined broadly, including vessels targeting fishery management unit species, with catches mainly comprising groundfish species, to those catching groundfish incidentally, and in small proportion to their total catch.

A screening for potentially significant socioeconomic impacts was conducted. The main determinant of which issues should receive attention were comments received during the scoping process and augmented

9/ It is important to recognize that bycatch may represent a social cost. Marketable fish may be discarded due to regulatory restrictions, decreasing potential revenue. Even if fish are discarded because there is no market for them or because production costs exceed potential revenues, a social cost may be incurred. This cost represents foregone opportunities, environmental services provided by the living fish, the value society attaches to the mere existence of the fish, and other values not adequately captured in prices.

by the analysts assessment of additional areas of potentially significant impacts. Table 1.4.5-1 summarizes the screening criteria applied to different components of the socioeconomic environment form table rows. These criteria are screened against the socioeconomic environment components listed in the column headings. (The column headings also list the Chapter 4 sections addressing each component.) The body of the table indicates for each criteria the components of the socioeconomic environment for which additional analysis was warranted to assess the potential for significant impacts and the section of Chapter 4 in which the analysis is provided (see the table key). Note that all socioeconomic impacts ultimately affect communities and the general public.

TABLE 1.4.5-1. Evaluation criteria screening matrix.

	4.5.1 All Sectors	4.5.2 Commercial Fisheries	4.5.3 Seafood Distribution Chain	4.5.3 Markets	4.5.4 Recreational Fishers	4.5.5 Tribal Fisheries	4.5.6 Communities	4.5.7 General Public
Net Value and Profits	I	I	I		I	I		I
- Revenue		I	I		I	I		
- Compliance		I	I		I			
- Flexiblity		I	I					
- Capacity		I	I					
- Debt Servicing		I			I			
Long-term Issues (Production Levels and Risk)	I	AS	AS		AS	AS	AS	AS
Markets Distortions and Barriers								
Distribution of Benefits and Costs	I	I	I		I	I	I	
Adjacent Fisheries		I			I			
Public Health and Safety		I			I			
Fairness and Equity	I	AS	AS		AS	AS	AS	
Bargaining Strength/Competitive Position			I					
Income		C	C		C	C	I	
Employment		C	C		C	C	I	

Key:
"I": potential impacts warranting analysis and addressed in the indicated section.
"AS": potential impacts were identified but are addressed in Section 4.5.1, covering all sectors.
"C": potential impacts were identified but are addressed in Section 4.5.6, covering coastal communities.

Government institutions are also part of the socioeconomic environment. As mentioned above in Section 1.4.4.4, there are costs to government of management and enforcement. These are discussed in Section 4.4.

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2.0 Alternatives Including the Proposed Action

Alternatives for managing the 2004 West Coast groundfish fishery analyzed in this EIS were decided by the Council at its June 2003 meeting in Foster City, California. Two public scoping sessions coinciding with the June Council meeting were advertised in the *Federal Register* and heard by the Council prior to a decision on the suite of harvest levels and management specifications that were analyzed in this EIS. Additional scoping for structuring the alternatives analyzed in this EIS is described in Section 1.4. In general, alternative management specifications address measures designed to reduce total mortality of overfished groundfish stocks and are analyzed for their potential effect on groundfish habitats, groundfish stocks and other marine resources, and the socioeconomic infrastructure of the West Coast fishery and fishing-dependent coastal communities.

2.1 How the Alternatives Address Key Management Issues

Target harvest levels for groundfish stocks and stock complexes for 2004 are based on results of new stock assessments and rebuilding analyses for overfished stocks, projected harvest levels from previous assessments and rebuilding analyses, Council-adopted rebuilding plans, or precautionary adjustments to the historical harvest of unassessed stocks based on catch trends and other considerations as laid out in the National Standard Guidelines (NSGs) and/or the groundfish FMP. Harvest levels for stocks managed under the latter case tend to be set at status quo levels unless new information is brought forward recommending a change.

Management measure options for 2004 were scoped during the Council process and are structured in this EIS to capture the full range of outcomes and considerations the Council and other entities have recommended for analysis. A range of catch sharing options, management measures and specifications, and policy choices were decided by the Council in June 2003 for analysis. These management measure options are structured in the alternatives analyzed in this EIS to understand the full effect of implementing them in combination. One overriding evaluation criterion in this analysis is the effectiveness of management measures to attain and not exceed alternative harvest levels. To the extent possible, sensitivity analyses are offered to better understand the impact, contribution, and effect of individual management measures and specifications. The following is a description and rationale for considering alternative 2004 groundfish harvest levels, catch sharing options, and other management measures and specifications.

2.1.1 Alternative Harvest Levels

New stock assessments for black rockfish (*Sebastes melanops*), bocaccio (*S. paucispinis*), darkblotched rockfish (*S. crameri*), Pacific ocean perch (*S. alutus*), widow rockfish (*S. entomelas*), and yellowtail rockfish (*S. flavidus*), as well as a cowcod (*S. levis*) rebuilding review, and rebuilding analyses for bocaccio, darkblotched rockfish, Pacific ocean perch, and widow rockfish have been approved by the Council for 2004 groundfish management decision-making. These new assessments and rebuilding analyses were used to range alternative harvest levels for these stocks as depicted in Table 2.1.1-1. Alternative acceptable biological catch (ABC) and optimum yield (OY) specifications are structured to capture either a range of rebuilding probabilities for the overfished stocks and/or the key scientific uncertainties in assessments. The 2004 harvest specifications for the other groundfish stocks and stock complexes managed under the groundfish FMP shown in Table 2.1.1-1 are projected from past assessments and rebuilding analyses or are status quo. The rationale for ranging alternative harvest levels are described in this section for those stocks with new assessments and for those stocks with harvest levels different than status quo.

2.1.1.1 Black Rockfish

A new black rockfish assessment was done for the portion of the coastwide stock occurring off the coasts of Oregon and California (Ralston and Dick 2003). Previous assessments were done for the portion of the stock occurring off the coasts of Oregon north of Cape Falcon and Washington. Alternative harvest levels for the portion of the black rockfish stock occurring off Oregon and California were ranged to capture the major uncertainty of historical landings prior to 1978. Black rockfish catches prior to 1945 were assumed to be zero in the assessment. Many gaps in historical landings of black rockfish since 1945 were evident and these landings were reconstructed using a variety of data sources. The base model assumed cumulative landings of black rockfish from all fisheries was 17,100 mt during 1945-1977. This base case catch scenario formed the basis for the *Medium OY* harvest alternative. The *Low OY* harvest alternative for black rockfish assumes lower landings in recreational and trawl fisheries prior to 1978 than used in the base model and assumes a cumulative catch during 1945-1977 of 9,400 mt. The high catch scenario in the assessment assumes a cumulative catch of 26,100 mt during 1945-1977 and forms the basis for the *High OY* alternative.

2.1.1.2 Bocaccio

A new bocaccio assessment (MacCall 2003b) and rebuilding analysis (MacCall 2003a) was done for the portion of the stock declared overfished occurring off California south of Cape Mendocino at 40°10' N latitude Three models were presented in the rebuilding analysis; STARb1 and STARb2 were recommended by the bocaccio Stock Assessment Review (STAR) Panel to bracket the uncertainty in the assessment and STATc recommended by the author that combines the assumptions in the two STAR Panel-recommended models (MacCall 2003a). Model STARb1 omits data from the NMFS triennial surveys and holds estimated recruitment constant to 1959, whereas model STARb2 omits the recreational catch per unit of effort (CPUE) data and holds estimated recruitment constant to 1969. Model STATc omits neither data source, holds estimated recruitment constant to 1959, and places a low emphasis on the stock-recruitment relationship to stabilize estimates of recent (post-1999) recruitment. The alternative bocaccio harvest levels recommended by the Council for analysis were ranged to capture uncertainty in these models as well as the differential rebuilding likelihoods as represented by probabilities of rebuilding within the maximum allowable time (P_{MAX}). The *Low OY* alternative harvest level is based on the use of model STARb2 with a P_{MAX} of 80%. The *Medium OY* alternative assumes model STATc with a P_{MAX} of 70% and the *High OY* alternative assumes model STARb1 with a P_{MAX} of 60%. The Council chose the *Medium OY* bocaccio harvest level as its preferred alternative.

2.1.1.3 Canary Rockfish

Although canary rockfish were not assessed in 2003, alternative harvest levels are analyzed because the OY is dependent on recreational and commercial catch sharing (see Section 2.1.2). This is because the recreational fishery tends to take smaller canary rockfish than the commercial fishery, and therefore, has a greater "per ton" impact on canary rockfish rebuilding than the commercial fishery. That is, as the recreational share of the available canary rockfish harvest increases, the OY decreases. Alternative canary rockfish harvest levels are based on projections from the 2002 rebuilding analysis (Methot and Piner 2002a) and the Council's adoption of a canary rockfish rebuilding plan as part of FMP Amendment 16-2 which specifies rebuilding targets consistent with a P_{MAX} of 60%. The *Low OY* canary rockfish harvest level is based on 50% recreational and 50% commercial catch shares. The *Medium OY* and *High OY* alternatives are based on 39% recreational and 61% commercial catch shares which represent the status quo catch shares adopted as harvest guidelines in 2003. The Council chose the *Medium OY* (same as *High OY*) canary rockfish harvest level as its preferred alternative.

2.1.1.4 Darkblotched Rockfish

Darkblotched rockfish alternative harvest levels are based on variable rebuilding projections from the new stock assessment and rebuilding analysis (Rogers 2003). Harvest projections are influenced by recent strong recruitment (the 2000 and 2001 year classes) which has not been completely validated in the data used to assess the stock. The Scientific and Statistical Committee (SSC) STAR Lite Panel requested progressive inclusion of 1997-1999, 2000, and 2001 recruitment estimates (Ralston *et al.* 2003). Risk of error progressively increased from including those recruitment estimates because they were based on increasingly limited data. Rebuilding results were sensitive to the high 2000 and 2001 recruitment estimates and including them allowed much greater 2004 OYs because those recruits enter the fishery and help rebuild the stock before the maximum allowable year (2028). The ABCs, on the other hand, were not as affected because the 2000 and 2001 recruits were too small to have entered the fishery in 2004. This led to 2004 OY estimates which were higher than the ABC, even given 90% probability of rebuilding by 2028. When the ending year was 1999 (2000 and 2001 estimates not included), the ABC was lower than the OY at an 80% probability of rebuilding by 2031. All alternative darkblotched rockfish harvest levels are consistent with the Council's adoption of a darkblotched rockfish rebuilding plan as part of FMP Amendment 16-2, which specifies rebuilding targets consistent with a P_{MAX} of 80%. The *Low OY* harvest level projects the OY by resampling recruits from the 1983-1999 period, the *Medium OY* harvest level projects the OY by resampling recruits from the 1983-2000 period, and the *High OY* harvest level projects the OY by resampling recruits from the 1983-2001 period. It is reiterated that the *Medium OY* and *High OY* ABCs are lower than the projected OYs for these alternatives. Since the Magnuson-Stevens Act does not allow harvest greater than the ABC, these ABC values are the harvest limits for these 2004 alternatives. The Council chose the *Medium OY* darkblotched rockfish harvest level as its preferred alternative.

2.1.1.5 Lingcod

The 2004 lingcod ABC and OY are projected from the most recent rebuilding analysis (Jagielo and Hastie 2001). The same OY is analyzed under each alternative and is consistent with the Council's adoption of a lingcod rebuilding plan as part of FMP Amendment 16-2, which specifies rebuilding targets consistent with a P_{MAX} of 60%. No departure from this rebuilding plan is contemplated in this EIS.

2.1.1.6 Pacific Ocean Perch

Alternative harvest levels for Pacific ocean perch were derived from a new rebuilding analysis done this year (Punt *et al.* 2003). Many cases were presented in the rebuilding analysis, and the one the Council chose, based on SSC advice, was the one based on the full Bayesian posterior distribution where recruits were resampled to project future recruitment (Case C). Using the full Bayesian posterior distribution captured more of the assessment model uncertainty than using the maximum of the posterior density function. Resampling recruits rather than recruits/spawner was recommended because only the southern fringe of the stock occurs in waters off the U.S. West Coast. One would want to resample recruits/spawner if measured recruitment is a function of measured stock size. However, it is not likely the recruitment measured off the U.S. West Coast is wholly from the portion of the parental stock occurring in the same waters. Therefore, resampling recruits was advised. Harvest alternatives were therefore ranged using Case C with different rebuilding probabilities. The *Low OY*, *Medium OY*, and *High OY* alternatives were based on rebuilding probabilities of 80%, 70%, and 60%, respectively. The Council adopted a rebuilding plan under FMP Amendment 16-2 that established a target rebuilding year of 2027 with a P_{MAX} of 70%. The target rebuilding year estimated in the new rebuilding analysis under the 70% rebuilding likelihood is 2026. A formal change in the rebuilding plan for Pacific ocean perch is contemplated in this EIS. However, the Council-preferred harvest level for Pacific ocean perch is the OY under the *Medium OY* alternative. According to the rebuilding framework adopted under FMP Amendment 16-1, the Council does not need to formally change the rebuilding plan if a new assessment or rebuilding analysis indicates faster rebuilding than previously anticipated in the adopted rebuilding plan. However, a new harvest rate for rebuilding the stock may need to be specified according to the new rebuilding analysis.

2.1.1.7 Pacific Whiting

The portion of the Pacific whiting stock in waters off the U.S. West Coast was declared overfished in April 2002. However, no formal rebuilding analysis has been approved for use in managing the stock and directing a rebuilding program. Furthermore, the SSC recommended that the 2002 assessment (Helser *et al.* 2002) not be used to project future harvest levels. A new assessment and rebuilding analysis are expected to be completed this winter and brought to the Council for approval in March 2004 prior to the April 1, 2004 start of the whiting fishery. These new analyses will form the basis for managing the 2004 whiting fishery. In lieu of a more informed range of possible 2004 whiting harvest levels, the Council decided to range whiting OYs ±50% of the status quo (2003) harvest level for analytical purposes. Therefore, the *Low OY* harvest level is -50% of the 2003 OY, the *Medium OY* is equal to the 2003 OY, and the *High OY* harvest level is +50% of the 2003 OY. It is expected that this range is adequately broad to encompass the range of outcomes from the new assessment and rebuilding analysis anticipated early next year.

2.1.1.8 Sablefish

The GMT recommended updating the sablefish ABC and OY ranges analyzed in last year's EIS for 2003 management. Therefore, updated harvest level alternatives are presented as derived in the 2002 assessment update (Schirripa 2002). The *Low OY* harvest level is based on an $F_{60\%}$ harvest rate under the assumption that sablefish recruitment is driven by the density of the parental stock (density-dependence hypothesis). The $F_{60\%}$ harvest rate is one predicted to result in increased abundance of the spawning stock biomass in the next ten years after the strong 2000 and 2001 year classes have finished contributing to stock productivity. The *Medium OY* harvest level also assumes a density-dependence recruitment hypothesis but is derived using the stock's default F_{MSY} harvest rate of $F_{45\%}$. The *High OY* harvest level is based on the default $F_{45\%}$ harvest rate but assumes recruitment variability is driven more by environmental regime shifts (regime shift hypothesis) than parental stock density. The “40-10" adjustment is applied to all the alternative OYs since the stock's spawning biomass is predicted to be less than 40% of its initial, unfished level ($B_{32\%}$ under a density-dependence hypothesis and $B_{39\%}$ under a regime shift hypothesis).

During the course of updating sablefish harvest level alternatives, a mistake was discovered in the 2003 sablefish harvest specifications. Past sablefish assessments assessed only the portion of the stock occurring north of Pt. Conception at 34°27' N latitude A separate sablefish allocation was made for Conception area fishers since the trawl/nontrawl sablefish allocation is specified in the FMP only for the Monterey area north (north of 36° N latitude). Therefore, the GMT had made an adjustment to sablefish specifications in the past to calculate the OY for the portion of the stock in the assessed area between 34°27' N latitude and 36° N latitude (the “Conception wedge”). This amount of available harvest was then added to the rest of the Conception area ABC and OY, which was based on the proportion of recent coastwide landings made south of Pt. Conception. The north of Conception OY was reduced accordingly to represent the OY for the Monterey, Eureka, Columbia, and U.S./Vancouver International North Pacific Fishery Commission (INPFC) areas. This adjustment was made to the 2003 sablefish specifications without realizing that the new assessment determined coastwide stock status and ABCs/OYs. The 2003 coastwide ABC and OY depicted in Table 2.1.1-1 are the correct specifications projected in the most recent assessment. The alternative coastwide 2004 specifications depicted in Table 2.1.1-1 are projected from the Schirripa (2002) assessment. These were stratified for the Conception and north of Conception areas by apportioning the coastwide ABCs and OYs based on average sablefish landings north and south of 36° N latitude during 1998-2002 (see Section 2.1.2.5).

2.1.1.9 Shortspine Thornyhead

The 2004 shortspine thornyhead ABC and OY are projected from the 2001 assessment (Piner and Methot 2001). The "40-10" adjustment was applied to the ABC to derive the OY since the stock's spawning biomass is estimated to be below 40% of its initial, unfished level.

2.1.1.10 Widow Rockfish

A new widow rockfish stock assessment (He *et al.* 2003b) and rebuilding analysis (He *et al.* 2003a) were approved this year for use in 2004 management. The models and simulations presented in the rebuilding analysis and recommended by the SSC were used to range 2004 widow rockfish ABCs and OYs for analysis in this EIS. The SSC recommended the rebuilding simulations presented in the rebuilding analysis under models 7, 8, and 9. These models pre-specify the recruitment for 2003-2005, do not use a stock-recruitment relationship (recruits per spawner ratios were used instead to project future recruitment), and vary the power coefficient between 2.0 and 4.0 in the Santa Cruz midwater juvenile survey. Models 7, 8, and 9 assume a midwater survey power coefficient of 2.0, 3.0, and 4.0, respectively. All harvest level alternatives chosen by the Council have a rebuilding probability (P_{MAX}) of 60%. The *Low OY*, *Medium OY*, and *High OY* harvest level alternatives are based on models 7, 8, and 9, respectively.

2.1.1.11 Yelloweye Rockfish

The 2004 yelloweye rockfish ABC and OY were projected from last year's rebuilding analysis (Methot and Piner 2002b). Both the ABC and OY are projected higher in 2004 relative to 2003; however, the increase is so small that the OY rounds to the same value as the 2003 OY while the ABC rounds to one mt higher.

2.1.1.12 Yellowtail Rockfish

A new yellowtail rockfish stock assessment (Lai *et al.* 2003) was approved for 2004 management. The 2004 ABC and OY are derived using model YT2003N in the assessment which updates the catch series used in the previous assessment (Tagart *et al.* 2000) with a newly revised series from Pacific Coast Fisheries Information Network (PacFIN), revised Canadian catches in INPFC area 3C, and new estimates of 1967-1976 foreign catches (Rogers In prep). The OY equals the ABC since the stock is estimated to be above the abundance level that supports maximum sustainable yield (or 40% of initial, unfished biomass). The yellowtail rockfish stock was estimated to be at 46% of its initial, unfished biomass in 2002 (Lai *et al.* 2003).

2.1.1.13 Other Harvest Level Changes from Status Quo

The only other changes to status quo harvest levels were to the rockfish complexes that used to contain the black rockfish stock. The ABCs and OYs for the "Remaining Rockfish North" and "Other Rockfish South" complexes were reduced when the black rockfish component was removed. Table 2.1.1-1 displays the 2004 harvest specifications for these two complexes as well as the ABCs and OYs for black rockfish in waters off Washington and waters off Oregon and California.

2.1.2 Catch Sharing Options

Harvest allocations for the most constraining groundfish stocks and those newly assessed stocks that have not been formally allocated (i.e., black rockfish) are based on criteria provided by the Council in June. Table 2.1.2-1 provides the catch sharing scenarios and analytical basis for these scenarios that are part of the analysis of alternatives presented in this EIS. Table 2.1.2-2 depicts the actual allocation of OY under each catch sharing scenario and alternative.

The following are some of the equity concerns expressed by Council members in identifying harvest levels for various sectors in the fishery:

- Recent and historic periods used as the basis for allocation should have total harvest levels similar to the levels proposed for 2004. In the past, sectors may have been differentially affected by changes in fishing opportunity. When available harvests were greater, absent a significant conservation issue, some sectors may have been allowed to take more of a now overfished species than was necessary to prosecute their primary target fisheries.

- Historic periods used for allocation should not penalize groups or geographic regions that voluntarily reduced harvest based on preliminary indications of future conservation issues (for example, Washington reduced its recreational yelloweye bag limits in 2000, but the Council did not have a reviewed and validated stock assessment indicating the need for such a reduction prior to the time it made final recommendations for the 2002 fishery).

- In evaluating historic catch, sectors should not receive credit for harvest in a particular year that was in excess of that sector's harvest guideline, and sectors should not be penalized if its harvest was cut short due to the overage of another sector.

- Data reliability and validity need to be taken into account. In particular, there was a break in the Marine Recreational Fisheries Statistical Survey (MRFSS) data in the early 1990s. The data series was partially restored in 1993 and not fully restored until 1997. Additionally, there have been serious concerns about differences between MRFSS estimates and state estimates of recreational harvest. For the commercial fisheries, consideration should be given to whether or not sorting of the species to be allocated was required in the years on which an allocation was based. If sorting was not required, some harvest of the species may have been grouped in a market fishery category. In such cases, the reliability of species composition data collected by port samplers for a particular gear type will affect the harvest estimate.

In the above listed concerns, an importance appears to be placed on the degree to which a sector utilized a particular species during a base period. Given this concern, and that a sector will need to cover its discard mortality with the amount of fish it is allocated in 2004, it may be appropriate to consider whether or not estimates of discard mortality during the historical harvest should be included as part of the base period harvest.

The species where alternative catch sharing options were offered for analysis and the rationale for these options are described as follows.

2.1.2.1 Black Rockfish

The black rockfish ABC/OY for the portion of the stock in waters off California and Oregon is derived from new assessment. How to equitably share this harvest between the two states is now posed. The Council considered a variety of criteria for analyzing catch share alternatives. Recent historical catches of black rockfish in California and Oregon commercial and recreational fisheries are used as a basis for two of the options analyzed. The time periods for these catch-based options are the 1990-2002, where the average shares are 37% California and 63% Oregon, and 1985-2002, where the average shares are 42% California and 58% Oregon. Two catch sharing options are based on the relative amount of area where black rockfish are generally found in each state. These area-based options assume the southern limit of the black rockfish distribution is San Francisco. The relative area within zero fm to 50 fm off each coast is 44% California and 56% Oregon which is the catch share under this option. Alternatively the relative lineal distance of coastline in each state where black rockfish occur is 51% California and 49% Oregon, which is the catch share under this option. Lastly, the GMT recommended a fifth catch sharing option where the available harvest greater than the actual 2002 harvest in each state is shared equally.

Black rockfish catch sharing options analyzed in the alternatives are the 49% Oregon/51% California option under the *Low OY* alternative, the 58% Oregon, 42% California option under the *Medium OY* alternative, and the 65% Oregon/35% California option under the *High OY* alternative.

The recreational and commercial harvest shares of black rockfish analyzed in this EIS are generally based on state nearshore fish management plans. While the states may propose black rockfish catch among sectors, the final shares will be determined by the Council with the general objective to maintain the northern minor rockfish (includes all non-overfished nearshore, shelf, and slope rockfish species) allocation of 91.7% limited entry and 8.3% open access; and the southern minor rockfish allocation of 55.7% limited entry and 44.3% open access.

2.1.2.2 Bocaccio

Decisions on how to share the available harvest of bocaccio only need to be made for California fisheries since the stock is only declared overfished south of Cape Mendocino and the specified OY alternatives only apply for that area. The commercial:recreational fishery sharing options the Council chose for analysis are a 50:50 option and a 44:56 option based on the 2002 harvest guidelines decided by the Council.

The bocaccio harvest sharing option for the affected commercial fishing sectors in California is 60% trawl:40% nontrawl based on the average catch sharing percentage during 1997-1999.

2.1.2.3 Canary Rockfish

Canary rockfish are distributed coastwide and are caught with a variety of fishing gears. Given the low available harvest of canary rockfish under the Council's adopted rebuilding plan and the wide variety of fisheries that incidentally catch canary rockfish, this stock is the most binding constraint to West Coast groundfish fisheries. Sharing the available canary rockfish harvest is perhaps the most difficult decision facing the Council and NMFS. With bocaccio constraints significantly eased in 2004 relative to 2003, canary rockfish catch sharing will now be an even weightier decision with California fisheries vying for available harvest to allow some increased shelf fishing opportunity.

The Council decided two commercial:recreational fishery canary rockfish sharing options for analysis, (1) a 50:50 share which would result in a 42 mt OY in 2004 under the Council's rebuilding plan, and (2) a 61:39

share which would result in a 46 mt OY in 2004 under the Council's rebuilding plan. The Council expressed a preference for the latter since it is based on the same catch shares adopted for 2003. Catch shares based on other years were not favored by the Council since canary rockfish OYs were significantly higher prior to 2003, and canary rockfish rebuilding did not constrain fishing opportunities to the same extent.

The same rationale for catch sharing options among commercial fishery sectors compelled the Council to recommend using the 2003 catch projections as the basis for analyzing commercial catch shares. These projections and resulting catch shares for analyzing allocation of the commercial harvest guideline among commercial sectors are 59% trawl, 3% limited entry fixed gear, 12% open access, and 26% tribal fisheries.

Sharing the available harvest of canary rockfish among states for the state-managed recreational fisheries could not be based on 2003 catch projections since California fisheries were largely constrained by bocaccio rebuilding measures. This year, with the bocaccio OY increasing significantly, shaping the California recreational fishery by some relaxation of the seasonal and depth restrictions imposed in 2003 to protect bocaccio will require a greater share of the available harvest of canary rockfish. A less biased approach recommended by the Council was to use recreational catch histories from the 1990s to analyze impacts in recreational fisheries. The choice of these data was based on the fact that the catches occurred prior to canary rockfish being declared overfished and thus rebuilding canary rockfish was not a primary factor in constraining fisheries. Older recreational data is less reliable since species catch compositions were not uniformly calculated and/or reported. In fact, the GMT recommended that catch histories from the 1993-1999 period be used for these reasons. The GMT also underscored other data biases such as California recreational catch estimates being generated from MRFSS, which has generally estimated higher catches than other data systems, while Oregon and Washington estimates are largely derived from the states' ocean sampling programs. Likewise, estimates of recreational discards are differentially sampled and reported by the coastal states. States also differentially implemented more conservative constraints on their recreational fisheries during the 1990s. For instance, in 1996 Washington went from a 15 rockfish daily bag limit to a 10 rockfish limit while the other states maintained a 15 rockfish limit. Despite recognized data bias, the GMT recommended using Recreational Fishery Information Network (RecFIN) estimates of landed catch during 1993-1999 to analyze recreational catch shares among the states. The resulting catch shares are 60% California, 34% Oregon, and 6% Washington.

As in the process the Council used to determine the canary rockfish harvest shares and ultimately the OY in 2003, the Council is expected to use the analyses in this EIS to understand the tradeoffs of different allocation scenarios and negotiate and adopt a final canary rockfish harvest sharing strategy and OY at the September meeting in Seattle, Washington.

2.1.2.4 Lingcod

A similar analytical approach and rationale for sharing the available lingcod harvest to sharing canary rockfish harvest was proposed by the Council, since access to lingcod was and will largely depend on controlling canary rockfish impacts. Therefore, the Council proposed using 2003 projected catch shares to determine the commercial:recreational lingcod catch sharing for analysis. This catch share is 31% commercial and 69% recreational. The same rationale for analyzing lingcod catch shares among commercial fishery sectors using 2003 catch projections gives 49% trawl, 12% limited entry fixed gear, 32% open access, and 7% tribal fisheries. Sharing the recreational harvest guideline of lingcod among the states by calculating the percentage of coastwide recreational landings during 1993-1999 using RecFIN data gives shares of 65% California, 22% Oregon, and 13% Washington. As in the canary rockfish example, the Council is expected to use the analyses in this EIS to understand the tradeoffs of different allocation scenarios, and negotiate and adopt a final lingcod harvest sharing strategy and OY at the September meeting in Seattle, Washington.

2.1.2.5 Sablefish

Trawl and nontrawl sablefish allocations are frameworked in the groundfish FMP and specified in federal regulations. Since all the specified allocations are based on the available harvest of sablefish north of 36° N latitude (the Conception-Monterey INPFC area boundary), the problem in the sablefish specifications discussed in Section 2.1.1.8 requires apportioning the coastwide sablefish OY to the Conception and north of Conception areas. The GMT proposed using the last five years (1998-2002) of commercial sablefish landings north and south of 36° N latitude to proportionally stratify the coastwide OY. The average share of total sablefish landings occurring in the Conception area during 1998-2002 is 3.5%.

Sablefish catch sharing would be based on the north of Conception OY alternatives. The allocations specified in the 2003 federal regulations (50 CFR 660) are as follows: 10% of the north of Conception OY off the top as a tribal set-aside, the expected research catch and estimated take in non-groundfish fisheries off the top with the remaining north of Conception OY allocated to the commercial fishery. This commercial OY is then allocated 9.4% to open access fisheries north of Conception with the remainder allocated to limited entry. The trawl/nontrawl limited entry allocation is 58% trawl and 42% nontrawl with the expected take of sablefish in the at-sea whiting fishery taken off the top of the limited entry trawl allocation. Assumed sablefish discard mortality rates are 8% of landed catch in limited entry and fixed gear non-tribal fisheries, and 3% of landed catch in fixed gear tribal fisheries. Although a 21% discard mortality rate has been assumed in the past for limited entry trawl fisheries, observed sablefish discard rates from the federal groundfish observer program will be used to analyze expected trawl impacts in this EIS. Observer data from the federal groundfish observer program for limited entry and open access fixed gear fisheries is anticipated in early 2004. These data are expected to be used inseason in 2004 to manage fixed gear fisheries.

2.1.2.6 Widow Rockfish

Directed non-tribal midwater fisheries targeting yellowtail and widow rockfish have not been considered since 2002 due to high canary rockfish bycatch. Canary and widow rockfish constraints in 2004 will likely continue to exclude consideration of directed midwater fisheries. Therefore, without directed yellowtail/widow rockfish midwater fisheries, the sectors that have the highest bycatch of widow rockfish are the at-sea and shoreside whiting fisheries. The Council directed that the analysis of 2004 management options presume that non-whiting fisheries be held harmless in managing widow rockfish bycatch and that all the widow rockfish impacts be managed in the tribal at-sea whiting, non-tribal at-sea whiting, and shoreside whiting sectors. The GMT recommended that the widow rockfish bycatch rate used for the at-sea whiting sectors be derived from the 1999-2002 average bycatch. They further recommended the widow rockfish bycatch rate assumed for the shoreside whiting sector be derived from the bycatch scorecard under the *No Action* alternative (Table 2.2.1-1).

2.1.2.7 Yelloweye Rockfish

Yelloweye rockfish catch sharing will assume the proportion of the estimated take of yelloweye rockfish in the 2003 catch projections as depicted in the bycatch scorecard under the *No Action* alternative (Table 2.2.1-1) for analysis of 2004 alternatives.

2.1.3 Exempted Fishing Permits

Exempted fishing permits (EFPs) allow fishing activities that would otherwise be prohibited. As an example, EFPs provide a process for testing innovative fishing gears and strategies to substantiate methods for prosecuting sustainable and risk-averse fishing opportunities. The Council requested consideration and analysis of incorporating two ongoing EFPs[10] into regulations in 2004 to provide increased fleetwide fishing opportunities for the limited entry trawl sector. These ongoing EFPs are the Washington-sponsored arrowtooth trawl EFP and selective flatfish trawl EFPs sponsored by Oregon and California. This EIS analyzes the potential costs, benefits, and risks of converting these EFPs into regulations and thereby providing increased fishing opportunities using the gears and strategies tested while prosecuting these EFPs. A description of these two EFPs follows.

2.1.3.1 Arrowtooth Trawl EFP

The arrowtooth trawl EFP was designed to test strategies and trawl configurations for the ability to selectively harvest arrowtooth flounder (*Atheresthes stomias*) and avoid overfished species, most notably canary and yelloweye rockfish. This EFP included provisions for 100% observer coverage (originally funded by Washington using federal disaster relief monies but later funded by participating vessel owners), individual vessel monthly and yearly bycatch caps on overfished species, overall (all participating vessels combined) bycatch caps on overfished species, and full retention of rockfish. If the individual vessel or overall bycatch cap was attained for any one species, the individual or all participating vessels (in the case of the overall cap being attained) would terminate their activities for the period or year.

The management option of converting this EFP into regulations in 2004 includes the same provisions that were adopted for the EFP. Such provisions include vessel owner-funded observer coverage to monitor compliance, bycatch caps, and full retention of rockfish regardless of size or condition. The potential benefit of allowing fleetwide opportunity would be access to the trawl Groundfish Conservation Area (GCA or also known as Rockfish Conservation Areas or RCAs) to pursue arrowtooth flounder.

2.1.3.2 Selective Flatfish Trawl EFP

The selective trawl EFPs include those sponsored by Oregon and California to test a new low-rise trawl with a cutback headrope designed to selectively catch flatfish while avoiding rockfish. Full observer coverage and bycatch caps for overfished groundfish species were provided in these EFPs.

The management option of converting these EFPs into regulations in 2004 includes the same provisions that were adopted for the EFP. Such provisions include full observer coverage (presumably vessel owner-funded) to monitor compliance, and bycatch caps for overfished groundfish species. The potential benefit of allowing fleetwide opportunity would not necessarily be higher flatfish limits, but access to the trawl GCA to pursue shelf flatfish species.

2.1.4 Trawl B Platoon

The GMT recommended that the trawl B platoon be eliminated in 2004 and beyond because the costs to our management and regulatory systems resulting from offering the trawl B platoon option to the groundfish trawl fishery currently outweigh the benefits to the industry. Implementation and enforcement of inseason

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10/ There are actually three EFPs under consideration, but two of them are similar enough to be categorized as one in that they are testing similar gears in waters off two different states. These two EFPs are the Oregon-sponsored selective flatfish trawl EFP and the California-sponsored nearshore flatfish EFP. Both are testing low-rise trawls with cutback head ropes to test the selectivity of this gear to catch flatfish and avoid rockfish. Both EFPs will be discussed in this EIS as one characterized as the selective flatfish trawl EFP.

line movements, administration of vessel monitoring systems, bycatch modeling, real time catch accounting and observer scheduling are all complicated by a trawl fleet fishing under two different regulatory time periods. Originally, the trawl B platoon was implemented as a means of dispersing landings over a longer period of time, increasing the value of the product and improving the stability of the supply. In 2003 only 28 vessels are currently in the trawl B platoon, and smoothing of product flow can be accomplished by the scheduling of landings between the vessel and processor. Also, should an emergency fishing closure be required as a result of attaining an OY for an overfished species, the trawl B platoon could be deprived of fishing time equal to the rest of the fleet or the Council could be faced with the decision of allowing continued fishing in order to provide equal opportunity to the trawl B platoon.

The GAP objected because it is the experience of both fishermen and processors who are involved with the dual platoon system that having the ability to better spread deliveries, even of smaller amounts of fish, produces a better product and more economic efficiency. Vessels also have more opportunities to take advantage of weather breaks, thereby promoting vessel safety, a key component of Magnuson-Stevens Act requirements and an issue often raised by the Coast Guard member of the Council. Use of a dual platoon system does not detract from conservation but does promote the economic welfare of coastal communities. In sum the dual platoon system directly embodies National Standards 8 and 10. The GAP understands that there may be some minor additional cost and inconvenience with the dual platoon structure.

The Council included this as a management measure for analysis in order to weigh the potential costs and benefits of eliminating the dual platoon system.

2.2 Description of the Alternatives

The alternatives analyzed in this EIS include a *No Action* alternative that describes the status quo regulations implemented in 2003, a *Low OY* alternative that describes the most conservative harvest levels analyzed, a *Medium OY* alternative that describes an intermediate level of harvest, a *High OY* alternative that describes the most liberal harvest levels analyzed, and a *Council OY* alternative that describes the harvest levels and management measures preferred by the Council. While the Council has indicated preferences for most of the harvest levels ranged in this analysis, they have not indicated preferred alternative management measures for 2004. Those decisions will be made at the September Council meeting in Seattle, Washington and analyzed before the Draft EIS is submitted to the Environmental Protection Agency for public comment. All alternatives analyzed will utilize the best available science for determining stock status, monitoring total catch, and understanding stock impacts. A description of the alternatives follows.

2.2.1 The No Action Alternative

The *No Action* alternative represents the harvest specifications and management measures implemented in regulations for the 2003 West Coast groundfish fishery. Depth-based restrictions, imposed by implementing seasonal area restrictions, termed GCAs, and other significant constraints to fishing opportunities imposed by rebuilding measures for bocaccio, canary rockfish, darkblotched rockfish, and yelloweye rockfish generally characterize 2003 management measures. The trip limits, area restrictions, and other regulatory constraints decided through June 2003 form the basis for the *No Action* alternative. The estimated mortality of overfished groundfish species under these regulations are shown in Table 2.1.1-1. All other alternatives analyzed in this EIS are compared to *No Action*. The estimated mortality of overfished groundfish species under the *No Action* alternative are depicted in Table 2.2.1-1. A description of the *No Action* alternative by fishery sector follows.

2.2.1.1 *Limited Entry Trawl*

Trip limits, cumulative landing limits, and the depth lines describing the trawl GCA by two-month period in 2003 are shown in Tables 2.2.1-2 and 2.2.1-3 for the limited entry trawl fishery north and south of 40°10' N latitude, respectively.

Non-Whiting Trawl

The limited entry trawl fishery was largely constrained at the outset of 2003 to waters deeper than a line specified by latitude/longitude waypoints approximating 250 fm north of 38° N latitude (near Pt. Reyes, California) to reduce mortality of darkblotched rockfish and Pacific ocean perch (overfished slope rockfish species). Specific areas between 150 fm and 250 fm were opened in periods 1 and 6 to provide access to petrale sole which aggregate in winter months in these areas and are an important trawl target species. Shallow water opportunities inside 100 fm except period 4, when the GCA was extended inshore to 75 fm, were available to trawlers using small footropes to access shelf flatfish species north of 40°10' N latitude (near Cape Mendocino, California). The 100 fm to 150 fm depth zone was closed year-round to trawling to protect overfished slope rockfish species and canary rockfish.

The limited entry trawl GCA south of 38° N latitude extended offshore to a specified line approximating 150 fm to protect bocaccio, canary rockfish, cowcod, and other overfished groundfish species inhabiting the shelf off California. Inshore opportunities to target shelf flatfish were provided by allowing trawl vessels south of 40°10' N latitude and north of Pt. Conception at 34°27' N latitude to fish from the bounds of the California territorial sea at three miles offshore to a line approximating 50 fm during period 1 and out to a line approximating 60 fm for the rest of the year. Trawlers fishing south of Pt. Conception were able to fish from three miles offshore out to a line approximating 100 fm along the mainland coast and offshore from a line approximating 150 fm.

In January 2003 a report from the first year of the NMFS Groundfish Observer Program with raw trawl discard data was provided by the Northwest Fisheries Science Center. An analysis of these data that included a reconciliation of total catch impacts in the trawl fishery using observer data and fish receiving tickets was presented to the Council at the April 2003 meeting in Vancouver, Washington. These data were also filtered using logbook records to emulate depth-based management by only including records where tows were initiated in currently open depth zones. The results of this analysis indicated the trawl bycatch rates used to manage bycatch of bocaccio, canary rockfish (*S. pinniger*), and lingcod (*Ophiodon elongatus*) were significantly higher than previously modeled. The Council decided to use these new observer-based bycatch rates for inseason management. Therefore, as of May 1, 2003, the trawl GCA was extended inshore to a line approximating 50 fm north of Cape Mendocino primarily to reduce canary rockfish and lingcod impacts. In June the Council decided to move the inshore GCA line to 75 fm during period 4 to avoid trawl interactions with molting Dungeness crab. The offshore trawl GCA line was moved from 250 fm to 200 fm coastwide as of May 1 since new observer-based trawl bycatch rates for darkblotched rockfish indicated there would still be a buffer between expected impacts on this stock and the total catch OY of 172 mt. The rationale for moving the deeper trawl GCA line out from 150 fm to 200 fm south of Pt. Reyes was to reduce mortality of bocaccio. Additionally, the Council decided to adopt differential trip limits for trawl-caught Dover sole, thornyheads, and sablefish (DTS species) using small footropes. Smaller trip limits for DTS species were applied to trawlers forced to use small footropes when fishing inshore of the trawl GCA. The larger limits allowed for trawlers fishing offshore of the GCA using large footropes were designed to provide an incentive for trawlers to fish deeper and avoid overfished groundfish species (particularly canary rockfish) residing on the shelf. The smaller DTS limits would apply for the entire two-month cumulative limit period if DTS species were landed using small footrope gear.

Whiting Trawl

The U.S. portion of the calculated U.S./Canada total catch Pacific whiting OY in 2003 was 148,200 mt. This was 80% of the projected U.S./Canada OY from the most recent assessment (Helser *et al.* 2002). The OY was apportioned among commercial sectors according to the allocations in federal regulations (50 CFR 660.306 and 550 CFR 660.323(a)(4)). The tribal allocation was based on the sliding scale methodology that has been in use since 1999, which specifies tribal allocation relative to incremental changes to the U.S. whiting OY. The 2003 tribal whiting allocation was 25,000 mt based on this methodology, which was taken off the top of the U.S. OY. An additional 2,000 mt of whiting was set-aside to accommodate bycatch in non-whiting fisheries to derive the non-tribal commercial OY of 121,200 mt. This commercial OY was allocated 34% (41,288 mt) to the catcher-processor sector, 24% (29,080 mt) to the mothership sector, and 42% (50,904 mt) to the shoreside sector.

2.2.1.2 Limited Entry Fixed Gear

The 2003 limited entry fixed gear fishery north of 40°10' N latitude was largely constrained to areas deeper than a line approximating 100 fm and nearshore areas inside of 27 fm in territorial waters off northern California and Oregon. No nearshore commercial groundfish opportunities were available in Washington territorial waters. This depth restriction was imposed on the northern fixed gear fisheries to reduce mortality of the overfished shelf groundfish species and particularly canary and yelloweye (*S. ruberrimus*) rockfish. Fixed gears are particularly efficient targeting valuable canary and yelloweye rockfish in the high relief, rocky habitats they reside. Gear restrictions, such as the small footrope restrictions imposed on the trawl sector when operating on the shelf, were not judged effective in controlling total mortality of shelf rockfish in fixed gear fisheries. Therefore, a conservative nontrawl GCA was established based on the depth distribution of these species and the depth-based species catch composition in fixed gear International Pacific Halibut Commission surveys (PFMC 2003). More direct sources of bycatch data such as direct observations and logbook records were not available for the fixed gear fleets.

The limited entry fixed gear fishery south of 40°10' N latitude in 2003 was largely constrained to waters deeper than a line approximating 150 fm and inshore of the 20 fm contour. As in the northern fishery, this GCA was designed to reduce mortality of overfished shelf groundfish species. However, unlike the northern fishery, the extent of the GCA was primarily based on the need to significantly reduce mortality of bocaccio. One exception to the southern nontrawl GCA in 2003 was adopted for a small area in the Southern California Bight to access aggregating California scorpionfish (*Scorpaena guttata*). During period 4, on Huntington Flats between a line drawn due south from Point Fermin (33°42'30" N latitude/118°17'30" W longitude) and a line drawn due west from the Newport South Jetty (33°35'37" N latitude/117°52'50" W longitude) vessels fishing for all federal groundfish species, except all rockfish and lingcod, with fixed gears were able to operate from shore to a line approximating 50 fm.

Trip limits, cumulative landing limits, and the depth lines describing the nontrawl GCA by two-month period in 2003 are shown in Tables 2.2.1-4 and 2.2.1-5 for the limited entry fixed gear fishery north and south of 40°10' N latitude, respectively.

2.2.1.3 Open Access

The open access sectors include directed groundfish fisheries that use fixed gears and a sector comprised of vessels targeting non-groundfish species but which incidentally catch groundfish species. The latter incidental open access sector use a variety of gears including fixed gears and exempted trawl gears (the groundfish FMP only allows groundfish targeting by trawls in the limited entry trawl sector). All nontrawl commercial groundfish fishing sectors in 2003 were subject to the nontrawl GCA described for the limited entry fixed gear fleet in Section 2.1.2. Many of the incidental open access fisheries such as the pink shrimp, Dungeness crab, and salmon troll fisheries were not subject to the GCA restrictions given either the lack of groundfish bycatch in the fishery or new gear modifications imposed to reduce groundfish bycatch. Mandatory use of finfish excluders or bycatch reduction devices (BRDs) in the pink shrimp fishery is an example of a precautionary gear modification in an incidental open access fishery.

Trip limits, cumulative landing limits, and the depth lines describing the nontrawl GCA by two-month period in 2003 are shown in Tables 2.2.1-6 and 2.2.1-7 for the open access fisheries north and south of 40°10' N latitude, respectively.

2.2.1.4 Tribal Fisheries

The Washington coastal tribes (Makah, Quileute, Hoh, and Quinault) prosecuted their groundfish fisheries in 2003 with the following allocations and trip limits. The sablefish allocation was 10% of the total catch OY (for the portion of the stock north of 36° N latitude) of 6,500 mt. This provided an allocation of 631 mt of sablefish after deducting an assumed 3% discard mortality. The tribal commercial harvest of black rockfish was managed with a harvest guideline of 20,000 pounds north of Cape Alava, Washington at 48°09'30" N latitude and 10,000 pounds between Destruction Island, Washington at 47°40' N latitude and Leadbetter Point, Washington at 46°38'10" N latitude Thornyheads were subject to a 300 pound trip limit as were canary rockfish. Yelloweye rockfish were subject to a 100-pound trip limit. Yellowtail rockfish taken in tribal midwater trawl fisheries were subject to a 30,000-pound, two-month cumulative landing limit and widow rockfish landings were limited to 10% of the weight of yellowtail rockfish landed in any two-month period. These midwater landing limits were subject to inseason adjustments to minimize the take of canary and widow rockfish. The tribes also delayed the start of their midwater fishery until September 2003 to minimize canary rockfish impacts. Other rockfish, including species in the minor nearshore, minor shelf, and minor slope rockfish complexes were subject to either a 300-pound trip limit per species or complex, or to the non-tribal limited entry trip limit for those species if those limits were less restrictive. Rockfish taken during the open competitive tribal commercial fisheries for Pacific halibut were not subject to trip limits. A full rockfish retention program as well as a tribal observer program were instituted to provide catch accountability. Lingcod were subject to a 300-pound trip limit and a 900-pound weekly landing limit. Trip limits for Pacific cod, petrale sole, English sole, rex sole, arrowtooth flounder, and other flatfish in the tribal bottom trawl fishery were the same as for non-tribal limited entry fixed gear at the start of the season (Table 2.2.1-2) using the same Council-approved gear. The tribal plan was not to reduce these limits inseason because of the low expected catch unless catch statistics indicated that the tribes would attain more than half the harvest of these species in their usual and accustomed fishing areas. The tribal allocation of Pacific whiting in 2003 was described in Section 2.2.1.1. The Makah tribe was the only one of the four tribes prosecuting a whiting-directed fishery in 2003.

2.2.1.5 Washington Recreational

In 2003 the Washington recreational fishery was open year round for groundfish except lingcod which was open from March 16 to October 15. There was a recreational groundfish bag limit of 15 fish per day including rockfish and lingcod. Of the 15 recreational groundfish allowed to be landed per day, only 10 could be rockfish, with a sublimit of one canary rockfish, no retention of yelloweye rockfish, and a sublimit of two lingcod with a 24 inch minimum size during the open lingcod season. A "C-shaped" Yelloweye

Rockfish Conservation Area (YRCA) was established where recreational groundfish and recreational halibut fishing was prohibited. The YRCA was defined by the following coordinates:

48°18' N latitude/125°18' W longitude,
48°18' N latitude/124°59' W longitude,
48°11' N latitude/125°11' W longitude,
48°11' N latitude/124°59' W longitude,
48°04' N latitude/125°11' W longitude,
48°04' N latitude/124°59' W longitude,
48°00' N latitude/125°18' W longitude, and
48°00' N latitude/124°59' W longitude

The Washington Department of Fish and Wildlife (WDFW) used their Ocean Sampling Program to monitor groundfish catches inseason. If canary or yelloweye rockfish harvest guidelines were projected to be attained inseason, WDFW would close the recreational groundfish fishery to inside the 25 fm contour to reduce impacts on these species.

2.2.1.6 Oregon Recreational

In 2003 the Oregon recreational groundfish fishery was open year round. Catches were managed using a 10 marine fish daily-bag-limit including rockfish, greenling (*Hexagrammos* spp.), cabezon (*Scorpaenichthys marmoratus*), and other groundfish species, but excluding salmon, lingcod, perch species, sturgeon, sanddabs, striped bass, tuna, and baitfish. Included in the marine fish daily-bag-limit were sublimits of one canary and one yelloweye rockfish. Additionally, anglers could keep two lingcod with a 24-inch minimum size and one Pacific halibut with a 32-inch minimum size when the halibut season was open. No canary or yelloweye were allowed to be retained if Pacific halibut were on board during the all-depth halibut season.

The Oregon Department of Fish and Wildlife (ODFW) used their Ocean Sampling Program to monitor groundfish catches inseason. If canary or yelloweye rockfish harvest guidelines were projected to be attained inseason, ODFW would close the recreational groundfish fishery to inside the 27 fm contour to reduce impacts on these species.

2.2.1.7 California Recreational

South of Cape Mendocino

The California recreational groundfish fishery south of Cape Mendocino was restricted to waters shallower than 20 fm in most areas with a six-month July through December season to significantly reduce bocaccio, canary rockfish, and yelloweye rockfish mortality. The area restriction exception is the Huntington Flats (as described for the nontrawl GCA exception in Section 2.1.2) where recreational fishing could occur out to 50 fm during July and August to access aggregating California scorpionfish. The daily-bag-limit was 10 fish in the RGC (rockfish, cabezon, greenling) complex, of which two could be from the shallow nearshore rockfish group (black and yellow rockfish (*S. chrysomelas*), gopher rockfish (*S. carnatus*), China rockfish (*S. nebulosus*), kelp rockfish (*S. atrovirens*), and grass rockfish (*S. rastrelliger*)), three could be cabezon (15-inch minimum size), and two could be greenling species (12 inch minimum size). Additionally, two lingcod with a 24 inch minimum size could be caught during the July through December recreational groundfish season. Up to five California scorpionfish could be taken per day with a 10-inch minimum size limit during January through February and July through December. Ocean whitefish could only be taken during July through December in waters shallower than 20 fm due to the close association with bocaccio on the shelf. No retention of bocaccio, canary rockfish, cowcod, or yelloweye rockfish was allowed.

The Cowcod Conservation Areas (CCAs) are two specific areas in the Southern California Bight closed to the taking of rockfish, lingcod, California scorpionfish, and ocean whitefish in waters deeper than 20 fm (Figure 2.2.1-1). These bottomfishing activities have been shown to incidentally catch cowcod. The CCAs are areas of highest cowcod density closed to these bottomfishing activities and, along with non-retention regulations, are the centerpiece of cowcod protective measures. The two CCAs (Area 1 and Area 2) in place for 2003 encompass about 4,300 square miles and are delineated as follows:

Area 1 is an area south of Point Conception that is bound by straight lines connecting the following points in the order listed:

33°50' N latitude, 119°30' W longitude;
33°50' N latitude, 118°50' W longitude;
32°20' N latitude, 118°50' W longitude;
32°20' N latitude, 119°37' W longitude;
33°00' N latitude, 119°37' W longitude;
33°00' N latitude, 119°53' W longitude;
33°33' N latitude, 119°53' W longitude;
33°33' N latitude, 119°30' W longitude;
33°50' N latitude, 119°30' W longitude; and
Area 2 is a smaller area west of San Diego that is bound by straight lines connecting the following points in the order listed:

32°42' N latitude, 118°02' W longitude;
32°42' N latitude, 117°50' W longitude;
32°36' 42" N latitude, 117°50' W longitude;
32°30' N latitude, 117°53'30" W longitude;
32°30' N latitude, 118°02' W longitude; and
32°42' N latitude, 118°02' W longitude

North of Cape Mendocino

The recreational groundfish fishery north of Cape Mendocino was managed to closely match the Oregon recreational management measures. The recreational groundfish season was open year round. An aggregate of 20 marine finfish were allowed per day of which 10 could be rockfish (with sublimits of two bocaccio, one canary rockfish, one yelloweye rockfish, and no retention of cowcod), 10 could be cabezon (15-inch minimum size), 10 could be greenling species (12-inch minimum size), two could be lingcod (24-inch minimum size), 10 could be California scorpionfish (10-inch minimum size), five could be California sheephead (*Semicossyphus pulcher*, 12-inch minimum size), and three could be California halibut (*Paralichthys californicus*, 22-inch minimum size).

2.2.2 The Low OY Alternative

The *Low OY* alternative represents the most conservative harvest specifications and management measures analyzed in this EIS for the 2004 West Coast groundfish fishery. These specifications and management measures were generally decided by the Council at its June 2003 meeting and subsequently refined by the GMT. The estimated mortality of overfished groundfish species under the *Low OY* alternative are shown in Table 2.2.2-1. The *Low OY* alternative is the environmentally preferable alternative. It results in the lowest levels of fishing mortality and is based on generally higher modeled probabilities of overfished species reaching target biomass within the time frame specified in the management framework. A description of the *Low OY* alternative by fishery sector follows.

2.2.2.1 Limited Entry Trawl

Trip limits, cumulative landing limits, and the depth lines describing the trawl GCA by two-month period under the *Low OY* alternative for 2004 are shown in Tables 2.2.2-2 and 2.2.2-3 for the limited entry trawl fishery north and south of 40°10' N latitude, respectively.

Non-Whiting Trawl

The limited entry trawl fishery would be constrained under the *Low OY* alternative to waters deeper than a line specified by latitude/longitude waypoints approximating 150 fm coastwide. Shallow water opportunities north of 40°10' N latitude inside 75 fm, except periods 2 and 3 when the GCA is extended inshore to 60 fm, would be available to trawlers using small footropes to access shelf flatfish species. The 75 fm to 150 fm depth zone would be closed year-round to trawling to protect overfished shelf and slope rockfish species.

The limited entry trawl GCA south of 40°10' N latitude would be extended offshore to a specified line approximating 150 fm to protect bocaccio, canary rockfish, cowcod, and other overfished groundfish species inhabiting the shelf off California. Inshore opportunities to target shelf flatfish would be provided by allowing trawl vessels to fish from the bounds of the California territorial sea at three miles offshore to a line approximating 75 fm during periods 1, 2, 5, and 6, and out to a line approximating 100 fm for periods 3 and 4.

As in 2003, the *Low OY* alternative specifies smaller trip limits north of 40°10' N latitude for DTS species for trawlers forced to use small footropes when fishing inshore of the trawl GCA. The larger limits allowed for trawlers fishing offshore of the GCA using large footropes are designed to provide an incentive for trawlers to fish deeper and avoid overfished groundfish species (particularly canary rockfish) residing on the shelf. The smaller DTS limits would apply for the entire two-month cumulative limit period if DTS species were landed using small footrope gear.

Whiting Trawl

The U.S. portion of the total catch Pacific whiting OY under the *Low OY* alternative is 74,100 mt. This OY was apportioned among commercial sectors according to the allocations in federal regulations (50 CFR 660.306 and 550 CFR 660.323(a)(4). The tribal allocation was based on the sliding scale methodology that has been in use since 1999, which specifies tribal allocation relative to incremental changes to the U.S. whiting OY. The *Low OY* tribal whiting allocation is 12,967.5 mt based on this methodology, which was taken off the top of the U.S. OY. An additional 2,000 mt of whiting was set-aside to accommodate bycatch in non-whiting fisheries and 1,000 mt to accommodate a cap for a WDFW-sponsored pollock EFP to derive the non-tribal commercial OY of 58,133 mt. This commercial OY was allocated 34% (19,765 mt) to the catcher-processor sector, 24% (13,952 mt) to the mothership sector, and 42% (24,416 mt) to the shoreside sector.

2.2.2.2 *Limited Entry Fixed Gear*

Trip limits, cumulative landing limits, and the depth lines describing the nontrawl GCA by two-month period under the *Low OY* alternative for 2004 are shown in Tables 2.2.2-4 and 2.2.2-5 for the limited entry fixed gear fishery north and south of 40°10' N latitude, respectively.

Discard rates of groundfish in the limited entry fixed gear fishery, determined using the first two years of observations from the federal groundfish observer program, are anticipated to be available for management use inseason during 2004. Although the management implications of using these new data are not yet known, the Council wanted consideration of a deeper nontrawl GCA boundary in case it is needed to manage he 2004 fishery. Therefore, under the *Low OY* alternative, an option of a 125 fm deeper line is considered to describe the outer bounds of the nontrawl GCA north of Cape Mendocino.

The CDFG is proposing establishing four marine regions to manage nearshore commercial and recreational fisheries off California under all 2004 alternatives. These regions are described as follows:

1. U.S./Mexico border to Pt. Conception at 34°27' N latitude.
2. Pt. Conception to Pt. San Pedro (near San Francisco Bay entrance at 37°59.4' N latitude).
3. Pt. San Pedro to Cape Mendocino at 40°10' N latitude.
4. Cape Mendocino to the California/Oregon border.

All the nearshore commercial seasons and depth restrictions by region would be the same as for the recreational fishery (see Section 2.2.2.7). A 50-pound bocaccio trip limit is specified under the *Low OY* alternative for nearshore commercial fisheries south of Cape Mendocino. There would be no cabezon retention and the greenling minimum size limit would be 16 inches

2.2.2.3 *Open Access*

Trip limits, cumulative landing limits, and the depth lines describing the nontrawl GCA by two-month period under the *Low OY* alternative for 2004 are shown in Tables 2.2.2-6 and 2.2.2-7 for open access gears north and south of 40°10' N latitude, respectively.

Discard rates of groundfish using open access gears, determined using the first two years of observations from the federal groundfish observer program, are anticipated to be available for management use inseason during 2004. Although the management implications of using these new data are not yet known, the Council wanted consideration of a deeper nontrawl GCA boundary in case it is needed to manage 2004 fixed gear fisheries. Therefore, under the *Low OY* alternative, an option of a 125 fm deeper line is considered to define the outer bounds of the nontrawl GCA.

The CDFG is proposing establishing four marine regions to manage nearshore commercial and recreational fisheries off California under all 2004 alternatives. These regions are described as follows:

1. U.S./Mexico border to Pt. Conception at 34°27' N latitude.
2. Pt. Conception to Pt. San Pedro (near San Francisco Bay entrance at 37°59.4' N latitude).
3. Pt. San Pedro to Cape Mendocino at 40°10' N latitude.
4. Cape Mendocino to the California-Oregon border.

All the nearshore commercial seasons and depth restrictions by region would be the same as for the recreational fishery under the *Low OY* alternative (see Section 2.2.2.7). A 50-pound bocaccio trip limit is specified under the *Low OY* alternative for nearshore commercial fisheries south of Cape Mendocino. There would be no cabezon retention and the greenling minimum size limit would be 16 inches

Elimination of the spot prawn trawl fishery in Oregon (the last remaining West Coast spot prawn trawl fishery) is anticipated under the *Low OY* alternative (and all other 2004 alternatives). The pink shrimp fishery will be required to install approved BRDs in their trawls as was the case in 2003. This became a permanent rule last year for all the West Coast states.

2.2.2.4 Tribal Fisheries

Tribal allocations and harvest guidelines for black rockfish, canary rockfish, thornyheads, yelloweye rockfish, minor nearshore, minor shelf, and minor slope rockfish under the *Low OY* alternative (and all other 2004 alternatives) are status quo (same as *No Action*). The sablefish harvest guideline under the *Low OY* alternative is 441 mt, which assumes a 4.38% average discard rate in tribal trawl and fixed gear fisheries. The proposed flatfish limits in tribal bottom trawl fisheries are based on the framework described under the *No Action* alternative. Trip limits for these species will be the same as those adopted for the non-tribal limited entry trawl fishery at the start of the year with the same gear restrictions. The tribes will continue to develop depth, area, and time restrictions in their directed Pacific halibut fishery to minimize impacts on yelloweye rockfish. The tribes are proposing an overall lingcod harvest guideline of 25 mt in 2004 for all tribal fisheries combined. Tribal fisheries would be restricted to 450 pounds per day and 1,350 pound, per week lingcod limits for all fisheries, which would be adjusted inseason to stay within the overall harvest guideline. The tribes propose a midwater trawl option of 150,000 pound, two-month limit of yellowtail rockfish on a fleet-wide basis, which is the same as the status quo vessel-based landing limit of 30,000 pounds per two months given that there are about five participating vessels in the fleet. Widow rockfish would be limited to 10% of the landed yellowtail rockfish. The tribes are proposing to again delay the start of their midwater trawl fishery until September 2004 to reduce the incidental take of canary rockfish.

2.2.2.5 Washington Recreational

The Washington recreational groundfish fishery regulations under the *Low OY* alternative would be the same as status quo except for the following changes:

- The canary rockfish sublimit is reduced from one per day to no retention.
- The lingcod season changes from March 16 through October 15 to the Saturday closest to March 16 through the Sunday closest to October 15.
- The nearshore line of 25 fm (used in inseason management to restrict depths where the recreational fishery would operate if the canary or yelloweye rockfish harvest guideline is projected to be attained early) would change to a 30-fm line; an inseason depth restriction would apply only in specific high bycatch areas.

2.2.2.6 Oregon Recreational

The Oregon recreational groundfish fishery regulations under the *Low OY* alternative would be the same as status quo except for the following changes:

- Groundfish open inside 40 fm year round.

- The canary rockfish sublimit is reduced from one per day to no retention.
- The yelloweye rockfish sublimit is reduced from one per day to no retention.
- The minimum size limit for lingcod increases from 24 inches to 26 inches.
- Cabezon retention is disallowed.
- A 12-inch minimum size limit is established for greenling species.

2.2.2.7 California Recreational

The California Department of Fish and Game (CDFG) is proposing establishing four marine regions to manage nearshore commercial and recreational fisheries off California under all 2004 alternatives. These regions are described as follows:

1. U.S./Mexico border to Pt. Conception at 34°27' N latitude.
2. Pt. Conception to Pt. San Pedro (near San Francisco Bay entrance at 37°59.4' N latitude).
3. Pt. San Pedro to Cape Mendocino at 40°10' N latitude.
4. Cape Mendocino to the California/Oregon border.

U.S./Mexico Border to Pt. Conception

The California recreational groundfish fishery regulations south of Pt. Conception under the *Low OY* alternative would be the same as status quo except for the following changes:

- Groundfish open January through February and May through December inside 80 fm.
- The bocaccio sublimit is increased from no retention to one fish per day.
- The lingcod minimum size limit is increased from 24 inches to 26 inches.
- Cabezon retention is disallowed.
- The greenling species' minimum size limit is increased from 12 inches to 16 inches.

Additionally, the CDFG proposes changing the boundaries of the Cowcod Conservation Areas to open more area to recreational (and commercial) bottomfishing. Under the *Low OY* alternative, the CCAs would be reduced to three areas that are bounded within the 20 fm to 260 fm depth range (Figure 2.2.2-1). Two of these closed area polygons are mostly within the status quo Area 1 described under the *No Action* alternative and the fourth closed area polygon is mostly within the status quo Area 2 described under the *No Action* alternative.

Pt. Conception to Pt. San Pedro

The California recreational groundfish fishery regulations for the area between Pt. Conception and Pt. San Pedro under the *Low OY* alternative would be the same as status quo except for the following changes:

- Groundfish open March through June inside 20 fm and July through December inside 30 fm.
- The bocaccio sublimit is increased from no retention to one fish per day.
- The lingcod minimum size limit is increased from 24 inches to 26 inches.
- Cabezon retention is disallowed.
- The greenling species' minimum size limit is increased from 12 inches to 16 inches.

Pt. San Pedro to Cape Mendocino

The California recreational groundfish fishery regulations for the area between Pt. San Pedro and Cape Mendocino under the *Low OY* alternative would be the same as described for the area between Pt. Conception and Pt. San Pedro.

Cape Mendocino to the California-Oregon Border

The California recreational groundfish fishery regulations for the area between Cape Mendocino and the California/Oregon border under the *Low OY* alternative would be the same as status quo except for the following changes:

- Groundfish open March through December inside 30 fm.
- The lingcod minimum size limit is increased from 24 inches to 26 inches.
- Cabezon retention is disallowed.
- The greenling species' minimum size limit is increased from 12 inches to 16 inches.

2.2.3 The Medium OY Alternative

The *Medium OY* alternative represents intermediate harvest specifications and management measures analyzed in this EIS for the 2004 West Coast groundfish fishery. These specifications and management measures were generally decided by the Council at its June 2003 meeting and subsequently refined by the GMT. The estimated mortality of overfished groundfish species under the *Medium OY* alternative are shown in Table 2.2.3-1. A description of the *Medium OY* alternative by fishery sector follows.

2.2.3.1 Limited Entry Trawl

Trip limits, cumulative landing limits, and the depth lines describing the trawl GCA by two-month period under the *Medium OY* alternative for 2004 are shown in Tables 2.2.3-2 and 2.2.3-3 for the limited entry trawl fishery north and south of 40°10' N latitude, respectively.

Non-Whiting Trawl

The limited entry trawl fishery would be constrained under the *Medium OY* alternative to waters deeper than a line specified by latitude/longitude waypoints approximating 150 fm coastwide. Shallow water opportunities north of 40°10' N latitude inside 75 fm, except periods 2 and 3 when the GCA is extended inshore to 60 fm, would be available to trawlers using small footropes to access shelf flatfish species. The 75 fm to 150 fm depth zone would be closed year-round to trawling to protect overfished shelf and slope rockfish species.

The limited entry trawl GCA south of 40°10' N latitude would be extended offshore to a specified line approximating 150 fm to protect bocaccio, canary rockfish, cowcod, and other overfished groundfish species inhabiting the shelf off California. Inshore opportunities to target shelf flatfish would be provided by allowing trawl vessels to fish from the bounds of the California territorial sea at three miles offshore to a line approximating 100 fm year-round.

As in 2003, the *Medium OY* alternative specifies smaller trip limits north of 40°10' N latitude for DTS species for trawlers forced to use small footropes when fishing inshore of the trawl GCA. The larger limits allowed for trawlers fishing offshore of the GCA using large footropes are designed to provide an incentive for trawlers to fish deeper and avoid overfished groundfish species (particularly canary rockfish) residing on the shelf. The smaller DTS limits would apply for the entire two-month cumulative limit period if DTS species were landed using small footrope gear.

Whiting Trawl

The U.S. portion of the total catch Pacific whiting OY and the sector allocations under the *Medium OY* alternative are the same as described in Section 2.2.1.1 under the *No Action* alternative, with the exception of an additional 1,000 mt of whiting set-aside to accommodate a cap for a WDFW-sponsored pollock EFP.

2.2.3.2 Limited Entry Fixed Gear

Trip limits, cumulative landing limits, and the depth lines describing the nontrawl GCA by two-month period under the *Medium OY* alternative for 2004 are shown in Tables 2.2.3-4 and 2.2.3-5 for the limited entry fixed gear fishery north and south of 40°10' N latitude, respectively.

Under the *Medium OY* alternative for 2004, the nontrawl GCA would be defined by management lines specified with waypoints at roughly 30 fm to 100 fm in waters off Oregon and zero fm to 100 fm (status quo or same as *No Action*) in waters off Washington.

The CDFG is proposing establishing four marine regions to manage nearshore commercial and recreational fisheries off California under all 2004 alternatives. These regions are described as follows:

1. U.S./Mexico border to Pt. Conception at 34°27' N latitude.
2, Pt. Conception to Pt. San Pedro (near San Francisco Bay entrance at 37°59.4' N latitude).
3. Pt. San Pedro to Cape Mendocino at 40°10' N latitude.
4. Cape Mendocino to the California/Oregon border.

All the nearshore commercial seasons and depth restrictions by region would be the same as for the recreational fishery under the *Medium OY* alternative (see Section 2.2.3.7). A 100-pound bocaccio trip limit is specified under the *Medium OY* alternative for nearshore commercial fisheries south of Cape Mendocino. There would be a specified cabezon slot limit of 15 inches to 21 inches and the greenling minimum size limit would be 13 inches

2.2.3.3 Open Access

Trip limits, cumulative landing limits, and the depth lines describing the nontrawl GCA by 2-month period under the *Medium OY* alternative for 2004 are shown in Tables 2.2.3-6 and 2.2.3-7 for open access gears north and south of 40°10' N latitude, respectively.

The same nontrawl GCA described for limited entry fixed gears under the *Medium OY* alternative (Section 2.2.3.2) would also apply for those open access fisheries not exempt from the GCA restrictions.

2.2.3.4 Tribal Fisheries

Tribal groundfish allocations and harvest guidelines under the *Medium OY* alternative are the same as described for the *Low OY* alternative (Section 2.2.2.4), except for Pacific whiting which is based on a sliding scale proportioned to the U.S. whiting OY, and sablefish. Under the *Medium OY* alternative, the tribal

Pacific whiting harvest guideline is 25,000 mt or status quo. The sablefish harvest guideline is 722 mt, which assumes a 3.85% average discard mortality rate for tribal trawl and fixed gear fisheries.

2.2.3.5 Washington Recreational

The Washington recreational groundfish fishery regulations under the *Medium OY* alternative would be the same as status quo except for the following changes:

- The canary rockfish sublimit is reduced from one per day to no retention.
- The lingcod season changes from March 16 through October 15 to the Saturday closest to March 16 through the Sunday closest to October 15.
- The nearshore line of 25 fm (used in inseason management to restrict depths where the recreational fishery would operate if the canary or yelloweye rockfish harvest guideline is projected to be attained early) would change to a 30 fm line; an inseason depth restriction would apply only in specific high bycatch areas.

2.2.3.6 Oregon Recreational

The Oregon recreational groundfish fishery regulations under the *Medium OY* alternative would be the same as status quo except for the following changes:

- Groundfish open year round with no depth restrictions except during June through September when the fishery is open only inside 40 fm.
- The canary rockfish sublimit is reduced from one per day to no retention.
- The yelloweye rockfish sublimit is reduced from one per day to no retention.
- The minimum size limit for cabezon increases from 15 inches to 16 inches
- An 11-inch minimum size limit is established for greenling species.

2.2.3.7 California Recreational

U.S./Mexico Border to Pt. Conception

The California recreational groundfish fishery regulations south of Pt. Conception under the *Medium OY* alternative would be the same as status quo except for the following changes:

- Groundfish open year round inside 80 fm.
- The bocaccio sublimit is increased from no retention to one fish per day.
- A cabezon slot limit of 15 inches to 21 inches is established.
- The greenling species' minimum size limit is increased from 12 inches to 13 inches

Additionally, the CDFG proposes changing the boundaries of the Cowcod Conservation Areas to open more area to recreational (and commercial) bottomfishing. Under the *Medium OY* alternative, the CCAs would be reduced to four areas that are bounded within the 20 fm to 200 fm depth range (Figure 2.2.3-1). Three of these closed area polygons are mostly within the status quo Area 1 described under the *No Action* alternative and the fourth closed area polygon is mostly within the status quo Area 2 described under the *No Action* alternative.

Pt. Conception to Pt. San Pedro

The California recreational groundfish fishery regulations for the area between Pt. Conception and Pt. San Pedro under the *Medium OY* alternative would be the same as status quo except for the following changes:

- Groundfish open January through April and November through December inside 20 fm and May through October inside 30 fm.
- The bocaccio sublimit is increased from no retention to one fish per day.
- A cabezon slot limit of 15 inches to 21 inches is established.
- The greenling species' minimum size limit is increased from 12 inches to 13 inches

Pt. San Pedro to Cape Mendocino

The California recreational groundfish fishery regulations for the area between Pt. San Pedro and Cape Mendocino under the *Medium OY* alternative would be the same as described for the area between Pt. Conception and Pt. San Pedro.

Cape Mendocino to the California/Oregon Border

The California recreational groundfish fishery regulations for the area between Cape Mendocino and the California-Oregon border under the *Medium OY* alternative would be the same as status quo except for the following changes:

- Groundfish open March-December inside 30 fm.
- The yelloweye sublimit is increased from no retention to one fish per day.
- A cabezon slot limit of 15 inches to 21 inches is established.
- The greenling species' minimum size limit is increased from 12 inches to 13 inches

2.2.4 The High OY Alternative

The *High OY* alternative represents the most liberal harvest specifications and management measures analyzed in this EIS for the 2004 West Coast groundfish fishery. These specifications and management measures were generally decided by the Council at its June 2003 meeting and subsequently refined by the GMT. The estimated mortality of overfished groundfish species under the *High OY* alternative are shown in Table 2.2.4-1. A description of the *High OY* alternative by fishery sector follows.

2.2.4.1 Limited Entry Trawl

Trip limits, cumulative landing limits, and the depth lines describing the trawl GCA by two-month period under the *High OY* alternative for 2004 are shown in Tables 2.2.4-2 and 2.2.4-3 for the limited entry trawl fishery north and south of 40°10' N latitude, respectively.

Non-Whiting Trawl

The limited entry trawl fishery would be constrained under the *High OY* alternative to waters deeper than a line specified by latitude/longitude waypoints approximating 150 fm coastwide. Shallow water opportunities north of 40°10' N latitude inside 75 fm, except periods 2 and 3 when the GCA is extended inshore to 60 fm, would be available to trawlers using small footropes to access shelf flatfish species. The 75 fm to 150 fm depth zone would be closed year-round to trawling to protect overfished shelf and slope rockfish species.

The limited entry trawl GCA south of 40°10' N latitude would be extended offshore to a specified line approximating 150 fm to protect bocaccio, canary rockfish, cowcod, and other overfished groundfish species inhabiting the shelf off California. Inshore opportunities to target shelf flatfish would be provided by allowing trawl vessels to fish from the bounds of the California territorial sea at three miles offshore to a line approximating 100 fm year-round.

As in 2003, the *High OY* alternative specifies smaller trip limits north of 40°10' N latitude for DTS species for trawlers forced to use small footropes when fishing inshore of the trawl GCA. The larger limits allowed for trawlers fishing offshore of the GCA using large footropes are designed to provide an incentive for trawlers to fish deeper and avoid overfished groundfish species (particularly canary rockfish) residing on the shelf. The smaller DTS limits would apply for the entire two-month cumulative limit period if DTS species were landed using small footrope gear.

Whiting Trawl

The U.S. portion of the total catch Pacific whiting OY under the *High OY* alternative is 222,300 mt. This OY was apportioned among commercial sectors according to the allocations in federal regulations (50 CFR 660.306 and 550 CFR 660.323(a)(4). The tribal allocation was based on the sliding scale methodology that has been in use since 1999, which specifies tribal allocation relative to incremental changes to the U.S. whiting OY. The *High OY* tribal whiting allocation is 30,000 mt based on this methodology, which was taken off the top of the U.S. OY. An additional 2,000 mt of whiting was set-aside to accommodate bycatch in non-whiting fisheries and 1,000 mt to accommodate a cap for a WDFW-sponsored pollock EFP to derive the non-tribal commercial OY of 189,300 mt. This commercial OY was allocated 34% (64,362 mt) to the catcher-processor sector, 24% (45,432 mt) to the mothership sector, and 42% (79,506 mt) to the shoreside sector.

2.2.4.2 Limited Entry Fixed Gear

Trip limits, cumulative landing limits, and the depth lines describing the nontrawl GCA by two-month period under the *High OY* alternative for 2004 are shown in Tables 2.2.4-4 and 2.2.4-5 for the limited entry fixed gear fishery north and south of 40°10' N latitude, respectively.

The CDFG is proposing establishing four marine regions to manage nearshore commercial and recreational fisheries off California under all 2004 alternatives. These regions are described as follows:

1. U.S./Mexico border to Pt. Conception at 34°27' N latitude.
2. Pt. Conception to Pt. San Pedro (near San Francisco Bay entrance at 37°59.4' N latitude).
3. Pt. San Pedro to Cape Mendocino at 40°10' N latitude.
4. Cape Mendocino to the California/Oregon border.

All the nearshore commercial seasons and depth restrictions by region would be the same as for the recreational fishery (see Section 2.2.4.7). A 150-pound bocaccio trip limit is specified under the *High OY* alternative for nearshore commercial fisheries south of Cape Mendocino. There would be a specified cabezon slot limit of 15 inches to 22 inches and the greenling minimum size limit would be 12 inches.

2.2.4.3 Open Access

Trip limits, cumulative landing limits, and the depth lines describing the nontrawl GCA by two-month period under the *High OY* alternative for 2004 are shown in Tables 2.2.4-6 and 2.2.4-7 for open access gears north and south of 40°10' N latitude, respectively.

2.2.4.4 Tribal Fisheries

Tribal groundfish allocations and harvest guidelines under the *High OY* alternative are the same as described for the *Low OY* alternative (Section 2.2.2.4), except for Pacific whiting which is based on a sliding scale proportioned to the U.S. whiting OY and sablefish. The tribal Pacific whiting harvest guideline is 30,000 mt under the *High OY* alternative. The sablefish harvest guideline is 781 mt, which assumes a 3.79% average discard mortality rate for tribal trawl and fixed gear fisheries.

2.2.4.5 Washington Recreational

The Washington recreational groundfish fishery regulations under the *High OY* alternative would be the same as status quo except for the following changes:

- The lingcod season changes from March 16 through October 15 to the Saturday closest to March 16 through the Sunday closest to October 15.
- The nearshore line of 25 fm (used in inseason management to restrict depths where the recreational fishery would operate if the canary or yelloweye rockfish harvest guideline is projected to be attained early) would change to a 30 fm line; an inseason depth restriction would apply only in specific high bycatch areas.

2.2.4.6 Oregon Recreational

The Oregon recreational groundfish fishery regulations under the *High OY* alternative would be the same as status quo except for the following changes:

- Groundfish open year round with no depth restrictions except during July when the fishery is open only inside 50 fm.
- A 10-inch minimum size limit is established for greenling species.

2.2.4.7 California Recreational

U.S./Mexico Border to Pt. Conception

The California recreational groundfish fishery regulations south of Pt. Conception under the *High OY* alternative would be the same as status quo except for the following changes:

- Groundfish open year round without depth restrictions.
- The bocaccio sublimit is increased from no retention to two fish per day.
- The canary rockfish sublimit is increased from no retention to one fish per day.
- A cabezon slot limit of 15 inches to 22 inches is established.

Additionally, the CDFG proposes changing the boundaries of the Cowcod Conservation Areas to open more area to recreational (and commercial) bottomfishing. Under the *High OY* alternative, the CCAs would be reduced to four areas that are bounded within the 20 fm to 180 fm depth range (Figure 2.2.4-1). Three of these closed area polygons are mostly within the status quo Area 1 described under the *No Action* alternative and the fourth closed area polygon is mostly within the status quo Area 2 described under the *No Action* alternative.

Pt. Conception to Pt. San Pedro

The California recreational groundfish fishery regulations for the area between Pt. Conception and Pt. San Pedro under the *High OY* alternative would be the same as status quo except for the following changes:

- Groundfish open March through December inside 30 fm.
- The bocaccio sublimit is increased from no retention to two fish per day.
- The canary rockfish sublimit is increased from no retention to one fish per day.
- A cabezon slot limit of 15 inches to 22 inches is established.

Pt. San Pedro to Cape Mendocino

The California recreational groundfish fishery regulations for the area between Pt. San Pedro and Cape Mendocino under the *High OY* alternative would be the same as described for the area between Pt. Conception and Pt. San Pedro.

Cape Mendocino to the California-Oregon Border

The California recreational groundfish fishery regulations for the area between Cape Mendocino and the California-Oregon border under the *High OY* alternative would be the same as status quo except for the following changes:

- Groundfish open year round inside 30 fm.
- The canary rockfish sublimit is increased from no retention to one fish per day.
- The yelloweye sublimit is increased from no retention to one fish per day.
- A cabezon slot limit of 15 inches to 22 inches is established.

2.2.5 The Council OY Alternative

The *Council OY* alternative represents the Council-preferred groundfish harvest specifications and management measures recommended to NMFS and the U.S. Secretary of Commerce for 2004. The Council will adopt these specifications and management measures at its September 8-12, 2003 meeting in Seattle, Washington.

2.2.6 Alternatives Considered, But Eliminated From Detailed Study

Bycatch caps
OYs for overfished species determined to have a P_{MAX} <50%
Commercial seasonal closures

TABLE 2.1.1-1. Pacific Fishery Management Council-recommended alternatives for acceptable biological catches (ABCs) and total catch optimum yields (OYs) (mt) for 2004. (Overfished stocks in CAPS).

Stock	2003 ABCs/OYs		2004 ABC and OY Alternatives							
			Low OY		Med OY		High OY		Council OY a/	
	ABC	OY	ABC	OY	ABC	OY	ABC	OY	ABC	OY
LINGCOD	841	651			1,385	735			1,385	735
Pacific Cod	3,200	3,200			3,200	3,200			3,200	3,200
PACIFIC WHITING (Coastwide)	188,000	148,200	94,000	74,100	188,000	148,200	282,000	222,300		
Sablefish (Coastwide) b/	8,460	6,794	8,487	4,812	8,487	7,786	8,487	8,423		
North of Conception			8,185	4,641	8,185	7,510	8,185	8,124		
Conception area			302	171	302	276	302	299		
PACIFIC OCEAN PERCH	689	377	980	318	980	444	980	555	980	444
Shortbelly Rockfish	13,900	13,900			13,900	13,900			13,900	13,900
WIDOW ROCKFISH	3,871	832	3076	181	3,460	284	3,908	501	3,460	284
CANARY ROCKFISH c/	256	44	256	42	256	46	256	46	256	46
Chilipepper Rockfish	2,700	2,000			2,700	2,000			2,700	2,000
BOCACCIO	198	≤20		199	586	306		526	586	306
Splitnose Rockfish	615	461			615	461			615	461
Yellowtail Rockfish	3,146	3,146			4,320	4,320			4,320	4,320
Shortspine Thornyhead	1,004	955			1,030	983			1,030	983
Longspine Thornyhead	2,461	2,461			2,461	2,461			2,461	2,461
S. of Pt. Conception	390	195			390	195			390	195
COWCOD (S. Concep)	5	2.4			5	2.4			5	2.4
N. Concep & Monterey	19	2.4			19	2.4			19	2.4
DARKBLOTCHED	205	172	217	172	240	272	247	364	240	272
YELLOWEYE	52	22			53	22			53	22
Nearshore Species										
Black WA	1,115	835			540	540			540	540
Black OR-CA			729	729	775	775	861	861		
Minor Rockfish North	4,795	3,115			4,795	3,115			4,795	3,115
Remaining Rockfish North	2,727	2,081			1,612	1,216			1,612	1,216
Bocaccio	318	239			318	239			318	239
Chilipepper - Eureka	32	32			32	32			32	32
Redstripe	576	432			576	432			576	432
Sharpchin	307	230			307	230			307	230
Silvergrey	38	29			38	29			38	29
Splitnose	242	182			242	182			242	182
Yellowmouth	99	74			99	74			99	74
Other Rockfish North	2,068	1,034			2,068	1,034			2,068	1,034
Minor Rockfish South	3,506	2,015			3,506	2,015			3,506	2,015
Remaining Rockfish South	854	689			854	689			854	689
Bank	350	263			350	263			350	263
Blackgill	343	306			343	306			343	306
Sharpchin	45	34			45	34			45	34
Yellowtail	116	87			116	87			116	87
Other Rockfish South	2,652	1,326			2,558	1,279			2,558	1,279
Dover Sole	8,510	7,440			8,510	7,440			8,510	7,440
English Sole	3,100	3,100			3,100	3,100			3,100	3,100
Petrale Sole	2,762	2,762			2,762	2,762			2,762	2,762
Arrowtooth Flounder	5,800	5,800			5,800	5,800			5,800	5,800
Other Flatfish	7,700	7,700			7,700	7,700			7,700	7,700
Other Fish	14,700	14,700			14,700	14,700			14,700	14,700

a/ Council OY is the Council's preferred harvest alternative for 2004. Those stocks without a specified Council OY will be so specified in September when the Council decides final harvest levels.

b/ The coastwide sablefish ABCs and OYs are projected from the most recent assessment (Schirripa 2002). A mistake was discovered in the specifications adopted in the last two years. The 2003 coastwide ABC and OY depicted in this table are corrected from those adopted in federal regulations (see section 2.1.1.8). The alternative 2004 coastwide specifications were apportioned to the north of Conception and Conception areas by applying the average proportion of landings north and south of the Conception-Monterey INPFC area boundary during 1998-2002 (see section 2.1.2.5).

c/ The canary rockfish ABC and OY are based on the Council's adopted rebuilding strategy that has a PMAX (probability of successful rebuilding within the maximum allowable time period) of 60%. The OY varies by the commercial:recreational catch share due to the fact that the recreational fishery takes smaller fish and therefore has a greater "per ton" impact than the commercial fishery. The canary stock was not assessed in 2003.

Table 2.1.2-1. Catch sharing options to be analyzed in the 2004 Annual Groundfish Specifications and Management Measures EIS.

Species	Recreational:Commercial		Among Commercial Sectors		Among States	
	Catch Shares	Analytical Basis	Catch Shares	Analytical Basis	Catch Shares	Analytical Basis
Black Rockfish (OR and CA)	Specified in each state's nearshore management plans or policies and adopted in federal regulations		To be allocated for the first time in 2004 independently of the minor rockfish north and south complexes.		37% CA, 63% OR	1990-2002 ave. catch share
					42% CA, 58% OR	1985-2002 ave. catch share
					44% CA, 56% OR	Relative ratio of area (within 50 fm) of affected coastline in each state
					51% CA, 49% OR	Relative ratio of miles of affected coastline in each state
					35% CA, 65% OR	Use 2002 catches for each state and apply any increase or decrease in the OY equally to each state
Bocaccio	50:50	Not specified	60% LE Trawl	1997-99 ave. catch share pct.	Overfishing OYs and catch shares only applied south of Cape Mendocino	NA
	56:44	Catch share in 2002				
Canary Rockfish	50:50	Not specified	59% trawl, 3% LE FG, 12% OA, 26% tribes	2003 projected catch share	60% CA, 34% OR, 6% WA	1993-1999 ave. catch share
	39:61	2003 projected catch share				
	Calculated Shares	Est. Impacts from 2004 Bycatch Scorecards	Calculated Shares	Est. Impacts from 2004 Bycatch Scorecards	Calculated Shares	Est. Impacts from 2004 Bycatch Scorecards
Lingcod	69:31	2003 projected catch share	49% trawl, 12% LE FG, 32% OA, 7% tribes	2003 projected catch share	65% CA, 22% OR, 13% WA	1993-1999 ave. catch share
	Calculated Shares	Est. Impacts from 2004 Bycatch Scorecards	Calculated Shares	Est. Impacts from 2004 Bycatch Scorecards	Calculated Shares	Est. Impacts from 2004 Bycatch Scorecards
Widow Rockfish	Impacts to be addressed in Pacific whiting fisheries					
Yelloweye Rockfish	Catch shares decided for 2003 to be discussed in the EIS					

Table 2.1.2-2. Options for sector and area species distributions analyzed for the 2004 West Coast groundfish fishery.

Sector	Sector Catch Share	State Catch Shares CA	OR	WA	Alternatives (mt) *Low OY*	*Med OY*	*High OY*
			Black Rockfish California - Oregon				
			49:51 CA:OR				
All sectors	100.0%	357.2	371.8	NA	729.0		
			42:58 CA:OR				
All sectors	100.0%	325.5	449.5	NA		775.0	
			35:65 CA:OR				
All sectors	100.0%	301.4	559.7	NA			861.0
			Bocaccio 50:50 Rec:Comm				
All sectors	100.0%	NA: Management alternatives only apply to CA fisheries			199.0		
Res.					2.0		
Rec.	50.0%				98.5		
LE Twl	30.0%				59.1		
LE & OA FG	20.0%				39.4		
			Bocaccio 56:44 Rec:Comm				
All sectors	100.0%	NA: Management alternatives only apply to CA fisheries				306.0	526.0
Res.						2.0	2.0
Rec.	56.0%					170.2	293.4
LE Twl	26.4%					80.3	138.3
LE & OA FG	17.6%					53.5	92.2
			Canary 50:50 Rec:Comm				
All sectors	100.0%				42.0		
Res.					1.0		
Rec.	50.0%	12.4	6.9	1.2	20.5		
LE Twl	29.5%				12.1		
LE & OA FG	7.5%				3.1		
Tribal	13.0%				5.3		
			Canary 39:61 Rec:Comm				
All sectors	100.0%					46.0	46.0
Res.						1.0	1.0
Rec.	39.0%	10.6	5.9	1.1		17.6	17.6
LE Twl	36.0%					16.2	16.2
LE & OA FG	9.2%					4.1	4.1
Tribal	15.9%					7.1	7.1
			Lingcod				
All sectors	100.0%					735.0	
Res.						3.0	
Rec.	69.0%	326.4	112.3	66.4		505.1	
LE Twl	15.2%					111.2	
LE & OA FG	13.6%					99.8	
Tribal	2.2%					15.9	

Table 2.2.1-1. Estimated mortality (mt) of overfished West Coast groundfish species by fishery in 2003 under the *No Action* alternative.

Fishery	Bocaccio a/	Canary	Cowcod	Dkbl	Lingcod b/	POP	Whiting c/	Widow	Yelloweye
Limited Entry Groundfish									
Trawl- Non-whiting *d/*	9.8	11.0		88.0	77.0	65.5		1.4	0.6
Fixed Gear	1.1	0.5		1.5	0.2	0.2		30.0	
Whiting									
At-sea whiting motherships		0.7		3.2	0.2	2.3	28,848	58.5	0.0
At-sea whiting cat-proc		0.6		4.3	0.1	7.1	40,868	74.3	0.0
Shoreside whiting		0.5		1.5	0.2	0.2	50,484	30.0	0.0
Tribal whiting		4.0		0.0	0.3	0.8	25,000	24.7	0.0
Open Access									
Groundfish directed	0.2	0.3	0.0		50.0				0.5
CA Halibut	0.5	0.1	0.1	0.0	0.0	0.0	0	0.0	0.1
CA Gillnet *e/*	0.5								
CA Sheephead *e/*									
CPS- wetfish *e/*	0.5								
CPS- squid *e/*									
Dungeness crab *f/*				0.0					
HMS *e/*		0.0	0.0	0.0					
Pacific Halibut *e/*	0.0	0.0		0.0		0.0		0.0	0.5
Pink shrimp	0.1	0.5		0.0	0.5	0.0	1	0.1	0.1
Ridgeback prawn	0.1	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0
Salmon troll	0.2	1.6			0.3			0.0	0.2
Sea Cucumber	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0
Spot Prawn (trap)									
Spot Prawn (trawl)									
Tribal									
Midwater Trawl		1.1		0.0	0.0	0.0	0	45.0	0.0
Bottom Trawl				0.0	4.5	0.0		0.0	0.0
Troll		0.5		0.0	0.9	0.0			0.1
Fixed gear		0.3		0.0	5.5	0.0		0.0	3.0
Recreational Groundfish									
WA		1.5			35.0				3.5
OR		9.6			105.0			4.0	3.7
CA (N)		0.5			195.0			1.0	0.1
CA (S)	6.3	2.8			20.0			0.0	0.4
Research: Based on 2 most recent NMFS trawl shelf and slope surveys, the IPHC halibut survey, and LOAs with expanded estimates for south of Pt. Conception.									
	2.0	1.0		1.6	3.0	3.0	200	1.5	0.8
Non-EFP Total	21.2	37.0	0.1	100.1	497.7	79.0		270.5	13.6
EFPs: *g/*									
CA: NS FF trawl	0.5	0.5	0.2		20.0				0.5
OR: selective FF trawl		4.0		3.1	13.0			1.0	1.2
WA: AT trawl		3.0		3.0	2.0	10.0		3.0	0.4
WA: dogfish LL		0.0		0.0	0.0	0.0	0	0.0	0.0
WA: pollock		0.0		0.0	0.0	0.0	0	0.0	0.0
EFP Subtotal	0.5	7.5	0.2	6.1	35.0	10.0	0.0	4.0	2.1
TOTAL	21.7	44.5	0.3	106.2	532.7	89.0	147,200	274.5	15.7
2003 OY	< 20	44	4.8	172	651	377	148,200	832	22

Key	
	= either not applicable; trace amount (<0.01 mt); or not reported in available data sources.
	= values not available at the time of printing, to be provided in future GMT reports.

a/ South of 40°10' N. lat.

b/ Lingcod total reflects total catch, not mortality.

c/ Estimated whiting mortality calculated by assuming a 2,000 mt impact in non-whiting fisheries. Tribal catch based on OY sliding scale. Non-tribal whiting fishery catch based on set allocations applied after tribal and non-whiting fishery impacts subtracted from the OY.

d/ Using observer data, all estimates from the Hastie trawl bycatch model.

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

f/ 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.

g/ Values are EFP bycatch caps, not estimates of total mortality. The EFP is terminated inseason if the cap is projected to be attained early. The Council capped the 2003 canary rockfish set-aside for all the EFPs in combination at 7.5 mt to derive an expected total catch of 44 mt of canary rockfish in 2003.

Table 2.2.1-2. Trip limits and gear requirements[1/] for limited entry trawl gear north of 40°10' N. latitude[2/] as specified July 1, 2003 and analyzed under the *No Action* alternative.

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area[10/] (RCA): North of 40°10' N. lat.	100 fm - 250 fm (line modified to incorporate petrale sole fishing grounds)	100 fm - 250 fm	50 fm - 200 fm	75 fm - 200 fm	50 fm - 200 fm	50 fm - 200 fm (line modified to incorporate petrale sole fishing grounds)
	Small footrope or midwater trawl gear is required shoreward of the RCA; all trawl gear (large footrope, midwater trawl, and small footrope gear) is permitted seaward of the RCA.						
	A vessel may have more than one type of limited entry bottom trawl gear on board, but the most restrictive trip limit associated with the gear on board applies for that trip and will count toward the cumulative trip limit for that gear. A vessel may not have limited entry bottom trawl gear on board if that vessel also has trawl gear on board that is permitted for use within a RCA, including limited entry midwater trawl gear, regardless of whether the vessel is intending to fish within a RCA on that fishing trip. **See IV.A.(14)(iv) for details.**						
1	**Minor slope rockfish[3/]**	1,800 lb/ 2 months					
2	**Pacific ocean perch**	3,000 lb/ 2 months					
3	**DTS complex**						
4	Sablefish	6,000 lb/ 2 months		10,000 lb/ 2 months providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, inshore or offshore of RCA) during the entire limit period, then 3,000 lb/2 mo.	9,000 lb/ 2 months, providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, shoreward or seaward of RCA) during the entire limit period, then the sablefish limit is 3,000 lb/2 months.		
5	Longspine thornyhead	8,000 lb/ 2 months	9,000 lb/ 2 months	14,000 lb/ 2 months providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, inshore or offshore of RCA) during the entire limit period, then retention of thornyheads prohibited.	11,500 lb/ 2 months, providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, shoreward or seaward of RCA) during the entire limit period, then the longspine thornyhead limit is 5,000 lb/ 2 months.		
6	Shortspine thornyhead	2,300 lb/ 2 months	2,400 lb/ 2 months	2,800 lb/ 2 months providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, inshore or offshore of RCA) during the entire limit period, then retention of thornyheads prohibited.	2,400 lb/ 2 months, providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, shoreward or seaward of RCA) during the entire limit period, then the shortspoine thornyheads limit is 1,000 lb/2 months.		
7	Dover sole	26,000 lb/ 2 months		31,000 lb/ 2 months providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, inshore or offshore of RCA) during the entire limit period, then 12,500 lb/2 mo.	34,000 lb/ 2 months, providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, shoreward or seaward of RCA) during the entire limit period, then the Dover sole limit is 12,500 lb/ 2 months.		
8	**Flatfish**						
9	All other flatfish[4/]	100,000 lb/ 2 months	All other flatfish plus petrale & rex sole: 100,000 lb/ 2 months, no more than 30,000 lb/ 2 months of which may be petrale sole providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, inshore or offshore of RCA) during the entire limit period, then 20,000 lb/ 2 months, no more than 10,000 lb/ 2 months of which may be petrale sole.				100,000 lb/ 2 months
10	Petrale sole	Not limited					Not limited
11	Rex sole	Included in all other flatfish					
12	Arrowtooth flounder	30,000 lb/ trip	200,000 lb/ 2 months providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, inshore or offshore of RCA) during the entire limit period, then 5,000 lb/2 mo.				
13	**Whiting[5/]**	20,000 lb/ trip		Primary Season (only mid-water trawl permitted in the RCA)		10,000 lb/ trip	
14	**Other Fish[9/]**	Not limited					
15	**Use of small footrope bottom trawl[7/] or mid-water trawl is required for landing all of the following species:**						
16	**Minor shelf rockfish and widow rockfish[3/]**	300 lb/ month		1,000 lb/ month, no more than 200 lb/ month of which may be yelloweye rockfish			300 lb/ month
17	**Widow rockfish**						
18	mid-water trawl - permitted within the RCA	CLOSED[6/]		During primary whiting season, in trips of at least 10,000 lb of whiting: combined widow and yellowtail limit of 500 lb/ trip, cumulative widow limit of 1,500 lb/ month		CLOSED[6/]	12,000 lb/ 2 months
19	**Canary rockfish**	100 lb/ month		300 lb/ month		100 lb/ month	
20	**Yellowtail**						
21	mid-water trawl - permitted within the RCA	CLOSED[6/]		During primary whiting season, in trips of at least 10,000 lb of whiting: combined widow and yellowtail limit of 500 lb/ trip, cumulative yellowtail limit of 2,000 lb/ month			18,000 lb/ 2 months
22	small footrope trawl[7/]	In landings without flatfish, 1,000 lb/ month. As flatfish bycatch, per trip limit is the sum of 33% (by weight) of all flatfish except arrowtooth flounder, plus 10% (by weight) of arrowtooth flounder. Total yellowtail landings not to exceed 10,000 lb/ 2 months, no more than 1,000 lb of which may be landed without flatfish.					
23	**Minor nearshore rockfish**	300 lb/ month					
24	**Lingcod[8/]**	800 lb/ 2 months		1,000 lb/ 2 months		800 lb/ 2 months	

1/ Gear requirements and prohibitions are explained above. See IV. A.(14).

2/ "North" means 40°10' N. lat. to the U.S.-Canada border. 40°10' N. lat. is about 20 nm south of Cape Mendocino, CA.

3/ Bocaccio and chilipepper are included in the trip limits for minor shelf rockfish and splitnose rockfish is included in the trip limits for minor slope rockfish.

4/ "Other" flatfish means all flatfish at 50 CFR 660.302 except those in this Table 3 with species specific management measures, including trip limits.

5/ The whiting "per trip" limit in the Eureka area shoreward of 100 fm is 10,000 lb/ trip throughout the year. Outside Eureka area, the 20,000 lb/ trip limit applies. See IV. B.(3).

6/ Closed means that it is prohibited to take and retain, possess, or land the designated species in the time or area indicated. See IV. A.(7).

7/ Small footrope trawl means a bottom trawl net with a footrope no larger than 8 inches (20 cm) in diameter.

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

9/ Other fish are defined at 50 CFR 660.302, as those groundfish species or species groups for which there is no trip limit, size limit, quota, or harvest guideline.

10/ The "Rockfish Conservation Area" is a gear and/or sector specific closed area generally described by depth contours but specifically defined by lat/long coordinates set out at IV. A.(19)(e), that may vary seasonally.

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

Table 2.2.1-3. **Trip limits and gear requirements**[1/] **for limited entry trawl gear south of 40°10' N. latitude**[2/] **as specified July 1, 2003 and analyzed under the *No Action* alternative.**

	JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
Rockfish Conservation Area[10/] **(RCA):**						
40°10' - 38° N. lat.	50 fm - 250 fm (line modified to incorporate petrale sole fishing grounds)	60 fm - 250 fm	60 fm - 200 fm	60 fm - 200 fm	60 fm - 200 fm	60 fm - 200 fm (line modified to incorporate petrale sole fishing grounds)
38° - 34°27' N. lat.	50 fm - 150 fm	60 fm - 150 fm	60 fm - 200 fm	60 fm - 200 fm	60 fm - 200 fm	60 fm - 200 fm (line modified to incorporate petrale sole fishing grounds)
South of 34°27' N. lat.	100 fm - 150 fm along the mainland coast; shoreline - 150 fm around islands		100 fm - 200 fm along the mainland coast; shoreline - 200 fm around islands	100 fm - 200 fm along the mainland coast; shoreline - 200 fm around islands	100 fm - 200 fm along the mainland coast; shoreline - 200 fm around islands	100 fm - 200 fm along the mainland coast; shoreline - 200 fm around islands (line modified to incorporate petrale sole fishing grounds)

Small footrope or midwater trawl gear is required shoreward of the RCA; all trawl gear (large footrope, midwater trawl, and small footrope gear) is permitted seaward of the RCA.

A vessel may have more than one type of limited entry bottom trawl gear on board, but the most restrictive trip limit associated with the gear on board applies for that trip and will count toward the cumulative trip limit for that gear. A vessel may not have limited entry bottom trawl gear on board if that vessel also has trawl gear on board that is permitted for use within a RCA, including limited entry midwater trawl gear, regardless of whether the vessel is intending to fish within a RCA on that fishing trip. **See IV.A.(14)(iv) for details.**

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
1	**Minor slope rockfish**[3/]						
2	40°10' - 38° N. lat.	1,800 lb/ 2 months					
3	South of 38° N. lat.	30,000 lb/ 2 months					
4	**Splitnose**						
5	40°10' - 38° N. lat.	1,800 lb/ 2 months					
6	South of 38° N. lat.	30,000 lb/ 2 months					
7	**DTS complex**						
8	Sablefish	6,000 lb/ 2 months		10,000 lb/ 2 months	9,000 lb/ 2 months		
9	Longspine thornyhead	8,000 lb /2 months	9,000 lb/ 2 months	14,000 lb/ 2 months	11,500 lb/ 2 months		
10	Shortspine thornyhead	2,300 lb/ 2 months	2,400 lb/ 2 months	2,800 lb/ 2 months	2,400 lb/ 2 months		
11	Dover sole	26,000 lb/ 2 months		31,000 lb/ 2 months	34,000 lb/ 2 months		
12	**Flatfish**						
13	All other flatfish[4/]	70,000 lb/ 2 months	All other flatfish plus petrale & rex sole: 70,000 lb/ 2 months, no more than 20,000 lb/ 2 months of which may be petrale sole				70,000 lb/ 2 months
14	Petrale sole	No limit					No limit
15	Rex sole	Included in all other flatfish					
16	Arrowtooth flounder	No limit	1,000 lb/ 2 months				No limit
17	**Whiting**[5/]	20,000 lb/ trip		Primary Season (only mid-water trawl permitted within the RCA)		10,000 lb/ trip	
18	**Other Fish**[9/]	Not limited					
19	**Use of small footrope bottom trawl**[7/] **or mid-water trawl is required for landing all of the following species:**						
20	**Minor shelf rockfish, widow, and chilipepper rockfish**[3/]	300 lb/ month					
21	**Widow rockfish**						
22	mid-water trawl - permitted within the RCA	CLOSED[6/]					12, 000 lb/ 2 months
23	**Canary rockfish**	100 lb/ month		300 lb/ month		100 lb/ month	
24	**Bocaccio**	CLOSED[6/]					
25	**Cowcod**	CLOSED[6/]					
26	**Minor nearshore rockfish**	300 lb/ month					
27	**Lingcod**[8/]	800 lb/ 2 months		1,000 lb/ 2 months		800 lb/ 2 months	

1/ Gear requirements and prohibitions are explained above. See IV. A.(14).
2/ "South" means 40°10' N. lat. to the U.S.-Mexico border. 40°10' N. lat. is about 20 nm south of Cape Mendocino, CA.
3/ Yellowtail is included in the trip limits for minor shelf rockfish and POP is included in the trip limits for minor slope rockfish.
4/ "Other" flatfish means all flatfish at 50 CFR 660.302 except those in this Table 3 with species specific management measures, including trip limits.
5/ The whiting "per trip" limit in the Eureka area shoreward of 100 fm is 10,000 lb/ trip throughout the year. Outside Eureka area, the 20,000 lb/ trip limit applies. See IV. B.(3).
6/ Closed means that it is prohibited to take and retain, possess, or land the designated species in the time or area indicated. See IV. A.(7).
7/ Small footrope trawl means a bottom trawl net with a footrope no larger than 8 inches (20 cm) in diameter.
8/ The minimum size limit for lingcod is 24 inches (61 cm) total length.
9/ Other fish are defined at 50 CFR 660.302, as those groundfish species or species groups for which there is no trip limit, size limit, quota, or harvest guideline.
10/ The "Rockfish Conservation Area" is a gear and/or sector specific closed area generally described by depth contours but specifically defined by lat./long. coordinates set out at IV. A.(19)(e), that may vary seasonally.
To convert pounds to kilograms, divide by 2.20462, the number of pounds in one kilogram.

Table 2.2.1-4. Trip limits and gear requirements[1/] for limited entry fixed gear north of 40o10' N. latitude[2/] as specified July 1, 2003 and analyzed under the No Action

	JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
Rockfish Conservation Area[8/] (RCA):						
North of 46°16' N. lat.	shoreline - 100 fm					
46°16' N. lat. - 40°10' N. lat.	27 fm - 100 fm					
1 **Minor slope rockfish**[4/]	1,800 lb/ 2 months	No more than 25% of the weight of sablefish landed/ trip				1,800 lb/ 2 months
2 **Pacific ocean perch**	1,800 lb/ 2 months					
3 **Sablefish**	300 lb/ day, or 1 landing per week of up to 800 lb, not to exceed 3,200 lb/ 2 months					
4 **Longspine thornyhead**	9,000 lb/ 2 months					
5 **Shortspine thornyhead**	2,000 lb/ 2 months					
6 **Dover sole**	5,000 lb/ month					
7 **Arrowtooth flounder**						
8 **Petrale sole**						
9 **Rex sole**						
10 **All other flatfish**[2/]						
11 **Whiting**[3/]	10,000 lb/ trip					
12 **Minor shelf rockfish, widow, and yellowtail rockfish**[4/]	200 lb/ month					
13 **Canary rockfish**	CLOSED[5/]					
14 **Yelloweye rockfish**	CLOSED[5/]					
15 **Cowcod**	CLOSED[5/]					
16 **Minor nearshore rockfish**	4,000 lb/ 2 months, no more than 1,200 lb of which may be species other than black or blue rockfish[6/]					
17 **Lingcod**[7/]	CLOSED[5/]		400 lb/ month			CLOSED[5/]
18 **Other fish**[9/]	Not limited					

1/ "North" means 40°10' N. lat. to the U.S.-Canada border. 40°10' N. lat. is about 20 nm south of Cape Mendocino, CA.

2/ "Other flatfish" means all flatfish at 50 CFR 660.302 except those in this Table 4 with species specific management measures, including trip limits.

3/ TThe whiting "per trip" limit in the Eureka area shoreward of 100 fm is 10,000 lb/ trip throughout the year. Outside Eureka area, the 20,000 lb/ trip limit applies. See IV. B.(3).

4/ Bocaccio and chilipepper are included in the trip limits for minor shelf rockfish and splitnose rockfish is included in the trip limits for minor slope rockfish.

5/ Closed means that it is prohibited to take and retain, possess, or land the designated species in the time or area indicated. See IV. A.(7).

6/ For black rockfish north of Cape Alava (48°09'30" N. lat.), and between Destruction Island (47°40'00" N. lat.) and Leadbetter Point (46°38'10" N. lat.), there is an additional limit of 100 lb or 30 percent by weight of all fish on board, whichever is greater, per vessel, per fishing trip.

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

8/ The "Rockfish Conservation Area" is a gear and/or sector specific closed area generally described by depth contours but specifically defined by lat./long. coordinates set out at IV. A.(19)(e), that may vary seasonally.

9/ Other fish are defined at 50 CFR 660.302, as those groundfish species or species groups for which there is no trip limit, size limit, quota, or harvest guideline.

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

Table 2.2.1-5. **Trip limits and gear requirements[1/] for limited entry fixed gear south of 40o10' N. latitude[2/] as specified July 1, 2003 and analyzed under the No Action alternative.**

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area[7/] (RCA): South of 40°10' N. lat.	20 fm - 150 fm			20 fm - 150 fm (See footnote 9 for description of Pt. Fermin/Newport South Jetty open area)	20 fm - 150 fm	
1	**Minor slope rockfish[4/]**						
2	40°10' - 38° N. lat.	1,800 lb/ 2 months	No more than 25% of weight of sablefish landed/ trip				1,800 lb/ 2 months
3	South of 38° N. lat.	30,000 lb/ 2 months					
4	**Splitnose**						
5	40°10' - 38° N. lat.	1,800 lb/ 2 months					
6	South of 38° N. lat.	20,000 lb/ 2 months					
7	**Sablefish**						
8	40°10' - 36° N. lat.	300 lb/ day, or 1 landing per week of up to 800 lb, not to exceed 3,200 lb/ 2 months					
9	South of 36° N. lat.	350 lb/ day, or 1 landing per week of up to 1,050 lb					
10	**Longspine thornyhead**	9,000 lb/ 2 months					
11	**Shortspine thornyhead**	2,000 lb/ 2 months					
12	**Dover sole**	5,000 lb/ month When fishing for Pacific sanddabs, vessels using hook-and-line gear with no more than 12 hooks per line, using hooks no larger than "Number 2" hooks, which measure 11 mm (0.44 inches) point to shank, and up to 1 lb (0.45 kg) of weight per line are not subject to the RCAs.					
13	**Arrowtooth flounder**						
14	**Petrale sole**						
15	**Rex sole**						
16	**All other flatfish[2/]**						
17	**Whiting[3/]**	10,000 lb/ trip					
18	**Minor shelf rockfish, widow, and yellowtail rockfish[4/]**	100 lb/ 2 month	CLOSED[5/]	200 lb/ 2 months	250 lb/ 2 months	200 lb/ 2 months	100 lb/ 2 months
19	**Canary rockfish**	CLOSED[5/]					
20	**Yelloweye rockfish**	CLOSED[5/]					
21	**Cowcod**	CLOSED[5/]					
22	**Bocaccio**	CLOSED[5/]					
23	**Minor nearshore rockfish**						
24	Shallow nearshore	200 lb/ 2 months	CLOSED[5/]	400 lb/ 2 months	400 lb/ 2 months	300 lb/ 2 months	200 lb/ 2 months
25	Deep nearshore	200 lb/ 2 months		200 lb/ 2 months	500 lb/ 2 months	300 lb/ 2 months	200 lb/ 2 months
26	California scorpionfish	CLOSED[5/]		800 lb/ 2 months		CLOSED[5/]	
27	**Lingcod[6/]**	CLOSED[5/]		400 lb/ month, when nearshore open			CLOSED[5/]
28	**Other fish[8/]**	Not limited					

1/ "South" means 40°10' N. lat. to the U.S.-Mexico border. 40°10' N. lat. is about 20 nm south of Cape Mendocino, CA.

2/ "Other flatfish" means all flatfish at 50 CFR 660.302 except those in this Table 4 with species specific management measures, including trip limits.

3/ The whiting "per trip" limit in the Eureka area shoreward of 100 fm is 10,000 lb/ trip throughout the year. Outside Eureka area, the 20,000 lb/ trip limit applies. See IV. B.(3).

4/ Chilipepper rockfish is included in the trip limits for minor shelf rockfish and POP is included in the trip limits for minor slope rockfish.

5/ Closed means that it is prohibited to take and retain, possess, or land the designated species in the time or area indicated. See IV. A.(7).

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

7/ The "Rockfish Conservation Area" is a gear and/or sector specific closed area generally described by depth contours but specifically defined by lat/long coordinates set out at IV. A.(19)(e) that may vary seasonally.

8/ Other fish are defined at 50 CFR 660.302, as those groundfish species or species groups for which there is no trip limit, size limit, quota, or harvest guideline.

9/ During July-August, between a line drawn due south from Point Fermin (33° 42' 30" N. lat.; 118° 17' 30" W. long.) and a line drawn due west from the Newport South Jetty (33° 35' 37" N .lat.; 117° 52' 50" W. long.,) vessels fishing for all federal groundfish species, except all rockfish and lingcod, with hook&line and/or trap (or pot) gear may operate from shore to a boundary line approximating 50 fm.

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

Table 2.2.1-6. Trip limits and gear requirements 1/ for open access gears north of 40o10' N. latitude 2/ as specified July 1, 2003 and analyzed under the No Action alternative.

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area 8/ (RCA):						
	North of 46°16' N. lat.	0 fm - 100 fm					
	46°16' N. lat. - 40°10' N. lat.	27 fm - 100 fm					
1	**Minor slope rockfish 2/**	Per trip, no more than 25% of weight of the sablefish landed					
2	**Pacific ocean perch**	100 lb/ month					
3	**Sablefish**	300 lb/ day, or 1 landing per week of up to 800 lb, not to exceed 3,200 lb/ 2 months					
4	**Thornyheads**	CLOSED 5/					
5	**Dover sole**	3,000 lb/month, no more than 300 lb of which may be species other than Pacific sanddabs.					
6	**Arrowtooth flounder**						
7	**Petrale sole**						
8	**Rex sole**						
9	**All other flatfish 3/**						
10	**Whiting**	300 lb/ month					
11	**Minor shelf rockfish, widow and yellowtail rockfish 2/**	200 lb/ month					
12	**Canary rockfish**	CLOSED 5/					
13	**Yelloweye rockfish**	CLOSED 5/					
14	**Cowcod**	CLOSED 5/					
15	**Minor nearshore rockfish**	4,000 lb/ 2 months, no more than 1,200 lb of which may be species other than black or blue rockfish 4/					
16	**Lingcod 6/**	CLOSED 5/		300 lb/ month			CLOSED 5/
17	**Other Fish 7/**	Not limited					
18	**PINK SHRIMP EXEMPTED TRAWL** *(not subject to RCAs)*						
19	North	**Effective April 1 - October 31, 2003:** groundfish 500 lb/day, multiplied by the number of days of the trip, not to exceed 1,500 lb/trip. The following sublimits also apply and are counted toward the overall 500 lb/day and 1,500 lb/trip groundfish limits: lingcod 300 lb/month (minimum 24 inch size limit); sablefish 2,000 lb/month; canary, thornyheads and yelloweye rockfish are PROHIBITED. All other groundfish species taken are managed under the overall 500 lb/day and 1,500 lb/trip groundfish limits. Landings of these species count toward the per day and per trip groundfish limits and do not have species-specific limits. The amount of groundfish landed may not exceed the amount of pink shrimp landed.					
20	**PRAWN EXEMPTED TRAWL** *(not subject to RCAs)*						
21	North	Groundfish 300 lb/trip. Limits and closures in this table also apply and are counted toward the 300 lb groundfish per trip limit. The amount of groundfish landed may not exceed the amount of the target species landed, except that the amount of spiny dogfish landed may exceed the amount of target species landed. Spiny dogfish are limited by the 300 lb/trip overall groundfish limit. The daily trip limits for sablefish coastwide and the overall groundfish "per trip" limit may not be multiplied by the number of days of the trip.					
22	**SALMON TROLL**						
23	North	Salmon trollers may retain and land up to 1lb of yellowtail rockfish for every 2 lbs of salmon landed, with a cumulative limit of 200 lb/month, both within and outside of the RCA. This limit is within the 200 lb per month combined limit for minor shelf rockfish, widow rockfish and yellowtail rockfish, and not in addition to that limit. All groundfish species are subject to the open access limits, seasons and RCA restrictions listed in the table above.					

1/ "North" means 40°10' N. lat. to the U.S.-Canada border. 40°10' N. lat. is about 20 nm south of Cape Mendocino, CA.

2/ Bocaccio and chilipepper rockfishes are included in the trip limits for minor shelf rockfish and splitnose rockfish is included in the trip limits for minor slope rockfish.

3/ "Other flatfish" means all flatfish at 50 CFR 660.302 except those in this Table 5 with species specific management measures, including trip limits.

4/ For black rockfish north of Cape Alava (48°09'30" N. lat.), and between Destruction Island (47°40' N. lat.) and Leadbetter Point (46°38'10" N. lat.), there is an additional limit of 100 lbs or 30 percent by weight of all fish on board, whichever is greater, per vessel, per fishing trip.

5/ Closed means that it is prohibited to take and retain, possess, or land the designated species in the time or area indicated. See IV. A.(7).

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

7/ Other fish are defined at 50 CFR 660.302, as those groundfish species or species groups for which there is no trip limit, size limit, quota, or harvest guideline.

8/ The "Rockfish Conservation Area" is a gear and/or sector specific closed area generally described by depth contours, but specifically defined by lat./long. coordinates set out at IV. A.(19)(e), that may vary seasonally.

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

Table 2.2.1-7. Trip limits and gear requirements[1/] for open access gears south of 40o10' N. latitude[2/] as specified July 1, 2003 and analyzed under the No Action alternative.

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area[7/] (RCA):						
	South of 40°10' N. lat.	20 fm - 150 fm			20 fm - 150 fm (See footnote 8 for description of Pt. Fermin/Newport South Jetty open area)	20 fm - 150 fm	
1	**Minor slope rockfish[2/]**						
2	40°10' - 38° N. lat.	Per trip, no more than 25% of weight of the sablefish landed					
3	South of 38° N. lat.	10,000 lb/ 2 months					
4	**Splitnose**	200 lb/ month					
5	**Sablefish**						
6	40°10' - 36° N. lat.	300 lb/ day, or 1 landing per week of up to 800 lb, not to exceed 3,200 lb/ 2 months					
7	South of 36° N. lat.	350 lb/ day, or 1 landing per week of up to 1,050 lb					
8	**Thornyheads**						
9	40°10' - 34°27' N. lat.	CLOSED[5/]					
10	South of 34°27' N. lat.	50 lb/ day, no more than 2,000 lb/ 2 months					
11	**Dover sole**	3,000 lb/month, no more than 300 lb of which may be species other than Pacific sanddabs. When fishing for Pacific sanddabs, vessels using hook-and-line gear with no more than 12 hooks per line, using hooks no larger than "Number 2" hooks, which measure 11 mm (0.44 inches) point to shank, and up to 1 lb of weight per line are not subject to the RCAs.					
12	**Arrowtooth flounder**						
13	**Petrale sole**						
14	**Rex sole**						
15	**All other flatfish[3/]**						
16	**Whiting**	300 lb/ month					
17	**Minor shelf rockfish, widow and chilipepper rockfish[2/]**	100 lb/ 2 month	CLOSED[5/]	200 lb/ 2 months	250 lb/ 2 months	200 lb/ 2 months	100 lb/ 2 months
18	**Canary rockfish**	CLOSED[5/]					
19	**Yelloweye rockfish**	CLOSED[5/]					
20	**Cowcod**	CLOSED[5/]					
21	**Bocaccio**	CLOSED[5/]					
22	**Minor nearshore rockfish**						
23	Shallow nearshore	200 lb/ 2 months	CLOSED[5/]	400 lb/ 2 months	400 lb/ 2 months	300 lb/ 2 months	200 lb/ 2 months
24	Deep nearshore	200 lb/ 2 months		200 lb/ 2 months	500 lb/ 2 months	300 lb/ 2 months	200 lb/ 2 months
25	California scorpionfish	CLOSED[5/]		800 lb/ 2 months		CLOSED[5/]	
26	**Lingcod[4/]**	CLOSED[5/]		300 lb/ month, when nearshore open			CLOSED[5/]
27	**Other Fish[6/]**	Not limited					
28	**PINK SHRIMP EXEMPTED TRAWL GEAR** *(not subject to RCAs)*						
29	South	**Effective April 1 - October 31, 2003:** Groundfish 500 lb/day, multiplied by the number of days of the trip, not to exceed 1,500 lb/trip. The following sublimits also apply and are counted toward the overall 500 lb/day and 1,500 lb/trip groundfish limits: lingcod 300 lb/ month (minimum 24 inch size limit); sablefish 2,000 lb/ month; canary, thornyheads and yelloweye rockfish are PROHIBITED. All other groundfish species taken are managed under the overall 500 lb/day and 1,500 lb/trip groundfish limits. Landings of these species count toward the per day and per trip groundfish limits and do not have species-specific limits. The amount of groundfish landed may not exceed the amount of pink shrimp landed.					
30	**PRAWN AND, SOUTH OF 38°57'30" N. LAT., CALIFORNIA HALIBUT AND SEA CUCUMBER EXEMPTED TRAWL**						
31	**EXEMPTED TRAWL Rockfish Conservation Area[8/] (RCA):**						
32	40°10' - 38° N. lat.	50 fm - 250 fm	60 fm - 250 fm	60 fm - 200 fm			
33	38° - 34°27' N. lat.	50 fm - 150 fm	60 fm - 150 fm	60 fm - 200 fm			
34	South of 34°27' N. lat.	100 fm - 150 fm along the mainland coast; shoreline - 150 fm around islands		100 fm - 200 fm along the mainland coast; shoreline - 200 fm around islands			
35		Groundfish 300 lb/trip. Trip limits in this table also apply and are counted toward the 300 lb groundfish per trip limit. The amount of groundfish landed may not exceed the amount of the target species landed, except that the amount of spiny dogfish landed may exceed the amount of target species landed. Spiny dogfish are limited by the 300 lb/trip overall groundfish limit. The daily trip limits for sablefish coastwide and thornyheads south of Pt. Conception and the overall groundfish "per trip" limit may not be multiplied by the number of days of the trip. Vessels participating in the California halibut fishery south of 38°57'30" N. lat. are allowed to (1) land up to 100 lb/day of groundfish without the ratio requirement, provided that at least one California halibut is landed and (2) land up to 3,000 lb/month of flatfish, no more than 300 lb of which may be species other than Pacific sanddabs, sand sole, starry flounder, rock sole, curlfin sole, or California scorpionfish (California scorpionfish is also subject to the trip limits and closures in line 25).					

1/ "South" means 40°10' N. lat. to the U.S.-Mexico border. 40°10' N. lat. is about 20 nm south of Cape Mendocino, CA.
2/ Yellowtail rockfish is included in the trip limits for minor shelf rockfish and POP is included in the trip limits for minor slope rockfish.
3/ "Other flatfish" means all flatfish at 50 CFR 660.302 except those in this Table 5 with species specific management measures, including trip limits.
4/ The size limit for lingcod is 24 inches (61 cm) total length.
5/ Closed means that it is prohibited to take and retain, possess, or land the designated species in the time or area indicated. See IV. A.(7).
6/ Other fish are defined at 50 CFR 660.302, as those groundfish species or species groups for which there is no trip limit, size limit, quota, or harvest guideline.
7/ The "Rockfish Conservation Area" is a gear and/or sector specific closed area generally described by depth contours, but specifically defined by lat./long. coordinates set out at IV. A.(19)(e), that may vary seasonally.
8/ During July-August, between a line drawn due south from Point Fermin (33° 42' 30" N. lat.; 118° 17' 30" W. long.) and a line drawn due west from the Newport South Jetty (33° 35' 37" N .lat.; 117° 52' 50" W. long.,) vessels fishing for all federal groundfish species, except all rockfish and lingcod, with hook&line and/or trap (or pot) gear may operate from shore to a boundary line approximating 50 fm.

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

Table 2.2.2-1. Estimated mortality (mt) of overfished West Coast groundfish species by fishery in 2004 under the *Low OY* alternative.

Fishery	Bocaccio a/	Canary	Cowcod	Dkbl	Lingcod b/	POP	Whiting c/	Widow	Yelloweye
Limited Entry Groundfish									
Trawl- Non-whiting *d/*	21.9	9.6	0.6	156.4	76.1	112.3		2.0	0.4
Fixed Gear									
Whiting									
At-sea whiting motherships		0.3		1.5	0.1	1.1	13,952	28.3	0.0
At-sea whiting cat-proc		0.3		2.1	0.0	3.4	19,765	35.9	0.0
Shoreside whiting		0.1		0.4	0.2	2.3	24,416	44.3	0.0
Tribal whiting		2.1		0.0	0.2	0.4	12,968	12.8	0.0
Open Access									
Groundfish directed									
CA Halibut	0.1			0.0	2.0	0.0			
CA Gillnet *e/*	0.5			0.0		0.0	0.0	0.0	
CA Sheephead *e/*				0.0		0.0	0.0	0.0	0.0
CPS- wetfish *e/*	0.3								
CPS- squid *f/*									
Dungeness crab *e/*	0.0		0.0	0.0		0.0			
HMS *e/*		0.0	0.0	0.0					
Pacific Halibut *e/*	0.0		0.0	0.0		0.0		0.0	0.5
Pink shrimp	0.1	0.5	0.0	0.0	0.5	0.0	1.0	0.1	0.1
Ridgeback prawn	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Salmon troll	0.2	1.6	0.0	0.0	0.3	0.0		0.0	0.2
Sea Cucumber	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spot Prawn (trap)									
Tribal (Non-whiting)									
Midwater Trawl		2.3		0.0	0.1	0.0		40.0	0.0
Bottom Trawl		0.5		0.0	9.0	0.0		0.0	0.0
Troll		0.5		0.0	1.0	0.0			0.0
Fixed gear		0.3		0.0	15.0	0.0		0.0	2.3
Recreational Groundfish									
WA		1.5			35.0				3.5
OR		4.3							
CA (N)		0.5			195.0			1.0	0.1
CA (S)	82.6	8.3	2.4		152.6			0.3	1.2
Research: Based on 2 most recent NMFS trawl shelf and slope surveys, the IPHC halibut survey, and LOAs with expanded estimates for south of Pt. Conception.									
	2.0	1.0		1.6	3.0	3.0	200	1.5	0.8
Non-EFP Total	107.8	33.7	3.0	162.0	490.1	122.5		166.2	9.2
EFPs *g/*									
CA: NS FF trawl h/	0.5	0.5	0.2		20.0				0.5
CA: CPFV	3.1	2.5	0.3		2.4				1.4
OR: selective FF trawl h/ i/		4.0		3.1	24.0			1.0	1.7
WA: AT trawl h/		2.5		3.0	2.0	18.0		3.0	0.5
WA: dogfish LL		0.1		0.5	2.0	0.5		0.5	1.0
WA: pollock		0.1					1,000	3.0	0.1
WA: NS FF trawl h/		1.0		3.0	2.0			1.0	0.1
EFP Subtotal	3.6	10.7	0.5	9.6	52.4	18.5	1,000	8.5	5.3
TOTAL	111.4	**44.3**	3.5	171.6	542.5	141.0	74,100	174.7	14.5
2004 OY	199	42	5	172	735	318	74,100	181	22

Key	
(light shading)	= either not applicable; trace amount (<0.01 mt); or not reported in available data sources.
(dark shading)	= values not available at the time of printing, to be provided in future GMT reports.

a/ South of 40°10' N. lat.

b/ Lingcod total reflects total catch, not mortality.

c/ Estimated whiting mortality calculated by assuming a 2,000 mt impact in non-whiting fisheries. Tribal catch based on OY sliding scale. Non-tribal whiting fishery catch based on set allocations applied after tribal and non-whiting fishery impacts subtracted from the OY.

d/ Using observer data, all estimates from the Hastie trawl bycatch model.

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

f/ 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.

g/ Values are proposed EFP bycatch caps, not estimates of total mortality. The EFP is terminated inseason if the cap is projected to be attained early.

h/ EFP could be converted into regulations in 2004.

i/ Based on participation of 12 vessels for 8 months.

Table 2.2.2-2. Trip limits and gear requirements[1/] for limited entry trawl gear north of 40°10' N. latitude[2/] analyzed under the *Low OY* alternative.

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area[10/] (RCA): North of 40°10' N. lat.	75 fm - 150 fm	60 fm - 150 fm		75 fm - 150 fm		
	Small footrope or midwater trawl gear is required shoreward of the RCA; all trawl gear (large footrope, midwater trawl, and small footrope gear) is permitted seaward of the RCA.						
	A vessel may have more than one type of limited entry bottom trawl gear on board, but the most restrictive trip limit associated with the gear on board applies for that trip and will count toward the cumulative trip limit for that gear. A vessel may not have limited entry bottom trawl gear on board if that vessel also has trawl gear on board that is permitted for use within a RCA, including limited entry midwater trawl gear, regardless of whether the vessel is intending to fish within a RCA on that fishing trip.						
1	**Minor slope rockfish[3/]**	1,800 lb/ 2 months					
2	**Pacific ocean perch**	3,000 lb/ 2 months					
3	**DTS complex**						
4	Sablefish	3,000 lb/ 2 months providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, inshore or offshore of RCA) during the entire limit period, then 1,900 lb/2 mo.		2,900 lb/ 2 months providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, inshore or offshore of RCA) during the entire limit period, then 1,900 lb/2 mo.		3,000 lb/ 2 months providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, inshore or offshore of RCA) during the entire limit period, then 1,900 lb/2 mo.	
5	Longspine thornyhead	10,000 lb/ 2 months, providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, shoreward or seaward of RCA) during the entire limit period, then the longspine thornyhead limit is 3,000 lb/ 2 months.					
6	Shortspine thornyhead	2,000 lb/ 2 months, providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, shoreward or seaward of RCA) during the entire limit period, then the shortspoine thornyheads limit is 1,000 lb/2 months.					
7	Dover sole	26,000 lb/ 2 months, providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, shoreward or seaward of RCA) during the entire limit period, then the Dover sole limit is 15,000 lb/ 2 months.					
8	**Flatfish**						
9	All other flatfish[4/]	All other flatfish plus rex sole: 100,000 lb/ 2 months providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, inshore or offshore of RCA) during the entire limit period, then 50,000 lb/ 2 months.	All other flatfish plus petrale & rex sole: 100,000 lb/ 2 months providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, inshore or offshore of RCA) during the entire limit period, then 50,000 lb/ 2 months, no more than 20,000 lb/ 2 months of which may be petrale sole.				All other flatfish plus rex sole: 100,000 lb/ 2 months providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, inshore or offshore of RCA) during the entire limit period, then 50,000 lb/ 2 months.
10	Petrale sole	Not limited					Not limited
11	Rex sole	Included in all other flatfish					
12	Arrowtooth flounder	Not limited providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, inshore or offshore of RCA) during the entire limit period, then 5,000 lb/2 mo.		150,000 lb/ 2 mo. providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, inshore or offshore of RCA) during the entire limit period, then 5,000 lb/2 mo.			Not limited providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, inshore or offshore of RCA) during the entire limit period, then 5,000 lb/2 mo.
13	**Whiting[5/]**	20,000 lb/ trip		Primary Season (only mid-water trawl permitted in the RCA)		10,000 lb/ trip	
14	**Other Fish[9/]**	Not limited					
15	**Use of small footrope bottom trawl[7/] or mid-water trawl is required for landing all of the following species:**						
16	**Minor shelf rockfish and widow rockfish[3/]**	300 lb/ month		1,000 lb/ month, no more than 200 lb/ month of which may be yelloweye rockfish			300 lb/ month
17	**Widow rockfish**						
18	mid-water trawl - permitted within the RCA	CLOSED[6/]		During primary whiting season, in trips of at least 10,000 lb of whiting: combined widow and yellowtail limit of 500 lb/ trip, cumulative widow limit of 1,500 lb/ month		CLOSED[6/]	12,000 lb/ 2 months
19	**Canary rockfish**	100 lb/ month		300 lb/ month		100 lb/ month	
20	**Yellowtail**						
21	mid-water trawl - permitted within the RCA	CLOSED[6/]		During primary whiting season, in trips of at least 10,000 lb of whiting: combined widow and yellowtail limit of 500 lb/ trip, cumulative yellowtail limit of 2,000 lb/ month			18,000 lb/ 2 months
22	small footrope trawl[7/]	In landings without flatfish, 1,000 lb/ month. As flatfish bycatch, per trip limit is the sum of 33% (by weight) of all flatfish except arrowtooth flounder, plus 10% (by weight) of arrowtooth flounder. Total yellowtail landings not to exceed 10,000 lb/ 2 months, no more than 1,000 lb of which may be landed without flatfish.					
23	**Minor nearshore rockfish**	300 lb/ month					
24	**Lingcod[8/]**	800 lb/ 2 months		1,000 lb/ 2 months		800 lb/ 2 months	

Key: [shaded] = management measures in need of revision, updates to be provided in future GMT reports.

1/ Gear requirements and prohibitions are explained above. See IV. A (14).
2/ "North" means 40°10' N. lat. to the U.S.-Canada border. 40°10' N. lat. is about 20 nm south of Cape Mendocino, CA.
3/ Bocaccio and chilipepper are included in the trip limits for minor shelf rockfish and splitnose rockfish is included in the trip limits for minor slope rockfish.
4/ "Other" flatfish means all flatfish at 50 CFR 660.302 except those in this Table 3 with species specific management measures, including trip limits.
5/ The whiting "per trip" limit in the Eureka area shoreward of 100 fm is 10,000 lb/ trip throughout the year. Outside Eureka area, the 20,000 lb/ trip limit applies. See IV. B.(3).
6/ Closed means that it is prohibited to take and retain, possess, or land the designated species in the time or area indicated. See IV. A.(7).
7/ Small footrope trawl means a bottom trawl net with a footrope no larger than 8 inches (20 cm) in diameter.
8/ The minimum size limit for lingcod is 24 inches (61 cm) total length.
9/ Other fish are defined at 50 CFR 660.302, as those groundfish species or species groups for which there is no trip limit, size limit, quota, or harvest guideline.
10/ The "Rockfish Conservation Area" is a gear and/or sector specific closed area generally described by depth contours but specifically defined by lat/long coordinates set out at IV. A.(19)(e), that may vary seasonally.
To convert pounds to kilograms, divide by 2.20462, the number of pounds in one kilogram.

Table 2.2.2-3. Trip limits and gear requirements[1/] for limited entry trawl gear south of 40°10' N. latitude[2/] analyzed under the *Low OY* alternative.

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area[10/] (RCA):						
	40°10' - 38° N. lat.	75 fm - 150 fm		100 fm - 150 fm		75 fm - 150 fm	
	South of 38° N. lat.	75 fm - 150 fm		100 fm - 150 fm		75 fm - 150 fm	
	Small footrope or midwater trawl gear is required shoreward of the RCA; all trawl gear (large footrope, midwater trawl, and small footrope gear) is permitted seaward of the RCA.						
	A vessel may have more than one type of limited entry bottom trawl gear on board, but the most restrictive trip limit associated with the gear on board applies for that trip and will count toward the cumulative trip limit for that gear. A vessel may not have limited entry bottom trawl gear on board if that vessel also has trawl gear on board that is permitted for use within a RCA, including limited entry midwater trawl gear, regardless of whether the vessel is intending to fish within a RCA on that fishing trip.						
1	**Minor slope rockfish[3/]**						
2	40°10' - 38° N. lat.	1,800 lb/ 2 months					
3	South of 38° N. lat.	30,000 lb/ 2 months					
4	**Splitnose**						
5	40°10' - 38° N. lat.	1,800 lb/ 2 months					
6	South of 38° N. lat.	30,000 lb/ 2 months					
7	**DTS complex**						
8	Sablefish	3,000 lb/ 2 months		2,900 lb/ 2 months		3,000 lb/ 2 months	
9	Longspine thornyhead	10,000 lb /2 months					
10	Shortspine thornyhead	2,000 lb/ 2 months					
11	Dover sole	26,000 lb/ 2 months					
12	**Flatfish**						
13	All other flatfish[4/]	100,000 lb/ 2 months	All other flatfish plus petrale & rex sole: 100,000 lb/ 2 months, no more than 20,000 lb/ 2 months of which may be petrale sole.				100,000 lb/ 2 months
14	Petrale sole	No limit					No limit
15	Rex sole	Included in all other flatfish					
16	Arrowtooth flounder	No limit	10,000 lb/ 2 months				No limit
17	**Whiting[5/]**	20,000 lb/ trip		Primary Season (only mid-water trawl permitted within the RCA)		10,000 lb/ trip	
18	**Other Fish[9/]**	Not limited					
19	**Use of small footrope bottom trawl[7/] or mid-water trawl is required for landing all of the following species:**						
20	**Minor shelf rockfish, widow, and chilipepper rockfish[3/]**	300 lb/ month					
21	**Widow rockfish**						
22	mid-water trawl - permitted within the RCA	CLOSED[6/]					12, 000 lb/ 2 months
23	**Canary rockfish**	100 lb/ month		300 lb/ month		100 lb/ month	
24	**Bocaccio**	CLOSED[6/]					
25	**Cowcod**	CLOSED[6/]					
26	**Minor nearshore rockfish**	300 lb/ month					
27	**Lingcod[8/]**	800 lb/ 2 months		1,000 lb/ 2 months		800 lb/ 2 months	

Key [shaded] = management measures in need of revision, updates to be provided in future GMT reports.

1/ Gear requirements and prohibitions are explained above. See IV. A.(14).
2/ "South" means 40°10' N. lat. to the U.S.-Mexico border. 40°10' N. lat. is about 20 nm south of Cape Mendocino, CA.
3/ Yellowtail is included in the trip limits for minor shelf rockfish and POP is included in the trip limits for minor slope rockfish.
4/ "Other" flatfish means all flatfish at 50 CFR 660.302 except those in this Table 3 with species specific management measures, including trip limits.
5/ The whiting "per trip" limit in the Eureka area shoreward of 100 fm is 10,000 lb/ trip throughout the year. Outside Eureka area, the 20,000 lb/ trip limit applies. See IV. B.(3).
6/ Closed means that it is prohibited to take and retain, possess, or land the designated species in the time or area indicated. See IV. A.(7).
7/ Small footrope trawl means a bottom trawl net with a footrope no larger than 8 inches (20 cm) in diameter.
8/ The minimum size limit for lingcod is 24 inches (61 cm) total length.
9/ Other fish are defined at 50 CFR 660.302, as those groundfish species or species groups for which there is no trip limit, size limit, quota, or harvest guideline.
10/ The "Rockfish Conservation Area" is a gear and/or sector specific closed area generally described by depth contours but specifically defined by lat./long. coordinates set out at IV. A.(19)(e), that may vary seasonally.

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

Table 2.2.2-4. Trip limits and gear requirements[1/] for limited entry fixed gear north of 40°10' N. latitude[2/] analyzed under the Low OY alternative.

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area[8/] (RCA):						
	North of 46°16' N. lat.	shoreline - 125 fm					
	46°16' N. lat. - 40°10' N. lat.	30 fm - 125 fm					
1	Minor slope rockfish[4/]	1,800 lb/ 2 months	No more than 25% of the weight of sablefish landed/ trip				1,800 lb/ 2 months
2	Pacific ocean perch	1,800 lb/ 2 months					
3	Sablefish	300 lb/ day, or 1 landing per week of up to 800 lb, not to exceed 2,400 lb/ 2 months					
4	Longspine thornyhead	9,000 lb/ 2 months					
5	Shortspine thornyhead	2,000 lb/ 2 months					
6	Dover sole	5,000 lb/ month					
7	Arrowtooth flounder	5,000 lb/ month					
8	Petrale sole	5,000 lb/ month					
9	Rex sole	5,000 lb/ month					
10	All other flatfish[2/]	5,000 lb/ month					
11	Whiting[3/]	10,000 lb/ trip					
12	Minor shelf rockfish, widow, and yellowtail rockfish[4/]	200 lb/ month					
13	Canary rockfish	CLOSED[5/]					
14	Yelloweye rockfish	CLOSED[5/]					
15	Cowcod	CLOSED[5/]					
16	Minor nearshore rockfish	3,000 lb/ 2 months, no more than 1,200 lb of which may be species other than black or blue rockfish[6/]					
17	Lingcod[7/]	CLOSED[5/]		400 lb/ month			CLOSED[5/]
18	Other fish[9/]	Not limited					

Key [shaded] = management measures in need of revision, updates to be provided in future GMT reports.

1/ "North" means 40°10' N. lat. to the U.S.-Canada border. 40°10' N. lat. is about 20 nm south of Cape Mendocino, CA.

2/ "Other flatfish" means all flatfish at 50 CFR 660.302 except those in this Table 4 with species specific management measures, including trip limits.

3/ TThe whiting "per trip" limit in the Eureka area shoreward of 100 fm is 10,000 lb/ trip throughout the year. Outside Eureka area, the 20,000 lb/ trip limit applies. See IV. B.(3).

4/ Bocaccio and chilipepper are included in the trip limits for minor shelf rockfish and splitnose rockfish is included in the trip limits for minor slope rockfish.

5/ Closed means that it is prohibited to take and retain, possess, or land the designated species in the time or area indicated. See IV. A.(7).

6/ For black rockfish north of Cape Alava (48°09'30" N. lat.), and between Destruction Island (47°40'00" N. lat.) and Leadbetter Point (46°38'10" N. lat.), there is an additional limit of 100 lb or 30 percent by weight of all fish on board, whichever is greater, per vessel, per fishing trip.

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

8/ The "Rockfish Conservation Area" is a gear and/or sector specific closed area generally described by depth contours but specifically defined by lat./long. coordinates set out at IV. A.(19)(e), that may vary seasonally.

9/ Other fish are defined at 50 CFR 660.302, as those groundfish species or species groups for which there is no trip limit, size limit, quota, or harvest guideline.

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

Table 2.2.2-5. Trip limits and gear requirements1/ for limited entry fixed gear south of 40°10' N. latitude2/ analyzed under the Low OY alternative.

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area7/ (RCA): South of 40°10' N. lat.						
	40°10' N. lat. - 34°27' N. lat.	Shoreline - 150 fm	20 fm - 150 fm		30 fm - 150 fm		
	South of 34°27' N. lat.	80 fm - 150 fm	Shoreline - 150 fm	80 fm - 150 fm			
1	**Minor slope rockfish4/**						
2	40°10' - 38° N. lat.	1,800 lb/ 2 months	No more than 25% of weight of sablefish landed/ trip				1,800 lb/ 2 months
3	South of 38° N. lat.	30,000 lb/ 2 months					
4	**Splitnose**						
5	40°10' - 38° N. lat.	1,800 lb/ 2 months					
6	South of 38° N. lat.	20,000 lb/ 2 months					
7	**Sablefish**	300 lb/ day, or 1 landing per week of up to 800 lb, not to exceed 2,400 lb/ 2 months					
8	**Longspine thornyhead**	9,000 lb/ 2 months					
9	**Shortspine thornyhead**	2,000 lb/ 2 months					
19	**Dover sole**	5,000 lb/ month When fishing for Pacific sanddabs, vessels using hook-and-line gear with no more than 12 hooks per line, using hooks no larger than "Number 2" hooks, which measure 11 mm (0.44 inches) point to shank, and up to 1 lb (0.45 kg) of weight per line are not subject to the RCAs.					
11	**Arrowtooth flounder**						
12	**Petrale sole**						
13	**Rex sole**						
14	**All other flatfish2/**						
15	**Whiting3/**	10,000 lb/ trip					
16	**Minor shelf rockfish, widow, and yellowtail rockfish4/**	100 lb/ 2 month	CLOSED5/	200 lb/ 2 months	250 lb/ 2 months	200 lb/ 2 months	100 lb/ 2 months
17	**Canary rockfish**	CLOSED5/					
18	**Yelloweye rockfish**	CLOSED5/					
19	**Cowcod**	CLOSED5/					
20	**Bocaccio**	50 lb/ 2 months					
21	**Minor nearshore rockfish**						
22	Shallow nearshore						
23	40°10' N. lat. - 34°27' N. lat.	CLOSED5/	150 lb/ 2 months		200 lb/ 2 months		150 lb/ 2 months
25	South of 34°27' N. lat.	150 lb/ 2 months	CLOSED5/	150 lb/ 2 months			
26	Deep nearshore						
27	40°10' N. lat. - 34°27' N. lat.	CLOSED5/	150 lb/ 2 months		200 lb/ 2 months		150 lb/ 2 months
28	South of 34°27' N. lat.	150 lb/ 2 months	CLOSED5/	150 lb/ 2 months			
29	California scorpionfish						
30	40°10' N. lat. - 34°27' N. lat.	CLOSED5/	150 lb/ 2 months		200 lb/ 2 months		150 lb/ 2 months
31	South of 34°27' N. lat.	150 lb/ 2 months	CLOSED5/	150 lb/ 2 months			
32	**Lingcod6/**	400 lb/ month, when nearshore open					
33	**Other fish8/**	Not limited					

Key [shaded] = management measures in need of revision, updates to be provided in future GMT reports.

1/ "South" means 40°10' N. lat. to the U.S.-Mexico border. 40°10' N. lat. is about 20 nm south of Cape Mendocino, CA.
2/ "Other flatfish" means all flatfish at 50 CFR 660.302 except those in this Table 4 with species specific management measures, including trip limits.
3/ The whiting "per trip" limit in the Eureka area shoreward of 100 fm is 10,000 lb/ trip throughout the year. Outside Eureka area, the 20,000 lb/ trip limit applies. See IV. B.(3).
4/ Chilipepper rockfish is included in the trip limits for minor shelf rockfish and POP is included in the trip limits for minor slope rockfish.
5/ Closed means that it is prohibited to take and retain, possess, or land the designated species in the time or area indicated. See IV. A.(7).
6/ The minimum size limit for lingcod is 24 inches (61 cm) total length.
7/ The "Rockfish Conservation Area" is a gear and/or sector specific closed area generally described by depth contours but specifically defined by lat/long coordinates set out at IV. A.(19)(e) that may vary seasonally.
8/ Other fish are defined at 50 CFR 660.302, as those groundfish species or species groups for which there is no trip limit, size limit, quota, or harvest guideline.
9/ During July-August, between a line drawn due south from Point Fermin (33° 42' 30" N. lat.; 118° 17' 30" W. long.) and a line drawn due west from the Newport South Jetty (33° 35' 37" N .lat.; 117° 52' 50" W. long.,) vessels fishing for all federal groundfish species, except all rockfish and lingcod, with hook&line and/or trap (or pot) gear may operate from shore to a boundary line approximating 50 fm.

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

Table 2.2.2-6. Trip limits and gear requirements[1] for open access gears north of 40°10' N. latitude[2] analyzed under the *Low OY* alternative.

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area[8] (RCA):						
	North of 46°16' N. lat.	0 fm - 125 fm					
	46°16' N. lat. - 40°10' N. lat.	30 fm - 125 fm					
1	**Minor slope rockfish[2]**	Per trip, no more than 25% of weight of the sablefish landed					
2	**Pacific ocean perch**	100 lb/ month					
3	**Sablefish**	300 lb/ day, or 1 landing per week of up to 800 lb, not to exceed 2,400 lb/ 2 months					
4	**Thornyheads**	CLOSED[5]					
5	**Dover sole**	3,000 lb/month, no more than 300 lb of which may be species other than Pacific sanddabs.					
6	**Arrowtooth flounder**						
7	**Petrale sole**						
8	**Rex sole**						
9	**All other flatfish[3]**						
10	**Whiting**	300 lb/ month					
11	**Minor shelf rockfish, widow and yellowtail rockfish[2]**	200 lb/ month					
12	**Canary rockfish**	CLOSED[5]					
13	**Yelloweye rockfish**	CLOSED[5]					
14	**Cowcod**	CLOSED[5]					
15	**Minor nearshore rockfish**	3,000 lb/ 2 months, no more than 1,200 lb of which may be species other than black or blue rockfish[4]					
16	**Lingcod[6]**	CLOSED[5]		300 lb/ month			CLOSED[5]
17	**Other Fish[7]**	Not limited					
18	**PINK SHRIMP EXEMPTED TRAWL** *(not subject to RCAs)*						
19	North	**Effective April 1 - October 31, 2004:** groundfish 500 lb/day, multiplied by the number of days of the trip, not to exceed 1,500 lb/trip. The following sublimits also apply and are counted toward the overall 500 lb/day and 1,500 lb/trip groundfish limits: lingcod 300 lb/month (minimum 24 inch size limit); sablefish 2,000 lb/month; canary, thornyheads and yelloweye rockfish are PROHIBITED. All other groundfish species taken are managed under the overall 500 lb/day and 1,500 lb/trip groundfish limits. Landings of these species count toward the per day and per trip groundfish limits and do not have species-specific limits. The amount of groundfish landed may not exceed the amount of pink shrimp landed.					
20	**PRAWN EXEMPTED TRAWL** *(not subject to RCAs)*						
21	North	Groundfish 300 lb/trip. Limits and closures in this table also apply and are counted toward the 300 lb groundfish per trip limit. The amount of groundfish landed may not exceed the amount of the target species landed, except that the amount of spiny dogfish landed may exceed the amount of target species landed. Spiny dogfish are limited by the 300 lb/trip overall groundfish limit. The daily trip limits for sablefish coastwide and the overall groundfish "per trip" limit may not be multiplied by the number of days of the trip.					
22	**SALMON TROLL**						
23	North	Salmon trollers may retain and land up to 1lb of yellowtail rockfish for every 2 lbs of salmon landed, with a cumulative limit of 200 lb/month, both within and outside of the RCA. This limit is within the 200 lb per month combined limit for minor shelf rockfish, widow rockfish and yellowtail rockfish, and not in addition to that limit. All groundfish species are subject to the open access limits, seasons and RCA restrictions listed in the table above.					

Key = management measures in need of revision, updates to be provided in future GMT reports.

1/ "North" means 40°10' N. lat. to the U.S.-Canada border. 40°10' N. lat. is about 20 nm south of Cape Mendocino, CA.

2/ Bocaccio and chilipepper rockfishes are included in the trip limits for minor shelf rockfish and splitnose rockfish is included in the trip limits for minor slope rockfish.

3/ "Other flatfish" means all flatfish at 50 CFR 660.302 except those in this Table 5 with species specific management measures, including trip limits.

4/ For black rockfish north of Cape Alava (48°09'30" N. lat.), and between Destruction Island (47°40' N. lat.) and Leadbetter Point (46°38'10" N. lat.), there is an additional limit of 100 lbs or 30 percent by weight of all fish on board, whichever is greater, per vessel, per fishing trip.

5/ Closed means that it is prohibited to take and retain, possess, or land the designated species in the time or area indicated. See IV. A.(7).

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

7/ Other fish are defined at 50 CFR 660.302, as those groundfish species or species groups for which there is no trip limit, size limit, quota, or harvest guideline.

8/ The "Rockfish Conservation Area" is a gear and/or sector specific closed area generally described by depth contours, but specifically defined by lat./long. coordinates set out at IV. A.(19)(e), that may vary seasonally.

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

Table 2.2.2-7. Trip limits and gear requirements[1/] for open access gears south of 40°10' N. latitude[2/] analyzed under the *Low OY* alternative.

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area[7/] (RCA): South of 40°10' N. lat.						
	40°10' N. lat. - 34°27' N. lat.	Shoreline - 150 fm	20 fm - 150 fm		30 fm - 150 fm		
	South of 34°27' N. lat.	80 fm - 150 fm	Shoreline - 150 fm	80 fm - 150 fm			
1	**Minor slope rockfish[2/]**						
2	40°10' - 38° N. lat.	Per trip, no more than 25% of weight of the sablefish landed					
3	South of 38° N. lat.	10,000 lb/ 2 months					
4	**Splitnose**	200 lb/ month					
5	**Sablefish**	300 lb/ day, or 1 landing per week of up to 800 lb, not to exceed 2,400 lb/ 2 months.					
6	**Thornyheads**						
7	40°10' - 34°27' N. lat.	CLOSED[5/]					
8	South of 34°27' N. lat.	50 lb/ day, no more than 2,000 lb/ 2 months					
9	**Dover sole**	3,000 lb/month, no more than 300 lb of which may be species other than Pacific sanddabs. When fishing for Pacific sanddabs, vessels using hook-and-line gear with no more than 12 hooks per line, using hooks no larger than "Number 2" hooks, which measure 11 mm (0.44 inches) point to shank, and up to 1 lb of weight per line are not subject to the RCAs.					
10	**Arrowtooth flounder**						
11	**Petrale sole**						
12	**Rex sole**						
13	**All other flatfish[3/]**						
14	**Whiting**	300 lb/ month					
15	**Minor shelf rockfish, widow and chilipepper rockfish[2/]**	100 lb/ 2 month	CLOSED[5/]	200 lb/ 2 months	250 lb/ 2 months	200 lb/ 2 months	100 lb/ 2 months
16	**Canary rockfish**	CLOSED[5/]					
17	**Yelloweye rockfish**	CLOSED[5/]					
18	**Cowcod**	CLOSED[5/]					
19	**Bocaccio**	50 lb/ 2 months					
21	**Minor nearshore rockfish**						
22	Shallow nearshore						
23	40°10' N. lat. - 34°27' N. lat.	CLOSED5/	150 lb/ 2 months		200 lb/ 2 months		150 lb/ 2 months
25	South of 34°27' N. lat.	150 lb/ 2 months	CLOSED5/	150 lb/ 2 months			
26	Deep nearshore						
27	40°10' N. lat. - 34°27' N. lat.	CLOSED5/	150 lb/ 2 months		200 lb/ 2 months		150 lb/ 2 months
28	South of 34°27' N. lat.	150 lb/ 2 months	CLOSED5/	150 lb/ 2 months			
29	California scorpionfish						
30	40°10' N. lat. - 34°27' N. lat.	CLOSED5/	150 lb/ 2 months		200 lb/ 2 months		150 lb/ 2 months
31	South of 34°27' N. lat.	150 lb/ 2 months	CLOSED5/	150 lb/ 2 months			
24	**Lingcod[4/]**	400 lb/ month, when nearshore open					
25	**Other Fish[6/]**	Not limited					
26	**PINK SHRIMP EXEMPTED TRAWL GEAR** *(not subject to RCAs)*						
27	South	**Effective April 1 - October 31, 2004:** Groundfish 500 lb/day, multiplied by the number of days of the trip, not to exceed 1,500 lb/trip. The following sublimits also apply and are counted toward the overall 500 lb/day and 1,500 lb/trip groundfish limits: lingcod 300 lb/ month (minimum 24 inch size limit); sablefish 2,000 lb/ month; canary, thornyheads and yelloweye rockfish are PROHIBITED. All other groundfish species taken are managed under the overall 500 lb/day and 1,500 lb/trip groundfish limits. Landings of these species count toward the per day and per trip groundfish limits and do not have species-specific limits. The amount of groundfish landed may not exceed the amount of pink shrimp landed.					
28	**PRAWN AND, SOUTH OF 38°57'30" N. LAT., CALIFORNIA HALIBUT AND SEA CUCUMBER EXEMPTED TRAWL**						
29	**EXEMPTED TRAWL Rockfish Conservation Area[8/] (RCA):**						
30	40°10' - 38° N. lat.	50 fm - 250 fm	60 fm - 250 fm	60 fm - 200 fm			
31	38° - 34°27' N. lat.	50 fm - 150 fm	60 fm - 150 fm	60 fm - 200 fm			
32	South of 34°27' N. lat.	100 fm - 150 fm along the mainland coast; shoreline - 150 fm around islands		100 fm - 200 fm along the mainland coast; shoreline - 200 fm around islands			
33		Groundfish 300 lb/trip. Trip limits in this table also apply and are counted toward the 300 lb groundfish per trip limit. The amount of groundfish landed may not exceed the amount of the target species landed, except that the amount of spiny dogfish landed may exceed the amount of target species landed. Spiny dogfish are limited by the 300 lb/trip overall groundfish limit. The daily trip limits for sablefish coastwide and thornyheads south of Pt. Conception and the overall groundfish "per trip" limit may not be multiplied by the number of days of the trip. Vessels participating in the California halibut fishery south of 38°57'30" N. lat. are allowed to (1) land up to 100 lb/day of groundfish without the ratio requirement, provided that at least one California halibut is landed and (2) land up to 3,000 lb/month of flatfish, no more than 300 lb of which may be species other than Pacific sanddabs, sand sole, starry flounder, rock sole, curlfin sole, or California scorpionfish (California scorpionfish is also subject to the trip limits and closures in line 25).					

Key: [shaded] = management measures in need of revision, updates to be provided in future GMT reports.

1/ "South" means 40°10' N. lat. to the U.S.-Mexico border. 40°10' N. lat. is about 20 nm south of Cape Mendocino, CA.

2/ Yellowtail rockfish is included in the trip limits for minor shelf rockfish and POP is included in the trip limits for minor slope rockfish.

3/ "Other flatfish" means all flatfish at 50 CFR 660.302 except those in this Table 5 with species specific management measures, including trip limits.

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

5/ Closed means that it is prohibited to take and retain, possess, or land the designated species in the time or area indicated. See IV. A.(7).

6/ Other fish are defined at 50 CFR 660.302, as those groundfish species or species groups for which there is no trip limit, size limit, quota, or harvest guideline.

7/ The "Rockfish Conservation Area" is a gear and/or sector specific closed area generally described by depth contours, but specifically defined by lat./long. coordinates set out at IV. A.(19)(e), that may vary seasonally.

8/ During July-August, between a line drawn due south from Point Fermin (33° 42' 30" N. lat.; 118° 17' 30" W. long.) and a line drawn due west from the Newport South Jetty (33° 35' 37" N .lat.; 117° 52' 50" W. long.,) vessels fishing for all federal groundfish species, except all rockfish and lingcod, with hook&line and/or trap (or pot) gear may operate from shore to a boundary line approximating 50 fm.

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

Table 2.2.3-1. Estimated mortality (mt) of overfished West Coast groundfish species by fishery in 2004 under the *Medium OY* alternative.

Fishery	Bocaccio a/	Canary	Cowcod	Dkbl b/	Lingcod c/	POP	Whiting d/	Widow	Yelloweye
Limited Entry Groundfish									
Trawl- Non-whiting e/	45.4	10.3	1.2	164.5	89.7	118.0		2.1	0.5
Fixed Gear									
Whiting									
At-sea whiting motherships		0.7		3.2	0.2	2.3	28,848	58.5	0.0
At-sea whiting cat-proc		0.6		4.3	0.1	7.1	40,868	74.3	0.0
Shoreside whiting		0.3		0.9	0.4	4.7	50,484	91.7	0.0
Tribal whiting		4.0		0.0	0.3	0.8	25,000	24.7	0.0
Open Access									
Groundfish directed									
CA Halibut	0.1			0.0	2.0	0.0			
CA Gillnet f/	0.5			0.0		0.0	0.0	0.0	
CA Sheephead f/				0.0		0.0	0.0	0.0	0.0
CPS- wetfish f/	0.3								
CPS- squid g/									
Dungeness crab f/	0.0		0.0	0.0		0.0			
HMS f/		0.0	0.0	0.0					
Pacific Halibut f/	0.0		0.0	0.0		0.0		0.0	0.5
Pink shrimp	0.1	0.5	0.0	0.0	0.5	0.0	1.0	0.1	0.1
Ridgeback prawn	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Salmon troll	0.2	1.6	0.0	0.0	0.3	0.0		0.0	0.2
Sea Cucumber	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spot Prawn (trap)									
Tribal									
Midwater Trawl		2.3		0.0	0.1	0.0		40.0	0.0
Bottom Trawl		0.5		0.0	9.0	0.0		0.0	0.0
Troll		0.5		0.0	1.0	0.0			0.0
Fixed gear		0.3		0.0	15.0	0.0		0.0	2.3
Recreational Groundfish									
WA		1.5			35.0				3.5
OR		6.5							
CA (N)		0.5			195.0			1.0	0.1
CA (S)	108.5	9.5	3.0		158.2			0.4	1.3
Research: Based on 2 most recent NMFS trawl shelf and slope surveys, the IPHC halibut survey, and LOAs with expanded estimates for south of Pt. Conception.									
	2.0	1.0		1.6	3.0	3.0	200	1.5	0.8
Non-EFP Total	157.2	40.5	4.2	174.4	509.8	135.9		294.3	9.3
EFPs h/									
CA: NS FF trawl i/	0.5	0.5	0.2		20.0				0.5
CA: CPFV	3.1	2.5	0.3		2.4				1.4
OR: selective FF trawl i/ j/		4.0		3.1	24.0			1.0	1.7
WA: AT trawl i/		2.5		3.0	2.0	18.0		3.0	0.5
WA: dogfish LL		0.1		0.5	2.0	0.5		0.5	1.0
WA: pollock		0.1					1,000	3.0	0.1
WA: NS FF trawl i/		1.0		3.0	2.0			1.0	0.1
EFP Subtotal	3.6	10.7	0.5	9.6	52.4	18.5	1,000	8.5	5.3
TOTAL	160.8	**51.2**	4.7	184.0	562.2	154.4	148,200	302.8	14.6
2004 OY	306	46	4.8	240	735	444	148,200	284	22

Key	
(light shading)	= either not applicable; trace amount (<0.01 mt); or not reported in available data sources.
(dark shading)	= values not available at the time of printing, to be provided in future GMT reports.

a/ South of 40°10' N. lat.

b/ Darkblotched harvest limit ("2004 OY" in this table) is the ABC of 240 mt, which is lower than the projected OY of 272 mt under the *Medium OY* alternative.

c/ Lingcod total reflects total catch, not mortality.

d/ Estimated whiting mortality calculated by assuming a 2,000 mt impact in non-whiting fisheries. Tribal catch based on OY sliding scale. Non-tribal whiting fishery catch based on set allocations applied after tribal and non-whiting fishery impacts subtracted from the OY.

e/ Using observer data, all estimates from the Hastie trawl bycatch model.

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

g/ 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.

h/ Values are proposed EFP bycatch caps, not estimates of total mortality. The EFP is terminated inseason if the cap is projected to be attained early.

i/ This EFP could be converted into regulations in 2004.

j/ Based on participation of 12 vessels for 8 months.

Table 2.2.3-2. Trip limits and gear requirements[1/] **for limited entry trawl gear north of 40°10' N. latitude**[2/] analyzed under the ***Medium OY*** alternative.

	JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
Rockfish Conservation Area[10/] **(RCA):** North of 40°10' N. lat.	75 fm - 150 fm	60 fm - 150 fm		75 fm - 150 fm		
Small footrope or midwater trawl gear is required shoreward of the RCA; all trawl gear (large footrope, midwater trawl, and small footrope gear) is permitted seaward of the RCA.						
A vessel may have more than one type of limited entry bottom trawl gear on board, but the most restrictive trip limit associated with the gear on board applies for that trip and will count toward the cumulative trip limit for that gear. A vessel may not have limited entry bottom trawl gear on board if that vessel also has trawl gear on board that is permitted for use within a RCA, including limited entry midwater trawl gear, regardless of whether the vessel is intending to fish within a RCA on that fishing trip.						
1 **Minor slope rockfish**[3/]	1,800 lb/ 2 months					
2 **Pacific ocean perch**	3,000 lb/ 2 months					
3 **DTS complex**						
4 Sablefish	7,500 lb/ 2 months providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, inshore or offshore of RCA) during the entire limit period, then 3,500 lb/2 mo.					
5 Longspine thornyhead	10,000 lb/ 2 months, providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, shoreward or seaward of RCA) during the entire limit period, then the longspine thornyhead limit is 3,000 lb/ 2 months.					
6 Shortspine thornyhead	2,000 lb/ 2 months, providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, shoreward or seaward of RCA) during the entire limit period, then the shortspoine thornyheads limit is 1,000 lb/2 months.					
7 Dover sole	26,000 lb/ 2 months, providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, shoreward or seaward of RCA) during the entire limit period, then the Dover sole limit is 15,000 lb/ 2 months.					
8 **Flatfish**						
9 All other flatfish[4/]	All other flatfish plus rex sole: 100,000 lb/ 2 months providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, inshore or offshore of RCA) during the entire limit period, then 50,000 lb/ 2 months.	All other flatfish plus petrale & rex sole: 100,000 lb/ 2 months providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, inshore or offshore of RCA) during the entire limit period, then 50,000 lb/ 2 months, no more than 20,000 lb/ 2 months of which may be petrale sole.				All other flatfish plus rex sole: 100,000 lb/ 2 months providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, inshore or offshore of RCA) during the entire limit period, then 50,000 lb/ 2 months.
10 Petrale sole	Not limited					Not limited
11 Rex sole	Included in all other flatfish					
12 Arrowtooth flounder	Not limited providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, inshore or offshore of RCA) during the entire limit period, then 5,000 lb/2 mo.		150,000 lb/ 2 mo. providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, inshore or offshore of RCA) during the entire limit period, then 5,000 lb/2 mo.			Not limited providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, inshore or offshore of RCA) during the entire limit period, then 5,000 lb/2 mo.
13 **Whiting**[5/]	20,000 lb/ trip		Primary Season (only mid-water trawl permitted in the RCA)		10,000 lb/ trip	
14 **Other Fish**[9/]	Not limited					
15 **Use of small footrope bottom trawl**[7/] **or mid-water trawl is required for landing all of the following species:**						
16 **Minor shelf rockfish and widow rockfish**[3/]	300 lb/ month		1,000 lb/ month, no more than 200 lb/ month of which may be yelloweye rockfish			300 lb/ month
17 **Widow rockfish**						
18 mid-water trawl - permitted within the RCA	CLOSED[6/]		During primary whiting season, in trips of at least 10,000 lb of whiting: combined widow and yellowtail limit of 500 lb/ trip, cumulative widow limit of 1,500 lb/ month		CLOSED[6/]	12,000 lb/ 2 months
19 **Canary rockfish**	100 lb/ month		300 lb/ month		100 lb/ month	
20 **Yellowtail**						
21 mid-water trawl - permitted within the RCA	CLOSED[6/]		During primary whiting season, in trips of at least 10,000 lb of whiting: combined widow and yellowtail limit of 500 lb/ trip, cumulative yellowtail limit of 2,000 lb/ month			18,000 lb/ 2 months
22 small footrope trawl[7/]	In landings without flatfish, 1,000 lb/ month. As flatfish bycatch, per trip limit is the sum of 33% (by weight) of all flatfish except arrowtooth flounder, plus 10% (by weight) of arrowtooth flounder. Total yellowtail landings not to exceed 10,000 lb/ 2 months, no more than 1,000 lb of which may be landed without flatfish.					
23 **Minor nearshore rockfish**	300 lb/ month					
24 **Lingcod**[8/]	800 lb/ 2 months		1,000 lb/ 2 months		800 lb/ 2 months	

Key [shaded box] = management measures in need of revision, updates to be provided in future GMT reports.

1/ Gear requirements and prohibitions are explained above. See IV. A.(14).
2/ "North" means 40°10' N. lat. to the U.S.-Canada border. 40°10' N. lat. is about 20 nm south of Cape Mendocino, CA.
3/ Bocaccio and chilipepper are included in the trip limits for minor shelf rockfish and splitnose rockfish is included in the trip limits for minor slope rockfish.
4/ "Other" flatfish means all flatfish at 50 CFR 660.302 except those in this Table 3 with species specific management measures, including trip limits.
5/ The whiting "per trip" limit in the Eureka area shoreward of 100 fm is 10,000 lb/ trip throughout the year. Outside Eureka area, the 20,000 lb/ trip limit applies. See IV. B.(3).
6/ Closed means that it is prohibited to take and retain, possess, or land the designated species in the time or area indicated. See IV. A.(7).
7/ Small footrope trawl means a bottom trawl net with a footrope no larger than 8 inches (20 cm) in diameter.
8/ The minimum size limit for lingcod is 24 inches (61 cm) total length.
9/ Other fish are defined at 50 CFR 660.302, as those groundfish species or species groups for which there is no trip limit, size limit, quota, or harvest guideline.
10/ The "Rockfish Conservation Area" is a gear and/or sector specific closed area generally described by depth contours but specifically defined by lat/long coordinates set out at IV. A.(19)(e), that may vary seasonally.

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

Table 2.2.3-3. Trip limits and gear requirements[1/] for limited entry trawl gear south of 40°10' N. latitude[2/] analyzed under the *Medium OY* alternative.

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area[10/] (RCA):						
	40°10' - 38° N. lat.	100 fm - 150 fm					
	South of 38° N. lat.						
	Small footrope or midwater trawl gear is required shoreward of the RCA; all trawl gear (large footrope, midwater trawl, and small footrope gear) is permitted seaward of the RCA.						
	A vessel may have more than one type of limited entry bottom trawl gear on board, but the most restrictive trip limit associated with the gear on board applies for that trip and will count toward the cumulative trip limit for that gear. A vessel may not have limited entry bottom trawl gear on board if that vessel also has trawl gear on board that is permitted for use within a RCA, including limited entry midwater trawl gear, regardless of whether the vessel is intending to fish within a RCA on that fishing trip.						
1	**Minor slope rockfish[3/]**						
2	40°10' - 38° N. lat.	1,800 lb/ 2 months					
3	South of 38° N. lat.	30,000 lb/ 2 months					
4	**Splitnose**						
5	40°10' - 38° N. lat.	1,800 lb/ 2 months					
6	South of 38° N. lat.	30,000 lb/ 2 months					
7	**DTS complex**						
8	Sablefish	7,500 lb/ 2 months					
9	Longspine thornyhead	10,000 lb /2 months					
10	Shortspine thornyhead	2,000 lb/ 2 months					
11	Dover sole	26,000 lb/ 2 months					
12	**Flatfish**						
13	All other flatfish[4/]	100,000 lb/ 2 months	All other flatfish plus petrale & rex sole: 100,000 lb/ 2 months, no more than 20,000 lb/ 2 months of which may be petrale sole.				100,000 lb/ 2 months
14	Petrale sole	No limit					No limit
15	Rex sole	Included in all other flatfish					
16	Arrowtooth flounder	No limit	10,000 lb/ 2 months				No limit
17	**Whiting[5/]**	20,000 lb/ trip		Primary Season (only mid-water trawl permitted within the RCA)		10,000 lb/ trip	
18	**Other Fish[9/]**	Not limited					
19	**Use of small footrope bottom trawl[7/] or mid-water trawl is required for landing all of the following species:**						
20	**Minor shelf rockfish, widow, and chilipepper rockfish[3/]**	300 lb/ month					
21	**Widow rockfish**						
22	mid-water trawl - permitted within the RCA	CLOSED[6/]					12, 000 lb/ 2 months
23	**Canary rockfish**	100 lb/ month		300 lb/ month		100 lb/ month	
24	**Bocaccio**	CLOSED[6/]					
25	**Cowcod**	CLOSED[6/]					
26	**Minor nearshore rockfish**	300 lb/ month					
27	**Lingcod[8/]**	800 lb/ 2 months		1,000 lb/ 2 months		800 lb/ 2 months	

Key [shaded] = management measures in need of revision, updates to be provided in future GMT reports.

1/ Gear requirements and prohibitions are explained above. See IV. A.(14).
2/ "South" means 40°10' N. lat. to the U.S.-Mexico border. 40°10' N. lat. is about 20 nm south of Cape Mendocino, CA.
3/ Yellowtail is included in the trip limits for minor shelf rockfish and POP is included in the trip limits for minor slope rockfish.
4/ "Other" flatfish means all flatfish at 50 CFR 660.302 except those in this Table 3 with species specific management measures, including trip limits.
5/ The whiting "per trip" limit in the Eureka area shoreward of 100 fm is 10,000 lb/ trip throughout the year. Outside Eureka area, the 20,000 lb/ trip limit applies. See IV. B.(3).
6/ Closed means that it is prohibited to take and retain, possess, or land the designated species in the time or area indicated. See IV. A.(7).
7/ Small footrope trawl means a bottom trawl net with a footrope no larger than 8 inches (20 cm) in diameter.
8/ The minimum size limit for lingcod is 24 inches (61 cm) total length.
9/ Other fish are defined at 50 CFR 660.302, as those groundfish species or species groups for which there is no trip limit, size limit, quota, or harvest guideline.
10/ The "Rockfish Conservation Area" is a gear and/or sector specific closed area generally described by depth contours but specifically defined by lat./long. coordinates set out at IV. A.(19)(e), that may vary seasonally.

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

Table 2.2.3-4. Trip limits and gear requirements[1/] for limited entry fixed gear north of 40°10' N. latitude[2/] analyzed under the *Medium OY* alternative.

	JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
Rockfish Conservation Area[8/] (RCA):						
North of 46°16' N. lat.	shoreline - 100 fm					
46°16' N. lat. - 40°10' N. lat.	30 fm - 100 fm					
1 Minor slope rockfish[4/]	1,800 lb/ 2 months	No more than 25% of the weight of sablefish landed/ trip				1,800 lb/ 2 months
2 Pacific ocean perch	1,800 lb/ 2 months					
3 Sablefish	300 lb/ day, or 1 landing per week of up to 900 lb, not to exceed 3,600 lb/ 2 months.			300 lb/ day, or 1 landing per week of up to 800 lb, not to exceed 3,200 lb/ 2 months.		300 lb/ day, or 1 landing per week of up to 900 lb, not to exceed 3,600 lb/ 2 months
4 Longspine thornyhead	9,000 lb/ 2 months					
5 Shortspine thornyhead	2,000 lb/ 2 months					
6 Dover sole	5,000 lb/ month					
7 Arrowtooth flounder						
8 Petrale sole						
9 Rex sole						
10 All other flatfish[2/]						
11 Whiting[3/]	10,000 lb/ trip					
12 Minor shelf rockfish, widow, and yellowtail rockfish[4/]	200 lb/ month					
13 Canary rockfish	CLOSED[5/]					
14 Yelloweye rockfish	CLOSED[5/]					
15 Cowcod	CLOSED[5/]					
16 Minor nearshore rockfish	4,000 lb/ 2 months, no more than 1,200 lb of which may be species other than black or blue rockfish[6/]					
17 Lingcod[7/]	CLOSED[5/]		400 lb/ month			CLOSED[5/]
18 Other fish[9/]	Not limited					

Key [shaded box] = management measures in need of revision, updates to be provided in future GMT reports.

1/ "North" means 40°10' N. lat. to the U.S.-Canada border. 40°10' N. lat. is about 20 nm south of Cape Mendocino, CA.

2/ "Other flatfish" means all flatfish at 50 CFR 660.302 except those in this Table 4 with species specific management measures, including trip limits.

3/ TThe whiting "per trip" limit in the Eureka area shoreward of 100 fm is 10,000 lb/ trip throughout the year. Outside Eureka area, the 20,000 lb/ trip limit applies. See IV. B.(3).

4/ Bocaccio and chilipepper are included in the trip limits for minor shelf rockfish and splitnose rockfish is included in the trip limits for minor slope rockfish.

5/ Closed means that it is prohibited to take and retain, possess, or land the designated species in the time or area indicated. See IV. A.(7).

6/ For black rockfish north of Cape Alava (48°09'30" N. lat.), and between Destruction Island (47°40'00" N. lat.) and Leadbetter Point (46°38'10" N. lat.), there is an additional limit of 100 lb or 30 percent by weight of all fish on board, whichever is greater, per vessel, per fishing trip.

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

8/ The "Rockfish Conservation Area" is a gear and/or sector specific closed area generally described by depth contours but specifically defined by lat./long. coordinates set out at IV. A.(19)(e), that may vary seasonally.

9/ Other fish are defined at 50 CFR 660.302, as those groundfish species or species groups for which there is no trip limit, size limit, quota, or harvest guideline.

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

Table 2.2.3-5. Trip limits and gear requirements[1/] **for limited entry fixed gear south of 40°10' N. latitude**[2/] analyzed under the ***Medium OY*** alternative.

	JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
Rockfish Conservation Area[7/] **(RCA):** South of 40°10' N. lat.						
40°10' N. lat. - 34°27' N. lat.	20 fm - 150 fm		30 fm - 150 fm			20 fm - 150 fm
South of 34°27' N. lat.	80 fm - 150 fm					
1 **Minor slope rockfish**[4/]						
2 40°10' - 38° N. lat.	1,800 lb/ 2 months	No more than 25% of weight of sablefish landed/ trip				1,800 lb/ 2 months
3 South of 38° N. lat.	30,000 lb/ 2 months					
4 **Splitnose**						
5 40°10' - 38° N. lat.	1,800 lb/ 2 months					
6 South of 38° N. lat.	20,000 lb/ 2 months					
7 **Sablefish**	300 lb/ day, or 1 landing per week of up to 900 lb, not to exceed 3,600 lb/ 2 months.			300 lb/ day, or 1 landing per week of up to 800 lb, not to exceed 3,200 lb/ 2 months.		300 lb/ day, or 1 landing per week of up to 900 lb, not to exceed 3,600 lb/ 2 months.
8 **Longspine thornyhead**	9,000 lb/ 2 months					
9 **Shortspine thornyhead**	2,000 lb/ 2 months					
19 **Dover sole**	5,000 lb/ month When fishing for Pacific sanddabs, vessels using hook-and-line gear with no more than 12 hooks per line, using hooks no larger than "Number 2" hooks, which measure 11 mm (0.44 inches) point to shank, and up to 1 lb (0.45 kg) of weight per line are not subject to the RCAs.					
11 **Arrowtooth flounder**						
12 **Petrale sole**						
13 **Rex sole**						
14 **All other flatfish**[2/]						
15 **Whiting**[3/]	10,000 lb/ trip					
16 **Minor shelf rockfish, widow, and yellowtail rockfish**[4/]	100 lb/ 2 month	CLOSED[5/]	200 lb/ 2 months	250 lb/ 2 months	200 lb/ 2 months	100 lb/ 2 months
17 **Canary rockfish**	CLOSED[5/]					
18 **Yelloweye rockfish**	CLOSED[5/]					
19 **Cowcod**	CLOSED[5/]					
20 **Bocaccio**	100 lb/ 2 month					
21 **Minor nearshore rockfish**						
22 Shallow nearshore						
23 40°10' N. lat. - 34°27' N. lat.	300 lb/ 2 months			400 lb/ 2 months		300 lb/ 2 months
25 South of 34°27' N. lat.						
26 Deep nearshore						
27 40°10' N. lat. - 34°27' N. lat.	300 lb/ 2 months			400 lb/ 2 months		300 lb/ 2 months
28 South of 34°27' N. lat.						
29 California scorpionfish						
30 40°10' N. lat. - 34°27' N. lat.	300 lb/ 2 months			400 lb/ 2 months		300 lb/ 2 months
31 South of 34°27' N. lat.						
32 **Lingcod**[6/]	400 lb/ month, when nearshore open					
33 **Other fish**[8/]	Not limited					

Key [shaded] = management measures in need of revision, updates to be provided in future GMT reports.

1/ "South" means 40°10' N. lat. to the U.S.-Mexico border. 40°10' N. lat. is about 20 nm south of Cape Mendocino, CA.

2/ "Other flatfish" means all flatfish at 50 CFR 660.302 except those in this Table 4 with species specific management measures, including trip limits.

3/ The whiting "per trip" limit in the Eureka area shoreward of 100 fm is 10,000 lb/ trip throughout the year. Outside Eureka area, the 20,000 lb/ trip limit applies. See IV. B.(3).

4/ Chilipepper rockfish is included in the trip limits for minor shelf rockfish and POP is included in the trip limits for minor slope rockfish.

5/ Closed means that it is prohibited to take and retain, possess, or land the designated species in the time or area indicated. See IV. A.(7).

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

7/ The "Rockfish Conservation Area" is a gear and/or sector specific closed area generally described by depth contours but specifically defined by lat/long coordinates set out at IV. A.(19)(e) that may vary seasonally.

8/ Other fish are defined at 50 CFR 660.302, as those groundfish species or species groups for which there is no trip limit, size limit, quota, or harvest guideline.

9/ During July-August, between a line drawn due south from Point Fermin (33° 42' 30" N. lat.; 118° 17' 30" W. long.) and a line drawn due west from the Newport South Jetty (33° 35' 37" N .lat.; 117° 52' 50" W. long.,) vessels fishing for all federal groundfish species, except all rockfish and lingcod, with hook&line and/or trap (or pot) gear may operate from shore to a boundary line approximating 50 fm.

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

Table 2.2.3-6. Trip limits and gear requirements[1/] for open access gears north of 40°10' N. latitude[2/] analyzed under the *Medium OY* alternative.

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area[8/] (RCA):						
	North of 46°16' N. lat.	0 fm - 100 fm					
	46°16' N. lat. - 40°10' N. lat.	30 fm - 100 fm					
1	**Minor slope rockfish[2/]**	Per trip, no more than 25% of weight of the sablefish landed					
2	**Pacific ocean perch**	100 lb/ month					
3	**Sablefish**	300 lb/ day, or 1 landing per week of up to 900 lb, not to exceed 3,600 lb/ 2 months.			300 lb/ day, or 1 landing per week of up to 800 lb, not to exceed 3,200 lb/ 2 months.		300 lb/ day, or 1 landing per week of up to 900 lb, not to exceed 3,600 lb/ 2 months.
4	**Thornyheads**	CLOSED[5/]					
5	**Dover sole**	3,000 lb/month, no more than 300 lb of which may be species other than Pacific sanddabs.					
6	**Arrowtooth flounder**						
7	**Petrale sole**						
8	**Rex sole**						
9	**All other flatfish[3/]**						
10	**Whiting**	300 lb/ month					
11	**Minor shelf rockfish, widow and yellowtail rockfish[2/]**	200 lb/ month					
12	**Canary rockfish**	CLOSED[5/]					
13	**Yelloweye rockfish**	CLOSED[5/]					
14	**Cowcod**	CLOSED[5/]					
15	**Minor nearshore rockfish**	4,000 lb/ 2 months, no more than 1,200 lb of which may be species other than black or blue rockfish[4/]					
16	**Lingcod[6/]**	CLOSED[5/]		300 lb/ month			CLOSED[5/]
17	**Other Fish[7/]**	Not limited					
18	**PINK SHRIMP EXEMPTED TRAWL** *(not subject to RCAs)*						
19	North	**Effective April 1 - October 31, 2004:** groundfish 500 lb/day, multiplied by the number of days of the trip, not to exceed 1,500 lb/trip. The following sublimits also apply and are counted toward the overall 500 lb/day and 1,500 lb/trip groundfish limits: lingcod 300 lb/month (minimum 24 inch size limit); sablefish 2,000 lb/month; canary, thornyheads and yelloweye rockfish are PROHIBITED. All other groundfish species taken are managed under the overall 500 lb/day and 1,500 lb/trip groundfish limits. Landings of these species count toward the per day and per trip groundfish limits and do not have species-specific limits. The amount of groundfish landed may not exceed the amount of pink shrimp landed.					
20	**PRAWN EXEMPTED TRAWL** *(not subject to RCAs)*						
21	North	Groundfish 300 lb/trip. Limits and closures in this table also apply and are counted toward the 300 lb groundfish per trip limit. The amount of groundfish landed may not exceed the amount of the target species landed, except that the amount of spiny dogfish landed may exceed the amount of target species landed. Spiny dogfish are limited by the 300 lb/trip overall groundfish limit. The daily trip limits for sablefish coastwide and the overall groundfish "per trip" limit may not be multiplied by the number of days of the trip.					
22	**SALMON TROLL**						
23	North	Salmon trollers may retain and land up to 1lb of yellowtail rockfish for every 2 lbs of salmon landed, with a cumulative limit of 200 lb/month, both within and outside of the RCA. This limit is within the 200 lb per month combined limit for minor shelf rockfish, widow rockfish and yellowtail rockfish, and not in addition to that limit. All groundfish species are subject to the open access limits, seasons and RCA restrictions listed in the table above.					

Key [shaded] = management measures in need of revision, updates to be provided in future GMT reports.

1/ "North" means 40°10' N. lat. to the U.S.-Canada border. 40°10' N. lat. is about 20 nm south of Cape Mendocino, CA.

2/ Bocaccio and chilipepper rockfishes are included in the trip limits for minor shelf rockfish and splitnose rockfish is included in the trip limits for minor slope rockfish.

3/ "Other flatfish" means all flatfish at 50 CFR 660.302 except those in this Table 5 with species specific management measures, including trip limits.

4/ For black rockfish north of Cape Alava (48°09'30" N. lat.), and between Destruction Island (47°40' N. lat.) and Leadbetter Point (46°38'10" N. lat.), there is an additional limit of 100 lbs or 30 percent by weight of all fish on board, whichever is greater, per vessel, per fishing trip.

5/ Closed means that it is prohibited to take and retain, possess, or land the designated species in the time or area indicated. See IV. A.(7).

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

7/ Other fish are defined at 50 CFR 660.302, as those groundfish species or species groups for which there is no trip limit, size limit, quota, or harvest guideline.

8/ The "Rockfish Conservation Area" is a gear and/or sector specific closed area generally described by depth contours, but specifically defined by lat./long. coordinates set out at IV. A.(19)(e), that may vary seasonally.

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

Table 2.2.3-7. Trip limits and gear requirements[1/] for open access gears south of 40o10' N. latitude[2/] analyzed under the *Medium OY* alternative.

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area[7/] (RCA): South of 40°10' N. lat.						
	40°10' N. lat. - 34°27' N. lat.	20 fm - 150 fm		30 fm - 150 fm			20 fm - 150 fm
	South of 34°27' N. lat.	80 fm - 150 fm					
1	**Minor slope rockfish[2/]**						
2	40°10' - 38° N. lat.	Per trip, no more than 25% of weight of the sablefish landed					
3	South of 38° N. lat.	10,000 lb/ 2 months					
4	**Splitnose**	200 lb/ month					
5	**Sablefish**	300 lb/ day, or 1 landing per week of up to 900 lb, not to exceed 3,600 lb/ 2 months.			300 lb/ day, or 1 landing per week of up to 800 lb, not to exceed 3,200 lb/ 2 months.		300 lb/ day, or 1 landing per week of up to 900 lb, not to exceed 3,600 lb/ 2 months.
6	**Thornyheads**						
7	40°10' - 34°27' N. lat.	CLOSED[5/]					
8	South of 34°27' N. lat.	50 lb/ day, no more than 2,000 lb/ 2 months					
9	**Dover sole**	3,000 lb/month, no more than 300 lb of which may be species other than Pacific sanddabs. When fishing for Pacific sanddabs, vessels using hook-and-line gear with no more than 12 hooks per line, using hooks no larger than "Number 2" hooks, which measure 11 mm (0.44 inches) point to shank, and up to 1 lb of weight per line are not subject to the RCAs.					
10	**Arrowtooth flounder**						
11	**Petrale sole**						
12	**Rex sole**						
13	**All other flatfish[3/]**						
14	**Whiting**	300 lb/ month					
15	**Minor shelf rockfish, widow and chilipepper rockfish[2/]**	100 lb/ 2 month	CLOSED[5/]	200 lb/ 2 months	250 lb/ 2 months	200 lb/ 2 months	100 lb/ 2 months
16	**Canary rockfish**	CLOSED[5/]					
17	**Yelloweye rockfish**	CLOSED[5/]					
18	**Cowcod**	CLOSED[5/]					
19	**Bocaccio**	100 lb/ 2 month					
20	**Minor nearshore rockfish**						
21	Shallow nearshore						
22	40°10' N. lat. - 34°27' N. lat.	300 lb/ 2 months			400 lb/ 2 months		300 lb/ 2 months
23	South of 34°27' N. lat.						
24	Deep nearshore						
25	40°10' N. lat. - 34°27' N. lat.	300 lb/ 2 months			400 lb/ 2 months		300 lb/ 2 months
26	South of 34°27' N. lat.						
27	California scorpionfish						
28	40°10' N. lat. - 34°27' N. lat.	300 lb/ 2 months			400 lb/ 2 months		300 lb/ 2 months
29	South of 34°27' N. lat.						
30	**Lingcod[4/]**	400 lb/ month, when nearshore open					
31	**Other fish[6/]**	Not limited					
32	**PINK SHRIMP EXEMPTED TRAWL GEAR** *(not subject to RCAs)*						
33	South	**Effective April 1 - October 31, 2004:** Groundfish 500 lb/day, multiplied by the number of days of the trip, not to exceed 1,500 lb/trip. The following sublimits also apply and are counted toward the overall 500 lb/day and 1,500 lb/trip groundfish limits: lingcod 300 lb/ month (minimum 24 inch size limit); sablefish 2,000 lb/ month; canary, thornyheads and yelloweye rockfish are PROHIBITED. All other groundfish species taken are managed under the overall 500 lb/day and 1,500 lb/trip groundfish limits. Landings of these species count toward the per day and per trip groundfish limits and do not have species-specific limits. The amount of groundfish landed may not exceed the amount of pink shrimp landed.					
34	**PRAWN AND, SOUTH OF 38°57'30" N. LAT., CALIFORNIA HALIBUT AND SEA CUCUMBER EXEMPTED TRAWL**						
35	**EXEMPTED TRAWL Rockfish Conservation Area[8/] (RCA):**						
36	40°10' - 38° N. lat.	50 fm - 250 fm	60 fm - 250 fm	60 fm - 200 fm			
37	38° - 34°27' N. lat.	50 fm - 150 fm	60 fm - 150 fm	60 fm - 200 fm			
38	South of 34°27' N. lat.	100 fm - 150 fm along the mainland coast; shoreline - 150 fm around islands		100 fm - 200 fm along the mainland coast; shoreline - 200 fm around islands			
39		Groundfish 300 lb/trip. Trip limits in this table also apply and are counted toward the 300 lb groundfish per trip limit. The amount of groundfish landed may not exceed the amount of the target species landed, except that the amount of spiny dogfish landed may exceed the amount of target species landed. Spiny dogfish are limited by the 300 lb/trip overall groundfish limit. The daily trip limits for sablefish coastwide and thornyheads south of Pt. Conception and the overall groundfish "per trip" limit may not be multiplied by the number of days of the trip. Vessels participating in the California halibut fishery south of 38°57'30" N. lat. are allowed to (1) land up to 100 lb/day of groundfish without the ratio requirement, provided that at least one California halibut is landed and (2) land up to 3,000 lb/month of flatfish, no more than 300 lb of which may be species other than Pacific sanddabs, sand sole, starry flounder, rock sole, curlfin sole, or California scorpionfish (California scorpionfish is also subject to the trip limits and closures in line 25).					

Key [shaded box] = management measures in need of revision, updates to be provided in future GMT reports.

1/ "South" means 40°10' N. lat. to the U.S.-Mexico border. 40°10' N. lat. is about 20 nm south of Cape Mendocino, CA.

2/ Yellowtail rockfish is included in the trip limits for minor shelf rockfish and POP is included in the trip limits for minor slope rockfish.

3/ "Other flatfish" means all flatfish at 50 CFR 660.302 except those in this Table 5 with species specific management measures, including trip limits.

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

5/ Closed means that it is prohibited to take and retain, possess, or land the designated species in the time or area indicated. See IV. A.(7).

6/ Other fish are defined at 50 CFR 660.302, as those groundfish species or species groups for which there is no trip limit, size limit, quota, or harvest guideline.

7/ The "Rockfish Conservation Area" is a gear and/or sector specific closed area generally described by depth contours, but specifically defined by lat./long. coordinates set out at IV. A.(19)(e), that may vary seasonally.

8/ During July-August, between a line drawn due south from Point Fermin (33° 42' 30" N. lat.; 118° 17' 30" W. long.) and a line drawn due west from the Newport South Jetty (33° 35' 37" N .lat.; 117° 52' 50" W. long.,) vessels fishing for all federal groundfish species, except all rockfish and lingcod, with hook&line and/or trap (or pot) gear may operate from shore to a boundary line approximating 50 fm.

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

Table 2.2.4-1. **Estimated mortality (mt) of overfished West Coast groundfish species by fishery in 2004 under the *High OY* alternative.**

Fishery	Bocaccio a/	Canary	Cowcod	Dkbl b/	Lingcod c/	POP	Whiting d/	Widow	Yelloweye
Limited Entry Groundfish									
Trawl- Non-whiting e/	45.5	10.4	1.2	166.1	90.2	119.1		2.1	0.5
Fixed Gear									
Whiting									
At-sea whiting motherships		1.1		5.0	0.3	3.6	45,432	92.2	0.0
At-sea whiting cat-proc		0.9		6.7	0.1	11.2	64,362	117.0	0.0
Shoreside whiting		0.5		1.4	0.6	7.5	79,506	144.4	0.0
Tribal whiting		4.8		0.0	0.4	0.9	30,000	29.6	0.0
Open Access									
Groundfish directed									
CA Halibut	0.1			0.0	2.0	0.0			
CA Gillnet f/	0.5			0.0		0.0	0.0	0.0	
CA Sheephead f/				0.0		0.0	0.0	0.0	0.0
CPS- wetfish f/	0.3								
CPS- squid g/									
Dungeness crab f/	0.0		0.0	0.0		0.0			
HMS f/		0.0	0.0	0.0					
Pacific Halibut f/	0.0		0.0	0.0		0.0		0.0	0.5
Pink shrimp	0.1	0.5	0.0	0.0	0.5	0.0	1.0	0.1	0.1
Ridgeback prawn	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Salmon troll	0.2	1.6	0.0	0.0	0.3	0.0		0.0	0.2
Sea Cucumber	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spot Prawn (trap)									
Tribal									
Midwater Trawl		2.3		0.0	0.1	0.0		40.0	0.0
Bottom Trawl		0.5		0.0	9.0	0.0		0.0	0.0
Troll		0.5		0.0	1.0	0.0			0.0
Fixed gear		0.3		0.0	15.0	0.0		0.0	2.3
Recreational Groundfish									
WA		1.5			35.0				3.5
OR		9.0							
CA (N)		0.5			195.0			1.0	0.1
CA (S)	125.9	16.2	4.6		161.5			0.4	1.2
Research: Based on 2 most recent NMFS trawl shelf and slope surveys, the IPHC halibut survey, and LOAs with expanded estimates for south of Pt. Conception.									
	2.0	1.0		1.6	3.0	3.0	200	1.5	0.8
Non-EFP Total	174.7	51.5	5.8	180.8	514.0	145.2		428.3	9.3
EFPs h/									
CA: NS FF trawl i/	0.5	0.5	0.2		20.0				0.5
CA: CPFV	3.1	2.5	0.3		2.4				1.4
OR: selective FF trawl i/ j/		4.0		3.1	24.0			1.0	1.7
WA: AT trawl i/		2.5		3.0	2.0	18.0		3.0	0.5
WA: dogfish LL		0.1		0.5	2.0	0.5		0.5	1.0
WA: pollock		0.1					1,000	3.0	0.1
WA: NS FF trawl i/		1.0		3.0	2.0			1.0	0.1
EFP Subtotal	3.6	10.7	0.5	9.6	52.4	18.5	1,000	8.5	5.3
TOTAL	178.3	**62.2**	**6.3**	190.4	566.4	163.7	222,300	436.8	14.6
2004 OY	526	46	4.8	247	735	555	222,300	501	22

Key	
(light shading)	= either not applicable; trace amount (<0.01 mt); or not reported in available data sources.
(dark shading)	= values not available at the time of printing, to be provided in future GMT reports.

a/ South of 40°10' N. lat.

b/ Darkblotched harvest limit ("2004 OY" in this table) is the ABC of 247 mt, which is lower than the projected OY of 364 mt under the *High OY* alternative.

c/ Lingcod total reflects total catch, not mortality.

d/ Estimated whiting mortality calculated by assuming a 2,000 mt impact in non-whiting fisheries. Tribal catch based on OY sliding scale. Non-tribal whiting fishery catch based on set allocations applied after tribal and non-whiting fishery impacts subtracted from the OY.

e/ Using observer data, all estimates from the Hastie trawl bycatch model.

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

g/ 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.

h/ Values are proposed EFP bycatch caps, not estimates of total mortality. The EFP is terminated inseason if the cap is projected to be attained early.

i/ This EFP could be converted into regulations in 2004.

j/ Based on participation of 12 vessels for 8 months.

Table 2.2.4-2. Trip limits and gear requirements[1/] for limited entry trawl gear north of 40°10' N. latitude[2/] analyzed under the *High OY* alternative.

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area[10/] (RCA): North of 40°10' N. lat.	75 fm - 150 fm	60 fm - 150 fm		75 fm - 150 fm		
	Small footrope or midwater trawl gear is required shoreward of the RCA; all trawl gear (large footrope, midwater trawl, and small footrope gear) is permitted seaward of the RCA.						
	A vessel may have more than one type of limited entry bottom trawl gear on board, but the most restrictive trip limit associated with the gear on board applies for that trip and will count toward the cumulative trip limit for that gear. A vessel may not have limited entry bottom trawl gear on board if that vessel also has trawl gear on board that is permitted for use within a RCA, including limited entry midwater trawl gear, regardless of whether the vessel is intending to fish within a RCA on that fishing trip.						
1	**Minor slope rockfish[3/]**	1,800 lb/ 2 months					
2	**Pacific ocean perch**	3,000 lb/ 2 months					
3	**DTS complex**						
4	Sablefish	8,200 lb/ 2 months providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, inshore or offshore of RCA) during the entire limit period, then 4,000 lb/2 mo.					
5	Longspine thornyhead	10,000 lb/ 2 months, providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, shoreward or seaward of RCA) during the entire limit period, then the longspine thornyhead limit is 3,000 lb/ 2 months.					
6	Shortspine thornyhead	2,000 lb/ 2 months, providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, shoreward or seaward of RCA) during the entire limit period, then the shortspoine thornyheads limit is 1,000 lb/2 months.					
7	Dover sole	26,000 lb/ 2 months, providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, shoreward or seaward of RCA) during the entire limit period, then the Dover sole limit is 15,000 lb/ 2 months.					
8	**Flatfish**						
9	All other flatfish[4/]	All other flatfish plus rex sole: 100,000 lb/ 2 months providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, inshore or offshore of RCA) during the entire limit period, then 50,000 lb/ 2 months.	All other flatfish plus petrale & rex sole: 100,000 lb/ 2 months providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, inshore or offshore of RCA) during the entire limit period, then 50,000 lb/ 2 months, no more than 20,000 lb/ 2 months of which may be petrale sole.				All other flatfish plus rex sole: 100,000 lb/ 2 months providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, inshore or offshore of RCA) during the entire limit period, then 50,000 lb/ 2 months.
10	Petrale sole	Not limited					Not limited
11	Rex sole	Included in all other flatfish					
12	Arrowtooth flounder	Not limited providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, inshore or offshore of RCA) during the entire limit period, then 5,000 lb/2 mo.		150,000 lb/ 2 mo. providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, inshore or offshore of RCA) during the entire limit period, then 5,000 lb/2 mo.			Not limited providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, inshore or offshore of RCA) during the entire limit period, then 5,000 lb/2 mo.
13	**Whiting[5/]**	20,000 lb/ trip		Primary Season (only mid-water trawl permitted in the RCA)		10,000 lb/ trip	
14	**Other Fish[9/]**	Not limited					
15	**Use of small footrope bottom trawl[7/] or mid-water trawl is required for landing all of the following species:**						
16	**Minor shelf rockfish and widow rockfish[3/]**	300 lb/ month		1,000 lb/ month, no more than 200 lb/ month of which may be yelloweye rockfish			300 lb/ month
17	**Widow rockfish**						
18	mid-water trawl - permitted within the RCA	CLOSED[6/]		During primary whiting season, in trips of at least 10,000 lb of whiting: combined widow and yellowtail limit of 500 lb/ trip, cumulative widow limit of 1,500 lb/ month		CLOSED[6/]	12,000 lb/ 2 months
19	**Canary rockfish**	100 lb/ month		300 lb/ month		100 lb/ month	
20	**Yellowtail**						
21	mid-water trawl - permitted within the RCA	CLOSED[6/]		During primary whiting season, in trips of at least 10,000 lb of whiting: combined widow and yellowtail limit of 500 lb/ trip, cumulative yellowtail limit of 2,000 lb/ month			18,000 lb/ 2 months
22	small footrope trawl[7/]	In landings without flatfish, 1,000 lb/ month. As flatfish bycatch, per trip limit is the sum of 33% (by weight) of all flatfish except arrowtooth flounder, plus 10% (by weight) of arrowtooth flounder. Total yellowtail landings not to exceed 10,000 lb/ 2 months, no more than 1,000 lb of which may be landed without flatfish.					
23	**Minor nearshore rockfish**	300 lb/ month					
24	**Lingcod[8/]**	800 lb/ 2 months		1,000 lb/ 2 months		800 lb/ 2 months	

Key [shaded] = management measures in need of revision, updates to be provided in future GMT reports.

1/ Gear requirements and prohibitions are explained above. See IV. A.(14).
2/ "North" means 40°10' N. lat. to the U.S.-Canada border. 40°10' N. lat. is about 20 nm south of Cape Mendocino, CA.
3/ Bocaccio and chilipepper are included in the trip limits for minor shelf rockfish and splitnose rockfish is included in the trip limits for minor slope rockfish.
4/ "Other" flatfish means all flatfish at 50 CFR 660.302 except those in this Table 3 with species specific management measures, including trip limits.
5/ The whiting "per trip" limit in the Eureka area shoreward of 100 fm is 10,000 lb/ trip throughout the year. Outside Eureka area, the 20,000 lb/ trip limit applies. See IV. B.(3).
6/ Closed means that it is prohibited to take and retain, possess, or land the designated species in the time or area indicated. See IV. A.(7).
7/ Small footrope trawl means a bottom trawl net with a footrope no larger than 8 inches (20 cm) in diameter.
8/ The minimum size limit for lingcod is 24 inches (61 cm) total length.
9/ Other fish are defined at 50 CFR 660.302, as those groundfish species or species groups for which there is no trip limit, size limit, quota, or harvest guideline.
10/ The "Rockfish Conservation Area" is a gear and/or sector specific closed area generally described by depth contours but specifically defined by lat/long coordinates set out at IV. A.(19)(e), that may vary seasonally.
To convert pounds to kilograms, divide by 2.20462, the number of pounds in one kilogram.

Table 2.2.4-3. Trip limits and gear requirements[1] for limited entry trawl gear south of 40°10' N. latitude[2] analyzed under the *High OY* alternative.

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area[10] (RCA):						
	40°10' - 38° N. lat.	100 fm - 150 fm					
	South of 38° N. lat.						
	Small footrope or midwater trawl gear is required shoreward of the RCA; all trawl gear (large footrope, midwater trawl, and small footrope gear) is permitted seaward of the RCA.						
	A vessel may have more than one type of limited entry bottom trawl gear on board, but the most restrictive trip limit associated with the gear on board applies for that trip and will count toward the cumulative trip limit for that gear. A vessel may not have limited entry bottom trawl gear on board if that vessel also has trawl gear on board that is permitted for use within a RCA, including limited entry midwater trawl gear, regardless of whether the vessel is intending to fish within a RCA on that fishing trip.						
1	**Minor slope rockfish[3]**						
2	40°10' - 38° N. lat.	1,800 lb/ 2 months					
3	South of 38° N. lat.	30,000 lb/ 2 months					
4	**Splitnose**						
5	40°10' - 38° N. lat.	1,800 lb/ 2 months					
6	South of 38° N. lat.	30,000 lb/ 2 months					
7	**DTS complex**						
8	Sablefish	8,200 lb/ 2 months					
9	Longspine thornyhead	10,000 lb /2 months					
10	Shortspine thornyhead	2,000 lb/ 2 months					
11	Dover sole	26,000 lb/ 2 months					
12	**Flatfish**						
13	All other flatfish[4]	100,000 lb/ 2 months	All other flatfish plus petrale & rex sole: 100,000 lb/ 2 months, no more than 20,000 lb/ 2 months of which may be petrale sole.				100,000 lb/ 2 months
14	Petrale sole	No limit					No limit
15	Rex sole	Included in all other flatfish					
16	Arrowtooth flounder	No limit	10,000 lb/ 2 months				No limit
17	**Whiting[5]**	20,000 lb/ trip		Primary Season (only mid-water trawl permitted within the RCA)		10,000 lb/ trip	
18	**Other Fish[9]**	Not limited					
19	**Use of small footrope bottom trawl[7] or mid-water trawl is required for landing all of the following species:**						
20	**Minor shelf rockfish, widow, and chilipepper rockfish[3]**	300 lb/ month					
21	**Widow rockfish**						
22	mid-water trawl - permitted within the RCA	CLOSED[6]					12, 000 lb/ 2 months
23	**Canary rockfish**	100 lb/ month		300 lb/ month		100 lb/ month	
24	**Bocaccio**	CLOSED[6]					
25	**Cowcod**	CLOSED[6]					
26	**Minor nearshore rockfish**	300 lb/ month					
27	**Lingcod[8]**	800 lb/ 2 months		1,000 lb/ 2 months		800 lb/ 2 months	

Key [shaded] = management measures in need of revision, updates to be provided in future GMT reports.

1/ Gear requirements and prohibitions are explained above. See IV. A.(14).
2/ "South" means 40°10' N. lat. to the U.S.-Mexico border. 40°10' N. lat. is about 20 nm south of Cape Mendocino, CA.
3/ Yellowtail is included in the trip limits for minor shelf rockfish and POP is included in the trip limits for minor slope rockfish.
4/ "Other" flatfish means all flatfish at 50 CFR 660.302 except those in this Table 3 with species specific management measures, including trip limits.
5/ The whiting "per trip" limit in the Eureka area shoreward of 100 fm is 10,000 lb/ trip throughout the year. Outside Eureka area, the 20,000 lb/ trip limit applies. See IV. B.(3).
6/ Closed means that it is prohibited to take and retain, possess, or land the designated species in the time or area indicated. See IV. A.(7).
7/ Small footrope trawl means a bottom trawl net with a footrope no larger than 8 inches (20 cm) in diameter.
8/ The minimum size limit for lingcod is 24 inches (61 cm) total length.
9/ Other fish are defined at 50 CFR 660.302, as those groundfish species or species groups for which there is no trip limit, size limit, quota, or harvest guideline.
10/ The "Rockfish Conservation Area" is a gear and/or sector specific closed area generally described by depth contours but specifically defined by lat./long. coordinates set out at IV. A.(19)(e), that may vary seasonally.
To convert pounds to kilograms, divide by 2.20462, the number of pounds in one kilogram.

Table 2.2.4-4. Trip limits and gear requirements[1/] for limited entry fixed gear north of 40°10' N. latitude[2/] analyzed under the *High OY* alternative.

	JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
Rockfish Conservation Area[8/] (RCA):						
North of 46°16' N. lat.	shoreline - 100 fm					
46°16' N. lat. - 40°10' N. lat.	30 fm - 100 fm					
1 **Minor slope rockfish[4/]**	1,800 lb/ 2 months	No more than 25% of the weight of sablefish landed/ trip				1,800 lb/ 2 months
2 **Pacific ocean perch**	1,800 lb/ 2 months					
3 **Sablefish**	300 lb/ day, or 1 landing per week of up to 900 lb, not to exceed 3,600 lb/ 2 months.					
4 **Longspine thornyhead**	9,000 lb/ 2 months					
5 **Shortspine thornyhead**	2,000 lb/ 2 months					
6 **Dover sole**	5,000 lb/ month					
7 **Arrowtooth flounder**						
8 **Petrale sole**						
9 **Rex sole**						
10 **All other flatfish[2/]**						
11 **Whiting[3/]**	10,000 lb/ trip					
12 **Minor shelf rockfish, widow, and yellowtail rockfish[4/]**	200 lb/ month					
13 **Canary rockfish**	CLOSED[5/]					
14 **Yelloweye rockfish**	CLOSED[5/]					
15 **Cowcod**	CLOSED[5/]					
16 **Minor nearshore rockfish**	4,000 lb/ 2 months, no more than 1,200 lb of which may be species other than black or blue rockfish[6/]					
17 **Lingcod[7/]**	CLOSED[5/]		400 lb/ month			CLOSED[5/]
18 **Other fish[9/]**	Not limited					

Key [shaded] = management measures in need of revision, updates to be provided in future GMT reports.

1/ "North" means 40°10' N. lat. to the U.S.-Canada border. 40°10' N. lat. is about 20 nm south of Cape Mendocino, CA.

2/ "Other flatfish" means all flatfish at 50 CFR 660.302 except those in this Table 4 with species specific management measures, including trip limits.

3/ TThe whiting "per trip" limit in the Eureka area shoreward of 100 fm is 10,000 lb/ trip throughout the year. Outside Eureka area, the 20,000 lb/ trip limit applies. See IV. B.(3).

4/ Bocaccio and chilipepper are included in the trip limits for minor shelf rockfish and splitnose rockfish is included in the trip limits for minor slope rockfish.

5/ Closed means that it is prohibited to take and retain, possess, or land the designated species in the time or area indicated. See IV. A.(7).

6/ For black rockfish north of Cape Alava (48°09'30" N. lat.), and between Destruction Island (47°40'00" N. lat.) and Leadbetter Point (46°38'10" N. lat.), there is an additional limit of 100 lb or 30 percent by weight of all fish on board, whichever is greater, per vessel, per fishing trip.

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

8/ The "Rockfish Conservation Area" is a gear and/or sector specific closed area generally described by depth contours but specifically defined by lat./long. coordinates set out at IV. A.(19)(e), that may vary seasonally.

9/ Other fish are defined at 50 CFR 660.302, as those groundfish species or species groups for which there is no trip limit, size limit, quota, or harvest guideline.

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

Table 2.2.4-5. Trip limits and gear requirements[1/] for limited entry fixed gear south of 40°10' N. latitude[2/] analyzed under the *High OY* alternative.

	JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
Rockfish Conservation Area[7/] (RCA): South of 40°10' N. lat.						
40°10' N. lat. - 34°27' N. lat.	Shoreline - 150 fm	30 fm - 150 fm				
South of 34°27' N. lat.	No depth restrictions					
1 **Minor slope rockfish[4/]**						
2 40°10' - 38° N. lat.	1,800 lb/ 2 months	No more than 25% of weight of sablefish landed/ trip				1,800 lb/ 2 months
3 South of 38° N. lat.	30,000 lb/ 2 months					
4 **Splitnose**						
5 40°10' - 38° N. lat.	1,800 lb/ 2 months					
6 South of 38° N. lat.	20,000 lb/ 2 months					
7 **Sablefish**	300 lb/ day, or 1 landing per week of up to 900 lb, not to exceed 3,600 lb/ 2 months.					
8 **Longspine thornyhead**	9,000 lb/ 2 months					
9 **Shortspine thornyhead**	2,000 lb/ 2 months					
19 **Dover sole**	5,000 lb/ month When fishing for Pacific sanddabs, vessels using hook-and-line gear with no more than 12 hooks per line, using hooks no larger than "Number 2" hooks, which measure 11 mm (0.44 inches) point to shank, and up to 1 lb (0.45 kg) of weight per line are not subject to the RCAs.					
11 **Arrowtooth flounder**						
12 **Petrale sole**						
13 **Rex sole**						
14 **All other flatfish[2/]**						
15 **Whiting[3/]**	10,000 lb/ trip					
16 **Minor shelf rockfish, widow, and yellowtail rockfish[4/]**	100 lb/ 2 month	CLOSED[5/]	200 lb/ 2 months	250 lb/ 2 months	200 lb/ 2 months	100 lb/ 2 months
17 **Canary rockfish**	CLOSED[5/]					
18 **Yelloweye rockfish**	CLOSED[5/]					
19 **Cowcod**	CLOSED[5/]					
20 **Bocaccio**	150 lb/ 2 months					
21 **Minor nearshore rockfish**						
22 Shallow nearshore						
23 40°10' N. lat. - 34°27' N. lat.	CLOSED5/	450 lb/ 2 months		600 lb/ 2 months		450 lb/ 2 months
25 South of 34°27' N. lat.	450 lb/ 2 months					
26 Deep nearshore						
27 40°10' N. lat. - 34°27' N. lat.	CLOSED5/	450 lb/ 2 months		600 lb/ 2 months		450 lb/ 2 months
28 South of 34°27' N. lat.	450 lb/ 2 months					
29 California scorpionfish						
30 40°10' N. lat. - 34°27' N. lat.	CLOSED5/	450 lb/ 2 months		600 lb/ 2 months		450 lb/ 2 months
31 South of 34°27' N. lat.	450 lb/ 2 months					
32 **Lingcod[6/]**	400 lb/ month, when nearshore open					
33 **Other fish[8/]**	Not limited					

Key [shaded box] = management measures in need of revision, updates to be provided in future GMT reports.

1/ "South" means 40°10' N. lat. to the U.S.-Mexico border. 40°10' N. lat. is about 20 nm south of Cape Mendocino, CA.
2/ "Other flatfish" means all flatfish at 50 CFR 660.302 except those in this Table 4 with species specific management measures, including trip limits.
3/ The whiting "per trip" limit in the Eureka area shoreward of 100 fm is 10,000 lb/ trip throughout the year. Outside Eureka area, the 20,000 lb/ trip limit applies. See IV. B.(3).
4/ Chilipepper rockfish is included in the trip limits for minor shelf rockfish and POP is included in the trip limits for minor slope rockfish.
5/ Closed means that it is prohibited to take and retain, possess, or land the designated species in the time or area indicated. See IV. A.(7).
6/ The minimum size limit for lingcod is 24 inches (61 cm) total length.
7/ The "Rockfish Conservation Area" is a gear and/or sector specific closed area generally described by depth contours but specifically defined by lat/long coordinates set out at IV. A.(19)(e) that may vary seasonally.
8/ Other fish are defined at 50 CFR 660.302, as those groundfish species or species groups for which there is no trip limit, size limit, quota, or harvest guideline.
9/ During July-August, between a line drawn due south from Point Fermin (33° 42' 30" N. lat.; 118° 17' 30" W. long.) and a line drawn due west from the Newport South Jetty (33° 35' 37" N .lat.; 117° 52' 50" W. long..) vessels fishing for all federal groundfish species, except all rockfish and lingcod, with hook&line and/or trap (or pot) gear may operate from shore to a boundary line approximating 50 fm.
To convert pounds to kilograms, divide by 2.20462, the number of pounds in one kilogram.

Table 2.2.4-6. Trip limits and gear requirements[1/] for open access gears north of 40°10' N. latitude[2/] analyzed under the *High OY* alternative.

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
Rockfish Conservation Area[8/] (RCA):							
	North of 46°16' N. lat.	0 fm - 100 fm					
	46°16' N. lat. - 40°10' N. lat.	30 fm - 100 fm					
1	**Minor slope rockfish[2/]**	Per trip, no more than 25% of weight of the sablefish landed					
2	**Pacific ocean perch**	100 lb/ month					
3	**Sablefish**	300 lb/ day, or 1 landing per week of up to 900 lb, not to exceed 3,600 lb/ 2 months.					
4	**Thornyheads**	CLOSED[5/]					
5	**Dover sole**	3,000 lb/month, no more than 300 lb of which may be species other than Pacific sanddabs.					
6	**Arrowtooth flounder**						
7	**Petrale sole**						
8	**Rex sole**						
9	**All other flatfish[3/]**						
10	**Whiting**	300 lb/ month					
11	**Minor shelf rockfish, widow and yellowtail rockfish[2/]**	200 lb/ month					
12	**Canary rockfish**	CLOSED[5/]					
13	**Yelloweye rockfish**	CLOSED[5/]					
14	**Cowcod**	CLOSED[5/]					
15	**Minor nearshore rockfish**	4,000 lb/ 2 months, no more than 1,200 lb of which may be species other than black or blue rockfish[4/]					
16	**Lingcod[6/]**	CLOSED[5/]		300 lb/ month			CLOSED[5/]
17	**Other Fish[7/]**	Not limited					
18	**PINK SHRIMP EXEMPTED TRAWL** *(not subject to RCAs)*						
19	North	**Effective April 1 - October 31, 2004:** groundfish 500 lb/day, multiplied by the number of days of the trip, not to exceed 1,500 lb/trip. The following sublimits also apply and are counted toward the overall 500 lb/day and 1,500 lb/trip groundfish limits: lingcod 300 lb/month (minimum 24 inch size limit); sablefish 2,000 lb/month; canary, thornyheads and yelloweye rockfish are PROHIBITED. All other groundfish species taken are managed under the overall 500 lb/day and 1,500 lb/trip groundfish limits. Landings of these species count toward the per day and per trip groundfish limits and do not have species-specific limits. The amount of groundfish landed may not exceed the amount of pink shrimp landed.					
20	**PRAWN EXEMPTED TRAWL** *(not subject to RCAs)*						
21	North	Groundfish 300 lb/trip. Limits and closures in this table also apply and are counted toward the 300 lb groundfish per trip limit. The amount of groundfish landed may not exceed the amount of the target species landed, except that the amount of spiny dogfish landed may exceed the amount of target species landed. Spiny dogfish are limited by the 300 lb/trip overall groundfish limit. The daily trip limits for sablefish coastwide and the overall groundfish "per trip" limit may not be multiplied by the number of days of the trip.					
22	**SALMON TROLL**						
23	North	Salmon trollers may retain and land up to 1lb of yellowtail rockfish for every 2 lbs of salmon landed, with a cumulative limit of 200 lb/month, both within and outside of the RCA. This limit is within the 200 lb per month combined limit for minor shelf rockfish, widow rockfish and yellowtail rockfish, and not in addition to that limit. All groundfish species are subject to the open access limits, seasons and RCA restrictions listed in the table above.					

Key [shaded] = management measures in need of revision, updates to be provided in future GMT reports.

1/ "North" means 40°10' N. lat. to the U.S.-Canada border. 40°10' N. lat. is about 20 nm south of Cape Mendocino, CA.

2/ Bocaccio and chilipepper rockfishes are included in the trip limits for minor shelf rockfish and splitnose rockfish is included in the trip limits for minor slope rockfish.

3/ "Other flatfish" means all flatfish at 50 CFR 660.302 except those in this Table 5 with species specific management measures, including trip limits.

4/ For black rockfish north of Cape Alava (48°09'30" N. lat.), and between Destruction Island (47°40' N. lat.) and Leadbetter Point (46°38'10" N. lat.), there is an additional limit of 100 lbs or 30 percent by weight of all fish on board, whichever is greater, per vessel, per fishing trip.

5/ Closed means that it is prohibited to take and retain, possess, or land the designated species in the time or area indicated. See IV. A.(7).

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

7/ Other fish are defined at 50 CFR 660.302, as those groundfish species or species groups for which there is no trip limit, size limit, quota, or harvest guideline.

8/ The "Rockfish Conservation Area" is a gear and/or sector specific closed area generally described by depth contours, but specifically defined by lat./long. coordinates set out at IV. A.(19)(e), that may vary seasonally.

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

Table 2.2.4-7. Trip limits and gear requirements[1/] for open access gears south of 40°10' N. latitude[2/] analyzed under the *High OY* alternative.

#		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area[7/] (RCA): South of 40°10' N. lat.						
	40°10' N. lat. - 34°27' N. lat.	Shoreline - 150 fm	30 fm - 150 fm				
	South of 34°27' N. lat.	No depth restrictions					
1	**Minor slope rockfish[2/]**						
2	40°10' - 38° N. lat.	Per trip, no more than 25% of weight of the sablefish landed					
3	South of 38° N. lat.	10,000 lb/ 2 months					
4	**Splitnose**	200 lb/ month					
5	**Sablefish**	300 lb/ day, or 1 landing per week of up to 900 lb, not to exceed 3,600 lb/ 2 months.					
6	**Thornyheads**						
7	40°10' - 34°27' N. lat.	CLOSED[5/]					
8	South of 34°27' N. lat.	50 lb/ day, no more than 2,000 lb/ 2 months					
9	**Dover sole**	3,000 lb/month, no more than 300 lb of which may be species other than Pacific sanddabs. When fishing for Pacific sanddabs, vessels using hook-and-line gear with no more than 12 hooks per line, using hooks no larger than "Number 2" hooks, which measure 11 mm (0.44 inches) point to shank, and up to 1 lb of weight per line are not subject to the RCAs.					
10	**Arrowtooth flounder**						
11	**Petrale sole**						
12	**Rex sole**						
13	**All other flatfish[3/]**						
14	**Whiting**	300 lb/ month					
15	**Minor shelf rockfish, widow and chilipepper rockfish[2/]**	100 lb/ 2 month	CLOSED[5/]	200 lb/ 2 months	250 lb/ 2 months	200 lb/ 2 months	100 lb/ 2 months
16	**Canary rockfish**	CLOSED[5/]					
17	**Yelloweye rockfish**	CLOSED[5/]					
18	**Cowcod**	CLOSED[5/]					
19	**Bocaccio**	150 lb/ 2 months					
20	**Minor nearshore rockfish**						
21	Shallow nearshore						
22	40°10' N. lat. - 34°27' N. lat.	CLOSED5/	450 lb/ 2 months		600 lb/ 2 months		450 lb/ 2 months
23	South of 34°27' N. lat.	450 lb/ 2 months					
24	Deep nearshore						
25	40°10' N. lat. - 34°27' N. lat.	CLOSED5/	450 lb/ 2 months		600 lb/ 2 months		450 lb/ 2 months
226	South of 34°27' N. lat.	450 lb/ 2 months					
27	California scorpionfish						
28	40°10' N. lat. - 34°27' N. lat.	CLOSED5/	450 lb/ 2 months		600 lb/ 2 months		450 lb/ 2 months
29	South of 34°27' N. lat.	450 lb/ 2 months					
30	**Lingcod[4/]**	400 lb/ month, when nearshore open					
31	**Other fish[6/]**	Not limited					
32	**PINK SHRIMP EXEMPTED TRAWL GEAR** *(not subject to RCAs)*						
33	South	**Effective April 1 - October 31, 2004:** Groundfish 500 lb/day, multiplied by the number of days of the trip, not to exceed 1,500 lb/trip. The following sublimits also apply and are counted toward the overall 500 lb/day and 1,500 lb/trip groundfish limits: lingcod 300 lb/ month (minimum 24 inch size limit); sablefish 2,000 lb/ month; canary, thornyheads and yelloweye rockfish are PROHIBITED. All other groundfish species taken are managed under the overall 500 lb/day and 1,500 lb/trip groundfish limits. Landings of these species count toward the per day and per trip groundfish limits and do not have species-specific limits. The amount of groundfish landed may not exceed the amount of pink shrimp landed.					
34	**PRAWN AND, SOUTH OF 38°57'30" N. LAT., CALIFORNIA HALIBUT AND SEA CUCUMBER EXEMPTED TRAWL**						
35	**EXEMPTED TRAWL Rockfish Conservation Area[8/] (RCA):**						
36	40°10' - 38° N. lat.	50 fm - 250 fm	60 fm - 250 fm	60 fm - 200 fm			
37	38° - 34°27' N. lat.	50 fm - 150 fm	60 fm - 150 fm	60 fm - 200 fm			
38	South of 34°27' N. lat.	100 fm - 150 fm along the mainland coast; shoreline - 150 fm around islands		100 fm - 200 fm along the mainland coast; shoreline - 200 fm around islands			
39		Groundfish 300 lb/trip. Trip limits in this table also apply and are counted toward the 300 lb groundfish per trip limit. The amount of groundfish landed may not exceed the amount of the target species landed, except that the amount of spiny dogfish landed may exceed the amount of target species landed. Spiny dogfish are limited by the 300 lb/trip overall groundfish limit. The daily trip limits for sablefish coastwide and thornyheads south of Pt. Conception and the overall groundfish "per trip" limit may not be multiplied by the number of days of the trip. Vessels participating in the California halibut fishery south of 38°57'30" N. lat. are allowed to (1) land up to 100 lb/day of groundfish without the ratio requirement, provided that at least one California halibut is landed and (2) land up to 3,000 lb/month of flatfish, no more than 300 lb of which may be species other than Pacific sanddabs, sand sole, starry flounder, rock sole, curlfin sole, or California scorpionfish (California scorpionfish is also subject to the trip limits and closures in line 25).					

Key [shaded box] = management measures in need of revision, updates to be provided in future GMT reports.

1/ "South" means 40°10' N. lat. to the U.S.-Mexico border. 40°10' N. lat. is about 20 nm south of Cape Mendocino, CA.
2/ Yellowtail rockfish is included in the trip limits for minor shelf rockfish and POP is included in the trip limits for minor slope rockfish.
3/ "Other flatfish" means all flatfish at 50 CFR 660.302 except those in this Table 5 with species specific management measures, including trip limits.
4/ The size limit for lingcod is 24 inches (61 cm) total length.
5/ Closed means that it is prohibited to take and retain, possess, or land the designated species in the time or area indicated. See IV. A.(7).
6/ Other fish are defined at 50 CFR 660.302, as those groundfish species or species groups for which there is no trip limit, size limit, quota, or harvest guideline.
7/ The "Rockfish Conservation Area" is a gear and/or sector specific closed area generally described by depth contours, but specifically defined by lat./long. coordinates set out at IV. A.(19)(e), that may vary seasonally.
8/ During July-August, between a line drawn due south from Point Fermin (33° 42' 30" N. lat.; 118° 17' 30" W. long.) and a line drawn due west from the Newport South Jetty (33° 35' 37" N .lat.; 117° 52' 50" W. long.,) vessels fishing for all federal groundfish species, except all rockfish and lingcod, with hook&line and/or trap (or pot) gear may operate from shore to a boundary line approximating 50 fm.

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

Existing and Proposed Cowcod Conservation Areas

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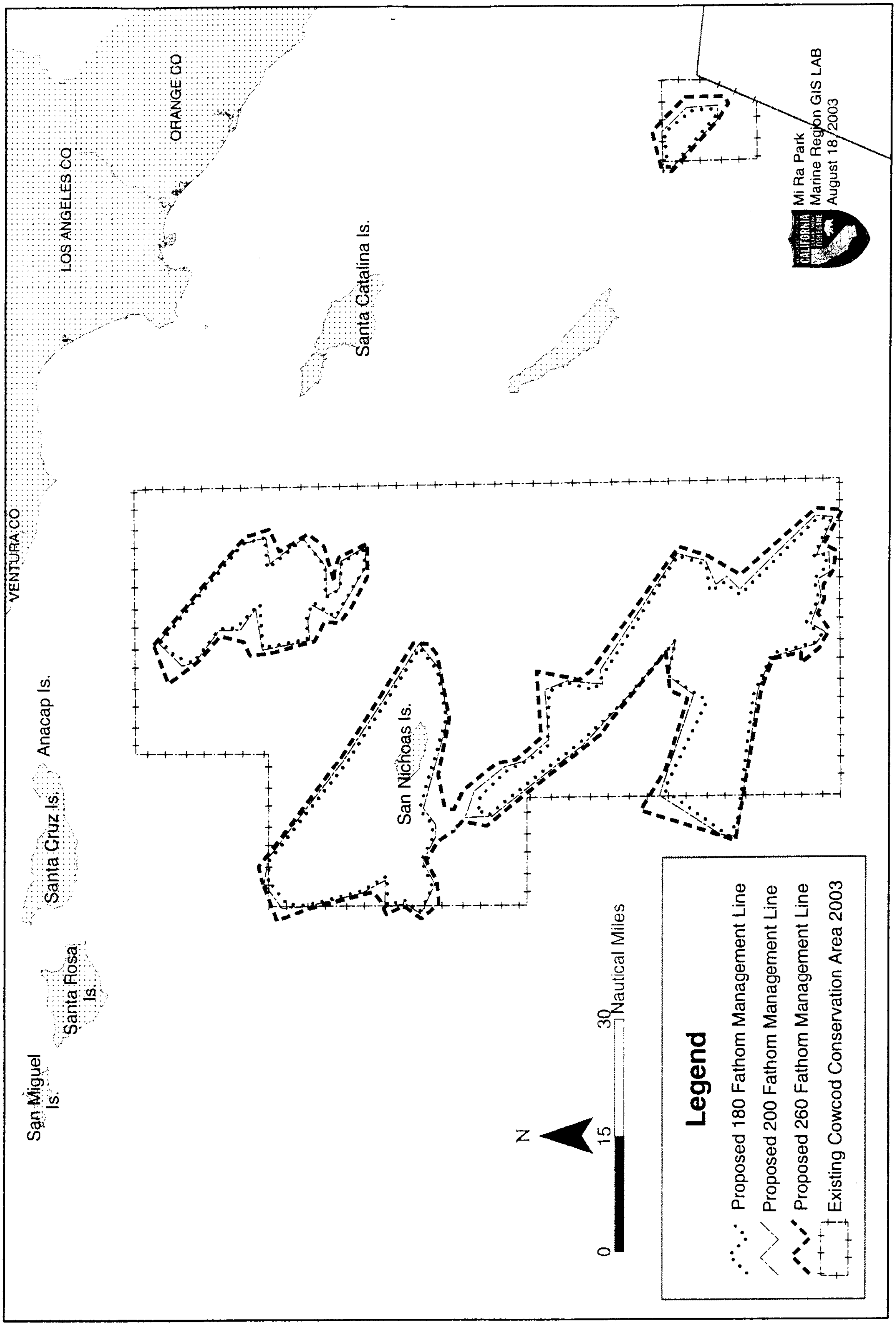

Figure 2.2.1-1. Existing and proposed Cowcod Conservation Areas.

Proposed Cowcod Conservation Area
260 Fathom

Draft Working Copy - August 18, 2003

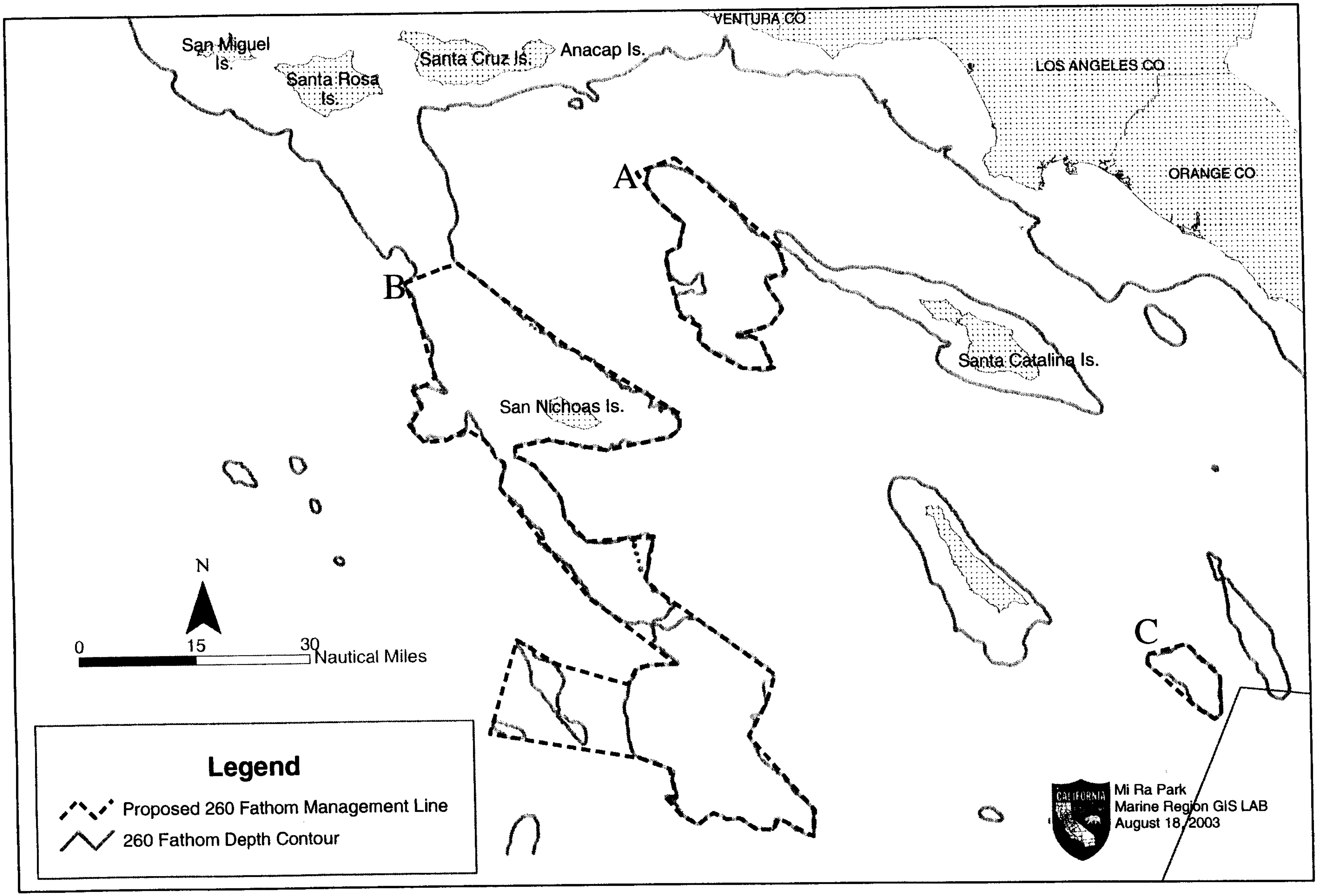

Figure 2.2.2-1. Proposed Cowcod Conservation Areas under the *Low OY* alternative.

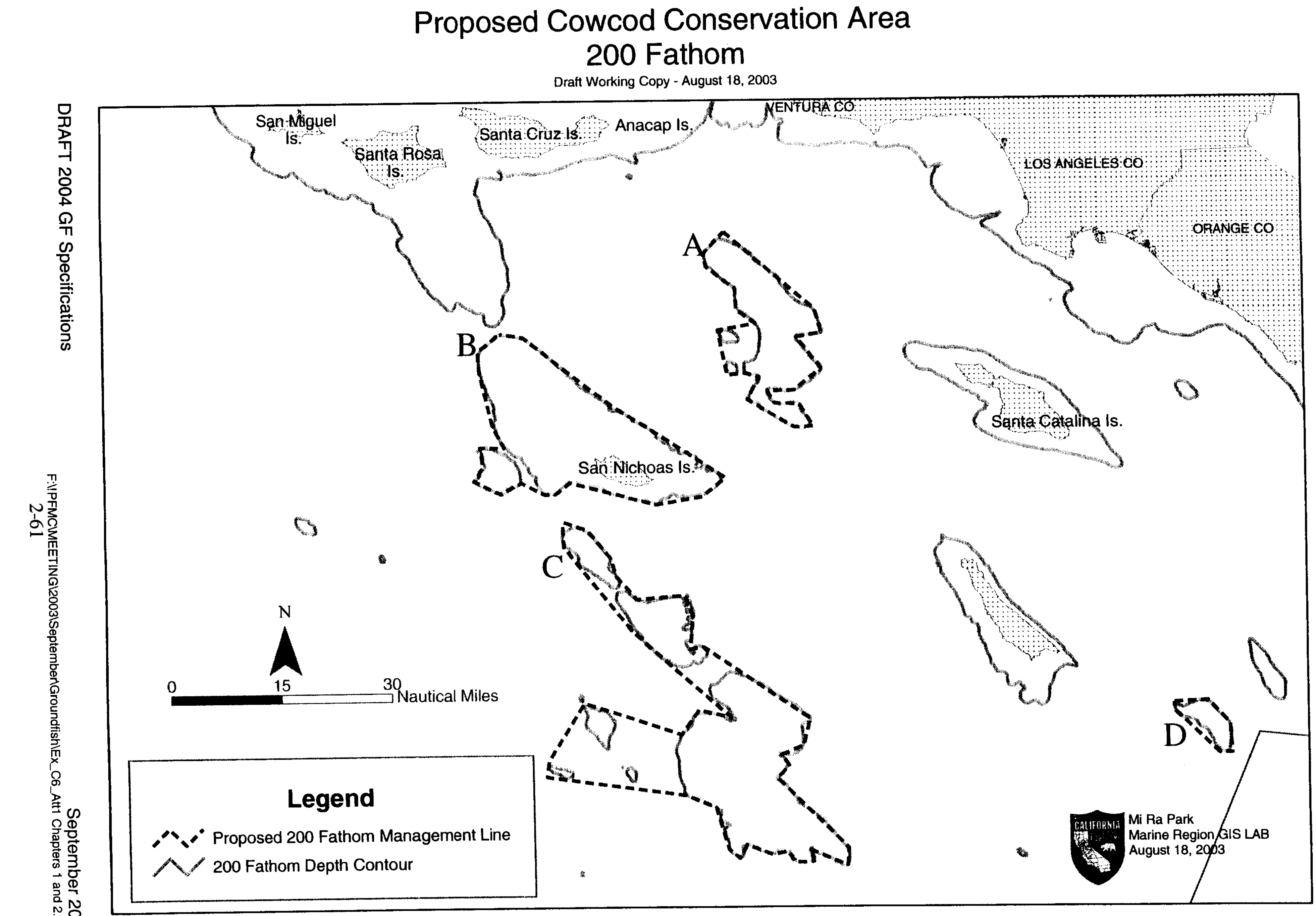

Figure 2.2.3-1. Proposed Cowcod Conservation Areas under the *Medium OY* alternative.

Proposed Cowcod Conservation Area
180 Fathom
Draft Working Copy - August 18, 2003

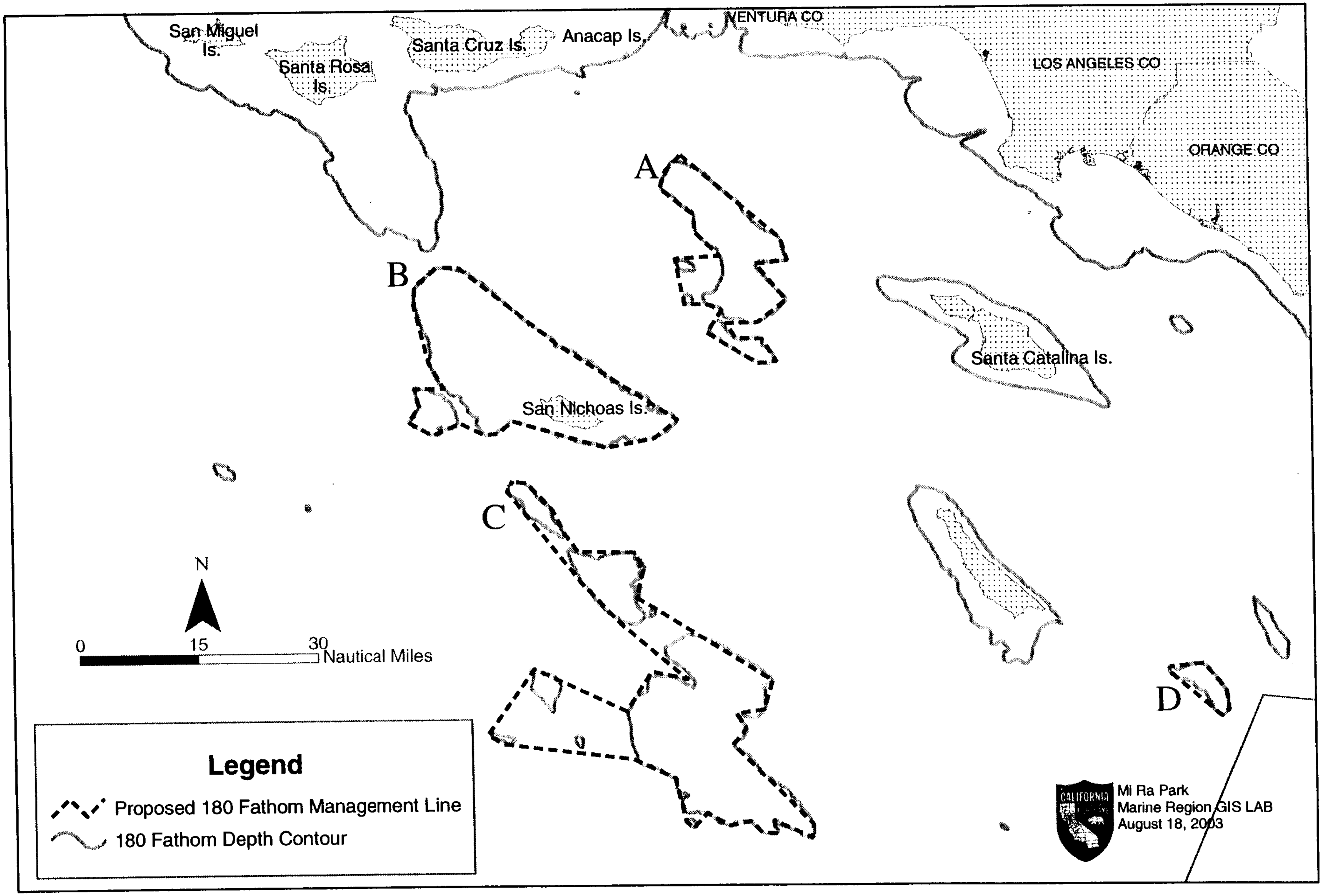

Figure 2.2.4-1. Proposed Cowcod Conservation Areas under the *High OY* alternative.

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Exhibit C.6
Attachment 2
September 2003

Annual Specifications Data and Analyses

(Selected Tables and Discussion for the *Draft Proposed Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for the 2004 Pacific Coast Groundfish Fishery*)

The text and tables in this document contain descriptions of key aspects of the affected environment, and draft analyses of the potential consequences of alternative management measures. These materials provide background information and supporting analyses for discussions found in Attachment 1. While this information will eventually also be incorporated in the 2004 Groundfish Annual Specifications Draft EIS, it is presented separately here so as to help the Council focus on the key information necessary for their decision under this agendum.

Note that materials prepared subsequent to the briefing book deadline are provided in Supplemental Attachment 3. Additional reports prepared by the Council's advisory bodies during the meeting will also be presented prior to the Council's final decision, and incorporated in the Draft EIS document.

Attachment 2 contains the following sections:

A - Historic Data Supporting Catch Sharing Options for Canary Rockfish, Lingcod, and Black Rockfish

B - OY/Allocation Combinations with Recent and Historic Comparisons (Black Rockfish and Canary Rockfish)

C - Tribal Fisheries Bycatch Information and Projected Catch for 2004

D - Bycatch Rates and Exvessel Revenue per Pound of Overfished Species Caught, by Target Strategy

E - Fishery Impacts of the Alternatives

F - Expected Catch in the 2004 California Recreational Fishery

G - Issues Involved with Allowing LE Trawlers to Use Longline Gear to Access Sablefish

Part A - Historic Data Supporting Catch Sharing Options for Canary Rockfish, Lingcod, and Black Rockfish.

This section contains the following tables:

Table A.1. Recreational catch of canary rockfish by state (mt), 1993-99.

Table A.2. Recreational catch of lingcod by state (mt), 1993-99.

Table A.3. Black rockfish landings (mt) from the sport (i.e., recreational), hook-and-line, and trawl fisheries from 1978-2002 in Oregon and northern California. (Ralston and Dick 2003).

Information presented in this section represents the data and analyses used to develop the catch sharing options described in section 2.1.2 of the *Draft Proposed Acceptable Biological Catch and Optimum Yield Specifications and Management Measures For The 2004 Pacific Coast Groundfish Fishery (Exhibit C.6, Attachment 1)*. Council members expressed the following equity concerns in identifying harvest levels for various sectors in the fishery:

- Recent and historic periods used as the basis for allocation should have total harvest levels similar to the levels proposed for 2004. In the past, sectors may have been differentially affected by changes in fishing opportunity. When available harvests were greater, absent a significant conservation issue, some sectors may have been allowed to take more of a now overfished species than was necessary to prosecute their primary target fisheries.

- Historic periods used for allocation should not penalize groups or geographic regions that voluntarily reduced harvest based on preliminary indications of future conservation issues. For example, Washington reduced its recreational yelloweye bag limits in 2000, but the Council did not have a reviewed and validated stock assessment indicating the need for such a reduction before the time it made final recommendations for the 2002 fishery.

- In evaluating historic catch, sectors should not receive credit for harvest in a particular year that was in excess of that sector's harvest guideline, and sectors should not be penalized if its harvest was cut short due to the overage of another sector.

- Data reliability and validity need to be taken into account. In particular, there was a break in the Marine Recreational Fisheries Statistical Survey (MRFSS) data in the early 1990s. The data series was partially restored in 1993 and not fully restored until 1997. Additionally, there have been serious concerns about differences between MRFSS estimates and state estimates of recreational harvest. For the commercial fisheries, consideration should be given to whether or not sorting of the species to be allocated was required in the years on which an allocation was based. If sorting was not required, some harvest of the species may have been grouped in a market fishery category. In such cases, the reliability of species composition data collected by port samplers for a particular gear type will affect the harvest estimate.

The Groundfish Management Team considered these and other equity concerns when determining the best available data sources for calculating historic catch shares. Recreational catch data for canary rockfish and lingcod (Table A.1 and Table A.2) were obtained from the Recreational Fishery Information Network (RecFIN) and data used for calculating black rockfish catch shares (Table A.3) is from the 2003 stock assessment (Ralston and Dick 2003).

TABLE A.1. Recreational catch of canary rockfish by state (mt), 1993-99.

	Metric Tons	Catch Share
	Washington	
1993	9.7	9.2%
1994	4.2	4.8%
1995	3.7	3.4%
1996	3.1	3.7%
1997	3.9	2.7%
1998	11.1	13.9%
1999	4.8	4.9%
Average	5.8	**6.1%**
	Oregon	
1993	34.0	32.2%
1994	31.6	35.8%
1995	35.8	33.0%
1996	18.7	22.3%
1997	39.4	27.0%
1998	43.3	54.1%
1999	29.8	30.2%
Average	33.2	**33.5%**
	California	
1993	62.1	58.7%
1994	52.5	59.4%
1995	69.0	63.6%
1996	61.9	74.0%
1997	102.4	70.3%
1998	25.6	32.0%
1999	64.1	64.9%
Average	62.5	**60.4%**
	All Areas	
1993	105.8	
1994	88.4	
1995	108.5	
1996	83.7	
1997	145.7	
1998	80.0	
1999	98.8	
Average	101.6	

Source: RecFIN 7-28-2003; Observed landed catch (A) in open ocean areas for all modes of fishing.

TABLE A.2. Recreational catch of lingcod by state (mt), 1993-99.

	Metric Tons	Catch Share
	Washington	
1993	76.9	12.9%
1994	110.1	23.2%
1995	61.4	16.1%
1996	53.7	11.7%
1997	48.4	11.6%
1998	27.1	8.4%
1999	35.9	8.1%
Average	59.1	**13.2%**
	Oregon	
1993	137.2	23.0%
1994	133.1	28.0%
1995	72.5	19.0%
1996	82.0	17.9%
1997	109.8	26.4%
1998	69.8	21.7%
1999	86.9	19.6%
Average	98.8	**22.2%**
	California	
1993	381.6	64.1%
1994	231.6	48.8%
1995	248.3	65.0%
1996	321.9	70.3%
1997	258.1	62.0%
1998	225.4	69.9%
1999	320.1	72.3%
Average	283.9	**64.6%**
	All Areas	
1993	595.7	
1994	474.8	
1995	382.2	
1996	457.6	
1997	416.3	
1998	322.3	
1999	442.9	
Average	441.7	

Source: RecFIN 7-28-2003; Observed landed catch (A) in open ocean areas for all modes of fishing.

TABLE A.3. Black rockfish landings (mt) from the sport (i.e., recreational), hook-and-line, and trawl fisheries from 1978-2002 in Oregon and northern California. (Ralston and Dick 2003).

	Oregon			California			
Year	Sport	Hook	Trawl	Sport	Hook	Trawl	Total
1945	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1946	11.1	2.2	0.7	3.9	0.2	21.3	39.4
1947	22.1	4.4	1.5	7.8	0.4	42.6	78.8
1948	33.2	6.6	2.2	11.6	0.7	63.8	118.1
1949	44.2	8.8	2.9	15.5	0.9	85.1	157.4
1950	55.3	10.9	3.7	19.4	1.1	106.4	196.8
1951	66.4	13.1	4.4	23.3	1.3	127.7	236.2
1952	77.4	15.3	5.1	27.2	1.5	149.0	275.5
1953	88.5	17.5	5.9	31.0	1.8	170.3	315.0
1954	99.5	19.7	6.6	34.9	2.0	191.5	354.2
1955	110.6	21.9	7.3	38.8	2.2	196.9	377.7
1956	121.7	24.1	8.1	40.0	2.4	230.6	426.9
1957	132.7	26.3	8.8	41.2	2.7	250.1	461.8
1958	143.8	28.4	9.5	42.5	2.9	253.6	480.7
1959	154.8	30.6	10.3	43.7	3.1	216.4	458.9
1960	165.9	32.8	11.0	44.9	3.3	209.3	467.2
1961	177.0	35.0	11.7	45.4	3.5	157.8	430.4
1962	188.0	37.2	12.5	45.9	3.8	138.3	425.7
1963	199.1	39.4	13.2	46.4	4.0	173.8	475.9
1964	210.2	41.6	5.6	46.8	4.2	150.6	459.0
1965	221.2	43.8	75.1	47.3	4.4	127.4	519.2
1966	232.3	45.9	129.3	72.0	4.6	104.2	588.3
1967	243.3	48.1	162.6	96.7	4.9	81.0	636.6
1968	254.4	50.3	84.8	121.3	5.1	57.7	573.6
1969	265.5	52.5	181.4	146.0	5.3	34.5	685.2
1970	276.5	54.7	210.6	170.7	5.5	57.3	775.3
1971	287.6	56.9	93.2	195.3	5.8	55.3	694.1
1972	298.6	59.1	80.6	220.0	6.0	78.2	742.5
1973	309.7	61.3	33.4	244.7	6.2	108.0	763.3
1974	320.8	63.4	52.1	269.3	6.4	119.0	831.0
1975	331.8	65.6	108.4	294.0	6.6	130.0	936.4
1976	342.9	67.8	241.3	318.7	6.9	141.0	1118.6
1977	353.9	70.0	10.4	343.3	7.1	152.1	936.8
1978	365.0	72.2	66.6	368.0	7.3	163.1	1042.2
1979	373.6	72.2	223.1	368.0	2.8	59.6	1099.3
1980	270.4	72.2	45.2	285.0	1.8	59.5	734.1
1981	451.1	72.2	343.1	500.0	19.6	449.8	1835.8
1982	649.0	55.2	106.2	467.0	123.4	235.2	1636.0
1983	418.9	125.9	374.4	220.0	87.2	99.1	1325.5
1984	566.2	81.0	177.3	400.0	10.2	38.0	1272.7
1985	294.2	66.5	55.7	442.0	245.8	82.3	1186.5
1986	279.3	44.5	73.6	398.0	8.2	12.2	815.8
1987	280.6	69.4	17.0	212.0	9.8	75.0	663.8
1988	367.2	62.3	130.1	283.0	23.7	49.6	915.9
1989	486.0	72.8	101.7	230.0	101.3	25.7	1017.5
1990	402.0	97.5	23.9	243.5	128.1	0.5	895.5
1991	201.7	107.0	1.4	257.0	123.1	21.1	711.3
1992	360.3	302.2	10.5	270.5	200.4	50.3	1194.2
1993	360.8	65.7	43.7	284.0	129.1	2.2	885.5
1994	330.0	131.2	43.4	210.0	130.9	1.1	846.6
1995	377.4	158.5	4.3	158.0	156.9	2.7	857.8
1996	401.3	225.6	7.7	154.0	103.4	10.5	902.5
1997	375.9	267.6	17.1	91.0	112.8	14.1	878.5
1998	375.2	191.6	58.6	117.0	78.6	6.3	827.3
1999	301.6	207.7	2.3	162.0	49.0	3.9	726.5
2000	320.7	105.6	0.6	129.0	43.7	2.3	601.9
2001	275.4	146.2	0.2	248.0	96.6	2.1	768.5
2002	241.6	125.2	1.2	179.7	67.0	2.0	616.7

Part B - OY/Allocation Combinations with Recent and Historic Comparisons (Black Rockfish and Canary Rockfish)

This part contains information on black rockfish and canary rockfish allocation. It augments Tables 2.1.2-1 and 2.1.2-2 in Attachment 1by providing results for all combinations of OYs and allocation options and comparisons to recent and historic catch: 1998, 2002, 2003 (projected) and a 1994-2003 average.

Black Rockfish

For black rockfish the primary concern is the OY for Oregon and northern California. This OY is allocated first between California and Oregon and then between recreational and commercial fisheries. Allocation among commercial fisheries will be conducted in accordance with Amendment 6 allocation rules. While the OY would be allocated between the states, the states have proposed state caps that would generally be lower than the OYs and imply state harvest shares slightly different than used to allocate the OY. The following is a description of the tables addressing this issue.

	Table
Comparison of historic and recent harvests by state to OY options	B-1
OR/CA allocations at different OY levels and comparisons to recent and historic periods	B-2
Cap ranges proposed by the states and comparisons to recent and historic periods	B-3

Canary Rockfish

The canary rockfish OY is first allocated between recreational and commercial fisheries. The recreational portion is then allocated between the states, and the commercial allocation is then allocated among commercial fisheries. The allocation among commercial fisheries need not be conducted in accordance with Amendment 6 allocation rules because canary rockfish is overfished. Allocations may be altered for overfished species. The following is a description of the tables addressing this issue.

	Table
Comparison of historic and recent harvests by sector to OY options	B-4
Allocations at different OY levels and comparisons to recent and historic periods	B-5
Recent and historic recreational harvests by state	B-6

TABLE B-1. Harvest of black rockfish from Oregon and California north of San Francisco compared to 2004 OY options.

	2004 OY Options	Historic Harvests (2003 Cap)			
		1998	2002	2003 (Cap)	1994-2003 Average
				Mt	
Oregon		625	368	453	515
California		202	249	131	246
Total		827	617	584	761
				Shares	
Oregon		0.76	0.60	0.78	0.68
California		0.24	0.40	0.22	0.32
		OY Options Minus Historic Total Harvests (mt)			
OY Options					
Low	729	-98	112	145	-32
Med	775	-52	158	191	14
High	861	34	244	277	100

Note: Historic values from 2003 Black Rockfish stock assessment (Ralston and Dick, 2003)

TABLE B-2. Black rockfish allocation and OY options (grey cells are those values that would not accommodate the low end of the range of options for state caps specified for each alternative shown in TABLE B-3).

		OY Level			Change from Historic Harvest (2003 Cap)											
		Low	Med	High	1998			2002			2003 (Cap)			1994-2003 Average		
	Allocation Shares	729 mt	775 mt	861 mt	Low	Med	High	Low	Med	High	Low	Med	High	Low	Med	High
					Mt											
Oregon	0.63	459	488	542	-166	-137	-83	91	120	174	6	35	89	-55	-26	28
California	0.37	270	287	319	68	85	117	21	38	70	139	156	188	23	40	72
Oregon	0.58	423	449	499	-202	-176	-126	55	81	131	-30	-4	46	-92	-65	-15
California	0.42	306	326	362	104	124	160	57	77	113	175	195	231	60	79	115
Oregon	0.56	408	434	482	-217	-191	-143	40	66	114	-45	-19	29	-106	-81	-33
California	0.44	321	341	379	119	139	177	72	92	130	190	210	248	74	95	132
Oregon	0.49	357	380	422	-268	-246	-203	-11	12	54	-96	-73	-31	-157	-135	-93
California	0.51	372	395	**439**	170	193	237	123	147	190	241	264	308	125	149	193
Oregon	0.65	474	504	**560**	-151	-122	-66	106	136	192	21	51	107	-41	-11	45
California	0.35	255	271	301	53	69	99	6	23	53	124	140	170	9	25	55
Oregon																
Max Alloc	0.65	474	504	560	-151	-122	-66	106	136	192	21	51	107	-41	-11	45
Min Alloc	0.49	357	380	422	-268	-246	-203	-11	12	54	-96	-73	-31	111	133	176
California																
Max Alloc	0.51	372	395	439	170	193	237	123	147	190	241	264	308	-143	-119	-76
Min Alloc	0.35	255	271	301	53	69	99	6	23	53	124	140	170	9	25	55

TABLE B-3. Range of proposed caps by alternative (caps are management targets that may be set more conservatively than the OY and the allocation for each state).

	OY Level			Change from											
	Low	Med	High	1998			2002			2003 Cap			1994-2003 Average		
	729 mt	775 mt	861 mt	Low	Med	High	Low	Med	High	Low	Med	High	Low	Med	High
				Mt											
Oregon															
Cap (mt) - Low	452	450	465	-173	-175	-160	84	82	97	-1	-3	12	-63	-65	-50
Cap (mt) - High		481	534		-144	-91		113	166		28	81		-34	19
OR/CA Cap ratio (Oregon Low)	0.56	0.58	0.54												
OR/CA Cap ratio (Oregon High)		0.62	0.62												
California															
Cap (mt) - High	350	325	396	148	123	194	101	76	147	219	194	265	104	79	150
Cap (mt) - Low		294	327		92	125		45.3	78.3		163	196		48	81
OR/CA Cap ratio (Oregon Low)	0.44	0.42	0.46												
OR/CA Cap ratio (Oregon High)		0.38	0.38												

TABLE B-4. Recreational and commercial harvest of canary rockfish compared to 2004 OY options.

	2004 OY Options	Historic Harvests (2003 Projection)[a]			
		1998	2002[b]	2003[c]	1994-2003 Average
				Mt	
Recreational		88	18	15	78
Commercial		1,127	52	29	638
Total		1,215	70	44	716
				Shares[d]	
Recreational		0.07	0.26	0.33	0.11
Commercial		0.93	0.74	0.67	0.89
				OY Options Minus Historic Total Harvests (mt) (excluding tribal harvest)	
OY Options					
Low	42	-1,173	-28	-2	-674
Med	46	-1,169	-24	3	-670
High	46	-1,169	-24	3	-670

a/ 1994-2001 commercial data from latest canary stock assessment (Methot and Piner, 2002)

b/ 2002 commercial data from PacFIN includes nominal canary.

c/ 2003 commercial data from Status Quo overfished species scorecard provided in Exhibit C.6. Attachment 1. The 2003 harvests and calculated shares are based on the most up-to-date projection for 2003. The 39:61 sport:commercial split proposed as an allocation option for the 2004 fishery is based on the overfished species scorecard for the 2003 fishery as it stood at the end of the September 2002 Council meeting.

d/ Shares for for the 1994-2003 harvest are calculated as a weighted average. The unwaited average for the period would be 23% recreational and 77% commercial.

TABLE B-5. Canary rockfish allocation and OY options with historic comparisons.

	Allocation Shares	OY Level Low 42 mt	OY Level Med 46 mt	OY Level High 46 mt	Change from Historic Harvest and 2003 Projection: 1998 Low	1998 Med	1998 High	2002 Low	2002 Med	2002 High	2003 Projection Low	2003 Projection Med	2003 Projection High	1994-2003 Average Low	1994-2003 Average Med	1994-2003 Average High
50/50 Rec/Com																
Recreational	0.50	20.5	[redacted]	[redacted]	-68	[redacted]	[redacted]	3	[redacted]	[redacted]	6	[redacted]	[redacted]	-57	[redacted]	[redacted]
Commercial	0.50	20.5	[redacted]	[redacted]	-1107	[redacted]	[redacted]	-31	[redacted]	[redacted]	-9	[redacted]	[redacted]	-617	[redacted]	[redacted]
39/61 Rec/Com																
Recreational	0.39	[redacted]	17.6	17.6	[redacted]	-70	-70	[redacted]	0	0	[redacted]	3	3	[redacted]	-60	-60
Commercial	0.61	[redacted]	27.4	27.4	[redacted]	-1,100	-1,100	[redacted]	-24	-24	[redacted]	-2	-2	[redacted]	-611	-611
Recreational Allocation Among States																
- Using 50/50 Rec/Com Result																
Washington	0.06	1.2	[redacted]	[redacted]	-10	[redacted]	[redacted]	-2	[redacted]	[redacted]	-0	[redacted]	[redacted]	-3	[redacted]	[redacted]
Oregon	0.34	6.9	[redacted]	[redacted]	-36	[redacted]	[redacted]	-1	[redacted]	[redacted]	-3	[redacted]	[redacted]	-17	[redacted]	[redacted]
California	0.60	12.4	[redacted]	[redacted]	-13	[redacted]	[redacted]	7	[redacted]	[redacted]	3	[redacted]	[redacted]	-37	[redacted]	[redacted]
Total		20.5	[redacted]	[redacted]												
- Using 39/61 Rec/Com Result																
Washington	0.06	[redacted]	1.1	1.1	[redacted]	-10	-10	[redacted]	-3	-3	[redacted]	-0	-0	[redacted]	-3	-3
Oregon	0.34	[redacted]	5.9	5.9	[redacted]	-37	-37	[redacted]	-2	-2	[redacted]	-4	-4	[redacted]	-18	-18
California	0.60	[redacted]	10.6	10.6	[redacted]	-15	-15	[redacted]	5	5	[redacted]	1	1	[redacted]	-39	-39
Total		[redacted]	17.6	17.6												

Note: Application of the 50/50 Rec/Com allocation to the medium and high OYs would change the medium and high OYs as would application of the 39/61 rec/com allocation to the low OY. Therefore allocations and comparisons for those combinations are not displayed.

TABLE B-6. Recent and historic recreational harvest by state.

	Historic Harvests (2003 Projection)			
	1998	2002	2003	1994-2003 Average
			Mt	
Washington	11	4	2	4
Oregon	43	8	10	24
California	26	6	4	49
Total	69	14	14	74
			Shares[a/]	
Washington	0.16	0.25	0.11	0.06
Oregon	0.63	0.59	0.74	0.33
California	0.37	0.41	0.26	0.67

a/ Shares for for the 1994-2003 harvest are calculated as a weighted average. The unwaited average for the period would be 7.2% for Washington, 35.5% for Oregon and 57.2% for California.

Part C - Tribal Fisheries Bycatch Information and Projected Catch for 2004

This section contains the following tables:

Table C.1 shows historic landings of groundfish species in the Tribal fisheries between 1995 and 2002.

Table C.2 shows ex-vessel revenue generated by the landings in Table D.1.

Table C.3 shows recent bycatch of groundfish species in the Makah trawl and troll fisheries.

Table C.4 shows recent bycatch of groundfish species in Tribal longline fisheries.

Table C.5 shows the assumptions underlying estimation of allocation and discard in the Tribal sablefish trawl and longline fisheries.

Table C.6 shows estimated groundfish bycatch under the 2004 Tribal whiting options.

Table C.7 shows estimated catch of important groundfish species under the proposed 2004 non-whiting Tribal fishery management option (assumes medium OY sablefish option).

Table C.8 shows projected groundfish catch by the Tribal fleet under the 2004 management alternatives, (These projections are displayed alongside historical catch from 1998 and 2002, as well as estimated 2003 catch.)

Table C.9 shows estimated ex-vessel revenue generated by the landings in Table C.8 (assumes 2002 average prices for projecting 2003 and 2004 ex-vessel revenue).

Notes on Tribal fisheries bycatch monitoring and assumptions:

Tribal directed groundfish fisheries are subject to full retention. For some rockfish species, where the tribes do not have formal allocations, trip limits proposed by the tribes are adopted by the Council to accommodate incidental catch in directed fisheries for Pacific halibut, sablefish, and yellowtail rockfish. These trip limits are intended to constrain direct catches while allowing for small incidental catches. Trip limits of 300 lbs. each exist for combined longspine and shortspine thornyheads, canary rockfish, minor shelf rockfish, and minor slope rockfish. Yelloweye rockfish are subject to a 100 lbs./trip limit. For all other species, limited entry trip limits apply. Rockfish trip limits do not apply during fully competitive fisheries for Pacific halibut nor in the tribal Pacific whiting fishery (where all rockfish are retained and forfeited to the tribe for charitable contribution). Groundfish bycatch in the Pacific whiting fishery is estimated by NMFS observers. Trip limit overages in all other fisheries are forfeited to the tribes. In 2002, the midwater yellowtail fishery accounted for all of the rockfish trip limit overages (443 lbs. of canary rockfish, 713 lbs. of darkblotched rockfish, and 212 lbs. of widow rockfish).

The tribal sablefish allocation is 10% of the OY for the area north of Point Conception. This amount is reduced by 3% to account for discard mortality. The tribal sablefish fishery is primarily a longline fishery. The discard mortality is calculated as the difference in market size category ratios in competitive compared to noncompetitive tribal longline fisheries. A small portion of the tribal sablefish allocation is also taken in the Makah bottom trawl fishery as an allowance to prevent discarding in the directed flatfish and Pacific cod fisheries. That portion of the tribal sablefish fishery that is taken by bottom trawl, estimated to be 48,000 lbs in 2003 and 2004, is subject to full retention. At the end of the season most trawl vessels make one to two directed sablefish tows to take the remainder of their allowance. All overages are forfeited to the tribe. In 2002 these forfeitures accounted for 1,634 lbs in four landings (one per vessel). The lack of discard in the tribal trawl fishery does not significantly affect the overall rate of 3% applied to tribal sablefish fisheries.

Table C.1. Historical West Coast groundfish catch in ocean areas by Tribal fleet: 1995 through 2002. (round weight-lbs.)

Species	1995	1996	1997	1998	1999	2000	2001	2002
Arrowtooth Flounder	240	3		255	13,195	331	961	7,137
Dover Sole	1,764	2,441	1,268	4,509	11,594	2,030	4,619	35,417
English Sole		4	118	1,847	593	996	7,103	88,684
Petrale Sole		5	12	3,249	545	80	1,954	45,479
Rex Sole					26	151	1,358	6,632
Rock Sole				2,396	16		22	5,833
Unsp. Flatfish				38	775		437	8,406
Unspecified Sanddab							1,599	19,655
Sand Sole		12	40				269	2,748
Starry Flounder		22	54				3	301
Butter Sole								605
Flatfish Total	2,004	2,487	1,492	12,294	26,744	3,588	18,325	220,897
Bocaccio				2	38	145	449	
Nom. Canary Rockfish	59	171	26	609	1,033	539	4,064	7,071
Canary Rockfish				277	252	330	1,380	
Darkblotched Rockfish					36	76	226	3,273
Greenstriped Rockfish				1	51	16		
Pacific Ocean Perch					110	20	16	
Redbanded Rockfish				1	128	492		
Redstripe Rockfish				1	63	131	1,510	
Rougheye Rockfish				1	80	76	1,529	
Rosethorn Rockfish								
Sharpchin Rockfish				1	9	10	85	
Silvergrey Rockfish					36	4	12	
Unsp. Pop Group		3			104			472
Unsp. Rockfish	114,684	79,545	65,121	65,245	59,875	45,953		
Widow Rockfish				54	411	2,010	16,265	
Nom. Widow Rockfish					53	3	51	27,969
Yelloweye Rockfish					68	3	2	
Nom. Yellowtail Rockfish	519	1,297	2,471	10,448	28,671	9,585	7,598	572,996
Yellowtail Rockfish				3,263	6,498	68,463	210,006	
Unsp. Shelf Rockfish						3,099	20,503	23,629
Unsp. Near-shore						10	58	116
Unsp. Slope Rockfish						19,891	54,920	32,941
Blackgill Rockfish							19	
Shortraker Rockfish							289	
Rockfish Total	115,262	81,016	67,618	79,903	97,516	150,856	318,982	668,467
Spiny Dogfish		5,521			881	6,251		2,607
Lingcod	2,873	2,732	1,648	5,247	7,051	6,817	9,429	24,854
Pacific Cod	2,814	1,540	2,166	4,873	2,677	4,573	8,712	128,530
Sablefish	1,696,098	1,881,702	1,775,108	980,719	1,566,260	1,555,808	1,451,522	959,982
Unspecified Skate	2,517	1,689	1,017	2,031	2,169	1,920	1,407	18,635
Nominal Shortspine Thornyhead	15,697	16,010	16,892	7,606	13,251	8,987	10,945	10,499
Shortspine Thornyhead				471	240		27	
Nominal Longspine Thornyhead	1,305	538	139	28				
Other Groundfish Total	1,721,304	1,909,732	1,796,970	1,000,975	1,592,529	1,584,356	1,482,042	1,145,107
Pacific Whiting		33,039,648	54,713,657	53,984,582	56,768,061	13,781,257	13,404,001	45,867,384
All Groundfish Species	1,838,570	35,032,883	56,579,737	55,077,754	58,484,850	15,520,057	15,223,350	47,901,855

Table C.2. Historical West Coast groundfish catch in ocean areas by tribal fleet: 1995 through 2002 (ex-vessel revenue $).

Species	1995	1996	1997	1998	1999	2000	2001	2002
Arrowtooth Flounder	24	1		26	1,319	33	111	715
Dover Sole	570	768	393	1,478	3,817	663	1,498	11,335
English Sole		1	106	613	220	309	2,726	29,289
Petrale Sole		8	8	3,249	545	84	1,692	46,509
Rex Sole					8	51	471	2,316
Rock Sole				791	5		7	2,033
Unsp. Flatfish				13	271		145	2,773
Unspecified Sanddab							372	5,110
Sand Sole		9	30				204	2,084
Starry Flounder		7	16				1	98
Butter Sole								206
Flatfish Total	594	794	553	6,170	6,185	1,140	7,227	102,468
Bocaccio				1	13	64	207	0
Nom. Canary Rockfish	20	60	12	230	372	196	1,901	3,329
Canary Rockfish				97	89	145	655	0
Darkblotched Rockfish				0	12	33	104	1,477
Greenstriped Rockfish				0	18	7	0	
Pacific Ocean Perch				0	38	9	7	0
Redbanded Rockfish				0	44	216	0	
Redstripe Rockfish				0	22	58	689	
Rougheye Rockfish				0	27	33	705	
Rosethorn Rockfish				0	0		0	
Sharpchin Rockfish				0	3	4	39	
Silvergrey Rockfish				0	12	2	5	
Unsp. Pop Group		1			36			212
Unsp. Rockfish	48,130	32,345	26,723	26,575	25,334	20,737		
Widow Rockfish				19	143	883	7,801	0
Nom. Widow Rockfish					19	1	16	13,425
Yelloweye Rockfish					24	2	0	0
Nom. Yellowtail Rockfish	189	438	864	3,542	10,256	3,429	3,379	274,509
Yellowtail Rockfish				1,142	2,275	30,124	99,901	
Unsp. Shelf Rockfish						1,758	13,068	9,794
Unsp. Near-shore						4	25	14,434
Unsp. Slope Rockfish						8,238	22,558	55
Blackgill Rockfish							9	
Shortraker Rockfish							134	
Rockfish Total	61,977	48,699	42,552	39,366	49,703	73,143	159,637	317,235
Spiny Dogfish		544			177	830		405
Lingcod	1,404	1,255	731	3,007	4,169	4,065	6,075	18,176
Pacific Cod	1,086	587	818	1,924	1,096	1,987	3,792	63,961
Sablefish	3,046,910	3,003,716	3,162,376	1,280,233	2,045,434	2,544,542	2,411,517	1,512,595
Unspecified Skate	588	120	68	136	145	129	143	2,563
Nominal Shortspine Thornyhead	12,581	15,340	14,828	7,310	10,751	7,199	8,414	8,232
Shortspine Thornyhead				425	215		20	
Nominal Longspine Thornyhead	1,057	515	125	25				
Other Groundfish Total	3,049,988	3,006,222	3,163,993	1,285,300	2,051,021	2,551,553	2,421,527	1,605,932
Pacific Whiting		1,651,982	2,735,683	2,699,229	2,838,403	551,250	536,160	2,065,122
All Groundfish Species	3,112,559	4,707,697	5,942,781	4,030,065	4,945,312	3,177,086	3,124,551	4,090,757

Table C.3. Bycatch of groundfish species in Makah trawl and troll fisheries in 2000, 2001 and 2002.

2000 MIDWATER	Pounds	2001 MIDWATER	Pounds	2002 MIDWATER	Pounds
black	0	black	0	black	0
lingcod	0	lingcod	6	lingcod	215
canary	306	canary	1,366	canary	3,594
yelloweye	0	yelloweye	0	yelloweye	53
widow	2,036	widow	11,549	widow	27,639
yellowtail	67,872	yellowtail	190,494	yellowtail	586,438
POP	0	POP	0	POP	0
darkblotched	0	darkblotched	102	darkblotched	3,611
SST a/	0	SST a/	0	SST a/	0
2000 BOTTOM	**Pounds**	**2001 BOTTOM**	**Pounds**	**2002 BOTTOM**	**Pounds**
black	0	black	53	black	0
lingcod	7	lingcod	508	lingcod	9,003
canary	24	canary	0	canary	1,068
yelloweye	0	yelloweye	0	yelloweye	0
widow	0	widow	0	widow	0
yellowtail	563	yellowtail	505	yellowtail	5,909
POP	0	POP	0	POP	0
darkblotched	0	darkblotched	0	darkblotched	0
SST a/	0	SST a/	0	SST a/	283
2000 Troll	**Pounds**	**2001 Troll**	**Pounds**	**2002 Troll**	**Pounds**
black	0	black	0	black	0
lingcod	1,958	lingcod	773	lingcod	2,006
canary	381	canary	607	canary	1,189
yelloweye	988	yelloweye	43	yelloweye	83
widow	0	widow	32	widow	0
yellowtail	8,948	yellowtail	7,060	yellowtail	7,071
POP	0	POP	0	POP	0
darkblotched	0	darkblotched	0	darkblotched	0
SST a/	0	SST a/	0	SST a/	0

Note: No data available for bycatch by target species in bottom trawl. Primary target species are Pacific cod and flatfish.

a/ Shortspine thornyhead

Table C.4. Bycatch of groundfish species in tribal longline fisheries in 2000, 2001 and 2002.

Target Fishery		Bycatch		Target Fishery		Bycatch		Target Fishery		Bycatch	
2000	Pounds	Bycatch Species	Pounds	2001	Pounds	Bycatch Species	Pounds	2002	Pounds	Bycatch Species	Pounds
						Quinault a/					
Halibut	85,252	b/		Halibut	85,644	rock	49	Halibut	104,191	canary	4
Sablefish	309,762	b/		Sablefish	288,511	rougheye	7,964			yelloweye	10
						blackgill	2,444			yellowtail	4
						shortraker	3,710			shelf	19
						SST c/	542	Sablefish	114,269	slope	4,121
										SST c/	570
						Quileute					
Halibut	42,666	black	30	Halibut	45,034	black	0	Halibut	67,290	black	0
		lingcod	144			lingcod	1,599			lingcod	1,074
		canary	74			canary	25			canary	117
		yelloweye	2,365			yelloweye	4,224			yelloweye	3,287
		yellowtail	63			yellowtail	19			yellowtail	74
		widow	0			widow	0			widow	0
		POP	0			POP	0			POP	0
		darkblotched	0			darkblotched	0			darkblotched	0
		SST c/	0			SST c/	0			SST c/	0
Sablefish	164,016	black	0	Sablefish	143,591	black	0	Sablefish	92,438	black	0
		lingcod	0			lingcod	0			lingcod	0
		canary	0			canary	0			canary	0
		yelloweye	0			yelloweye	0			yelloweye	0
		yellowtail	0			yellowtail	0			yellowtail	0
		widow	0			widow	0			widow	0
		POP	0			POP	0			POP	0
		darkblotched	0			darkblotched	0			darkblotched	0
		SST c/	624			SST c/	482			SST c/	91
						Makah					
Halibut	151,268	black	0	Halibut	270,365	black	0	Halibut	294,618	black	0
		lingcod	2,289			lingcod	4,092			lingcod	10,793
		canary	19,547			canary	2,330			canary	597
		yelloweye	523			yelloweye	2,075			yelloweye	1,819
		yellowtail	0			yellowtail	382			yellowtail	235
		widow	3			widow	19			widow	0
		POP	0			POP	0			POP	0
		darkblotched	0			darkblotched	0			darkblotched	0
		SST c/	0			SST c/	0			SST c/	0
Sablefish	490,229	black	0	Sablefish	464,723	black	0	Sablefish	227,740	black	0
		lingcod	0			lingcod	0			lingcod	0
		canary	0			canary	0			canary	0
		yelloweye	0			yelloweye	0			yelloweye	0
		yellowtail	0			yellowtail	0			yellowtail	0
		widow	0			widow	0			widow	0
		POP	0			POP	0			POP	0
		darkblotched	0			darkblotched	0			darkblotched	0
		SST c/	7,662			SST c/	10,081			SST c/	9,229

a/ No black rockfish, lingcod, Pacific ocean perch, widow, or darkblotched caught for these fisheries/years for Quinault.
b/ Data unavailable.
c/ Shortspine thornyhead

Table C.5. 2003-2004 tribal sablefish allocations and discard estimates.

2003 Tribal OY = 650 mt				
dressed lb	895,619	**Trawl**	48,000	trawl landed dressed
Total lb	1,432,990		76,800	trawl landed round
			16,896	assumed trawl discard mortality (18% of total trawl)
			93,696	total trawl (landed + discard mortality)
1,432,990 - 93,696 =		**Longline**	1,339,294	total longline (total - trawl)
			40,179	longline discard mortality (3% of total longline)
			1,299,115	longline landed
1,299,115 + 76,800 =		**Total**	1,375,915	total landed catch (trawl + longline)
			96.02%	landed / total OY
			4.0%	total discard / total OY
2004 Tribal OY (Low) = 464 mt				
dressed lb	639,334	**Trawl**	48,000	trawl landed dressed
Total lb	1,022,026		76,800	trawl landed round
			16,896	assumed trawl discard mortality (18% of total trawl)
			93,696	total trawl (landed + discard mortality)
1,022,026 - 93,696 =		**Longline**	928,330	total longline (total - trawl)
			27,850	longline discard mortality (3% of total longline)
			900,481	longline landed
900,481+ 76800 =		**Total**	977,281	total landed catch (trawl + longline)
			95.62%	landed / total OY
			4.38%	total discard / total OY
2004 Tribal OY (Med) = 751 mt				
dressed lb	1,034,784	**Trawl**	48,000	trawl landed dressed
Total lb	1,654,185		76,800	trawl landed round
			16,896	assumed trawl discard mortality (18% of total trawl)
			93,696	total trawl (landed + discard mortality)
1,654,185 - 93,696 =		**Longline**	1,560,489	total longline (total - trawl)
			46,815	longline discard mortality (3% of total longline)
			1,513,674	longline landed
1,513,674 + 76,800 =		**Total**	1,590,474	total landed catch (trawl + longline)
			96.15%	landed / total OY
			3.85%	total discard / total OY
2004 Tribal OY (High) = 812 mt				
dressed lb	1,118,835	**Trawl**	48,000	trawl landed dressed
Total lb	1,788,546		76,800	trawl landed round
			16,896	assumed trawl discard mortality (18% of total trawl)
			93,696	total trawl (landed + discard mortality)
1,788,546 - 93,696 =		**Longline**	1,694,850	total longline (total - trawl)
			50,846	longline discard mortality (3% of total longline)
			1,644,005	longline landed
1,644,005 + 76,800 =		**Total**	1,720,805	total landed catch (trawl + longline)
			96.21%	landed / total OY
			3.79%	total discard / total OY

a/ Sablefish taken in the tribal bottom trawl fishery are subject to full retention. See "Notes on Tribal fisheries bycatch monitoring and assumptions" on page C-1.

Table C.6. Expected bycatch in the tribal whiting fishery under three OY options for 2004 (mts)

Spp.	LOW WHITING OY U.S. = 74,100 mt Tribal = 12,968 mt	MED WHITING OY U.S. = 148,200 mt Tribal = 25,000 mt	HIGH WHITING OY U.S. = 222,300 mt Tribal = 30,000 mt
Yellowtail	104.99	202.91	243.50
Widow	11.34	21.91	26.30
Canary	1.68	3.25	3.91
Darkblotched	0.04	0.08	0.10
POP	0.12	0.24	0.29
Lingcod	0.14	0.26	0.32

Note: All bycatch numbers based on NMFS observer estimates from 2002 tribal fishery

Table C.7. Expected catch of important groundfish species under the proposed 2004 tribal fishery management option.

Species	Longline		Midwater Trawl		Bottom Trawl		Troll		Total- All Gears	
	lbs	mt	lbs	mt	lbs	mt	lbs	mt	lbs	mt
black a/	0	0	0	0	0	0	0	0	0	0
lingcod	33,000	15.0	200	0.1	19,800	9.0	19,800	9.0	55,200	25.1
canary	700	0.3	5,100	2.3	1,100	0.5	1,100	0.5	8,100	3.7
yelloweye	5,100	2.3	50	0.02	0	0	0	0	5,250	2.4
yellowtail	300	0.1	882,000	400.4	5,900	2.7	5,900	2.7	895,300	406.5
widow	0	0	88,200	40.0	0	0	0	0	88,200	40.0
POP	0	0	0	0	0	0	0	0	0	0
darkblotched	0	0	0	0	0	0	0	0	0	0
shortspine thornyhead b/	17,137	7.8	0	0	300	0.1	300	0.1	17,400	7.9

a/ Not including unspecified rockfish. About 15-25 mt landed on average in 1996-2001.

b/ Expected catch under sablefish medium OY option.

Table C.8. Projected groundfish landings by Tribal fleet under the 2004 alternatives, displayed against 1998, 2002 and estimated 2003 landings. (round-weight lbs.)

				2004 Projections		
Species	1998	2002	2003 est.	Low OY	Med OY	High OY
Arrowtooth Flounder	255	7,137				
Dover Sole	4,509	35,417				
English Sole	1,847	88,684				
Petrale Sole	3,249	45,479				
Rex Sole		6,632				
Rock Sole	2,396	5,833				
Unsp. Flatfish	38	8,406				
Unspecified Sanddab		19,655				
Sand Sole		2,748				
Starry Flounder		301				
Butter Sole		605				
Flatfish Total	12,294	220,897	441,794	441,794	441,794	441,794
Nom. Canary Rockfish	886	7,514	15,702	12,243	15,702	17,155
Darkblotched Rockfish	0	3,986	889	801	889	933
Pacific Ocean Perch	0	472	529	264	529	639
Unsp. Rockfish	65,245					
Nom. Widow Rockfish	54	27,969	136,460	113,178	136,460	146,130
Yelloweye Rockfish		0	5,250	5,250	5,250	5,250
Nom. Yellowtail Rockfish	13,711	581,924	1,351,166	1,135,484	1,351,166	1,440,572
Unsp. Shelf Rockfish		23,629				
Unsp. Near-shore Rockfish		116				
Unsp. Slope Rockfish		32,941				
Rockfish Total	79,903	668,467	1,509,996	1,267,220	1,509,996	1,610,678
Spiny Dogfish		2,607	2,607	2,607	2,607	2,607
Lingcod	5,247	24,854	29,473	55,508	55,773	55,905
Pacific Cod	4,873	128,530	128,530	128,530	128,530	128,530
Sablefish	980,719	959,982	1,375,915	977,281	1,590,474	1,720,805
Unspecified Skate	2,031	18,635	18,635	18,635	18,635	18,635
Nominal Shortspine Thornyhead	8,105	10,499	10,200	10,836	17,400	19,202
Other Groundfish Total	1,000,975	1,145,107	1,565,360	1,193,397	1,813,419	1,945,684
Pacific Whiting	53,984,582	45,867,384	55,066,079	28,563,877	55,066,079	66,079,295
All Groundfish Species Total	55,077,754	47,901,855	58,583,229	31,466,288	58,831,288	70,077,451

Table C.9. Projected groundfish revenue by Tribal fleet under the 2004 alternatives, displayed against 1998, 2002 and estimated 2003 revenue. ($ ex-vessel)

				2004 Projections a/		
Species	1998	2002	2003 est. a/	Low OY	Med OY	High OY
Arrowtooth Flounder	26	715				
Dover Sole	1,478	11,335				
English Sole	613	29,289				
Petrale Sole	3,249	46,509				
Rex Sole		2,316				
Rock Sole	791	2,033				
Unsp. Flatfish	13	2,773				
Unspecified Sanddab		5,110				
Sand Sole		2,084				
Starry Flounder		98				
Butter Sole		206				
Flatfish Total	6,170	102,468	204,936	204,936	204,936	204,936
Nom. Canary Rockfish	327	3,329	6,956	5,424	6,956	7,600
Darkblotched Rockfish	0	1,477	329	297	329	346
Pacific Ocean Perch	0	212	237	119	237	287
Unsp. Rockfish	26,575					
Nom. Widow Rockfish	19	13,425	65,500	54,325	65,500	70,142
Yelloweye Rockfish		0	2,326	2,326	2,326	2,326
Nom. Yellowtail Rockfish	4,684	274,509	637,381	535,638	637,381	679,556
Unsp. Shelf Rockfish		9,794				
Unsp. Near-shore Rockfish		14,434				
Unsp. Slope Rockfish		55				
Rockfish Total	39,366	317,235	712,731	598,129	712,731	760,257
Spiny Dogfish		405	405	405	405	405
Lingcod	3,007	18,176	21,554	40,594	40,787	40,884
Pacific Cod	1,924	63,961	63,961	63,961	63,961	63,961
Sablefish	1,280,233	1,512,595	2,167,960	1,539,851	2,506,030	2,711,385
Unspecified Skate	136	2,563	2,563	2,563	2,563	2,563
Nominal Shortspine Thornyhead	7,760	8,232	7,998	8,496	13,643	15,056
Other Groundfish Total	1,285,300	1,605,932	2,264,440	1,655,871	2,627,389	2,834,253
Pacific Whiting	2,699,229	2,065,122	2,479,282	1,286,053	2,479,282	2,975,138
All Groundfish Species Total	4,030,065	4,090,757	5,661,388	3,744,988	6,024,337	6,774,584

a/ Assumes 2002 average ex-vessel prices.

Part D - Bycatch Rates and Exvessel Revenue per Pound of Overfished Species Caught, by Target Strategy

This part contains two subsections:

Incidental Catch Rates and Discards for Overfished and Targeted Species

The bycatch estimates provided for scorecards in Chapter 2 (Exhibit B.2, Attachment 1), and estimates of total harvest mortality for target species rely on estimates of catch rates and discard mortality. This section provides the catch rates and discard mortality rates used to analyze the alternatives. These tables provide incidental catch rates which guided the development of options. The tables can be used as initial indicators of the degree of effect which might be expected from modifying an alternative. For example, Table D-1 shows that for lingcod north of 40°10' north latitude, movement of the inside boundary of the RCA from 75 fm to 50 fm would approximately halve the lingcod bycatch rate, on average, for the year (decrease it from 4.48% to 2.42%). However, additional analysis from the GMT would be needed for any specific proposals, as there are factors that influence bycatch estimates that are not included in these tables (for example, bimonthly period in which target species are harvested and amounts of target species harvest).

The bycatch rates used to model the 2003 fishery were stratified by management area, depth, period, and target species. For 2003 and previous years, logbooks and information from special observer studies were used to develop bycatch estimates. At its April 2003 meeting, the Council decided to replace these estimates with estimates from the first year of the new at-sea observer program. There is not enough observer data yet to support the development of reliable estimates of bycatch by target fishery; therefore, bycatch rates have been developed by management area, depth strata and period. The validity of these bycatch estimates depends on 2004 effort within a depth strata being distributed among target strategies in proportions similar to those observed in the first year of the observer program.

For the whiting fishery an average of the 1998 through 2002 bycatch rates is used to develop estimates of bycatch; however, the considerable variability in bycatch rates is likely to have policy implications. The smallest range of bycatch rates was for canary rockfish in the shoreside whiting fishery, for which the high end of the range was only 1.7 times the low end. The greatest range was for darkblotched in the shoreside whiting fishery, for which the high end of the range was over 2,000 times the low end. Bycatch rates are substantially influenced by the rare occurrence of a "disaster tow" (a tow composed largely of one or more species other than whiting). There is concern that for the 2004 fishery, a few disaster tows might easily use all of the widow rockfish impacts planned for a sector in the overfished species "scorecards" provided in Chapter 2. The fishery for each whiting sector occurs at a different time of year, with the shoreside season opening first. Questions to consider include whether one whiting sector's projected impacts should be considered a cap on the sector, such that if the cap were reached the sector would be shut down, and whether one sector's harvest in excess of the cap should affect the fishing opportunity of other sectors. Anticipation of the possibility that unexpected harvests of overfished species might shut down a whiting sector could exacerbate the "race for fish" in the shoreside and mothership sectors. A race for fish would not be expected for the catcher-processor sector because those vessels fish together as part of a cooperative.

A note on Terminology: "Bycatch" is used in these tables synonymously with the term "incidental catch." Thus the bycatch rates and estimates do not infer anything about the disposition of the incidental catch; i.e., "bycatch" as used in these tables includes both discarded an retained incidental catch. This usage differs from the Magnuson-Stevens Fishery Management and Conservation Act definition, which refers to bycatch as only that portion of the catch that is discarded.

The following is a general description of the tables provided:

Fishery Complex Values Per Pound of Overfished Species

The attached tables give an indication of the degree to which the need to conserve overfished species may constrain total revenue from target fisheries. In the current management system, overfished species are often the constraint on total harvest. When an overfished species is part of a harvest complex, the economic value of each additional pound of that species is substantially greater than what would be indicated by the exvessel value of one pound of the overfished species alone. If an overfished species is taken as part of a particular target strategy, and OY and allocation decisions require harvest mortality of the overfished species taken in that strategy be reduced, then absent an ability to structure the season or change a fishing gear or practice enough to sufficiently reduce harvest of the overfished species, then harvest of the target species would have to be reduced.

Information is provided on the amount and frequency of occurrence of overfished species in landings by target strategy, the exvessel value associated with the target strategy, and revenue per pound of overfished species landed or in the bycatch (where bycatch estimates are available). This information is provided in the following tables.

Primary targets for a trip are identified by the landed catch composition (methods documented in Section 3.4.2.1 of Amendment 16-2). For each primary target, the percent of trips with the overfished species of interest in the landing is indicated in each table. Total exvessel revenue of all such target trips is provided, along with the actual landings of the overfished species. For target strategies and time periods for which incidental catch rates were available, actual landings of the overfished species were replaced with estimates based on the incidental catch rates. Results are sorted from strategies with the lowest catch/landing of the overfished species to highest, and a column is provided with the cumulative metric tons of overfished species. To provide a sense of the importance of each target fishery to the overall fishing industry in the region, the exvessel revenue of the target fishery is presented as a percent and cumulative percent of the total exvessel revenue for the region. Using Table D-5 as an example, in the pink shrimp fishery north of Cape Mendocino there were 1,963 trips made in 2002. Of these trips, 0.8% included some darkblotched rockfish in their landing. The total exvessel revenue for all species landed on pink shrimp trips was $15.1 million. The total amount of darkblotched landed was 0.59 metric tons. No estimated bycatch rates are available therefore the landed catch column is identical to the landed or estimated catch column. A total of 1.249 mt of darkblotched was taken by the pink shrimp strategy and all other strategies consuming at least as much darkblotched as the pink shrimp strategy. Pink shrimp comprised 12% of the total exvessel value of landings north of Cape Mendocino. Trips accounting for 27% of the total exvessel value of landings north of Cape Mendocino accounted for 1.249 mt of darkblotched rockfish. On pink shrimp trips, the average exvessel revenue per pound of darkblotched rockfish landed was $11,601.

In some cases, where actual landings of the overfished species were replaced with estimates based on the incidental catch rates, the resulting estimate of overfished species caught is lower than for the actual landings. Examples for darkblotched rockfish are the limited entry trawl arrowtooth fishery and the limited entry trawl DTS fishery north of Cape Mendocino. This is apparently the result of bycatch rate estimates based on periods other than 2002 and 2002 trip limits which allowed the landing of most of the incidental catch of darkblotched. Despite these anomalies, the overall north of Cape Mendocino estimated darkblotched rockfish catch and bycatch of 142.3 mt far exceeded the landed darkblotched rockfish catch of 66.6 mt.

Tables D-5 through D-13 have not been updated with the bycatch rates adopted by the Council in April 2003. The updated bycatch rates are generally higher than those used in these tables. When these tables are regenerated using the new rates, the "Landed or Estimated Catch" columns will be greater for strategies in which bycatch rates have been increased, and the corresponding row of the exvessel revenue per pound of overfished species column will be reduced. All other values in the table will remain unchanged.

There are two sources of error that must be taken into account in using species composition information to assign a trip to a particular target strategy, (1) a species may be discarded before landing, and (2) multiple strategies may be pursued on the same trip. For the first type of error, discarded species may result in an underestimate of the presence of a particular species in the catch complex associated with a particular target strategy. Discards may occur due to market factors or regulatory constraints. For the second type of error, catch taken during a target strategy that comprised only a minor portion of the total effort on a trip could be erroneously interpreted as incidental catch for the dominant target strategy. Therefore, landing data aggregated for an entire trip provides only an indicator of the species composition encountered in a particular target strategy.

In evaluating the likelihood that a restriction on an overfished species would affect a particular strategy, the number of trips on which the strategy was employed should be compared to the number of trips on which the overfished species was retained. A higher frequency of overfished species retention may indicate a higher likelihood of a need for management measures to restrict the fishery. A low frequency of overfished species retention could indicate employment of a secondary strategy during a particular trip, rather than a rare co-occurrence of the overfished species with the primary target species. Fishticket errors are another possible explanation of an extremely rare occurrence of an overfished species in a complex in which they would not normally be expected to be found.

A key point in determining how much catch must be forgone under a particular strategy in order to reduce mortality of overfished species is whether or not gear or fishing methods can be modified to reduce overfished species mortality without reducing catch of target species. If such changes can be made, target species harvest may be maintained while still reducing overfished species mortality. However there are likely to be some increased fishing costs associated with such changes.

TABLE D-1.--Bycatch rates for overfished species, expressed as a percentage of target species landings, organized by subareas and management depth zones used in modeling the 2004 fishery.

	<=50 fm	<= 60 fm	<=75 fm	<=100 fm	>150 fm	>180 fm	>200 fm	>250 fm	All depths
Lingcod									
N. of 40°10'	2.42%	3.62%	4.48%	5.55%	0.09%	0.06%	0.00%	0.00%	2.63%
38° - 40°10'	1.29%	0.79%	0.87%	2.90%	0.09%	0.06%	0.00%	0.00%	1.86%
S. of 38°	1.29%	0.79%	0.87%	2.90%	1.30%	1.39%	0.02%	0.01%	1.86%
Canary									
N. of 40°10'	0.10%	0.26%	0.72%	1.01%	0.01%	0.00%	0.00%	0.00%	0.47%
38° - 40°10'	0.21%	0.04%	0.05%	0.11%	0.01%	0.00%	0.00%	0.00%	0.03%
S. of 38°	0.21%	0.04%	0.05%	0.11%	0.00%	0.00%	0.00%	0.00%	0.03%
Widow									
N. of 40°10'	0.00%	0.05%	0.04%	0.06%	0.01%	0.00%	0.00%	0.00%	0.03%
38° - 40°10'	0.31%	0.03%	0.01%	0.02%	0.01%	0.00%	0.00%	0.00%	0.02%
S. of 38°	0.31%	0.03%	0.01%	0.02%	0.01%	0.00%	0.00%	0.00%	0.02%
Yelloweye									
N. of 40°10'	0.00%	0.00%	0.03%	0.03%	0.00%	0.00%	0.00%	0.00%	0.01%
38° - 40°10'	0.31%	0.03%	0.01%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%
S. of 38°	0.31%	0.03%	0.01%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%
Bocaccio									
N. of 40°10'	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
38° - 40°10'	2.43%	0.81%	0.51%	3.77%	0.00%	0.00%	0.00%	0.00%	1.62%
S. of 38°	2.43%	0.81%	0.51%	3.77%	0.31%	0.31%	0.00%	0.00%	1.62%
Cowcod									
N. of 40°10'	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
38° - 40°10'	0.00%	0.00%	0.01%	0.09%	0.00%	0.00%	0.00%	0.00%	0.05%
S. of 38°	0.00%	0.00%	0.01%	0.09%	0.01%	0.00%	0.00%	0.00%	0.05%
Darkblotched									
N. of 40°10'	0.00%	0.08%	0.23%	0.50%	1.20%	0.92%	0.52%	0.00%	1.25%
38° - 40°10'	0.00%	0.00%	0.00%	0.05%	1.20%	0.92%	0.52%	0.00%	0.35%
S. of 38°	0.00%	0.00%	0.00%	0.05%	0.13%	0.10%	0.04%	0.00%	0.07%
POP									
N. of 40°10'	0.02%	0.03%	0.29%	0.51%	1.05%	0.69%	0.55%	0.00%	1.50%
38° - 40°10'	0.00%	0.00%	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%	0.02%
S. of 38°	0.00%	0.00%	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%

TABLE D-2. Bycatch rates of overfished species observed by sector and year in the whiting fishery, 1999-2002.

Species	1998		1999		2000		2001		2002		Sum 98-02	
	Catch	Bycatch Rate	Catch	Bycatch Rate	Catch	Bycatch Rate	Catch	Bycatch Rate	Catch	Bycatch Rate	Catch	Bycatch Rate
Tribal												
Whiting	24,509		25,846		6,251		6,080		21,793		84,479	
Yellowtail	158.91	0.6484%	450.94	1.7447%	99.89	1.5980%	86.98	1.4306%	176.45	0.8097%	973.17	1.1520%
Widow	14.47	0.0590%	36.76	0.1422%	9.81	0.1569%	3.28	0.0539%	19.06	0.0875%	83.38	0.0987%
Canary	2.76	0.0113%	4.42	0.0171%	0.93	0.0149%	2.44	0.0401%	2.83	0.0130%	13.38	0.0158%
Darkblotched	0.01	0.0000%	0	0.0000%	0	0.0000%	0	0.0000%	0.07	0.0003%	0.08	0.0001%
POP	0.4	0.0016%	1.24	0.0048%	0.03	0.0005%	0.72	0.0118%	0.21	0.0010%	2.60	0.0031%
Lingcod	0.33	0.0013%	0.19	0.0007%	0.06	0.0010%	0.35	0.0058%	0.23	0.0011%	1.16	0.0014%
Motherships												
Whiting	50,087		47,580		46,840		35,823		26,593		206,924	
Yellowtail	313.26	0.6254%	253.26	0.5323%	285.54	0.6096%	91.82	0.2563%	1.42	0.0053%	945.30	0.4568%
Widow	171.84	0.3431%	47.7	0.1003%	150.65	0.3216%	29.19	0.0815%	20.5	0.0771%	419.88	0.2029%
Canary	2.46	0.0049%	0.19	0.0004%	0.56	0.0012%	0.95	0.0027%	0.81	0.0030%	4.97	0.0024%
Darkblotched	11.27	0.0225%	4.84	0.0102%	5.15	0.0110%	0.57	0.0016%	0.93	0.0035%	22.76	0.0110%
POP	6.50	0.0130%	4.44	0.0093%	3.03	0.0065%	0.05	0.0001%	2.17	0.0082%	16.19	0.0078%
Lingcod	0.11	0.0002%	0.39	0.0008%	0.25	0.0005%	0.48	0.0013%	0.11	0.0004%	1.34	0.0006%
Catcher-Processors												
Whiting	70,379		67,679		67,815		58,628		36,341		300,841	
Yellowtail	63.72	0.0905%	430.87	0.6366%	270.02	0.3982%	33.16	0.0566%	12.86	0.0354%	810.63	0.2695%
Widow	120.92	0.1718%	101.25	0.1496%	69.97	0.1032%	139.71	0.2383%	115.1	0.3167%	546.95	0.1818%
Canary	0.25	0.0004%	1.03	0.0015%	0.86	0.0013%	0.65	0.0011%	1.59	0.0044%	4.38	0.0015%
Darkblotched	6.94	0.0099%	6.94	0.0103%	3.81	0.0056%	11.5	0.0196%	2.19	0.0060%	31.38	0.0104%
POP	14.78	0.0210%	9.71	0.0143%	6.57	0.0097%	19.69	0.0336%	1.45	0.0040%	52.20	0.0174%
Lingcod	0.00	0.0000%	0.02	0.0000%	0.16	0.0002%	0.18	0.0003%	0.16	0.0004%	0.52	0.0002%
Shoreside												
Whiting	87,626		83,272		85,652		73,326		45,276		375,152	
Yellowtail	501.06	0.5718%	481.39	0.5781%	189.81	0.2216%	95.86	0.1307%	41.37	0.0914%	1,309.49	0.3491%
Widow	366	0.4177%	192	0.2306%	76	0.0887%	42	0.0573%	5.319	0.0117%	681.32	0.1816%
Canary	0.38	0.0004%	0.61	0.0007%	0.52	0.0006%	0.45	0.0006%	0.212	0.0005%	2.17	0.0006%
Darkblotched	3.97	0.0045%	0.42	0.0005%	1.21	0.0014%	0.81	0.0011%	0.001	0.0000%	6.41	0.0017%
POP	27.26	0.0311%	7.47	0.0090%	0.22	0.0003%	0.04	0.0001%	0.221	0.0005%	35.21	0.0094%
Lingcod	0.44	0.0005%	0.61	0.0007%	0.83	0.0010%	0.76	0.0010%	0.216	0.0005%	2.86	0.0008%
Yelloweye	0.05	0.0001%	0.02	0.0000%	0	0.0000%	0	0.0000%	0	0.0000%	0.07	0.0000%

TABLE D-3a.--Preliminary coastwide target species discard, as a percentage of total catch, calculated using the first year of NMFS observer data, organized by management depth zones used in modeling the 2004 fishery.

	<=50 fm	<= 60 fm	<=75 fm	<=100 fm	>150 fm	>180 fm	>200 fm	>250 fm	All depths
Sablefish	**96%**	**95%**	**94%**	**89%**	**37%**	**35%**	**32%**	**25%**	**65%**
mortality from discards	**90%**	**90%**	**88%**	**82%**	**29%**	**27%**	**24%**	**19%**	**46%**
Longspine	**0%**	**0%**	**0%**	**0%**	**19%**	**19%**	**19%**	**19%**	**19%**
Shortspine	**0%**	**3%**	**17%**	**30%**	**35%**	**34%**	**33%**	**32%**	**37%**
Dover	**22%**	**19%**	**27%**	**31%**	**13%**	**13%**	**12%**	**16%**	**17%**
Petrale	**11%**	**14%**	**17%**	**17%**	**0%**	**0%**	**1%**	**3%**	**10%**
Arrowtooth	**91%**	**85%**	**55%**	**50%**	**26%**	**31%**	**26%**	**24%**	**44%**
"Other" flatfish	**39%**	**42%**	**38%**	**39%**	**38%**	**40%**	**42%**	**54%**	**38%**
Derivation of sablefish mortality estimates									
% of total catch discarded	96%	95%	94%	89%	37%	35%	32%	25%	65%
with a 3% reduction (shallow) for smaller size limit	93%	92%	91%	87%	37%	35%	32%	25%	63%
Landings + discard per 100 lb landed	1,443	1,319	1,138	744	159	153	146	134	270
Assumed mortality rate of discards	70%	70%	70%	70%	70%	70%	70%	70%	50%
Discard mortality (lb)	940	853	726	451	41	37	32	24	85
as a % of (landings + discard mortality)	90.4%	89.5%	87.9%	81.9%	29.1%	27.0%	24.4%	19.3%	45.9%

TABLE D-3b.--Preliminary coastwide target species discard, as a percentage of total catch, calculated using the first year of NMFS observer data, organized by exclusive depth intervals.

	0 - 50 fm	50 - 60 fm	60 - 75 fm	75 - 100 fm	150 - 180 fm	180 - 200 fm	200 - 250 fm	> 250 fm	All depths
Sablefish	96%	95%	92%	81%	74%	79%	60%	25%	65%
Longspine	0%	0%	0%	1%	78%	30%	21%	19%	19%
Shortspine	0%	9%	20%	33%	54%	64%	51%	32%	37%
Dover	22%	17%	33%	38%	17%	23%	3%	16%	17%
Petrale	11%	17%	21%	14%	1%	0%	0%	3%	10%
Arrowtooth	91%	82%	53%	42%	15%	58%	29%	24%	44%
"Other" flatfish	39%	44%	30%	46%	29%	25%	14%	54%	38%

TABLE D-4a.--Preliminary summary of target species presence, catch and discard amounts, and discard rates from the first year of NMFS observer data, organized by management depth zones used in modeling the 2004 fishery.

	<=50 fm	<= 60 fm	<=75 fm	<=100 fm	>150 fm	>180 fm	>200 fm	>250 fm
Total # of observed tows	586	983	1,450	1,856	1,198	1,082	951	759
Tows with sablefish								
number	146	399	745	1,073	1,150	1,050	933	750
percent	25%	41%	51%	58%	96%	97%	98%	99%
discard lb	81,825	229,867	377,115	565,995	197,885	174,312	148,779	98,612
catch lb	85,279	240,658	401,056	634,229	535,371	503,478	471,151	387,893
% discarded	**96%**	**96%**	**94%**	**89%**	**37%**	**35%**	**32%**	**25%**
Tows with longspine								
number	10	17	29	62	843	822	785	691
percent	2%	2%	2%	3%	70%	76%	83%	91%
discard lb	0	0	8	13	113,032	112,497	112,042	109,647
catch lb	443	605	2,309	2,867	593,171	592,481	590,964	579,341
% discarded	**0%**	**0%**	**0%**	**0%**	**19%**	**19%**	**19%**	**19%**
Tows with shortspine								
number	16	28	61	157	1,081	990	888	726
percent	3%	3%	4%	8%	90%	91%	93%	96%
discard lb	0	10	235	2,073	84,225	79,178	75,137	64,957
catch lb	207	313	1,419	6,927	240,735	231,323	224,983	205,162
% discarded	**0%**	**3%**	**17%**	**30%**	**35%**	**34%**	**33%**	**32%**
Tows with Dover								
number	329	636	1,005	1,348	1,100	1,005	892	708
percent	56%	65%	69%	73%	92%	93%	94%	93%
discard lb	9,703	20,997	65,200	122,633	194,451	183,377	160,177	149,632
catch lb	44,164	109,425	244,837	394,917	1,472,349	1,407,588	1,306,477	935,524
% discarded	**22%**	**19%**	**27%**	**31%**	**13%**	**13%**	**12%**	**16%**
Tows with petrale								
number	440	825	1,280	1,639	346	273	161	83
percent	75%	84%	88%	88%	29%	25%	17%	11%
discard lb	8,167	22,856	54,637	64,796	1,059	830	516	190
catch lb	77,020	163,272	314,274	389,220	260,216	221,448	72,537	7,153
% discarded	**11%**	**14%**	**17%**	**17%**	**0%**	**0%**	**1%**	**3%**
Tows with arrowtooth								
number	289	546	943	1,281	561	472	372	235
percent	49%	56%	65%	69%	47%	44%	39%	31%
discard lb	10,919	27,858	282,497	416,995	96,002	79,463	55,637	22,885
catch lb	11,965	32,591	510,788	827,504	366,268	253,128	212,126	97,370
% discarded	**91%**	**85%**	**55%**	**50%**	**26%**	**31%**	**26%**	**24%**
Tows with "other" flatfish								
number	584	981	1,443	1,844	1,079	972	845	672
percent	100%	100%	100%	99%	90%	90%	89%	89%
discard lb	175,273	328,256	449,164	533,961	48,522	41,711	38,499	34,464
catch lb	445,388	790,246	1,187,019	1,372,808	128,496	104,741	91,861	63,960
% discarded	**39%**	**42%**	**38%**	**39%**	**38%**	**40%**	**42%**	**54%**

TABLE D-4b.--Preliminary summary of target species presence, catch and discard amounts, and discard rates from the first year of NMFS observer data, organized by exclusive depth intervals.

	0 - 50 fm	50 - 60 fm	60 - 75 fm	75 - 100 fm	100 - 125 fm	125 - 150 fm	150 - 180 fm	180 - 200 fm	200 - 250 fm	> 250 fm	All depths
Total # of observed tows	586	397	467	406	124	99	116	131	192	759	3,277
Tows with sablefish											
number	146	253	346	328	114	81	100	117	183	750	2,418
percent	25%	64%	74%	81%	92%	82%	86%	89%	95%	99%	74%
discard lb	81,825	148,042	147,248	188,880	17,882	21,724	23,573	25,533	50,167	98,612	803,486
catch lb	85,279	155,379	160,398	233,173	37,643	31,941	31,893	32,326	83,259	387,893	1,239,185
% discarded	**96%**	**95%**	**92%**	**81%**	**48%**	**68%**	**74%**	**79%**	**60%**	**25%**	**65%**
Tows with longspine											
number	10	7	12	33	18	13	21	37	94	691	936
percent	2%	2%	3%	8%	15%	13%	18%	28%	49%	91%	29%
discard lb	0	0	8	6	157	76	535	456	2,395	109,647	113,278
catch lb	443	162	1,704	558	589	927	690	1,517	11,623	579,341	597,555
% discarded	**0%**	**0%**	**0%**	**1%**	**27%**	**8%**	**78%**	**30%**	**21%**	**19%**	**19%**
Tows with shortspine											
number	16	12	33	96	66	67	91	102	162	726	1,371
percent	3%	3%	7%	24%	53%	68%	78%	78%	84%	96%	42%
discard lb	0	10	225	1,837	5,822	4,283	5,047	4,042	10,179	64,957	96,403
catch lb	207	107	1,105	5,508	7,996	7,247	9,411	6,340	19,821	205,162	262,905
% discarded	**0%**	**9%**	**20%**	**33%**	**73%**	**59%**	**54%**	**64%**	**51%**	**32%**	**37%**
Tows with Dover											
number	329	307	369	343	111	80	95	113	184	708	2,639
percent	56%	77%	79%	84%	90%	81%	82%	86%	96%	93%	81%
discard lb	9,703	11,294	44,203	57,433	20,660	7,873	11,074	23,201	10,545	149,632	345,618
catch lb	44,164	65,261	135,412	150,080	88,524	61,271	64,762	101,110	370,953	935,524	2,017,061
% discarded	**22%**	**17%**	**33%**	**38%**	**23%**	**13%**	**17%**	**23%**	**3%**	**16%**	**17%**
Tows with petrale											
number	440	385	455	359	89	77	73	112	78	83	2,151
percent	75%	97%	97%	88%	72%	78%	63%	85%	41%	11%	66%
discard lb	8,167	14,689	31,780	10,159	2,276	429	228	314	326	190	68,559
catch lb	77,020	86,253	151,001	74,946	11,725	37,688	38,769	148,911	65,384	7,153	698,849
% discarded	**11%**	**17%**	**21%**	**14%**	**19%**	**1%**	**1%**	**0%**	**0%**	**3%**	**10%**
Tows with arrowtooth											
number	289	257	397	338	105	63	89	100	137	235	2,010
percent	49%	65%	85%	83%	85%	64%	77%	76%	71%	31%	61%
discard lb	10,919	16,939	254,639	134,498	35,665	16,477	16,538	23,827	32,752	22,885	565,139
catch lb	11,965	20,626	478,197	316,716	69,057	30,387	113,140	41,001	114,757	97,370	1,293,216
% discarded	**91%**	**82%**	**53%**	**42%**	**52%**	**54%**	**15%**	**58%**	**29%**	**24%**	**44%**
Tows with "other" flatfish											
number	584	397	462	401	122	98	107	127	173	672	3,143
percent	100%	100%	99%	99%	98%	99%	92%	97%	90%	89%	96%
discard lb	175,273	152,983	120,909	84,797	25,081	7,703	6,810	3,212	4,035	34,464	615,266
catch lb	445,388	344,858	396,773	185,788	62,158	55,040	23,755	12,880	27,901	63,960	1,618,501
% discarded	**39%**	**44%**	**30%**	**46%**	**40%**	**14%**	**29%**	**25%**	**14%**	**54%**	**38%**

Note: Shaded depths are not used in modeling options for the 2004 fishery.

TABLE D-5. Catch and/or landed catch of darkblotched rockfish and exvessel revenue by trip target type (2002).[a/] (Page 1 of 1)

Primary Target for Trip	Trips with Primary Target	Percent of Primary Target Trips with Darkblotched in Landing	Total Exvessel Revenue for All Species Landed	Darkblotched Landed (mt)	Darkblotched Landed or Estimated Catch (mt)	Cumulative Darkblotched (mt)	Total Exvessel Revenue for Area: Percent of Total	Total Exvessel Revenue for Area: Cumulative Percent	Exvessel Revenue/ Pounds (Landed & Bycatch)
North of Cape Mendocino									
Limited Entry Trawl, Canary	1	100.0%	83	0.000	0.000	0.000	0%	0%	83
Open Access, Shelf	381	0.3%	96,087	0.002	0.002	0.002	0%	0%	24,022
Open Access, Nearshore	4,229	0.0%	1,501,444	0.005	0.005	0.007	1%	1%	136,495
Other Groundfish (plurality, but <50%)	336	0.6%	791,167	0.010	0.010	0.017	1%	2%	37,675
Limited Entry Trawl, Whiting	632	0.5%	4,824,800	0.010	0.010	0.027	4%	6%	209,774
Open Access, Sablefish, Slope	216	0.9%	1,100,262	0.014	0.014	0.041	1%	6%	35,492
Open Access, Slope	2	50.0%	1,175	0.015	0.015	0.056	0%	6%	37
Limited Entry Trawl, Lingcod	8	12.5%	3,899	0.034	0.034	0.090	0%	6%	52
Limited Entry Fixed Gear Sablefish, Shelf	105	3.8%	905,116	0.044	0.044	0.133	1%	7%	9,428
Limited Entry Fixed Gear Sablefish, Slope	316	3.5%	2,068,272	0.143	0.143	0.277	2%	9%	6,545
Limited Entry Trawl, Midwater (Yellowtaill and Widow)	63	4.8%	601,804	0.149	0.177	0.454	0%	9%	1,543
Other Species	3,880	0.1%	7,786,606	0.205	0.205	0.659	6%	15%	17,189
Pink Shrimp	1,963	0.8%	15,093,298	0.590	0.590	1.249	12%	27%	11,601
Open Access Trawl, Other, >50% Groundfish	135	8.9%	510,025	1.485	1.485	2.734	0%	27%	156
Limited Entry Trawl, Slope Rockfish	19	26.3%	108,415	1.500	1.500	4.234	0%	27%	33
Limited Entry Trawl, Left Over	158	1.3%	491,678	0.129	2.509	6.743	0%	27%	89
Limited Entry Trawl, Arrowtooth	184	45.1%	2,345,701	5.100	4.915	11.658	2%	29%	216
Limited Entry Trawl, Petrale Sole	229	25.3%	1,570,707	9.880	18.324	29.982	1%	30%	39
Limited Entry Trawl, DTS	1,020	20.6%	7,477,358	31.913	29.709	59.691	6%	36%	114
Limited Entry Trawl, Flatfish	1,275	12.1%	4,975,044	15.364	82.652	142.343	4%	40%	27
Total All Northern Fisheries[b/]	43,556		131,046,019	66.591	142.343				
South of Cape Mendocino									
Open Access Trawl, Other, >50% Groundfish	29	3.4%	29,406	0.003	0.003	0.003	0%	0%	4,901
Open Access, Sablefish, Slope	281	0.4%	180,345	0.003	0.003	0.006	0%	0%	25,764
Open Access, Slope	269	0.4%	185,765	0.008	0.008	0.014	0%	0%	10,927
Open Access, Nearshore	3,838	0.1%	1,760,441	0.011	0.011	0.025	2%	2%	70,418
Limited Entry Trawl, Left Over	3	0.0%	10,750	0.000	0.058	0.083	0%	2%	84
Open Access, Shelf	928	0.5%	250,132	0.059	0.059	0.142	0%	3%	1,909
Limited Entry Trawl, Chilipepper	54	3.7%	137,730	0.177	0.177	0.319	0%	3%	353
Limited Entry Trawl, Petrale Sole	53	1.9%	287,972	0.012	7.903	8.222	0%	3%	17
Limited Entry Trawl, Slope Rockfish	53	9.4%	250,821	8.172	8.172	16.394	0%	3%	14
Limited Entry Trawl, Flatfish	369	3.8%	1,025,588	0.309	12.232	28.626	1%	5%	38
Limited Entry Trawl, DTS	625	6.4%	4,279,277	3.356	26.460	55.087	5%	9%	73
Total All Southern Fisheries[b/]	61,427		88,511,363	12.110	55.087				729

a/ See text for important caveats.
b/ Includes primary strategies not listed in the table.

TABLE D-6. Catch and/or landed catch of Pacific ocean perch and exvessel revenue by trip target type north of Cape Mendocino (2002).a/ (Page 1 of 1)

Primary Target for Trip	Trips	Percent of Primary Target Trips with Pacific Ocean Perch in Landing	Total Exvessel Revenue for All Species Landed	Pacific Ocean Perch Landed (mt)	Pacific Ocean Perch Landed or Estimated Catch (mt)	Cumulative Pacific Ocean Perch (mt)	Total Exvessel Revenue for Area: Percent of Total	Total Exvessel Revenue for Area: Cumulative Percent	Exvessel Revenue/ Pounds (Landed & Bycatch)
Limited Entry Trawl, Yellowtail	10	10.0%	9,255	0.001	0.001	0.001	0%	0%	4,628
Limited Entry Trawl, Canary	1	100.0%	83	0.004	0.004	0.005	0%	0%	9
Pacific Halibut	379	0.3%	1,564,532	0.006	0.006	0.011	1%	1%	120,349
Open Access, Nearshore	4,229	0.0%	1,501,444	0.012	0.012	0.023	1%	2%	57,748
Other Species	3,880	0.1%	7,786,606	0.019	0.019	0.041	6%	8%	189,917
Limited Entry Fixed Gear Sablefish, Shelf	105	2.9%	905,116	0.021	0.021	0.063	1%	9%	19,258
Pink Shrimp	1,963	0.2%	15,093,298	0.032	0.032	0.095	12%	20%	212,582
Limited Entry Fixed Gear Sablefish, Slope	316	2.2%	2,068,272	0.186	0.186	0.280	2%	22%	5,057
Open Access Trawl, Other, >50% Groundfish	135	2.2%	510,025	0.214	0.214	0.494	0%	22%	1,081
Limited Entry Trawl, Whiting	632	1.7%	4,824,800	0.221	0.221	0.715	4%	26%	9,907
Limited Entry Trawl, Slope Rockfish	19	42.1%	108,415	3.365	3.365	4.081	0%	26%	15
Limited Entry Trawl, Leftover	158	2.5%	491,678	0.518	3.802	7.883	0%	27%	59
Limited Entry Trawl, Petrale Sole	229	17.0%	1,570,707	8.077	14.435	22.318	1%	28%	49
Limited Entry Trawl, DTS	1,020	18.9%	7,477,358	60.566	37.779	60.097	6%	34%	90
Limited Entry Trawl, Arrowtooth	184	69.6%	2,345,701	43.282	39.727	99.824	2%	35%	27
Limited Entry Trawl, Flatfish	1,275	11.4%	4,975,044	29.703	81.958	181.783	4%	39%	28
Total All Northern Fisheries[b/]	43,556		131,046,019	146	181.783				327

a/ See text for important caveats.

b/ Includes primary strategies not listed in the table.

TABLE D-7. Catch and/or landed catch of canary rockfish and exvessel revenue by trip target type (2002).[a/] (Page 1 of 2)

Primary Target for Trip	Trips	Percent of Primary Target Trips with Canary Rockfish in Landing	Total Exvessel Revenue for All Species Landed	Canary Rockfish Landed (MT)	Canary Rockfish Landed or Estimated Catch (MT)	Cumulative Canary Rockfish (MT)	Total Exvessel Revenue for Area		Exvessel Revenue/Pounds (Landed & Bycatch)
							Percent of Total	Cumulative Percent	
North of Cape Mendocino									
Limited Entry Fixed Gear Sablefish, Slope	316	0.3%	2,068,272	0.001	0.001	0.001	2%	2%	689,424
Other Groundfish (plurality but <50%)	336	1.2%	791,167	0.010	0.010	0.012	1%	2%	34,399
Open Access, Sablefish, Slope	216	0.5%	1,100,262	0.021	0.021	0.033	1%	3%	23,410
Open Access, Nearshore	4,229	0.2%	1,501,444	0.031	0.031	0.064	1%	4%	21,760
Limited Entry Trawl, Canary	1	100.0%	83	0.061	0.061	0.126	0%	4%	1
Pacific Halibut	379	1.3%	1,564,532	0.102	0.102	0.227	1%	5%	6,985
Open Access, Sablefish, Shelf	128	3.9%	311,694	0.166	0.166	0.393	0%	6%	854
Other Species	3,880	0.3%	7,786,606	0.211	0.211	0.604	6%	12%	16,709
Limited Entry Trawl, Slope Rockfish	19	21.1%	108,415	0.239	0.239	0.843	0%	12%	206
Limited Entry Trawl, Other Rockfish	1	100.0%	2,233	0.251	0.251	1.094	0%	12%	4
Limited Entry Trawl, Leftover	158	20.9%	491,678	0.844	0.257	1.351	0%	12%	867
Open Access, Shelf	381	1.3%	96,087	0.262	0.262	1.613	0%	12%	167
Limited Entry Fixed Gear Sablefish, Shelf	105	4.8%	905,116	0.272	0.272	1.885	1%	13%	1,509
Limited Entry Trawl, Yellowtail	10	50.0%	9,255	0.286	0.286	2.171	0%	13%	15
Limited Entry Trawl, Whiting	632	14.2%	4,824,800	0.433	0.433	2.604	4%	16%	5,052
Salmon	8,390	0.2%	7,139,761	0.445	0.445	3.049	5%	22%	7,278
Limited Entry Trawl, DTS	1,020	12.3%	7,477,358	5.174	0.908	3.957	6%	28%	3,737
Pink Shrimp	1,963	4.8%	15,093,298	1.214	1.214	5.171	12%	39%	5,638
Limited Entry Fixed Gear, Other Groundfish, Shelf	52	1.9%	225,343	1.333	1.333	6.504	0%	39%	77
Limited Entry Trawl, Petrale Sole	229	21.8%	1,570,707	2.224	1.399	7.903	1%	40%	509
Open Access Trawl, Other, >50% Groundfish	135	32.6%	510,025	2.316	2.316	10.219	0%	41%	100
Limited Entry Trawl, Midwater (Yellowtaill and Widow)	63	36.5%	601,804	1.128	2.649	12.868	0%	41%	103
Limited Entry Trawl, Arrowtooth	184	57.1%	2,345,701	12.271	12.224	25.092	2%	43%	87
Limited Entry Trawl, Flatfish	1,275	34.7%	4,975,044	15.696	14.353	39.446	4%	47%	157
Total All Northern Fisheries[b/]	43,556		131,046,019	44.991	39.446				1,507

TABLE D-7. Catch and/or landed catch of canary rockfish and exvessel revenue by trip target type (2002).[a] (Page 2 of 2)

Primary Target for Trip	Trips	Percent of Primary Target Trips with Canary Rockfish in Landing	Total Exvessel Revenue for All Species Landed	Canary Rockfish Landed (MT)	Canary Rockfish Landed or Estimated Catch (MT)	Cumulative Canary Rockfish (MT)	Total Exvessel Revenue for Area: Percent of Total	Total Exvessel Revenue for Area: Cumulative Percent	Exvessel Revenue/Pounds (Landed & Bycatch)
South of Cape Mendocino									
Other Groundfish (plurality, but <50%)	180	0.6%	170,145	0.002	0.002	0.002	0%	0%	34,029
Limited Entry Trawl, Other Rockfish	28	3.6%	193,986	0.003	0.003	0.005	0%	0%	32,331
Limited Entry Trawl, Widow	1	100.0%	3,728	0.009	0.009	0.014	0%	0%	196
Open Access, Shelf	928	0.3%	250,132	0.010	0.010	0.024	0%	1%	10,875
Prawns	2,083	0.1%	3,990,047	0.028	0.028	0.052	5%	5%	65,411
Limited Entry Trawl, Slope Rockfish	53	1.9%	250,821	0.036	0.036	0.088	0%	5%	3,175
Open Access, Nearshore	3,838	0.2%	1,760,441	0.046	0.046	0.133	2%	7%	17,430
Limited Entry Trawl, DTS	625	7.7%	4,279,277	1.492	0.186	0.320	5%	12%	10,412
Limited Entry Trawl, Flatfish	369	6.2%	1,025,588	0.748	0.415	0.735	1%	13%	1,121
Limited Entry Trawl, Chilipepper	54	25.9%	137,730	0.698	0.698	1.433	0%	14%	89
Total All Southern Fisheries[b]	61,427		88,511,363	3.147	1.433				28,019

a/ See text for important caveats.

b/ Includes primary strategies not listed in the table.

TABLE D-8. Catch and/or landed catch of lingcod and exvessel revenue by trip target type (2002).[a/] (Page 1 of 2)

Primary Target for Trip	Trips	Percent of Primary Target Trips with Lingcod in Landing	Total Exvessel Revenue for All Species Landed	Lingcod Landed (MT)	Lingcod Landed or Estimated Catch (MT)	Cumulative Lingcod (MT)	Total Exvessel Revenue for Area: Percent of Total	Total Exvessel Revenue for Area: Cumulative Percent	Exvessel Revenue/Pounds (Landed & Bycatch)
North of Cape Mendocino									
California Halibut	115	0.9%	18,893	0.003	0.003	0.00	0.0%	0%	2,699
Dungenes Crab	13,725	0.0%	48,706,889	0.018	0.018	0.02	37.2%	37%	1,217,672
OA, SF, Nearshore	7	14.3%	8,507	0.101	0.101	0.12	0.0%	37%	38
OA, SF, Slope	216	6.9%	1,100,262	0.127	0.127	0.25	0.8%	38%	3,916
No landing wt or two species groups of equal wt	8	62.5%	2,671	0.129	0.129	0.38	0.0%	38%	9
Limited Entry Trawl, Yellowtail	10	60.0%	9,255	0.149	0.149	0.53	0.0%	38%	28
Limited Entry Trawl, Whiting	632	10.1%	4,824,800	0.216	0.216	0.74	3.7%	42%	10,136
Limited Entry Trawl, Midwater (Yellowtaill and Widow)	63	7.9%	601,804	0.042	0.216	0.96	0.5%	42%	1,264
Limited Entry Trawl, Slope Rockfish	19	31.6%	108,415	0.359	0.359	1.32	0.1%	42%	137
Limited Entry Fixed Gear, Other Groundfish, Slope	21	19.0%	35,190	0.408	0.408	1.73	0.0%	42%	39
Limited Entry Trawl, Other Rockfish	1	100.0%	2,233	0.435	0.435	2.16	0.0%	42%	2
Limited Entry Fixed Gear, Other Groundfish, Shelf	52	36.5%	225,343	0.890	0.890	3.05	0.2%	42%	115
Limited Entry Fixed Gear Sablefish, Slope	316	13.9%	2,068,272	0.953	0.953	4.00	1.6%	44%	984
Limited Entry Trawl, Lingcod	8	100.0%	3,899	1.016	1.016	5.02	0.0%	44%	2
Other Species	3,880	0.6%	7,786,606	1.153	1.153	6.17	5.9%	50%	3,064
Limited Entry Trawl, Leftover	158	48.1%	491,678	3.113	1.310	7.48	0.4%	50%	170
Open Access, Sablefish, Shelf	128	27.3%	311,694	1.650	1.650	9.13	0.2%	51%	86
Other Groundfish (plurality, but <50%)	336	28.0%	791,167	2.411	2.411	11.54	0.6%	51%	149
Limited Entry Fixed Gear Sablefish, Shelf	105	58.1%	905,116	2.898	2.898	14.44	0.7%	52%	142
Limited Entry Fixed Gear, Other Groundfish, Nearshor	185	53.0%	174,051	2.907	2.907	17.35	0.1%	52%	27
Pacific Halibut	379	19.3%	1,564,532	3.870	3.870	21.22	1.2%	53%	183
Salmon	8,390	3.2%	7,139,761	3.892	3.892	25.11	5.4%	59%	832
Open Access Trawl, Other, >50% Groundfish	135	50.4%	510,025	4.903	4.903	30.02	0.4%	59%	47
Pink Shrimp	1,963	12.3%	15,093,298	6.224	6.224	36.24	11.5%	71%	1,100
Limited Entry Trawl, Petrale Sole	229	38.4%	1,570,707	6.069	6.731	42.97	1.2%	72%	106
Limited Entry Trawl, DTS	1,020	19.6%	7,477,358	16.140	9.203	52.17	5.7%	77%	369
Limited Entry Trawl, Arrowtooth	184	55.4%	2,345,701	14.223	14.564	66.74	1.8%	79%	73
Open Access, Shelf	381	95.5%	96,087	18.248	18.248	84.99	0.1%	79%	2
Open Access, Nearshore	4,229	35.3%	1,501,444	25.193	25.193	110.18	1.1%	80%	27
Limited Entry Trawl, Flatfish	1,275	59.1%	4,975,044	42.286	67.423	177.60	3.8%	84%	33
Total All Northern Fisheriesb/	43,556		131,046,019	160.026	177.600				335

TABLE D-8. Catch and/or landed catch of lingcod and exvessel revenue by trip target type (2002).[a] (Page 2 of 2)

Primary Target for Trip	Trips	Percent of Primary Target Trips with Lingcod in Landing	Total Exvessel Revenue for All Species Landed	Lingcod Landed (MT)	Lingcod Landed or Estimated Catch (MT)	Cumulative Lingcod (MT)	Total Exvessel Revenue for Area: Percent of Total	Total Exvessel Revenue for Area: Cumulative Percent	Exvessel Revenue/Pounds (Landed & Bycatch)
South of Cape Mendocino									
Prawns	2,083	0.1%	3,990,047	0.005	0.005	0.01	4.5%	5%	332,504
Dungeness Crab	3,242	0.0%	7,482,080	0.007	0.007	0.01	8.5%	13%	498,805
CPS Plan Species	2,867	0.0%	7,157,169	0.008	0.008	0.02	8.1%	21%	397,621
Sea Cucumber	1,177	0.1%	790,470	0.010	0.010	0.03	0.9%	22%	35,930
Limited Entry Fixed Gear Sablefish, Slope	697	0.4%	614,030	0.012	0.012	0.04	0.7%	23%	23,617
Limited Entry Trawl, Leftover	3	33.3%	10,750	0.194	0.013	0.05	0.0%	23%	384
Open Access, Sablefish, Slope	281	0.7%	180,345	0.025	0.025	0.08	0.2%	23%	3,220
No landing wt or two species groups of equal wt	105	2.9%	692,760	0.027	0.027	0.11	0.8%	24%	11,742
Open Access, Slope	269	1.1%	185,765	0.029	0.029	0.14	0.2%	24%	2,903
Sea Urchins	9,720	0.1%	9,845,830	0.030	0.030	0.17	11.1%	35%	149,179
Limited Entry Fixed Gear Sablefish, Shelf	4	25.0%	3,909	0.030	0.030	0.20	0.0%	35%	58
Other Crustaceans	8,529	0.1%	6,400,611	0.044	0.044	0.24	7.2%	42%	65,312
Limited Entry Fixed Gear, Other Groundfish, Slope	756	0.3%	744,983	0.050	0.050	0.29	0.8%	43%	6,773
HMS Plan Species	1,968	0.5%	9,075,799	0.077	0.077	0.37	10.3%	53%	53,387
Other Species	3,600	0.2%	2,999,637	0.081	0.081	0.45	3.4%	57%	16,758
Gillnet Complex	2,770	0.6%	1,495,529	0.083	0.083	0.53	1.7%	58%	8,172
California Sheephead	389	2.8%	378,433	0.115	0.115	0.65	0.4%	59%	1,496
Limited Entry Trawl, Other Rockfish	28	10.7%	193,986	0.144	0.144	0.79	0.2%	59%	612
Limited Entry Trawl, Slope Rockfish	53	3.8%	250,821	0.204	0.204	0.99	0.3%	59%	557
Limited Entry Fixed Gear, Other Groundfish, Nearshore	56	19.6%	56,212	0.229	0.229	1.22	0.1%	59%	111
Open Access, Sablefish, Shelf	7	57.1%	3,628	0.337	0.337	1.56	0.0%	59%	5
Other Groundfish (plurality, but <50%)	196	6.6%	271,096	0.348	0.348	1.91	0.3%	60%	353
Salmon	8,129	0.6%	7,067,130	0.469	0.469	2.38	8.0%	68%	6,835
California Halibut	4,296	1.8%	1,795,391	0.791	0.791	3.17	2.0%	70%	1,030
Limited Entry Trawl, Lingcod	6	100.0%	3,680	0.818	0.818	3.99	0.0%	70%	2
Limited Entry Trawl, Petrale Sole	53	30.2%	287,972	1.562	0.904	4.89	0.3%	70%	144
Limited Entry Fixed Gear, Other Groundfish, Shelf	177	6.2%	69,150	1.393	1.393	6.28	0.1%	70%	23
Limited Entry Trawl, DTS	625	11.4%	4,279,277	6.056	1.428	7.71	4.8%	75%	1,359
Limited Entry Trawl, Chilipepper	54	44.4%	137,730	1.857	1.857	9.57	0.2%	75%	34
Limited Entry Trawl, Flatfish	369	15.7%	1,025,588	4.279	2.983	12.55	1.2%	76%	156
Open Access, Shelf	932	32.2%	250,959	9.829	9.829	22.38	0.3%	77%	12
Open Access, Nearshore	3,852	36.7%	1,762,533	15.545	15.545	37.93	2.0%	79%	51
Total All Southern Fisheries[b]	190,012		88,511,363	44.688	37.926				1,059

a/ See text for important caveats.

b/ Includes primary strategies not listed in the table.

TABLE D-9. Catch and/or landed catch of widow rockfish and exvessel revenue by trip target type (2002).[a/] (Page 1 of 1)

Primary Target for Trip	Trips	Percent of Primary Target Trips with Widow in Landing	Total Exvessel Revenue	Widow Landed (mt)	Widow Landed or Estimated Catch (mt)	Cumulative Widow (Mt)	Total Exvessel Revenue for Area: Percent of Total	Total Exvessel Revenue for Area: Cumulative Percent	Exves Rev/Lb Widow (Landed & Bycatch)
North of Mendocino									
Oth GF (plurality but <50%)	336	0.3%	791,167	0.001	0.001	0.001	0.6%	1%	395,584
OA, SF, Shelf	128	0.8%	311,694	0.001	0.001	0.002	0.2%	1%	103,898
LE Fxd Gr, Oth GF, Shelf	52	1.9%	225,343	0.002	0.002	0.004	0.2%	1%	56,336
LE Fxd Gr, Oth GF, Nearshore	185	0.5%	174,051	0.005	0.005	0.010	0.1%	1%	14,504
LE TWL, Lingcod	8	12.5%	3,899	0.005	0.005	0.015	0.0%	1%	325
LE Fxd Gr SF, Shelf	105	1.0%	905,116	0.015	0.015	0.030	0.7%	2%	26,621
Salmon	8,390	0.1%	7,139,761	0.021	0.021	0.052	5.4%	7%	151,910
LE TWL, Slope RF	19	10.5%	108,415	0.050	0.050	0.102	0.1%	7%	977
OA, Shelf	381	0.5%	96,087	0.057	0.057	0.159	0.1%	7%	769
Oth Species	3,880	0.1%	7,786,606	0.069	0.069	0.228	5.9%	13%	50,893
OA, Nearshore	4,229	0.2%	1,501,444	0.129	0.129	0.357	1.1%	15%	5,287
Pink Shrimp	1,963	1.3%	15,093,298	0.174	0.174	0.531	11.5%	26%	39,305
LE TWL, Petrale Sole	229	2.6%	1,570,707	0.574	1.208	1.740	1.2%	27%	590
LE TWL, Leftover	158	3.8%	491,678	0.011	1.493	3.233	0.4%	28%	149
LE TWL, Whiting	632	18.8%	4,824,800	5.318	5.318	8.551	3.7%	31%	411
LE TWL, DTS	1,020	3.1%	7,477,358	1.213	7.045	15.596	5.7%	37%	481
LE TWL, Flatfish	1,275	7.2%	4,975,044	2.285	8.187	23.783	3.8%	41%	276
OA TWL, Oth, >50% GF	135	29.6%	510,025	12.687	12.687	36.469	0.4%	41%	18
LE TWL, Arrowtooth	184	33.2%	2,345,701	18.777	18.991	55.461	1.8%	43%	56
LE TWL, Midwater	63	96.8%	601,804	223.765	223.765	279.225	0.5%	43%	1
Total All Northern Fisheries	43,556		131,046,019	265.162	279.225				213
South of Mendocino									
Gillnet Complex	2,767	0.0%	1,495,473	0.000	0.000	0.000	1.7%	2%	1,495,473
OA TWL, Oth, >50% GF	29	3.4%	29,406	0.001	0.001	0.001	0.0%	2%	14,703
LE Fxd Gr, Oth GF, Shelf	32	3.1%	29,006	0.010	0.010	0.012	0.0%	2%	1,261
LE TWL, Leftover	3	33.3%	10,750	0.133	0.100	0.112	0.0%	2%	49
California Halibut	4,326	0.1%	1,805,186	0.135	0.135	0.247	2.0%	4%	6,078
OA, Shelf	928	2.3%	250,132	0.268	0.268	0.514	0.3%	4%	424
LE TWL, Petrale Sole	53	5.7%	287,972	0.108	0.301	0.815	0.3%	4%	434
LE TWL, Slope RF	53	9.4%	250,821	0.426	0.426	1.241	0.3%	5%	267
LE TWL, Oth RF	28	14.3%	193,986	0.583	0.583	1.824	0.2%	5%	151
LE TWL, Midwater	2	100.0%	1,277	0.749	0.749	2.573	0.0%	5%	1
LE TWL, Chilipepper	54	33.3%	137,730	0.894	0.894	3.467	0.2%	5%	70
LE TWL, Widow	1	100.0%	3,728	1.264	1.264	4.731	0.0%	5%	1
LE TWL, DTS	625	6.2%	4,279,277	1.290	1.662	6.392	4.8%	10%	1,168
LE TWL, Flatfish	369	9.8%	1,025,588	1.093	3.307	9.699	1.2%	11%	141
Total All Southern Fisheries	61,427		88,511,363	6.953	9.699				4,139

a/ See text for important caveats and assumptions.

TABLE D-10. Catch and/or landed catch of bocaccio and exvessel revenue by trip target type (2002).[a/] (Page 1 of 1)

Primary Target for Trip	Trips	Percent of Primary Target Trips with Bocaccio in Landing	Total Exvessel Revenue	Bocaccio Landed (mt)	Bocaccio Landed or Estimated Catch (mt)	Cumulative Bocaccio (mt)	Total Exvessel Revenue for Area: Percent of Total	Total Exvessel Revenue for Area: Cumulative Percent	Exves Rev/Lb Bocaccio (Landed & Bycatch)
North of Mendocino									
Pink Shrimp	1,963	0.1%	15,093,298	0.004	0.004	0.004	11.5%	12%	1,886,662
LE TWL, Whiting	632	0.2%	4,824,800	0.004	0.004	0.007	3.7%	15%	603,100
LE TWL, DTS	1,020	0.1%	7,477,358	0.010	0.010	0.018	5.7%	21%	325,103
LE TWL, Slope RF	19	5.3%	108,415	0.029	0.029	0.046	0.1%	21%	1,721
LE TWL, Flatfish	1,275	0.9%	4,975,044	0.154	0.154	0.200	3.8%	25%	14,632
Total All Northern Fisheries	43,556		131,046,019	0.200	0.200				296,484
South of Mendocino									
Oth Crustaceans	8,526	0.0%	6,399,995	0.002	0.002	0.002	7.2%	7%	1,599,999
CPS Plan Species	2,969	0.0%	7,175,550	0.002	0.002	0.004	8.1%	15%	1,435,110
OA, Nearshore	3,838	0.1%	1,760,441	0.003	0.003	0.007	2.0%	17%	293,407
California Sheephead	387	0.3%	378,451	0.005	0.005	0.011	0.4%	18%	37,845
Gillnet Complex	2,767	0.1%	1,495,473	0.007	0.007	0.018	1.7%	19%	99,698
Salmon	8,117	0.0%	7,058,263	0.008	0.008	0.026	8.0%	27%	415,192
No landing wt or 2 equal wts	143	2.1%	701,249	0.014	0.014	0.040	0.8%	28%	22,621
Oth Species	3,651	0.1%	3,028,537	0.016	0.016	0.056	3.4%	32%	84,126
LE TWL, Leftover	3	66.7%	10,750	0.066	0.020	0.076	0.0%	32%	244
LE TWL, Slope RF	53	5.7%	250,821	0.023	0.023	0.099	0.3%	32%	4,918
Prawns	2,083	0.2%	3,990,047	0.025	0.025	0.124	4.5%	36%	72,546
OA, Slope	269	0.7%	185,765	0.027	0.027	0.151	0.2%	37%	3,149
California Halibut	4,326	0.0%	1,805,186	0.034	0.034	0.185	2.0%	39%	24,394
OA, SF, Slope	281	0.4%	180,345	0.041	0.041	0.226	0.2%	39%	1,982
LE Fxd Gr, Oth GF, Slope	746	0.3%	740,909	0.057	0.057	0.283	0.8%	40%	5,927
OA TWL, Oth, >50% GF	29	10.3%	29,406	0.065	0.065	0.348	0.0%	40%	204
LE TWL, Petrale Sole	53	13.2%	287,972	2.300	0.150	0.498	0.3%	40%	870
LE Fxd Gr, Oth GF, Shelf	32	31.3%	29,006	0.168	0.168	0.666	0.0%	40%	78
LE TWL, Lingcod	6	33.3%	3,680	0.310	0.310	0.976	0.0%	40%	5
Oth GF (plurality but <50%)	180	10.6%	170,145	0.388	0.388	1.364	0.2%	40%	199
LE TWL, Oth RF	28	17.9%	193,986	1.330	1.330	2.693	0.2%	41%	66
LE TWL, Chilipepper	54	35.2%	137,730	2.122	2.122	4.815	0.2%	41%	29
OA, Shelf	928	15.3%	250,132	2.609	2.609	7.424	0.3%	41%	43
LE TWL, DTS	625	11.7%	4,279,277	6.318	2.905	10.329	4.8%	46%	668
LE TWL, Flatfish	369	19.0%	1,025,588	4.777	18.255	28.584	1.2%	47%	25
Total All Southern Fisheries	61,427		88,511,363	20.715	28.584				1,405

a/ See text for important caveats and assumptions.

TABLE D-11. Catch and/or landed catch of cowcod and exvessel revenue by trip target type (2002).[a/] (Page 1 of 1)

Primary Target for Trip	Trips	Percent of Primary Target Trips with Cowcod in Landing	Total Exvessel Revenue	Cowcod Landed (mt)	Cowcod Landed or Estimated Catch (mt)	Cumulative Cowcod (mt)	Total Exvessel Revenue for Area: Percent of Total	Total Exvessel Revenue for Area: Cumulative Percent	Exves Rev/Lb Cowcod (Landed & Bycatch)
North of Mendocino									
Total All Northern Fisheries	43,556	0	131,046,019	0.000	0.000	0.000	-	-	-
South of Mendocino									
LE TWL, Chilipepper	54	1.9%	137,730	0.000	0.000	0.000	0.2%	0%	137,730
LE TWL, DTS	625	0.2%	4,279,277	0.009	0.009	0.009	4.8%	5%	225,225
LE Fxd Gr SF, Slope	695	0.1%	613,422	0.018	0.018	0.027	0.7%	6%	15,336
LE TWL, Flatfish	369	0.8%	1,025,588	0.024	0.024	0.051	1.2%	7%	19,351
Total All Southern Fisheries	61,427		88,511,363	0.051	0.051		100.0%		783,286

a/ See text for important caveats and assumptions.

TABLE D-12. Catch and/or landed catch of yelloweye rockfish and exvessel revenue by trip target type (2002).[a/] (Page 1 of 1)

Primary Target for Trip	Trips	Percent of Primary Target Trips with Yelloweye in Landing	Total Exvessel Revenue	Yelloweye Landed (mt)	Yelloweye Landed or Estimated Catch (mt)	Cumulative Yelloweye (mt)	Total Exvessel Revenue for Area: Percent of Total	Total Exvessel Revenue for Area: Cumulative Percent	Exves Rev/Lb Yelloweye (Landed & Bycatch)
North of Mendocino									
OA, Shelf	381	0.3%	96,087	0.000	0.000	0.000	0.1%	0%	96,087
OA, Nearshore	4,229	0.0%	1,501,444	0.002	0.002	0.002	1.1%	1%	375,361
LE Fxd Gr SF, Slope	316	0.6%	2,068,272	0.002	0.002	0.005	1.6%	3%	413,654
LE TWL, Arrowtooth	184	0.5%	2,345,701	0.005	0.005	0.009	1.8%	5%	234,570
Pink Shrimp	1,963	0.1%	15,093,298	0.005	0.005	0.015	11.5%	16%	1,257,775
OA, SF, Slope	216	0.5%	1,100,262	0.011	0.011	0.026	0.8%	17%	44,010
LE TWL, Petrale Sole	229	0.9%	1,570,707	0.027	0.027	0.053	1.2%	18%	26,178
LE TWL, DTS	1,020	1.3%	7,477,358	0.094	0.094	0.147	5.7%	24%	35,949
Pacific Halibut	379	0.5%	1,564,532	0.202	0.202	0.350	1.2%	25%	3,508
LE TWL, Flatfish	1,275	1.7%	4,975,044	0.215	0.215	0.565	3.8%	29%	10,474
Total All Northern Fisheries	43,556		131,046,019	0.565	0.565				105,173
South of Mendocino									
LE TWL, DTS	625	0.2%	4,279,277	0.002	0.002	0.002	4.8%	5%	1,069,819
LE TWL, Petrale Sole	53	1.9%	287,972	0.002	0.002	0.004	0.3%	5%	71,993
LE TWL, Slope RF	53	1.9%	250,821	0.009	0.009	0.013	0.3%	5%	12,541
LE TWL, Flatfish	369	0.8%	1,025,588	0.019	0.019	0.032	1.2%	7%	24,419
OA, Nearshore	3,838	0.1%	1,760,441	0.032	0.032	0.064	2.0%	9%	25,149
Total All Southern Fisheries	61,427		88,511,363	0.064	0.064				632,224

a/ See text for important caveats and assumptions.

TABLE D-13. Catch and/or landed catch of shoreside whiting and exvessel revenue by trip target type (2002).[a/] (Page 1 of 1)

Primary Target for Trip	Trips	Percent of Primary Target Trips with Shoreside Whiting in Landing	Total Exvessel Revenue	Shoreside Whiting Landed (mt)	Shoreside Whiting Landed or Estimated Catch (mt)	Cumulative Shoreside Whiting (mt)	Total Exvessel Revenue for Area: Percent of Total	Total Exvessel Revenue for Area: Cumulative Percent	Exves Rev/Lb Shoreside Whiting (Landed & Bycatch)
North of Mendocino									
LE TWL, Midwater	63	1.6%	601,804	0.086	0.086	0.086	0.5%	0%	3,184
LE TWL, Petrale Sole	229	0.4%	1,570,707	0.259	0.259	0.345	1.2%	2%	2,746
LE TWL, DTS	1,020	0.7%	7,477,358	3.577	3.577	3.923	5.7%	7%	948
LE TWL, Flatfish	1,275	1.2%	4,975,044	24.789	24.789	28.712	3.8%	11%	91
LE TWL, Leftover	158	3.8%	491,678	36.683	36.683	65.395	0.4%	12%	6
Oth Species	3,880	0.9%	7,786,606	182.932	182.932	248.327	5.9%	17%	19
LE TWL, Whiting	632	100.0%	4,824,800	45,458.931	45,458.931	45,707.257	3.7%	21%	0
Total	43,556		131,046,019	45,707.257	45,707.257				1

a/ See text for important caveats and assumptions.

Part E - Fishery Impacts of the Alternatives

This part contains three subsections:

All Fisheries

Under the alternatives developed by the team and Council it appears that the management options developed may result in overfished species impacts that exceed the OY for widow rockfish, canary rockfish, and darkblotched rockfish:

Alternative	Mt by Which the OYs Would Be Exceeded Under Initial Alternatives	
Low OY	Widow	23.7
	Canary	3.1
	Darkblotched	1.1
Medium OY	Widow	48.8
	Canary	6.0
High OY	Canary	17.0

Caveat: This summary was developed before impact estimates were available for the limited entry fixed gear and directed open access commercial fisheries, as well as other fisheries for which impacts are not provided in the Chapter 2 scorecards (Exhibit C.6, Attachment 1, Tables 2.2.2-1, 2.2.3-1 and 2.2.4-1). For the limited entry fixed gear and directed open access fisheries, 2003 impacts were used as a temporary proxy for 2004 fishery impacts. As impacts for these fisheries are incorporated into the analysis, the amounts by which OYs would be exceeded may decrease or increase.

The Council directed that consideration be given to reducing the whiting OY in order to eliminate any projected overage in the widow rockfish harvest. The degree to which the whiting OY would have to be reduced in order to keep widow rockfish impacts under the OY is provided in the "Whiting Trawl" section.

Nonwhiting Trawl

This section provides a suite of tables for the base alternatives (the low, medium, and high OY alternatives), and sensitivity analyses to show how effects vary with changes in the size of the trawl fleet or movement of the Rockfish Conservation Area (RCA) inside (shoreward) and/or outside (seaward) boundaries.

The tables on the base alternatives provided in this section are more convenient than those in Chapter 2 (Exhibit C.6, Attachment 1) for comparing key management parameters between the options and sensitivity analyses. They provide a finer level of detail on the calculation of target species impacts and the impacts on overfished species, and provide a summary of the economic effect for trawl vessels. The key management parameters in the tables consist of the RCA depth lines and the bimonthly trip limits for target species. The following is a summary of the tables provided for the base alternatives.

Table Numbers for Results for Main Alternatives	Low OY	Medium OY	High OY
Management Parameters	Table E-1	Table E-5	Table E-9
Projected Catch of Target Species	Table E-2	Table E-6	Table E-10
Projected Bycatch of Overfished Species (by bimonthly period)	Table E-3	Table E-7	Table E-11
Projected Changes in Trawl Vessel Revenue	Table E-4	Table E-8	Table E-12

Two scenarios were analyzed to assess the possible effects of implementing a fleet buyback program in 2004. The medium OY alternative was used as the base alternative and trawl fleet sizes were varied. The first scenario is based on a 33% reduction in the number of trawl vessels and the second on a 50% reduction in the number of trawl vessels. Results are in the following tables.

Table Numbers for Results	Medium OY	Medium OY with a 33% Reduction in the Trawl Fleet	Medium OY with a 50% Reduction in the Trawl Fleet
Management Parameters	Table E-5	Table E-13	Table E-17
Projected Catch of Target Species	Table E-6	Table E-14	Table E-18
Projected Bycatch of Overfished Species (by bimonthly period)	Table E-7	Table E-15	Table E-19
Projected Changes in Trawl Vessel Revenue	Table E-8	Table E-16	Table E-20

Additionally, different lines were considered for delimiting the boundaries of the RCA. The medium OY alternative was used as the base alternative, and management lines of the medium OY alternative were varied to create five scenarios for consideration. The following table summarizes the differences between the scenarios and provides references to the tables with the corresponding results.

RCA Boundary Scenarios

	Medium OY		Line Scenario 1		Line Scenario 2		Line Scenario 3		Line Scenario 4		Line Scenario 5	
	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
Fathom Lines												
North of 40°10'	75 & 60	150	50	nc	75	180	100	200	100	250	75	nc
South of 40°10'	100	150	50	nc	75	180	nc	200	nc	250	nc	nc
Table Numbers for Results												
Management Parameters	Table E-5		Table E-21		Table E-24		Table E-27		Table E-30		Table E-33	
Projected Catch of Target Species	Table E-6		Table E-22		Table E-25		Table E-28		Table E-31		Table E-34	
Projected Bycatch of Overfished Species (by bimonthly period)	Table E-7		Table E-23		Table E-26		Table E-29		Table E-32		Table E-35	

75 & 60 = 60 fathoms March-June and 75 fathoms the rest of the year.
nc = no change as compared to medium OY alternative.

For comparison purposes Tables E-36, E-37 and E-38 provide the corresponding management parameters, projected catches and bycatch estimates for the 2003 fishery. In 2003 the management lines were as follows:

Fathom lines for RCA boundaries in 2003

	Inside	Outside		Inside	Outside
	North of 40°10'			40°10' to 38°	
Jan-Apr	100	250	Jan-Feb	50	250
May-June	50	200	March-Apr	60	250
July-Aug	75	200	May-Dec	60	200
Sept-Dec	50	200		South of 38°	
			Same as 40°10' to 38° except for January through April the outside line was at 150 fm instead of 250 fm.		

Whiting Trawl

At its June meeting, the Council directed that if adjustments are needed reduce impacts on widow rockfish, reductions should be considered for the whiting fishery. The following are the initial whiting OYs and the reduced whiting harvest levels required to meet the widow rockfish constraint.

OYs	Low OY	Medium OY	High OY
		Mt	
Initial Whiting OYs	74,100	148,200	222,300
OYs Reduced for Widow Rockfish Constraint	60,200	120,200	222,300
Widow Rockfish OY	181	284	501

Note: The widow OY of 501 mt could potentially support a whiting OY of up to 241,700 mt.

The allocation of the reduction would be made in compliance with current whiting allocation formulas (Table E-39). Assuming a value of $0.045 per pound, exvessel value in the whiting fishery would be reduced by $1.4 million under the low OY alternative and $2.8 million under the medium OY alternative (Table E-39). The impacts on overfished species by sector at the original whiting OY levels and the reduced whiting OY levels are provided in Tables E-40 and E-41. The differences for species for which the OY would be exceeded are as follows.

Effect of Whiting Oy Adjustment on Overfished Species

	Low OY	Med OY	High OY
Metric Tons by Which Overfished Species OYs Are Exceeded, Using Initial Alternatives			
Widow	23.7	48.8	-
Canary	3.1	6.0	17.0
Darkblotched	1.1	-	-
Metric Tons by Which Overfished Species OYs Are Exceeded after the Whiting OY Has Been Adjusted for Widow Impacts			
Widow	-	-	-
Canary	2.6	5.0	17.0
Darkblotched	0.4	-	-

TABLE E-1.--Scenario: Low OY-1. Management parameters for the low OY scenario

Period	Shallow line (fm)	Deep line (fm)	Bi-monthly trip limits sablefish	longspine	shortspine	dover	arrowtooth	petrale	otr. flatfish
N. of 40°10'									
1	75	150	3,000	10,000	2,000	26,000	999,999	999,999	100,000
2	60	150	3,000	10,000	2,000	26,000	999,999	100,000	100,000
3	60	150	2,900	10,000	2,000	26,000	150,000	100,000	100,000
4	75	150	2,900	10,000	2,000	26,000	150,000	100,000	100,000
5	75	150	3,000	10,000	2,000	26,000	150,000	100,000	100,000
6	75	150	3,000	10,000	2,000	26,000	999,999	999,999	100,000
If small footrope used in period									
1	75	150	1,900	3,000	1,000	15,000	5,000	20,000	50,000
2	60	150	1,900	3,000	1,000	15,000	5,000	20,000	50,000
3	60	150	1,900	3,000	1,000	15,000	5,000	20,000	50,000
4	75	150	1,900	3,000	1,000	15,000	5,000	20,000	50,000
5	75	150	1,900	3,000	1,000	15,000	5,000	20,000	50,000
6	75	150	1,900	3,000	1,000	15,000	5,000	20,000	50,000
38°-40°10'									
1	75	150	3,000	10,000	2,000	26,000	999,999	999,999	100,000
2	75	150	3,000	10,000	2,000	26,000	10,000	20,000	100,000
3	100	150	2,900	10,000	2,000	26,000	10,000	20,000	100,000
4	100	150	2,900	10,000	2,000	26,000	10,000	20,000	100,000
5	75	150	3,000	10,000	2,000	26,000	10,000	20,000	100,000
6	75	150	3,000	10,000	2,000	26,000	999,999	999,999	100,000
S. of 38°									
1	75	150	3,000	10,000	2,000	26,000	999,999	999,999	100,000
2	75	150	3,000	10,000	2,000	26,000	10,000	20,000	100,000
3	100	150	2,900	10,000	2,000	26,000	10,000	20,000	100,000
4	100	150	2,900	10,000	2,000	26,000	10,000	20,000	100,000
5	75	150	3,000	10,000	2,000	26,000	10,000	20,000	100,000
6	75	150	3,000	10,000	2,000	26,000	999,999	999,999	100,000

Note: a trip limit of amount of 999,999 represents no limit on the amount of the species that may be landed during that period

TABLE E-2 .--Scenario: Low OY-1. Projected catch, landings, and discard of major target species.

	sablefish	longspine	shortspine	dover	arrowtooth	petrale	otr. flatfish
Total catch/mortality (mt)							
N. of 40°10'	1,671	1,225	631	5,008	2,496	1,571	2,611
38°-40°10'	309	288	190	1,334	24	425	1,299
S. of 38°	166	262	120	972	3	105	193
Coastwide	2,146	1,776	942	7,313	2,522	2,102	4,103
Retained catch (mt)							
N. of 40°10'	893	993	412	4,306	1,682	1,521	1,615
38°-40°10'	174	234	124	1,156	15	391	804
S. of 38°	114	212	78	840	2	102	120
Coastwide	1,181	1,439	614	6,302	1,699	2,014	2,539
Discard mortality (mt)							
N. of 40°10'	778	232	219	701	814	50	996
38°-40°10'	136	55	67	178	9	34	495
S. of 38°	51	50	42	132	1	4	73
Coastwide	965	337	328	1,011	823	88	1,564

TABLE E-3.--Scenario: Low OY-1. Projected total bycatch of rebuilding species.

	period	lingcod	canary	POP	darkblotched	widow	yelloweye	bocaccio	cowcod
N. of 40°10'									
	1	2.3	0.4	20.5	23.4	0.2	0.0	0.0	0.0
	2	3.5	0.4	22.1	25.3	0.2	0.0	0.0	0.0
	3	10.2	1.1	17.6	20.3	0.3	0.0	0.0	0.0
	4	18.1	3.9	21.6	24.1	0.4	0.2	0.0	0.0
	5	10.7	2.3	18.2	20.5	0.3	0.1	0.0	0.0
	6	2.4	0.5	12.1	13.7	0.1	0.0	0.0	0.0
	Total	47.2	8.7	112.0	127.4	1.5	0.3	0.0	0.0
S. of 40°10'									
	1	3.2	0.1	0.0	4.6	0.1	0.0	1.3	0.0
	2	3.7	0.1	0.0	4.4	0.1	0.0	1.6	0.0
	3	7.3	0.3	0.0	3.8	0.1	0.0	8.5	0.2
	4	7.7	0.2	0.1	5.1	0.1	0.0	7.9	0.2
	5	3.9	0.1	0.1	5.5	0.1	0.0	1.6	0.0
	6	3.2	0.1	0.1	5.7	0.1	0.0	1.1	0.0
	Total	29.0	0.9	0.3	29.0	0.4	0.1	21.9	0.6
Coastwide									
	1	5.5	0.5	20.5	28.0	0.3	0.0	1.3	0.0
	2	7.2	0.6	22.2	29.7	0.3	0.0	1.6	0.0
	3	17.5	1.3	17.6	24.1	0.4	0.0	8.5	0.2
	4	25.8	4.2	21.6	29.2	0.5	0.2	7.9	0.2
	5	14.6	2.4	18.2	26.0	0.3	0.1	1.6	0.0
	6	5.6	0.6	12.1	19.5	0.2	0.0	1.1	0.0
	Total	76.1	9.6	112.3	156.4	2.0	0.4	21.9	0.6

TABLE E-4.--Scenario: Low OY-1. Summary of changes in projected 2004 vessel groundfish revenue from 2002.

Fleet/ Avg. 2002 revenue / Direction of change	< 20% change in projected revenue					> 20% change in projected revenue					All vessels				
	# of ves.	Avg. 2002 GF ($)	Proj. 2004 GF ($)	Average change in GF revenue $	%	# of ves.	Avg. 2002 GF ($)	Proj. 2004 GF ($)	Average change in GF revenue $	%	# of ves.	Avg. 2002 GF ($)	Proj. 2004 GF ($)	Average change in GF revenue $	%
Non-whiting vessels															
$21 - $100,000															
Lower 2004 revenue	12	66,053	57,918	-8,135	-12%	19	58,889	35,746	-23,143	-42%	31	61,662	44,329	-17,333	-30%
Higher 2004 revenue	11	71,935	76,581	4,646	7%	19	36,323	63,684	27,361	138%	30	49,381	68,413	19,032	90%
Total	23	68,866	66,844	-2,022	-3%	38	47,606	49,715	2,109	48%	61	55,622	56,174	551	29%
> $100,000															
Lower 2004 revenue	36	144,819	128,334	-16,486	-11%	56	183,162	108,495	-74,667	-39%	92	168,158	116,258	-51,900	-28%
Higher 2004 revenue	8	140,549	151,254	10,705	8%	13	132,420	183,357	50,937	37%	21	135,516	171,127	35,611	26%
Total	44	144,043	132,501	-11,542	-8%	69	173,602	122,600	-51,002	-25%	113	162,092	126,455	-35,637	-18%
All															
Lower 2004 revenue	48	125,128	110,730	-14,398	-12%	75	151,680	90,066	-61,614	-40%	123	141,318	98,130	-43,188	-29%
Higher 2004 revenue	19	100,825	108,022	7,197	7%	32	75,362	112,301	36,939	97%	51	84,848	110,707	25,859	64%
Total	67	118,236	109,962	-8,274	-6%	107	128,856	96,716	-32,140	1%	174	124,767	101,816	-22,950	-2%
Whiting vessels															
$21 - $100,000															
Lower 2004 revenue	1	62,293	55,095	-7,198	-12%	2	87,212	34,896	-52,317	-60%	3	78,906	41,629	-37,277	-44%
Higher 2004 revenue						3	34,157	74,715	40,559	708%	3	34,157	74,715	40,559	708%
Total	1	62,293	55,095	-7,198	-12%	5	55,379	58,787	3,409	401%	6	56,531	58,172	1,641	332%
> $100,000															
Lower 2004 revenue	2	149,871	140,593	-9,278	-6%	25	250,559	132,363	-118,197	-46%	27	243,101	132,972	-110,129	-43%
Higher 2004 revenue															
Total	2	149,871	140,593	-9,278	-6%	25	250,559	132,363	-118,197	-46%	27	243,101	132,972	-110,129	-43%
All															
Lower 2004 revenue	3	120,678	112,094	-8,585	-8%	27	238,460	125,143	-113,317	-47%	30	226,682	123,838	-102,844	-43%
Higher 2004 revenue						3	34,157	74,715	40,559	708%	3	34,157	74,715	40,559	708%
Total	3	120,678	112,094	-8,585	-8%	30	218,029	120,100	-97,929	28%	33	209,179	119,372	-89,807	25%
All vessels															
$21 - $100,000															
Lower 2004 revenue	13	65,764	57,701	-8,063	-12%	21	61,587	35,665	-25,921	-43%	34	63,184	44,091	-19,093	-32%
Higher 2004 revenue	11	71,935	76,581	4,646	7%	22	36,028	65,189	29,161	216%	33	47,997	68,986	20,989	146%
Total	24	68,592	66,354	-2,238	-4%	43	48,510	50,770	2,260	89%	67	55,704	56,353	649	56%
> $100,000															
Lower 2004 revenue	38	145,085	128,979	-16,106	-11%	81	203,964	115,862	-88,102	-41%	119	185,162	120,051	-65,112	-32%
Higher 2004 revenue	8	140,549	151,254	10,705	8%	13	132,420	183,357	50,937	37%	21	135,516	171,127	35,611	26%
Total	46	144,296	132,853	-11,443	-8%	94	194,069	125,196	-68,873	-30%	140	177,715	127,712	-50,003	-23%
All															
Lower 2004 revenue	51	124,866	110,810	-14,056	-11%	102	174,651	99,351	-75,300	-42%	153	158,056	103,171	-54,885	-32%
Higher 2004 revenue	19	100,825	108,022	7,197	7%	35	71,830	109,080	37,249	149%	54	82,032	108,708	26,675	99%
Total	70	118,341	110,053	-8,287	-6%	137	148,383	101,836	-46,547	7%	207	138,224	104,615	-33,609	3%

TABLE E-5.--Scenario: Mid OY-1. Management parameters for the medium OY scenario.

Period	Shallow line (fm)	Deep line (fm)	Bi-monthly trip limits sablefish	longspine	shortspine	dover	arrowtooth	petrale	otr. flatfish
N. of 40°10'									
1	75	150	7,500	10,000	2,000	26,000	999,999	999,999	100,000
2	60	150	7,500	10,000	2,000	26,000	999,999	100,000	100,000
3	60	150	7,500	10,000	2,000	26,000	150,000	100,000	100,000
4	75	150	7,500	10,000	2,000	26,000	150,000	100,000	100,000
5	75	150	7,500	10,000	2,000	26,000	150,000	100,000	100,000
6	75	150	7,500	10,000	2,000	26,000	999,999	999,999	100,000
If small footrope used in period									
1	75	150	3,500	3,000	1,000	15,000	5,000	20,000	50,000
2	60	150	3,500	3,000	1,000	15,000	5,000	20,000	50,000
3	60	150	3,500	3,000	1,000	15,000	5,000	20,000	50,000
4	75	150	3,500	3,000	1,000	15,000	5,000	20,000	50,000
5	75	150	3,500	3,000	1,000	15,000	5,000	20,000	50,000
6	75	150	3,500	3,000	1,000	15,000	5,000	20,000	50,000
38°-40°10'									
1	100	150	7,500	10,000	2,000	26,000	999,999	999,999	100,000
2	100	150	7,500	10,000	2,000	26,000	10,000	20,000	100,000
3	100	150	7,500	10,000	2,000	26,000	10,000	20,000	100,000
4	100	150	7,500	10,000	2,000	26,000	10,000	20,000	100,000
5	100	150	7,500	10,000	2,000	26,000	10,000	20,000	100,000
6	100	150	7,500	10,000	2,000	26,000	999,999	999,999	100,000
S. of 38°									
1	100	150	7,500	10,000	2,000	26,000	999,999	999,999	100,000
2	100	150	7,500	10,000	2,000	26,000	10,000	20,000	100,000
3	100	150	7,500	10,000	2,000	26,000	10,000	20,000	100,000
4	100	150	7,500	10,000	2,000	26,000	10,000	20,000	100,000
5	100	150	7,500	10,000	2,000	26,000	10,000	20,000	100,000
6	100	150	7,500	10,000	2,000	26,000	999,999	999,999	100,000

Note: a trip limit of amount of 999,999 represents no limit on the amount of the species that may be landed during that period

TABLE E-6.--Scenario: Mid OY-1. Projected catch, landings, and discard of major target species.

	sablefish	longspine	shortspine	dover	arrowtooth	petrale	otr. flatfish
Total catch/mortality (mt)							
N. of 40°10'	2,636	1,225	631	5,008	2,496	1,571	2,611
38°-40°10'	502	288	191	1,336	24	489	1,384
S. of 38°	372	262	120	973	3	122	200
Coastwide	3,510	1,776	942	7,317	2,523	2,182	4,195
Retained catch (mt)							
N. of 40°10'	1,447	993	412	4,306	1,682	1,521	1,615
38°-40°10'	282	234	124	1,157	15	442	850
S. of 38°	250	212	78	841	2	115	123
Coastwide	1,979	1,439	615	6,304	1,699	2,077	2,589
Discard mortality (mt)							
N. of 40°10'	1,189	232	219	701	814	50	996
38°-40°10'	220	55	67	180	9	47	534
S. of 38°	122	50	42	132	1	8	76
Coastwide	1,531	337	328	1,013	824	105	1,607

TABLE E-7.--Scenario: Mid OY-1. Projected total bycatch of rebuilding species.

	period	lingcod	canary	POP	darkblotched	widow	yelloweye	bocaccio	cowcod
N. of 40°10'									
	1	2.4	0.4	21.2	24.2	0.2	0.0	0.0	0.0
	2	3.6	0.5	23.3	26.6	0.3	0.0	0.0	0.0
	3	10.4	1.1	18.6	21.4	0.4	0.0	0.0	0.0
	4	18.4	4.0	22.3	25.0	0.4	0.2	0.0	0.0
	5	11.0	2.4	19.6	22.1	0.3	0.1	0.0	0.0
	6	2.5	0.5	12.7	14.4	0.1	0.0	0.0	0.0
	Total	48.3	8.9	117.7	133.8	1.6	0.3	0.0	0.0
S. of 40°10'									
	1	6.3	0.2	0.0	4.7	0.1	0.0	7.6	0.2
	2	7.4	0.3	0.1	4.6	0.1	0.0	9.0	0.2
	3	7.6	0.3	0.1	4.0	0.1	0.0	8.7	0.2
	4	8.1	0.2	0.1	5.4	0.1	0.0	8.0	0.2
	5	6.7	0.2	0.1	5.9	0.1	0.0	7.1	0.2
	6	5.2	0.2	0.1	6.0	0.1	0.0	5.0	0.1
	Total	41.4	1.4	0.3	30.7	0.5	0.1	45.4	1.2
Coastwide									
	1	8.7	0.7	21.3	28.9	0.3	0.0	7.6	0.2
	2	11.1	0.7	23.3	31.3	0.3	0.0	9.0	0.2
	3	18.1	1.4	18.6	25.5	0.4	0.0	8.7	0.2
	4	26.5	4.3	22.4	30.4	0.5	0.2	8.0	0.2
	5	17.7	2.6	19.7	28.0	0.4	0.1	7.1	0.2
	6	7.6	0.7	12.7	20.4	0.2	0.0	5.0	0.1
	Total	89.7	10.3	118.0	164.5	2.1	0.5	45.4	1.2

TABLE E-8.--Scenario: Mid OY-1. Summary of changes in projected 2004 vessel groundfish revenue from 2002.

Fleet/ Avg. 2002 revenue / Direction of change	< 20% change in projected revenue					> 20% change in projected revenue					All vessels				
	# of ves.	Avg. 2002 GF ($)	Proj. 2004 GF ($)	Average change in GF revenue		# of ves.	Avg. 2002 GF ($)	Proj. 2004 GF ($)	Average change in GF revenue		# of ves.	Avg. 2002 GF ($)	Proj. 2004 GF ($)	Average change in GF revenue	
				$	%				$	%				$	%
Non-whiting vessels															
$21 - $100,000															
Lower 2004 revenue	11	70,380	62,690	-7,691	-11%	16	52,006	30,767	-21,239	-42%	27	59,492	43,773	-15,719	-30%
Higher 2004 revenue	10	74,324	82,441	8,117	10%	24	43,477	74,193	30,716	133%	34	52,549	76,619	24,069	97%
Total	21	72,258	72,095	-163	-1%	40	46,888	56,822	9,934	63%	61	55,622	62,080	6,458	41%
> $100,000															
Lower 2004 revenue	38	145,218	131,587	-13,631	-9%	41	194,645	115,527	-79,119	-40%	79	170,870	123,252	-47,618	-25%
Higher 2004 revenue	15	147,832	160,193	12,361	9%	19	136,852	199,565	62,713	46%	34	141,696	182,195	40,499	30%
	53	145,958	139,683	-6,275	-4%	60	176,344	142,139	-34,205	-12%	113	162,092	140,987	-21,105	-8%
All															
Lower 2004 revenue	49	128,418	116,120	-12,297	-10%	57	154,606	91,734	-62,872	-40%	106	142,500	103,007	-39,493	-26%
Higher 2004 revenue	25	118,429	129,092	10,663	9%	43	84,736	129,590	44,854	95%	68	97,123	129,407	32,284	63%
Total	74	125,043	120,503	-4,540	-3%	100	124,562	108,012	-16,550	18%	174	124,767	113,324	-11,442	9%
Whiting vessels															
$21 - $100,000															
Lower 2004 revenue	1	89,276	71,442	-17,834	-20%	1	85,149	36,683	-48,466	-57%	2	87,212	54,062	-33,150	-38%
Higher 2004 revenue						4	41,191	105,806	64,616	1056%	4	41,191	105,806	64,616	1056%
Total	1	89,276	71,442	-17,834	-20%	5	49,982	91,982	41,999	833%	6	56,531	88,558	32,027	691%
> $100,000															
Lower 2004 revenue	7	231,903	209,816	-22,087	-10%	7	287,879	174,739	-113,140	-40%	14	259,891	192,277	-67,614	-25%
Higher 2004 revenue	10	228,835	247,607	18,772	9%	3	212,304	287,569	75,264	36%	13	225,020	256,829	31,809	15%
Total	17	230,098	232,046	1,948	1%	10	265,206	208,588	-56,619	-17%	27	243,101	223,358	-19,743	-5%
All															
Lower 2004 revenue	8	214,074	192,519	-21,556	-11%	8	262,537	157,482	-105,056	-42%	16	238,306	175,000	-63,306	-26%
Higher 2004 revenue	10	228,835	247,607	18,772	9%	7	114,525	183,704	69,179	619%	17	181,766	221,294	39,528	260%
Total	18	222,275	223,123	849	0%	15	193,465	169,719	-23,746	267%	33	209,179	198,849	-10,331	121%
All vessels															
$21 - $100,000															
Lower 2004 revenue	12	71,955	63,419	-8,536	-12%	17	53,955	31,115	-22,840	-43%	29	61,403	44,482	-16,921	-30%
Higher 2004 revenue	10	74,324	82,441	8,117	10%	28	43,150	78,709	35,559	265%	38	51,354	79,691	28,337	198%
Total	22	73,032	72,065	-966	-2%	45	47,232	60,729	13,497	149%	67	55,704	64,451	8,748	99%
> $100,000															
Lower 2004 revenue	45	158,702	143,756	-14,946	-9%	48	208,242	124,162	-84,080	-40%	93	184,271	133,643	-50,628	-25%
Higher 2004 revenue	25	180,233	195,159	14,925	9%	22	147,141	211,566	64,425	45%	47	164,743	202,839	38,095	26%
Total	70	166,392	162,114	-4,278	-3%	70	189,039	151,632	-37,407	-13%	140	177,715	156,873	-20,843	-8%
All															
Lower 2004 revenue	57	140,440	126,843	-13,597	-10%	65	167,890	99,826	-68,064	-40%	122	155,065	112,449	-42,616	-26%
Higher 2004 revenue	35	149,973	162,954	12,980	9%	50	88,906	137,166	48,260	168%	85	114,052	147,784	33,733	103%
Total	92	144,067	140,581	-3,486	-3%	115	133,549	116,061	-17,488	50%	207	138,224	126,959	-11,265	27%

TABLE E-9.--Scenario: High OY-1. Management parameters for the high OY scenario

Period	Shallow line (fm)	Deep line (fm)	Bi-monthly trip limits						
			sablefish	longspine	shortspine	dover	arrowtooth	petrale	otr. flatfish
N. of 40°10'									
1	75	150	8,200	10,000	2,000	26,000	999,999	999,999	100,000
2	60	150	8,200	10,000	2,000	26,000	999,999	100,000	100,000
3	60	150	8,200	10,000	2,000	26,000	150,000	100,000	100,000
4	75	150	8,200	10,000	2,000	26,000	150,000	100,000	100,000
5	75	150	8,200	10,000	2,000	26,000	150,000	100,000	100,000
6	75	150	8,200	10,000	2,000	26,000	999,999	999,999	100,000
If small footrope used in period									
1	75	150	4,000	3,000	1,000	15,000	5,000	20,000	50,000
2	60	150	4,000	3,000	1,000	15,000	5,000	20,000	50,000
3	60	150	4,000	3,000	1,000	15,000	5,000	20,000	50,000
4	75	150	4,000	3,000	1,000	15,000	5,000	20,000	50,000
5	75	150	4,000	3,000	1,000	15,000	5,000	20,000	50,000
6	75	150	4,000	3,000	1,000	15,000	5,000	20,000	50,000
38°-40°10'									
1	100	150	8,200	10,000	2,000	26,000	999,999	999,999	100,000
2	100	150	8,200	10,000	2,000	26,000	10,000	20,000	100,000
3	100	150	8,200	10,000	2,000	26,000	10,000	20,000	100,000
4	100	150	8,200	10,000	2,000	26,000	10,000	20,000	100,000
5	100	150	8,200	10,000	2,000	26,000	10,000	20,000	100,000
6	100	150	8,200	10,000	2,000	26,000	999,999	999,999	100,000
S. of 38°									
1	100	150	8,200	10,000	2,000	26,000	999,999	999,999	100,000
2	100	150	8,200	10,000	2,000	26,000	10,000	20,000	100,000
3	100	150	8,200	10,000	2,000	26,000	10,000	20,000	100,000
4	100	150	8,200	10,000	2,000	26,000	10,000	20,000	100,000
5	100	150	8,200	10,000	2,000	26,000	10,000	20,000	100,000
6	100	150	8,200	10,000	2,000	26,000	999,999	999,999	100,000

Note: a trip limit of amount of 999,999 represents no limit on the amount of the species that may be landed during that period

TABLE E-10.--Scenario: High OY-1. Projected catch, landings, and discard of major target species.

	sablefish	longspine	shortspine	dover	arrowtooth	petrale	otr. flatfish
Total catch/mortality (mt)							
N. of 40°10'	2,849	1,225	631	5,008	2,496	1,571	2,611
38°-40°10'	543	288	191	1,336	24	489	1,384
S. of 38°	403	262	120	973	3	122	200
Coastwide	3,795	1,776	942	7,317	2,523	2,182	4,195
Retained catch (mt)							
N. of 40°10'	1,561	993	412	4,306	1,682	1,521	1,615
38°-40°10'	305	234	124	1,157	15	442	850
S. of 38°	271	212	78	841	2	115	123
Coastwide	2,136	1,439	615	6,304	1,699	2,077	2,589
Discard mortality (mt)							
N. of 40°10'	1,288	232	219	701	814	50	996
38°-40°10'	238	55	67	180	9	47	534
S. of 38°	132	50	42	132	1	8	76
Coastwide	1,659	337	328	1,013	824	105	1,607

TABLE E-11.--Scenario: High OY-1. Projected total bycatch of rebuilding species.

	period	lingcod	canary	POP	darkblotched	widow	yelloweye	bocaccio	cowcod
N. of 40°10'									
	1	2.4	0.5	21.4	24.4	0.2	0.0	0.0	0.0
	2	3.7	0.5	23.5	26.9	0.3	0.0	0.0	0.0
	3	10.5	1.1	18.7	21.6	0.4	0.0	0.0	0.0
	4	18.5	4.0	22.4	25.1	0.4	0.2	0.0	0.0
	5	11.1	2.4	19.9	22.4	0.3	0.1	0.0	0.0
	6	2.5	0.5	12.8	14.6	0.1	0.0	0.0	0.0
	Total	48.6	9.0	118.8	135.1	1.6	0.3	0.0	0.0
S. of 40°10'									
	1	6.3	0.2	0.0	4.7	0.1	0.0	7.6	0.2
	2	7.5	0.3	0.1	4.7	0.1	0.0	9.0	0.2
	3	7.7	0.3	0.1	4.1	0.1	0.0	8.7	0.2
	4	8.1	0.2	0.1	5.4	0.1	0.0	8.0	0.2
	5	6.8	0.2	0.1	6.0	0.1	0.0	7.1	0.2
	6	5.2	0.2	0.1	6.1	0.1	0.0	5.1	0.1
	Total	41.7	1.4	0.3	31.0	0.5	0.1	45.5	1.2
Coastwide									
	1	8.7	0.7	21.4	29.2	0.3	0.0	7.6	0.2
	2	11.2	0.7	23.6	31.6	0.3	0.0	9.0	0.2
	3	18.2	1.4	18.8	25.7	0.4	0.0	8.7	0.2
	4	26.7	4.3	22.5	30.5	0.5	0.2	8.0	0.2
	5	17.9	2.6	20.0	28.4	0.4	0.1	7.1	0.2
	6	7.7	0.7	12.9	20.7	0.2	0.0	5.1	0.1
	Total	90.2	10.4	119.1	166.1	2.1	0.5	45.5	1.2

TABLE E-12.--Scenario: High OY-1. Summary of changes in projected 2004 vessel groundfish revenue from 2002.

Fleet/ Avg. 2002 revenue / Direction of change	< 20% change in projected revenue					> 20% change in projected revenue						All vessels					
	# of ves.	Avg. 2002 GF ($)	Proj. 2004 GF ($)	Average change in GF revenue $	Average change in GF revenue %	# of ves.	Avg. 2002 GF ($)	Proj. 2004 GF ($)	Average change in GF revenue $	Average change in GF revenue %	# of ves.	Avg. 2002 GF ($)	Proj. 2004 GF ($)	Average change in GF revenue $	Average change in GF revenue %
Non-whiting vessels															
$21 - $100,000															
Lower 2004 revenue	11	68,003	60,226	-7,777	-12%	15	51,149	29,764	-21,385	-43%	26	58,279	42,652	-15,628	-30%
Higher 2004 revenue	10	75,624	83,943	8,319	10%	25	44,858	76,136	31,278	132%	35	53,648	78,367	24,718	97%
Total	21	71,632	71,520	-112	-1%	40	47,217	58,747	11,529	66%	61	55,622	63,144	7,522	43%
> $100,000															
Lower 2004 revenue	30	147,628	133,286	-14,343	-10%	41	194,645	117,457	-77,189	-38%	71	174,779	124,145	-50,634	-26%
Higher 2004 revenue	21	143,977	152,375	8,398	6%	21	137,314	199,342	62,028	45%	42	140,645	175,859	35,213	26%
Total	51	146,125	141,146	-4,979	-3%	62	175,227	145,192	-30,035	-10%	113	162,092	143,366	-18,726	-7%
All															
Lower 2004 revenue	41	126,265	113,684	-12,581	-10%	56	156,209	93,968	-62,241	-40%	97	143,552	102,301	-41,251	-27%
Higher 2004 revenue	31	121,928	130,300	8,373	7%	46	87,066	132,382	45,316	92%	77	101,101	131,544	30,443	58%
Total	72	124,398	120,838	-3,559	-3%	102	125,027	111,292	-13,735	20%	174	124,767	115,242	-9,524	11%
Whiting vessels															
$21 - $100,000															
Lower 2004 revenue						1	85,149	41,491	-43,658	-51%	1	85,149	41,491	-43,658	-51%
Higher 2004 revenue						5	50,808	134,447	83,640	1313%	5	50,808	134,447	83,640	1313%
Total						6	56,531	118,955	62,423	1085%	6	56,531	118,955	62,423	1085%
> $100,000															
Lower 2004 revenue	2	396,210	362,324	-33,886	-9%	3	229,081	142,573	-86,508	-37%	5	295,932	230,473	-65,459	-26%
Higher 2004 revenue	6	239,973	266,267	26,294	12%	16	227,764	359,594	131,830	59%	22	231,094	334,141	103,047	46%
Total	8	279,032	290,281	11,249	7%	19	227,972	325,328	97,355	44%	27	243,101	314,943	71,842	33%
All															
Lower 2004 revenue	2	396,210	362,324	-33,886	-9%	4	193,098	117,303	-75,795	-41%	6	260,802	198,976	-61,825	-30%
Higher 2004 revenue	6	239,973	266,267	26,294	12%	21	185,632	305,988	120,356	358%	27	197,708	297,161	99,453	281%
Total	8	279,032	290,281	11,249	7%	25	186,826	275,798	88,972	294%	33	209,179	279,309	70,130	224%
All vessels															
$21 - $100,000															
Lower 2004 revenue	11	68,003	60,226	-7,777	-12%	16	53,274	30,497	-22,777	-43%	27	59,275	42,609	-16,666	-31%
Higher 2004 revenue	10	75,624	83,943	8,319	10%	30	45,850	85,854	40,005	329%	40	53,293	85,377	32,083	249%
Total	21	71,632	71,520	-112	-1%	46	48,432	66,600	18,168	199%	67	55,704	68,142	12,438	136%
> $100,000															
Lower 2004 revenue	32	163,165	147,600	-15,564	-9%	44	196,993	119,169	-77,824	-38%	76	182,750	131,140	-51,609	-26%
Higher 2004 revenue	27	165,309	177,684	12,375	7%	37	176,428	268,640	92,213	51%	64	171,737	230,268	58,531	33%
Total	59	164,146	161,368	-2,778	-2%	81	187,599	187,446	-153	3%	140	177,715	176,456	-1,259	1%
All															
Lower 2004 revenue	43	138,821	125,249	-13,572	-10%	60	158,668	95,523	-63,145	-40%	103	150,382	107,933	-42,449	-27%
Higher 2004 revenue	37	141,070	152,349	11,279	8%	67	117,960	186,796	68,836	176%	104	126,182	174,541	48,359	116%
Total	80	139,861	137,783	-2,079	-2%	127	137,192	143,675	6,483	74%	207	138,224	141,398	3,174	45%

TABLE E-13.--Scenario: Mid OY-50% fleet reduction. Management parameters for the medium OY scenario

Period	Shallow line (fm)	Deep line (fm)	Bi-monthly trip limits						
			sablefish	longspine	shortspine	dover	arrowtooth	petrale	otr. flatfish
N. of 40°10'									
1	75	150	7,800	10,000	2,000	26,000	999,999	999,999	100,000
2	75	150	7,800	10,000	2,000	26,000	999,999	100,000	100,000
3	75	150	17,300	25,000	5,000	60,000	150,000	100,000	100,000
4	75	150	18,000	25,000	5,000	60,000	150,000	100,000	100,000
5	75	150	18,000	25,000	5,000	60,000	150,000	100,000	100,000
6	75	150	18,000	25,000	5,000	60,000	999,999	999,999	100,000
If small footrope used in period									
1	75	150	4,000	3,000	1,000	15,000	5,000	20,000	50,000
2	75	150	4,000	3,000	1,000	15,000	5,000	20,000	50,000
3	75	150	8,000	5,000	2,500	45,000	10,000	40,000	80,000
4	75	150	8,000	5,000	2,500	45,000	10,000	40,000	80,000
5	75	150	8,000	5,000	2,500	45,000	10,000	40,000	80,000
6	75	150	8,000	5,000	2,500	45,000	10,000	40,000	80,000
38°-40°10'									
1	100	150	7,800	10,000	2,000	26,000	999,999	999,999	100,000
2	100	150	7,800	10,000	2,000	26,000	10,000	20,000	100,000
3	100	150	18,000	25,000	5,000	60,000	10,000	40,000	100,000
4	100	150	18,000	25,000	5,000	60,000	10,000	40,000	100,000
5	100	150	18,000	25,000	5,000	60,000	10,000	40,000	100,000
6	100	150	18,000	25,000	5,000	60,000	999,999	999,999	100,000
S. of 38°									
1	100	150	7,800	10,000	2,000	26,000	999,999	999,999	100,000
2	100	150	7,800	10,000	2,000	26,000	10,000	20,000	100,000
3	100	150	18,000	25,000	5,000	60,000	10,000	40,000	100,000
4	100	150	18,000	25,000	5,000	60,000	10,000	40,000	100,000
5	100	150	18,000	25,000	5,000	60,000	10,000	40,000	100,000
6	100	150	18,000	25,000	5,000	60,000	999,999	999,999	100,000

Note: these results reflect one possible, randomly chosen 50% reduction in fleet size. For the purposes of illustrating the general range of impacts that might be associated with fleet reduction, no attempt has been made to predict which vessels/permits would remain in the fishery.

TABLE E-14.--Scenario: Mid OY-50% fleet reduction. Projected catch, landings, and discard of major target species.

	sablefish	longspine	shortspine	dover	arrowtooth	petrale	otr. flatfish
Total catch/mortality (mt)							
N. of 40°10'	2,504	1,120	577	4,425	1,156	930	1,440
38°-40°10'	501	317	194	1,306	18	239	730
S. of 38°	486	374	166	1,295	2	104	128
Coastwide	3,492	1,812	938	7,026	1,176	1,273	2,298
Retained catch (mt)							
N. of 40°10'	1,337	907	377	3,779	816	897	896
38°-40°10'	282	257	126	1,131	12	213	448
S. of 38°	332	303	108	1,118	1	98	79
Coastwide	1,950	1,467	611	6,028	829	1,207	1,423
Discard mortality (mt)							
N. of 40°10'	1,168	213	201	646	340	33	544
38°-40°10'	220	60	68	175	6	26	282
S. of 38°	154	71	58	177	1	7	49
Coastwide	1,542	344	327	998	347	66	875

TABLE E-15.--Scenario: Mid OY-50% fleet reduction. Projected total bycatch of rebuilding species.

	period	lingcod	canary	POP	darkblotched	widow	yelloweye	bocaccio	cowcod
N. of 40°10'									
	1	1.4	0.3	10.5	12.0	0.1	0.0	0.0	0.0
	2	2.9	0.6	11.6	13.2	0.1	0.0	0.0	0.0
	3	11.0	2.4	19.2	21.6	0.3	0.1	0.0	0.0
	4	12.3	2.7	17.8	20.0	0.3	0.1	0.0	0.0
	5	8.1	1.7	17.2	19.5	0.2	0.1	0.0	0.0
	6	2.6	0.5	12.2	13.9	0.1	0.0	0.0	0.0
	Total	38.4	8.2	88.5	100.2	1.1	0.3	0.0	0.0
S. of 40°10'									
	1	3.3	0.1	0.0	2.2	0.0	0.0	3.6	0.1
	2	4.1	0.1	0.0	2.3	0.0	0.0	4.8	0.1
	3	8.5	0.2	0.1	5.2	0.1	0.0	7.5	0.2
	4	7.9	0.2	0.1	6.0	0.1	0.0	5.7	0.2
	5	7.1	0.2	0.1	6.7	0.1	0.0	5.6	0.2
	6	4.7	0.1	0.1	4.7	0.1	0.0	3.5	0.1
	Total	35.6	0.9	0.3	27.0	0.4	0.1	30.7	0.9
Coastwide									
	1	4.8	0.4	10.5	14.1	0.1	0.0	3.6	0.1
	2	7.1	0.8	11.6	15.5	0.2	0.0	4.8	0.1
	3	19.5	2.6	19.3	26.8	0.4	0.1	7.5	0.2
	4	20.2	2.8	17.9	26.0	0.4	0.1	5.7	0.2
	5	15.2	1.9	17.3	26.1	0.3	0.1	5.6	0.2
	6	7.3	0.7	12.3	18.7	0.2	0.0	3.5	0.1
	Total	74.0	9.2	88.9	127.2	1.6	0.4	30.7	0.9

TABLE E-16.--Scenario: Mid OY-50% fleet reduction. Summary of changes in projected 2004 vessel groundfish revenue from 2002.

Fleet/ Avg. 2002 revenue / Direction of change	< 20% change in projected revenue					> 20% change in projected revenue					All vessels				
	# of ves.	Avg. 2002 GF ($)	Proj. 2004 GF ($)	Average change in GF revenue		# of ves.	Avg. 2002 GF ($)	Proj. 2004 GF ($)	Average change in GF revenue		# of ves.	Avg. 2002 GF ($)	Proj. 2004 GF ($)	Average change in GF revenue	
				$	%				$	%				$	%
Non-whiting vessels															
$21 - $100,000															
Lower 2004 revenue	4	30,721	25,131	-5,590	-15%	4	39,519	28,372	-11,147	-30%	8	35,120	26,751	-8,368	-22%
Higher 2004 revenue	2	68,811	79,592	10,781	16%	19	65,267	135,037	69,770	119%	21	65,604	129,757	64,152	109%
Total	6	43,418	43,285	-133	-4%	23	60,789	116,487	55,698	93%	29	57,195	101,341	44,147	73%
> $100,000															
Lower 2004 revenue	5	178,369	159,128	-19,241	-11%	5	246,394	142,910	-103,484	-47%	10	212,382	151,019	-61,362	-29%
Higher 2004 revenue	5	127,915	142,708	14,794	11%	45	145,907	241,835	95,928	69%	50	144,108	231,923	87,815	63%
Total	10	153,142	150,918	-2,224	0%	50	155,956	231,943	75,987	57%	60	155,487	218,439	62,952	48%
All															
Lower 2004 revenue	9	112,748	99,574	-13,174	-13%	9	154,450	92,004	-62,445	-40%	18	133,599	95,789	-37,809	-26%
Higher 2004 revenue	7	111,028	124,675	13,647	13%	64	121,967	210,130	88,163	84%	71	120,889	201,704	80,816	77%
Total	16	111,995	110,556	-1,439	-2%	73	125,972	195,566	69,594	68%	89	123,459	180,283	56,824	56%
Whiting vessels															
$21 - $100,000															
Lower 2004 revenue															
Higher 2004 revenue						2	24,876	184,982	160,106	3775%	2	24,876	184,982	160,106	3775%
Total						2	24,876	184,982	160,106	3775%	2	24,876	184,982	160,106	3775%
> $100,000															
Lower 2004 revenue	1	177,739	163,064	-14,674	-8%	1	283,156	182,656	-100,499	-35%	2	230,447	172,860	-57,587	-22%
Higher 2004 revenue	2	303,064	348,444	45,380	14%	11	251,872	448,385	196,513	85%	13	259,748	433,009	173,261	74%
Total	3	261,289	286,651	25,362	7%	12	254,479	426,241	171,762	75%	15	255,841	398,323	142,482	61%
All															
Lower 2004 revenue	1	177,739	163,064	-14,674	-8%	1	283,156	182,656	-100,499	-35%	2	230,447	172,860	-57,587	-22%
Higher 2004 revenue	2	303,064	348,444	45,380	14%	13	216,950	407,861	190,912	652%	15	228,432	399,939	171,507	567%
Total	3	261,289	286,651	25,362	7%	14	221,679	391,775	170,096	603%	17	228,669	373,224	144,555	498%
All vessels															
$21 - $100,000															
Lower 2004 revenue	4	30,721	25,131	-5,590	-15%	4	39,519	28,372	-11,147	-30%	8	35,120	26,751	-8,368	-22%
Higher 2004 revenue	2	68,811	79,592	10,781	16%	21	61,420	139,794	78,374	467%	23	62,063	134,559	72,496	428%
Total	6	43,418	43,285	-133	-4%	25	57,916	121,966	64,050	388%	31	55,110	106,738	51,628	312%
> $100,000															
Lower 2004 revenue	6	178,264	159,784	-18,480	-11%	6	252,521	149,535	-102,987	-45%	12	215,393	154,659	-60,733	-28%
Higher 2004 revenue	7	177,957	201,490	23,533	12%	56	166,722	282,408	115,686	72%	63	167,970	273,417	105,447	65%
Total	13	178,099	182,241	4,142	2%	62	175,025	269,549	94,524	61%	75	175,558	254,416	78,858	50%
All															
Lower 2004 revenue	10	119,247	105,923	-13,324	-12%	10	167,320	101,069	-66,251	-39%	20	143,283	103,496	-39,787	-26%
Higher 2004 revenue	9	153,703	174,402	20,699	13%	77	138,003	243,513	105,510	180%	86	139,646	236,280	96,634	162%
Total	19	135,568	138,360	2,792	0%	87	141,373	227,140	85,767	155%	106	140,332	211,227	70,894	127%

TABLE E-17.--Scenario: Mid OY-33% fleet reduction. Management parameters for the medium OY scenario.

Period	Shallow line (fm)	Deep line (fm)	Bi-monthly trip limits sablefish	longspine	shortspine	dover	arrowtooth	petrale	otr. flatfish
N. of 40°10'									
1	75	150	7,800	10,000	2,000	26,000	999,999	999,999	100,000
2	75	150	7,800	10,000	2,000	26,000	999,999	100,000	100,000
3	75	150	12,300	17,000	3,500	47,000	150,000	100,000	100,000
4	75	150	12,300	17,000	3,500	46,000	150,000	100,000	100,000
5	75	150	12,300	17,000	3,500	46,000	150,000	100,000	100,000
6	75	150	12,300	17,000	3,500	47,000	999,999	999,999	100,000
If small footrope used in period									
1	75	150	4,000	3,000	1,000	15,000	5,000	20,000	50,000
2	75	150	4,000	3,000	1,000	15,000	5,000	20,000	50,000
3	75	150	5,500	5,000	2,000	25,000	8,000	25,000	59,000
4	75	150	5,500	5,000	2,000	25,000	8,000	25,000	59,000
5	75	150	5,500	5,000	2,000	25,000	8,000	25,000	60,000
6	75	150	5,500	5,000	2,000	25,000	8,000	25,000	60,000
38°-40°10'									
1	100	150	7,800	10,000	2,000	26,000	999,999	999,999	100,000
2	100	150	7,800	10,000	2,000	26,000	10,000	20,000	100,000
3	100	150	12,300	17,000	3,500	47,000	10,000	40,000	100,000
4	100	150	12,300	17,000	3,500	46,000	10,000	40,000	100,000
5	100	150	12,300	17,000	3,500	46,000	10,000	40,000	100,000
6	100	150	12,300	17,000	3,500	47,000	999,999	999,999	100,000
S. of 38°									
1	100	150	7,800	10,000	2,000	26,000	999,999	999,999	100,000
2	100	150	7,800	10,000	2,000	26,000	10,000	20,000	100,000
3	100	150	12,300	17,000	3,500	47,000	10,000	40,000	100,000
4	100	150	12,300	17,000	3,500	46,000	10,000	40,000	100,000
5	100	150	12,300	17,000	3,500	46,000	10,000	40,000	100,000
6	100	150	12,500	20,000	4,000	47,000	999,999	999,999	100,000

Note: these results reflect one possible, randomly chosen 33% reduction in fleet size. For the purposes of illustrating the general range of impacts that might be associated with fleet reduction, no attempt has been made to predict which vessels/permits would remain in the fishery.

TABLE E-18.--Scenario: Mid OY-33% fleet reduction. Projected catch, landings, and discard of major target species.

	sablefish	longspine	shortspine	dover	arrowtooth	petrale	otr. flatfish
Total catch/mortality (mt)							
N. of 40°10'	2,585	1,132	597	4,757	1,506	1,154	1,808
38°-40°10'	498	289	186	1,396	22	297	880
S. of 38°	417	316	150	1,210	3	110	150
Coastwide	3,501	1,738	933	7,363	1,530	1,561	2,838
Retained catch (mt)							
N. of 40°10'	1,327	920	391	4,059	1,052	1,111	1,125
38°-40°10'	284	235	121	1,209	14	263	540
S. of 38°	286	256	97	1,045	2	102	92
Coastwide	1,897	1,410	609	6,313	1,067	1,476	1,757
Discard mortality (mt)							
N. of 40°10'	1,259	212	206	698	454	43	683
38°-40°10'	213	55	65	187	8	34	340
S. of 38°	131	60	52	165	1	8	57
Coastwide	1,603	327	324	1,050	462	84	1,080

TABLE E-19.--Scenario: Mid OY-33% fleet reduction. Projected total bycatch of rebuilding species.

	period	lingcod	canary	POP	darkblotched	widow	yelloweye	bocaccio	cowcod
N. of 40°10'									
	1	1.7	0.3	12.7	14.5	0.1	0.0	0.0	0.0
	2	4.3	0.9	14.9	17.0	0.2	0.0	0.0	0.0
	3	13.6	2.9	20.9	23.6	0.3	0.1	0.0	0.0
	4	15.4	3.4	18.8	21.0	0.3	0.1	0.0	0.0
	5	10.3	2.2	17.8	20.0	0.3	0.1	0.0	0.0
	6	2.6	0.5	12.0	13.7	0.1	0.0	0.0	0.0
	Total	47.9	10.3	97.2	109.9	1.3	0.4	0.0	0.0
S. of 40°10'									
	1	3.9	0.1	0.0	2.8	0.0	0.0	4.3	0.1
	2	5.0	0.2	0.0	2.9	0.1	0.0	6.0	0.2
	3	7.9	0.2	0.1	4.9	0.1	0.0	7.7	0.2
	4	8.2	0.2	0.1	6.1	0.1	0.0	6.3	0.2
	5	6.8	0.2	0.1	6.7	0.1	0.0	6.1	0.2
	6	4.7	0.1	0.1	5.0	0.1	0.0	4.0	0.1
	Total	36.5	1.1	0.3	28.4	0.4	0.1	34.3	0.9
Coastwide									
	1	5.6	0.5	12.8	17.3	0.2	0.0	4.3	0.1
	2	9.4	1.1	15.0	19.9	0.2	0.1	6.0	0.2
	3	21.5	3.2	21.0	28.5	0.4	0.1	7.7	0.2
	4	23.6	3.5	18.9	27.1	0.4	0.1	6.3	0.2
	5	17.0	2.4	17.8	26.7	0.3	0.1	6.1	0.2
	6	7.3	0.7	12.1	18.7	0.2	0.0	4.0	0.1
	Total	84.4	11.4	97.6	138.2	1.8	0.5	34.3	0.9

TABLE E-20.--Scenario: Mid OY-33% fleet reduction. Summary of changes in projected 2004 vessel groundfish revenue from 2002.

Fleet/ Avg. 2002 revenue / Direction of change	< 20% change in projected revenue					> 20% change in projected revenue					All vessels				
	# of ves.	Avg. 2002 GF ($)	Proj. 2004 GF ($)	Average change in GF revenue		# of ves.	Avg. 2002 GF ($)	Proj. 2004 GF ($)	Average change in GF revenue		# of ves.	Avg. 2002 GF ($)	Proj. 2004 GF ($)	Average change in GF revenue	
				$	%				$	%				$	%
Non-whiting vessels															
$21 - $100,000															
Lower 2004 revenue	5	44,319	38,944	-5,375	-9%	8	42,845	28,111	-14,734	-35%	13	43,412	32,277	-11,134	-25%
Higher 2004 revenue	3	77,692	83,316	5,624	7%	23	59,880	109,807	49,927	119%	26	61,935	106,750	44,815	106%
Total	8	56,833	55,583	-1,250	-3%	31	55,484	88,724	33,241	79%	39	55,760	81,926	26,166	62%
> $100,000															
Lower 2004 revenue	8	150,151	133,756	-16,395	-10%	12	202,928	122,669	-80,259	-42%	20	181,817	127,104	-54,713	-29%
Higher 2004 revenue	18	153,075	166,429	13,354	9%	39	140,384	208,457	68,072	51%	57	144,392	195,185	50,793	37%
Total	26	152,175	156,376	4,201	3%	51	155,101	188,271	33,171	29%	77	154,113	177,501	23,389	20%
All															
Lower 2004 revenue	13	109,446	97,290	-12,157	-10%	20	138,895	84,846	-54,049	-39%	33	127,294	89,748	-37,546	-28%
Higher 2004 revenue	21	142,306	154,556	12,250	8%	62	110,520	171,861	61,341	76%	83	118,562	167,482	48,920	59%
Total	34	129,742	132,660	2,918	1%	82	117,441	150,638	33,197	48%	116	121,046	145,368	24,322	34%
Whiting vessels															
$21 - $100,000															
Lower 2004 revenue						1	85,149	62,438	-22,711	-27%	1	85,149	62,438	-22,711	-27%
Higher 2004 revenue						3	37,348	134,156	96,808	1864%	3	37,348	134,156	96,808	1864%
Total						4	49,298	116,226	66,928	1391%	4	49,298	116,226	66,928	1391%
> $100,000															
Lower 2004 revenue	5	294,211	264,194	-30,017	-11%	3	271,947	178,269	-93,677	-35%	8	285,862	231,972	-53,890	-20%
Higher 2004 revenue	4	236,265	274,300	38,035	15%	9	228,715	355,037	126,322	56%	13	231,038	330,195	99,156	44%
Total	9	268,457	268,686	228	1%	12	239,523	310,845	71,322	33%	21	251,923	292,777	40,853	20%
All															
Lower 2004 revenue	5	294,211	264,194	-30,017	-11%	4	225,247	149,312	-75,936	-33%	9	263,560	213,135	-50,425	-20%
Higher 2004 revenue	4	236,265	274,300	38,035	15%	12	180,873	299,817	118,943	508%	16	194,721	293,437	98,716	385%
Total	9	268,457	268,686	228	1%	16	191,967	262,190	70,223	373%	25	219,503	264,529	45,025	239%
All vessels															
$21 - $100,000															
Lower 2004 revenue	5	44,319	38,944	-5,375	-9%	9	47,545	31,925	-15,620	-34%	14	46,393	34,432	-11,961	-25%
Higher 2004 revenue	3	77,692	83,316	5,624	7%	26	57,280	112,616	55,337	320%	29	59,391	109,585	50,194	288%
Total	8	56,833	55,583	-1,250	-3%	35	54,777	91,867	37,091	229%	43	55,159	85,117	29,957	186%
> $100,000															
Lower 2004 revenue	13	205,559	183,924	-21,634	-10%	15	216,732	133,789	-82,943	-40%	28	211,544	157,066	-54,478	-26%
Higher 2004 revenue	22	168,200	186,042	17,842	10%	48	156,946	235,940	78,994	52%	70	160,483	220,258	59,775	39%
Total	35	182,076	185,255	3,179	2%	63	171,181	211,619	40,438	30%	98	175,072	202,203	27,131	20%
All															
Lower 2004 revenue	18	160,770	143,652	-17,118	-10%	24	153,287	95,590	-57,697	-38%	42	156,494	116,188	-40,306	-26%
Higher 2004 revenue	25	157,339	173,715	16,375	10%	74	121,928	192,610	70,682	146%	99	130,871	187,839	56,968	112%
Total	43	158,775	161,130	2,355	1%	98	129,608	168,850	39,242	101%	141	138,503	166,496	27,993	71%

TABLE E-21.--Scenario: Mid OY-Sensitivity test to management line changes 1, management parameters.

Period	Shallow line (fm)	Deep line (fm)	Bi-monthly trip limits						
			sablefish	longspine	shortspine	dover	arrowtooth	petrale	otr. flatfish
N. of 40°10'									
1	50	150	7,500	10,000	2,000	26,000	999,999	999,999	100,000
2	50	150	7,500	10,000	2,000	26,000	999,999	100,000	100,000
3	50	150	7,500	10,000	2,000	26,000	150,000	100,000	100,000
4	50	150	7,500	10,000	2,000	26,000	150,000	100,000	100,000
5	50	150	7,500	10,000	2,000	26,000	150,000	100,000	100,000
6	50	150	7,500	10,000	2,000	26,000	999,999	999,999	100,000
If small footrope used in period									
1	50	150	3,500	3,000	1,000	15,000	5,000	20,000	50,000
2	50	150	3,500	3,000	1,000	15,000	5,000	20,000	50,000
3	50	150	3,500	3,000	1,000	15,000	5,000	20,000	50,000
4	50	150	3,500	3,000	1,000	15,000	5,000	20,000	50,000
5	50	150	3,500	3,000	1,000	15,000	5,000	20,000	50,000
6	50	150	3,500	3,000	1,000	15,000	5,000	20,000	50,000
38°-40°10'									
1	50	150	7,500	10,000	2,000	26,000	999,999	999,999	100,000
2	50	150	7,500	10,000	2,000	26,000	10,000	20,000	100,000
3	50	150	7,500	10,000	2,000	26,000	10,000	20,000	100,000
4	50	150	7,500	10,000	2,000	26,000	10,000	20,000	100,000
5	50	150	7,500	10,000	2,000	26,000	10,000	20,000	100,000
6	50	150	7,500	10,000	2,000	26,000	999,999	999,999	100,000
S. of 38°									
1	50	150	7,500	10,000	2,000	26,000	999,999	999,999	100,000
2	50	150	7,500	10,000	2,000	26,000	10,000	20,000	100,000
3	50	150	7,500	10,000	2,000	26,000	10,000	20,000	100,000
4	50	150	7,500	10,000	2,000	26,000	10,000	20,000	100,000
5	50	150	7,500	10,000	2,000	26,000	10,000	20,000	100,000
6	50	150	7,500	10,000	2,000	26,000	999,999	999,999	100,000

Note: This is on of several examples intended to illustrate the effects of implementing the same trip limits as in the base mid-OY scenario in conjunction with alternate depth specifications for the shallow and deep management lines. The trip limits shown in this table should not be interpreted as the limits that would achieve bycatch and target species catch objectives, given this set of management lines.

TABLE E-22.--Scenario: Mid OY-Sensitivity test to line changes 1. Projected catch, landings, and discard of major target species.

	sablefish	longspine	shortspine	dover	arrowtooth	petrale	otr. flatfish
Total catch/mortality (mt)							
N. of 40°10'	2,284	1,229	629	4,543	2,205	1,157	2,297
38°-40°10'	406	288	190	1,329	17	296	1,085
S. of 38°	352	262	120	966	2	98	182
Coastwide	3,042	1,780	940	6,838	2,224	1,551	3,564
Retained catch (mt)							
N. of 40°10'	1,387	995	410	3,929	1,343	1,138	1,421
38°-40°10'	268	233	124	1,153	12	289	665
S. of 38°	249	212	78	839	2	97	113
Coastwide	1,904	1,441	612	5,921	1,356	1,524	2,198
Discard mortality (mt)							
N. of 40°10'	897	234	219	614	862	19	876
38°-40°10'	137	55	67	176	5	7	420
S. of 38°	103	50	42	128	1	1	70
Coastwide	1,137	339	327	918	868	27	1,366

TABLE E-23.--Scenario: Mid OY-Sensitivity test to line changes 1. Projected total bycatch of rebuilding species.

	period	lingcod	canary	POP	darkblotched	widow	yelloweye	bocaccio	cowcod
N. of 40°10'									
	1	1.7	0.2	21.1	24.2	0.2	0.0	0.0	0.0
	2	2.4	0.3	23.0	26.3	0.2	0.0	0.0	0.0
	3	5.1	0.4	17.9	20.4	0.2	0.0	0.0	0.0
	4	5.5	0.4	15.4	17.6	0.1	0.0	0.0	0.0
	5	3.1	0.3	16.5	18.8	0.2	0.0	0.0	0.0
	6	1.3	0.2	12.0	13.7	0.1	0.0	0.0	0.0
	Total	19.1	1.8	105.9	121.0	1.0	0.1	0.0	0.0
S. of 40°10'									
	1	3.2	0.2	0.1	4.9	0.3	0.2	2.5	0.0
	2	3.8	0.2	0.1	4.7	0.4	0.3	3.2	0.0
	3	4.5	0.3	0.1	4.0	0.4	0.4	4.1	0.0
	4	5.2	0.2	0.1	5.5	0.3	0.3	3.5	0.1
	5	4.0	0.2	0.1	6.0	0.3	0.2	2.8	0.0
	6	3.3	0.2	0.1	6.1	0.2	0.2	2.1	0.0
	Total	23.9	1.4	0.4	31.3	2.0	1.6	18.3	0.2
Coastwide									
	1	4.8	0.4	21.2	29.1	0.5	0.2	2.5	0.0
	2	6.2	0.5	23.1	31.0	0.6	0.3	3.2	0.0
	3	9.7	0.7	17.9	24.4	0.6	0.4	4.1	0.0
	4	10.7	0.7	15.5	23.0	0.5	0.3	3.5	0.1
	5	7.1	0.5	16.6	24.9	0.5	0.2	2.8	0.0
	6	4.6	0.3	12.1	19.9	0.3	0.2	2.1	0.0
	Total	43.1	3.2	106.3	152.3	3.0	1.7	18.3	0.2

TABLE E-24.--Scenario: Mid OY-Sensitivity test to management line changes 2, management parameters.

Period	Shallow line (fm)	Deep line (fm)	Bi-monthly trip limits sablefish	longspine	shortspine	dover	arrowtooth	petrale	otr. flatfish
N. of 40°10'									
1	75	180	7,500	10,000	2,000	26,000	999,999	999,999	100,000
2	75	180	7,500	10,000	2,000	26,000	999,999	100,000	100,000
3	75	180	7,500	10,000	2,000	26,000	150,000	100,000	100,000
4	75	180	7,500	10,000	2,000	26,000	150,000	100,000	100,000
5	75	180	7,500	10,000	2,000	26,000	150,000	100,000	100,000
6	75	180	7,500	10,000	2,000	26,000	999,999	999,999	100,000
If small footrope used in period									
1	75	180	3,500	3,000	1,000	15,000	5,000	20,000	50,000
2	75	180	3,500	3,000	1,000	15,000	5,000	20,000	50,000
3	75	180	3,500	3,000	1,000	15,000	5,000	20,000	50,000
4	75	180	3,500	3,000	1,000	15,000	5,000	20,000	50,000
5	75	180	3,500	3,000	1,000	15,000	5,000	20,000	50,000
6	75	180	3,500	3,000	1,000	15,000	5,000	20,000	50,000
38°-40°10'									
1	75	180	7,500	10,000	2,000	26,000	999,999	999,999	100,000
2	75	180	7,500	10,000	2,000	26,000	10,000	20,000	100,000
3	75	180	7,500	10,000	2,000	26,000	10,000	20,000	100,000
4	75	180	7,500	10,000	2,000	26,000	10,000	20,000	100,000
5	75	180	7,500	10,000	2,000	26,000	10,000	20,000	100,000
6	75	180	7,500	10,000	2,000	26,000	999,999	999,999	100,000
S. of 38°									
1	75	180	7,500	10,000	2,000	26,000	999,999	999,999	100,000
2	75	180	7,500	10,000	2,000	26,000	10,000	20,000	100,000
3	75	180	7,500	10,000	2,000	26,000	10,000	20,000	100,000
4	75	180	7,500	10,000	2,000	26,000	10,000	20,000	100,000
5	75	180	7,500	10,000	2,000	26,000	10,000	20,000	100,000
6	75	180	7,500	10,000	2,000	26,000	999,999	999,999	100,000

Note: This is on of several examples intended to illustrate the effects of implementing the same trip limits as in the base mid-OY scenario in conjunction with alternate depth specifications for the shallow and deep management lines. The trip limits shown in this table should not be interpreted as the limits that would achieve bycatch and target species catch objectives, given this set of management lines.

TABLE E-25.--Scenario: Mid OY-Sensitivity test to line changes 2. Projected catch, landings, and discard of major target species.

	sablefish	longspine	shortspine	dover	arrowtooth	petrale	otr. flatfish
Total catch/mortality (mt)							
N. of 40°10'	2,573	1,219	611	4,964	2,460	1,605	2,706
38°-40°10'	444	287	185	1,301	14	362	1,245
S. of 38°	342	262	119	952	3	95	187
Coastwide	3,359	1,768	915	7,218	2,477	2,062	4,139
Retained catch (mt)							
N. of 40°10'	1,420	989	403	4,260	1,632	1,541	1,645
38°-40°10'	264	233	122	1,130	9	331	768
S. of 38°	248	212	78	828	2	92	114
Coastwide	1,932	1,434	603	6,218	1,642	1,965	2,527
Discard mortality (mt)							
N. of 40°10'	1,153	229	207	705	828	63	1,061
38°-40°10'	180	54	63	171	6	31	478
S. of 38°	93	50	41	124	1	3	73
Coastwide	1,427	333	312	1,000	835	97	1,612

TABLE E-26.--Scenario: Mid OY-Sensitivity test to line changes 2. Projected total bycatch of rebuilding species.

	period	lingcod	canary	POP	darkblotched	widow	yelloweye	bocaccio	cowcod
N. of 40°10'									
	1	1.9	0.2	13.2	17.6	0.1	0.0	0.0	0.0
	2	5.1	0.9	15.7	20.7	0.1	0.0	0.0	0.0
	3	16.0	3.4	14.5	18.6	0.2	0.1	0.0	0.0
	4	18.8	4.1	14.4	18.4	0.3	0.2	0.0	0.0
	5	11.3	2.4	12.5	16.1	0.2	0.1	0.0	0.0
	6	2.2	0.4	8.2	10.9	0.1	0.0	0.0	0.0
	Total	55.4	11.4	78.6	102.4	1.0	0.4	0.0	0.0
S. of 40°10'									
	1	3.3	0.1	0.0	3.5	0.0	0.0	1.3	0.0
	2	4.0	0.1	0.0	3.5	0.0	0.0	1.6	0.0
	3	4.5	0.1	0.0	2.9	0.0	0.0	1.9	0.0
	4	5.4	0.1	0.0	4.0	0.0	0.0	2.0	0.0
	5	4.3	0.1	0.0	4.2	0.0	0.0	1.7	0.0
	6	3.3	0.0	0.0	4.3	0.0	0.0	1.2	0.0
	Total	24.9	0.4	0.0	22.3	0.2	0.1	9.7	0.1
Coastwide									
	1	5.2	0.3	13.2	21.1	0.1	0.0	1.3	0.0
	2	9.2	1.0	15.7	24.2	0.2	0.1	1.6	0.0
	3	20.5	3.5	14.5	21.5	0.3	0.1	1.9	0.0
	4	24.2	4.2	14.4	22.4	0.3	0.2	2.0	0.0
	5	15.6	2.5	12.5	20.4	0.2	0.1	1.7	0.0
	6	5.5	0.4	8.2	15.2	0.1	0.0	1.2	0.0
	Total	80.3	11.9	78.6	124.7	1.2	0.5	9.7	0.1

TABLE E-27.--Scenario: Mid OY-Sensitivity test to management line changes 3, management parameters.

Period	Shallow line (fm)	Deep line (fm)	Bi-monthly trip limits						
			sablefish	longspine	shortspine	dover	arrowtooth	petrale	otr. flatfish
N. of 40°10'									
1	100	200	7,500	10,000	2,000	26,000	999,999	999,999	100,000
2	100	200	7,500	10,000	2,000	26,000	999,999	100,000	100,000
3	100	200	7,500	10,000	2,000	26,000	150,000	100,000	100,000
4	100	200	7,500	10,000	2,000	26,000	150,000	100,000	100,000
5	100	200	7,500	10,000	2,000	26,000	150,000	100,000	100,000
6	100	200	7,500	10,000	2,000	26,000	999,999	999,999	100,000
If small footrope used in period									
1	100	200	3,500	3,000	1,000	15,000	5,000	20,000	50,000
2	100	200	3,500	3,000	1,000	15,000	5,000	20,000	50,000
3	100	200	3,500	3,000	1,000	15,000	5,000	20,000	50,000
4	100	200	3,500	3,000	1,000	15,000	5,000	20,000	50,000
5	100	200	3,500	3,000	1,000	15,000	5,000	20,000	50,000
6	100	200	3,500	3,000	1,000	15,000	5,000	20,000	50,000
38°-40°10'									
1	100	200	7,500	10,000	2,000	26,000	999,999	999,999	100,000
2	100	200	7,500	10,000	2,000	26,000	10,000	20,000	100,000
3	100	200	7,500	10,000	2,000	26,000	10,000	20,000	100,000
4	100	200	7,500	10,000	2,000	26,000	10,000	20,000	100,000
5	100	200	7,500	10,000	2,000	26,000	10,000	20,000	100,000
6	100	200	7,500	10,000	2,000	26,000	999,999	999,999	100,000
S. of 38°									
1	100	200	7,500	10,000	2,000	26,000	999,999	999,999	100,000
2	100	200	7,500	10,000	2,000	26,000	10,000	20,000	100,000
3	100	200	7,500	10,000	2,000	26,000	10,000	20,000	100,000
4	100	200	7,500	10,000	2,000	26,000	10,000	20,000	100,000
5	100	200	7,500	10,000	2,000	26,000	10,000	20,000	100,000
6	100	200	7,500	10,000	2,000	26,000	999,999	999,999	100,000

Note: This is one of several examples intended to illustrate the effects of implementing the same trip limits as in the base mid-OY scenario in conjunction with alternate depth specifications for the shallow and deep management lines. The trip limits shown in this table should not be interpreted as the limits that would achieve bycatch and target species catch objectives, given this set of management lines.

TABLE E-28.--Scenario: Mid OY-Sensitivity test to line changes 3. Projected catch, landings, and discard of major target species.

	sablefish	longspine	shortspine	dover	arrowtooth	petrale	otr. flatfish
Total catch/mortality (mt)							
N. of 40°10'	2,659	1,206	604	5,201	2,292	1,514	2,940
38°-40°10'	480	287	184	1,274	20	417	1,344
S. of 38°	347	260	116	938	3	108	200
Coastwide	3,486	1,752	905	7,413	2,315	2,039	4,484
Retained catch (mt)							
N. of 40°10'	1,460	983	404	4,408	1,600	1,423	1,742
38°-40°10'	271	233	123	1,113	12	364	813
S. of 38°	246	211	78	818	2	99	119
Coastwide	1,978	1,427	604	6,340	1,613	1,887	2,674
Discard mortality (mt)							
N. of 40°10'	1,199	222	201	793	692	91	1,198
38°-40°10'	209	54	61	161	9	52	531
S. of 38°	101	49	39	119	1	8	81
Coastwide	1,509	326	301	1,073	702	152	1,810

TABLE E-29.--Scenario: Mid OY-Sensitivity test to line changes 3. Projected total bycatch of rebuilding species.

	period	lingcod	canary	POP	darkblotched	widow	yelloweye	bocaccio	cowcod
N. of 40°10'									
	1	1.9	0.4	9.4	8.9	0.1	0.0	0.0	0.0
	2	10.0	2.4	13.2	12.5	0.2	0.1	0.0	0.0
	3	31.5	7.4	13.2	12.7	0.5	0.2	0.0	0.0
	4	35.8	8.4	13.5	13.0	0.5	0.3	0.0	0.0
	5	24.6	5.8	11.9	11.3	0.4	0.2	0.0	0.0
	6	3.2	0.8	6.7	6.3	0.1	0.0	0.0	0.0
	Total	106.9	25.1	67.9	64.8	1.7	0.8	0.0	0.0
S. of 40°10'									
	1	4.6	0.2	0.0	1.8	0.0	0.0	7.6	0.2
	2	4.9	0.2	0.0	2.0	0.0	0.0	8.3	0.2
	3	4.8	0.2	0.0	1.6	0.0	0.0	7.9	0.2
	4	4.2	0.2	0.0	2.2	0.0	0.0	7.0	0.2
	5	3.9	0.2	0.0	2.4	0.0	0.0	6.6	0.2
	6	3.1	0.2	0.0	2.0	0.0	0.0	5.2	0.1
	Total	25.5	1.3	0.0	12.0	0.2	0.1	42.6	1.0
Coastwide									
	1	6.5	0.7	9.4	10.7	0.1	0.0	7.6	0.2
	2	14.9	2.6	13.2	14.5	0.2	0.1	8.3	0.2
	3	36.2	7.6	13.2	14.3	0.5	0.3	7.9	0.2
	4	40.0	8.6	13.5	15.2	0.6	0.3	7.0	0.2
	5	28.5	6.0	11.9	13.7	0.4	0.2	6.6	0.2
	6	6.3	0.9	6.7	8.4	0.1	0.0	5.2	0.1
	Total	132.4	26.4	67.9	76.8	2.0	0.9	42.6	1.0

TABLE E-30.--Scenario: Mid OY-Sensitivity test to management line changes 4, management parameters.

Period	Shallow line (fm)	Deep line (fm)	Bi-monthly trip limits sablefish	longspine	shortspine	dover	arrowtooth	petrale	otr. flatfish
N. of 40°10'									
1	100	250	7,500	10,000	2,000	26,000	999,999	999,999	100,000
2	100	250	7,500	10,000	2,000	26,000	999,999	100,000	100,000
3	100	250	7,500	10,000	2,000	26,000	150,000	100,000	100,000
4	100	250	7,500	10,000	2,000	26,000	150,000	100,000	100,000
5	100	250	7,500	10,000	2,000	26,000	150,000	100,000	100,000
6	100	250	7,500	10,000	2,000	26,000	999,999	999,999	100,000
If small footrope used in period									
1	100	250	3,500	3,000	1,000	15,000	5,000	20,000	50,000
2	100	250	3,500	3,000	1,000	15,000	5,000	20,000	50,000
3	100	250	3,500	3,000	1,000	15,000	5,000	20,000	50,000
4	100	250	3,500	3,000	1,000	15,000	5,000	20,000	50,000
5	100	250	3,500	3,000	1,000	15,000	5,000	20,000	50,000
6	100	250	3,500	3,000	1,000	15,000	5,000	20,000	50,000
38°-40°10'									
1	100	250	7,500	10,000	2,000	26,000	999,999	999,999	100,000
2	100	250	7,500	10,000	2,000	26,000	10,000	20,000	100,000
3	100	250	7,500	10,000	2,000	26,000	10,000	20,000	100,000
4	100	250	7,500	10,000	2,000	26,000	10,000	20,000	100,000
5	100	250	7,500	10,000	2,000	26,000	10,000	20,000	100,000
6	100	250	7,500	10,000	2,000	26,000	999,999	999,999	100,000
S. of 38°									
1	100	250	7,500	10,000	2,000	26,000	999,999	999,999	100,000
2	100	250	7,500	10,000	2,000	26,000	10,000	20,000	100,000
3	100	250	7,500	10,000	2,000	26,000	10,000	20,000	100,000
4	100	250	7,500	10,000	2,000	26,000	10,000	20,000	100,000
5	100	250	7,500	10,000	2,000	26,000	10,000	20,000	100,000
6	100	250	7,500	10,000	2,000	26,000	999,999	999,999	100,000

Note: This is one of several examples intended to illustrate the effects of implementing the same trip limits as in the base mid-OY scenario in conjunction with alternate depth specifications for the shallow and deep management lines. The trip limits shown in this table should not be interpreted as the limits that would achieve bycatch and target species catch objectives, given this set of management lines.

TABLE E-31.--Scenario: Mid OY-Sensitivity test to line changes 4. Projected catch, landings, and discard of major target species.

	sablefish	longspine	shortspine	dover	arrowtooth	petrale	otr. flatfish
Total catch/mortality (mt)							
N. of 40°10'	2,493	1,197	566	4,947	1,986	1,340	3,328
38°-40°10'	448	281	174	1,211	19	355	1,357
S. of 38°	316	259	113	874	2	68	187
Coastwide	3,257	1,737	854	7,032	2,007	1,764	4,872
Retained catch (mt)							
N. of 40°10'	1,391	977	387	4,024	1,415	1,230	1,708
38°-40°10'	257	228	119	1,013	10	299	790
S. of 38°	236	210	78	729	2	59	102
Coastwide	1,884	1,416	584	5,767	1,426	1,587	2,600
Discard mortality (mt)							
N. of 40°10'	1,102	220	179	923	572	111	1,620
38°-40°10'	191	53	55	198	9	56	567
S. of 38°	80	49	36	144	1	10	86
Coastwide	1,373	322	270	1,265	581	176	2,272

TABLE E-32.--Scenario: Mid OY-Sensitivity test to line changes 4. Projected total bycatch of rebuilding species.

	period	lingcod	canary	POP	darkblotched	widow	yelloweye	bocaccio	cowcod
N. of 40°10'									
	1	1.9	0.4	0.2	0.2	0.0	0.0	0.0	0.0
	2	10.5	2.4	1.2	1.2	0.1	0.1	0.0	0.0
	3	33.8	7.7	3.9	3.9	0.4	0.2	0.0	0.0
	4	38.2	8.7	4.4	4.4	0.5	0.3	0.0	0.0
	5	26.3	6.0	3.0	3.0	0.3	0.2	0.0	0.0
	6	3.6	0.8	0.4	0.4	0.0	0.0	0.0	0.0
	Total	114.5	26.1	13.1	13.1	1.5	0.8	0.0	0.0
S. of 40°10'									
	1	5.0	0.2	0.0	0.1	0.0	0.0	8.2	0.2
	2	5.2	0.3	0.0	0.1	0.0	0.0	8.5	0.2
	3	5.0	0.2	0.0	0.1	0.0	0.0	8.2	0.2
	4	4.5	0.2	0.0	0.1	0.0	0.0	7.3	0.2
	5	4.3	0.2	0.0	0.1	0.0	0.0	6.9	0.2
	6	3.7	0.2	0.0	0.1	0.0	0.0	6.0	0.1
	Total	27.7	1.3	0.0	0.6	0.2	0.1	45.0	1.1
Coastwide									
	1	6.9	0.7	0.2	0.3	0.1	0.0	8.2	0.2
	2	15.7	2.7	1.2	1.3	0.2	0.1	8.5	0.2
	3	38.8	7.9	3.9	4.0	0.5	0.3	8.2	0.2
	4	42.7	8.9	4.4	4.5	0.5	0.3	7.3	0.2
	5	30.6	6.2	3.0	3.1	0.4	0.2	6.9	0.2
	6	7.3	1.0	0.4	0.5	0.1	0.0	6.0	0.1
	Total	142.1	27.4	13.1	13.7	1.7	1.0	45.0	1.1

TABLE E-33.--Scenario: Mid OY-Sensitivity test to management line changes 5, management parameters.

Period	Shallow line (fm)	Deep line (fm)	Bi-monthly trip limits						
			sablefish	longspine	shortspine	dover	arrowtooth	petrale	otr. flatfish
N. of 40°10'									
1	75	150	7,500	10,000	2,000	26,000	999,999	999,999	100,000
2	75	150	7,500	10,000	2,000	26,000	999,999	100,000	100,000
3	75	150	7,500	10,000	2,000	26,000	150,000	100,000	100,000
4	75	150	7,500	10,000	2,000	26,000	150,000	100,000	100,000
5	75	150	7,500	10,000	2,000	26,000	150,000	100,000	100,000
6	75	150	7,500	10,000	2,000	26,000	999,999	999,999	100,000
If small footrope used in period									
1	75	150	3,500	3,000	1,000	15,000	5,000	20,000	50,000
2	75	150	3,500	3,000	1,000	15,000	5,000	20,000	50,000
3	75	150	3,000	3,000	1,000	6,500	3,000	6,500	15,000
4	75	150	3,000	3,000	1,000	6,500	3,000	6,500	15,000
5	75	150	3,200	3,000	1,000	10,000	5,000	8,000	20,000
6	75	150	3,500	3,000	1,000	15,000	5,000	20,000	50,000
38°-40°10'									
1	100	150	7,500	10,000	2,000	26,000	999,999	999,999	100,000
2	100	150	7,500	10,000	2,000	26,000	10,000	20,000	100,000
3	100	150	7,500	10,000	2,000	26,000	10,000	20,000	100,000
4	100	150	7,500	10,000	2,000	26,000	10,000	20,000	100,000
5	100	150	7,500	10,000	2,000	26,000	10,000	20,000	100,000
6	100	150	7,500	10,000	2,000	26,000	999,999	999,999	100,000
S. of 38°									
1	100	150	7,500	10,000	2,000	26,000	999,999	999,999	100,000
2	100	150	7,500	10,000	2,000	26,000	10,000	20,000	100,000
3	100	150	7,500	10,000	2,000	26,000	10,000	20,000	100,000
4	100	150	7,500	10,000	2,000	26,000	10,000	20,000	100,000
5	100	150	7,500	10,000	2,000	26,000	10,000	20,000	100,000
6	100	150	7,500	10,000	2,000	26,000	999,999	999,999	100,000

Note: a trip limit of amount of 999,999 represents no limit on the amount of the species that may be landed during that period.

TABLE E-34.--Scenario: Mid OY-Sensitivity test to line changes 5. Projected catch, landings, and discard of major target species.

	sablefish	longspine	shortspine	dover	arrowtooth	petrale	otr. flatfish
Total catch/mortality (mt)							
N. of 40°10'	2,638	1,221	630	4,988	2,463	1,615	2,443
38°-40°10'	502	288	191	1,336	24	489	1,384
S. of 38°	372	262	120	973	3	122	200
Coastwide	3,512	1,772	941	7,298	2,490	2,226	4,027
Retained catch (mt)							
N. of 40°10'	1,448	991	412	4,289	1,765	1,569	1,520
38°-40°10'	282	234	124	1,157	15	442	850
S. of 38°	250	212	78	841	2	115	123
Coastwide	1,980	1,437	614	6,287	1,782	2,126	2,494
Discard mortality (mt)							
N. of 40°10'	1,190	231	219	699	698	46	923
38°-40°10'	220	55	67	180	9	47	534
S. of 38°	122	50	42	132	1	8	76
Coastwide	1,532	335	327	1,011	708	101	1,534

TABLE E-35.--Scenario: Mid OY-Sensitivity test to line changes 5. Projected total bycatch of rebuilding species.

	period	lingcod	canary	POP	darkblotched	widow	yelloweye	bocaccio	cowcod
N. of 40°10'									
	1	2.4	0.4	21.2	24.2	0.2	0.0	0.0	0.0
	2	5.4	1.1	24.2	27.6	0.3	0.0	0.0	0.0
	3	12.1	2.6	22.2	25.0	0.3	0.1	0.0	0.0
	4	13.6	2.9	21.2	23.8	0.3	0.1	0.0	0.0
	5	10.6	2.3	19.2	21.6	0.3	0.1	0.0	0.0
	6	2.5	0.5	12.7	14.4	0.1	0.0	0.0	0.0
	Total	46.6	9.9	120.6	136.7	1.5	0.4	0.0	0.0
S. of 40°10'									
	1	6.3	0.2	0.0	4.7	0.1	0.0	7.6	0.2
	2	7.4	0.3	0.1	4.6	0.1	0.0	9.0	0.2
	3	7.6	0.3	0.1	4.0	0.1	0.0	8.7	0.2
	4	8.1	0.2	0.1	5.4	0.1	0.0	8.0	0.2
	5	6.7	0.2	0.1	5.9	0.1	0.0	7.1	0.2
	6	5.2	0.2	0.1	6.0	0.1	0.0	5.0	0.1
	Total	41.4	1.4	0.3	30.7	0.5	0.1	45.4	1.2
Coastwide									
	1	8.7	0.7	21.3	28.9	0.3	0.0	7.6	0.2
	2	12.9	1.4	24.3	32.2	0.3	0.1	9.0	0.2
	3	19.8	2.9	22.2	29.0	0.4	0.1	8.7	0.2
	4	21.7	3.2	21.3	29.2	0.4	0.1	8.0	0.2
	5	17.4	2.5	19.2	27.6	0.4	0.1	7.1	0.2
	6	7.6	0.7	12.7	20.4	0.2	0.0	5.0	0.1
	Total	88.0	11.4	121.0	167.4	2.0	0.5	45.4	1.2

TABLE E-36.--Scenario: 2003 management parameters (status quo)

Period	Shallow line (fm)	Deep line (fm)	Bi-monthly trip limits sablefish	longspine	shortspine	dover	arrowtooth	petrale	otr. flatfish
N. of 40°10'									
1	100	250*	6,000	8,000	2,300	26,000	999,999	999,999	100,000
2	100	250	6,000	9,000	2,400	26,000	60,000	30,000	100,000
3	50	200	10,000	14,000	2,800	31,000	200,000	30,000	100,000
4	75	200	9,000	11,500	2,400	34,000	200,000	30,000	100,000
5	50	200	9,000	11,500	2,400	34,000	200,000	30,000	100,000
6	50	200*	9,000	11,500	2,400	34,000	200,000	999,999	100,000
If small footrope used in period									
1	100	250*	na	na	na	na	na	na	na
2	100	250	na	na	na	na	na	na	na
3	50	200	3,000	0	0	12,500	5,000	10,000	20,000
4	75	200	3,000	5,000	1,000	12,500	5,000	10,000	20,000
5	50	200	3,000	5,000	1,000	12,500	5,000	10,000	20,000
6	50	200*	3,000	5,000	1,000	12,500	5,000	10,000	20,000
38°-40°10'									
1	50	250*	6,000	8,000	2,300	26,000	999,999	999,999	70,000
2	60	250	6,000	9,000	2,400	26,000	1,000	20,000	70,000
3	60	200	10,000	14,000	2,800	31,000	1,000	20,000	70,000
4	60	200	9,000	11,500	2,400	34,000	1,000	20,000	70,000
5	60	200	9,000	11,500	2,400	34,000	1,000	20,000	70,000
6	60	200*	9,000	11,500	2,400	34,000	999,999	999,999	70,000
S. of 38°									
1	50	150	6,000	8,000	2,300	26,000	999,999	999,999	70,000
2	60	150	6,000	9,000	2,400	26,000	1,000	20,000	70,000
3	60	200	10,000	14,000	2,800	31,000	1,000	20,000	70,000
4	60	200	9,000	11,500	2,400	34,000	1,000	20,000	70,000
5	60	200	9,000	11,500	2,400	34,000	1,000	20,000	70,000
6	60	200*	9,000	11,500	2,400	34,000	999,999	999,999	70,000

* Specified areas open for petrale into as shallow as 150 fm.

Note: a trip limit of amount of 999,999 represents no limit on the amount of the species that may be landed during that period.

TABLE E-37.--Scenario: 2003 management (status quo). Projected catch, landings, and discard of major target species.

	sablefish	longspine	shortspine	dover	arrowtooth	petrale	otr. flatfish
Total catch/mortality (mt)							
N. of 40°10'	2,451	1,370	712	5,070	2,076	1,365	2,406
38°-40°10'	426	320	220	1,532	10	330	1,117
S. of 38°	373	297	144	1,133	2	99	186
Coastwide	3,250	1,986	1,076	7,735	2,087	1,794	3,708
Retained catch (mt)							
N. of 40°10'	1,482	1,110	474	4,351	1,364	1,303	1,426
38°-40°10'	282	259	146	1,331	4	314	657
S. of 38°	275	240	95	990	1	97	111
Coastwide	2,040	1,610	715	6,672	1,370	1,714	2,194
Discard mortality (mt)							
N. of 40°10'	969	260	238	719	711	61	980
38°-40°10'	143	60	74	201	5	16	460
S. of 38°	98	56	49	143	1	2	74
Coastwide	1,210	376	362	1,063	717	80	1,515

TABLE E-38.--Scenario: 2003 management (status quo). Projected total bycatch of rebuilding species.

period	lingcod	canary	POP	darkblotched	widow	yelloweye	bocaccio	cowcod
N. of 40°10'								
1	4.6	1.0	20.8	23.7	0.2	0.0	0.0	0.0
2	25.2	6.0	3.0	3.0	0.3	0.2	0.0	0.0
3	3.8	0.2	9.3	8.7	0.1	0.0	0.0	0.0
4	15.2	3.2	13.1	12.2	0.2	0.1	0.0	0.0
5	2.3	0.1	9.2	8.6	0.1	0.0	0.0	0.0
6	1.5	0.2	14.3	16.3	0.1	0.0	0.0	0.0
Total	52.6	10.7	69.6	72.6	1.0	0.4	0.0	0.0
S. of 40°10'								
1	3.1	0.2	0.0	4.7	0.3	0.2	2.5	0.0
2	3.3	0.0	0.0	0.3	0.1	0.0	1.9	0.0
3	0.9	0.1	0.0	1.9	0.1	0.0	1.2	0.0
4	0.7	0.0	0.0	2.6	0.0	0.0	0.8	0.0
5	0.7	0.0	0.0	2.8	0.0	0.0	0.8	0.0
6	3.5	0.1	0.1	6.9	0.1	0.0	1.5	0.0
Total	12.2	0.5	0.1	19.2	0.6	0.4	8.7	0.1
Coastwide								
1	7.7	1.2	20.8	28.4	0.5	0.3	2.5	0.0
2	28.5	6.0	3.0	3.3	0.4	0.2	1.9	0.0
3	4.8	0.3	9.3	10.6	0.1	0.0	1.2	0.0
4	15.9	3.2	13.1	14.8	0.3	0.2	0.8	0.0
5	3.0	0.2	9.2	11.4	0.1	0.0	0.8	0.0
6	5.0	0.3	14.3	23.2	0.2	0.0	1.5	0.0
Total	64.8	11.2	69.8	91.8	1.6	0.8	8.7	0.1

TABLE E-39. Adjustments to whiting allocation required in order to meet widow rockfish OY constraint.

Sectors	2004 Allocations of Whiting			2004 OY adjusted to meet widow rockfish constraint.			Change in whiting catch necessary to meet widow rockfish constraint.			Projected change in exvessel revenue from whiting as a result of adjustements to meet widow rockfish constraints.		
	Low OY	Med OY	High OY	Low OY	Med OY	High OY	Low OY	Med OY	High OY	Low OY	Med OY	High OY
Tribal	12,968	25,000	30,000	10,535	21,035	30,000	-2,433	-3,965	0	-241,323	-393,359	0
Non-wht impact	2,000	2,000	2,000	2,000	2,000	2,000	0	0	0	0	0	0
Pollock EFP	1,000	1,000	1,000	1,000	1,000	1,000	0	0	0	0	0	0
Commercial OY	58,133	120,200	189,300	46,665	96,165	189,300	-11,468	-24,035	0	-1,137,667	-2,384,462	0
Motherships	13,952	28,848	45,432	11,200	23,080	45,432	-2,752	-5,768	0	-273,040	-572,271	0
Catcher-Processors	19,765	40,868	64,362	15,866	32,696	64,362	-3,899	-8,172	0	-386,807	-810,717	0
Shoreside	24,416	50,484	79,506	19,599	40,389	79,506	-4,816	-10,095	0	-477,820	-1,001,474	0
Total	74,100	148,200	222,300	60,200	120,200	222,300	-13,900	-28,000	0	-1,378,990	-2,777,821	0

Assumed price / lb = $0.045 /pound

TABLE E-40. Estimated catch of selected groundfish species in the whiting fisherry under the 2004 EIS alternatives.

Sector	1998-2002 bycatch rate	EIS Alternatives Low OY	Med OY	High OY
		estimated catch (mt)		
		74,100	148,200	222,300
Tribal				
Whiting		12,968	25,000	30,000
Yellowtail	1.1520%	149.38	287.99	345.59
Widow	0.0987%	12.80	24.67	29.61
Canary	0.0158%	2.05	3.96	4.75
Darkblotch	0.0001%	0.01	0.02	0.03
POP	0.0031%	0.40	0.77	0.92
Lingcod	0.0014%	0.18	0.34	0.41
Motherships				
Whiting		13,952	28,848	45,432
Yellowtail	0.4568%	63.74	131.79	207.55
Widow	0.2029%	28.31	58.54	92.19
Canary	0.0024%	0.34	0.69	1.09
Darkblotch	0.0110%	1.53	3.17	5.00
POP	0.0078%	1.09	2.26	3.55
Lingcod	0.0006%	0.09	0.19	0.29
Catcher-Processors				
Whiting		19,765	40,868	64,362
Yellowtail	0.2695%	53.26	110.12	173.43
Widow	0.1818%	35.93	74.30	117.01
Canary	0.0015%	0.29	0.60	0.94
Darkblotch	0.0104%	2.06	4.26	6.71
POP	0.0174%	3.43	7.09	11.17
Lingcod	0.0002%	0.03	0.07	0.11
Shoreside				
Whiting		24,416	50,484	79,506
Yellowtail	0.3491%	85.22	176.22	277.52
Widow	0.1816%	44.34	91.68	144.39
Canary	0.0006%	0.14	0.29	0.46
Darkblotched	0.0017%	0.42	0.86	1.36
POP	0.0094%	2.29	4.74	7.46
Lingcod	0.0008%	0.19	0.38	0.61
Yelloweye	0.0000%	0.00	0.01	0.01
All Whiting Sectors				
Whiting		71,100	145,200	219,300
Yellowtail		352	706	1,004
Widow		121	249	383
Canary		3	6	7
Darkblotched		4	8	13
POP		7	15	23
Lingcod		0	1	1
Yelloweye		0	0	0

TABLE E-41. Estimated catch of selected groundfish species in the whiting fishery under the 2004 EIS alternatives (after adjustment for widow rockfish constraint)

Sector	1998-2002 bycatch rate	EIS Alternatives *Low OY*	*Med OY*	*High OY*
		estimated catch (mt)		
		60,200	120,200	222,300
		Tribal		
Whiting		10,535	21,035	30,000
Yellowtail	1.1520%	121.36	242.32	345.59
Widow	0.0987%	10.40	20.76	29.61
Canary	0.0158%	1.67	3.33	4.75
Darkblotch	0.0001%	0.01	0.02	0.03
POP	0.0031%	0.32	0.65	0.92
Lingcod	0.0014%	0.14	0.29	0.41
		Motherships		
Whiting		11,200	23,080	45,432
Yellowtail	0.4568%	51.16	105.44	207.55
Widow	0.2029%	22.73	46.83	92.19
Canary	0.0024%	0.27	0.55	1.09
Darkblotch	0.0110%	1.23	2.54	5.00
POP	0.0078%	0.88	1.81	3.55
Lingcod	0.0006%	0.07	0.15	0.29
		Catcher-Processors		
Whiting		15,866	32,696	64,362
Yellowtail	0.2695%	42.75	88.10	173.43
Widow	0.1818%	28.85	59.44	117.01
Canary	0.0015%	0.23	0.48	0.94
Darkblotch	0.0104%	1.65	3.41	6.71
POP	0.0174%	2.75	5.67	11.17
Lingcod	0.0002%	0.03	0.06	0.11
		Shoreside		
Whiting		19,599	40,389	79,506
Yellowtail	0.3491%	68.41	140.98	277.52
Widow	0.1816%	35.59	73.35	144.39
Canary	0.0006%	0.11	0.23	0.46
Darkblotched	0.0017%	0.33	0.69	1.36
POP	0.0094%	1.84	3.79	7.46
Lingcod	0.0008%	0.15	0.31	0.61
Yelloweye	0.0000%	0.00	0.01	0.01
		All Whiting Sectors		
Whiting		57,200	117,200	219,300
Yellowtail		284	577	1,004
Widow		98	200	383
Canary		2	5	7
Darkblotched		3	7	13
POP		6	12	23
Lingcod		0	1	1
Yelloweye		0	0	0

Part F - Expected Catch in the 2004 California Recreational Fishery

This section contains the following tables:

Table F.1. Summary of expected 2004 California recreational total catch (mt) of selected groundfish species and species complexes by region and alternative.

Table F.2. Expected 2004 California recreational **bocaccio** catch (mt) by region, depth, and period.

Table F.3. Expected 2004 California recreational **canary rockfish** catch (mt) by region, depth, and period under the **Low OY** and **Medium OY** alternatives (**assumes no retention**).

Table F.4. Expected 2004 California recreational **canary rockfish** catch (mt) by region, depth, and period under the **High OY** alternative (**assumes 1 canary rockfish sublimit**)

Table F.5. Expected 2004 California recreational **cowcod** catch (mt) by region, depth, and period

Table F.6. Expected 2004 California recreational **deeper nearshore rockfish** catch (mt) by region, depth, and period.

Table F.7. Expected 2004 California recreational **lingcod** catch (mt) by region, depth, and period

Table F.8. Expected 2004 California recreational **California scorpionfish** catch (mt) by region, depth, and period.

Table F.9. Expected 2004 California recreational **shallow nearshore rockfish** catch (mt) by region, depth, and period

Table F.10. Expected 2004 California recreational **widow rockfish** catch (mt) by region, depth, and period.

Table F.11. Expected 2004 California recreational **yelloweye rockfish** catch (mt) by region, depth, and period.

Notes on Expected Catch in the 2004 California Recreational Fishery:

California recreational fisheries in 2003 south of Cape Mendocino are restricted to a six month season from July through December in areas no deeper than 20 fathoms as a means of limiting impacts to overfished species, primarily bocaccio. The Council requested that management measure alternatives for 2004 California recreational fisheries explore moving the shoreward line of the Rockfish Conservation Area seaward by 10 fathom increments with varying seasonal structures. This section contains the data and analyses to support recreational fishery alternatives and estimated impacts to overfished species presented in the *Draft Proposed Acceptable Biological Catch and Optimum Yield Specifications and Management Measures For The 2004 Pacific Coast Groundfish Fishery (Exhibit C.6, Attachment 1).* Data and analyses are provided by California Department of Fish and Game staff.

TABLE F.1. Summary of expected 2004 California recreational total catch (mt) of selected groundfish species and species complexes by region and alternative.

Mgmt. Region	EIS Alternatives *Low OY*	*Med OY*	*High OY*
Bocaccio			
U.S.-Mexico Border to Pt. Conception	80.3	105.7	122.7
Pt. Conception to Cape Mendocino	2.3	2.8	3.2
Total Catch	82.6	108.5	125.9
Canary			
U.S.-Mexico Border to Pt. Conception	0.4	0.5	1.1
Pt. Conception to Pt. San Pedro	4.3	5.0	7.6
Pt. San Pedro to Cape Mendocino	3.5	3.9	7.5
Cape Mendocino to CA-OR Border	0.5	0.5	0.5
Total Catch	8.8	10.0	16.7
Cowcod			
U.S.-Mexico Border to Pt. Conception	2.0	2.5	4.1
Pt. Conception to Pt. San Pedro	0.2	0.2	0.2
Pt. San Pedro to Cape Mendocino	0.2	0.3	0.2
Cape Mendocino to CA-OR Border	0.0	0.0	0.0
Total Catch	2.4	3.0	4.6
Deeper Nearshore Rockfish			
U.S.-Mexico Border to Pt. Conception	50.8	63.8	64.6
Pt. Conception to Pt. San Pedro	111.9	119.2	124.5
Pt. San Pedro to Cape Mendocino	170.6	180.3	176.7
Cape Mendocino to CA-OR Border [a/]	36.8	36.8	36.8
Total Catch	370.1	400.2	402.5
Lingcod			
U.S.-Mexico Border to Pt. Conception	15.8	17.2	17.6
Pt. Conception to Pt. San Pedro	68.8	70.9	72.3
Pt. San Pedro to Cape Mendocino	68.1	70.2	71.5
Cape Mendocino to CA-OR Border	195.0	195.0	195.0
Total Catch	347.6	353.2	356.5
Scorpionfish			
U.S.-Mexico Border to Pt. Conception	95.1	114.4	114.6
Total Catch	95.1	114.4	114.6
Shallow Nearshore Rockfish			
U.S.-Mexico Border to Pt. Conception	8.8	10.9	11.0
Pt. Conception to Pt. San Pedro	43.7	47.2	48.1
Pt. San Pedro to Cape Mendocino	18.8	19.8	19.1
Cape Mendocino to CA-OR Border [a/]	3.7	3.7	3.7
Total Catch	75.0	81.6	81.9
Widow			
U.S.-Mexico Border to Pt. Conception	0.03	0.10	0.10
Pt. Conception to Pt. San Pedro	0.12	0.17	0.18
Pt. San Pedro to Cape Mendocino	0.10	0.11	0.16
Cape Mendocino to CA-OR Border	1.00	1.00	1.00
Total Catch	1.25	1.39	1.44
Yelloweye			
U.S.-Mexico Border to Pt. Conception	0.79	0.79	0.79
Pt. Conception to Pt. San Pedro	0.00	0.00	0.00
Pt. San Pedro to Cape Mendocino	0.42	0.48	0.45
Cape Mendocino to CA-OR Border	0.10	0.10	0.10
Total Catch	1.31	1.36	1.34

a/ Minimum estimates subject to revision. Represents CFGC precautionary approach capping nearshore fisheries north of Cape Mendocino at half of average catch between 1994-99.

TABLE F.2. Expected 2004 California recreational **bocaccio** catch (mt) by region, depth, and period.

Depth range (fm)	Jan-Feb	Mar-Apr	May-Jun	Jul-Aug	Sep-Oct	Nov-Dec	All Periods
U.S.-Mexico Border to Point Conception							
1-10	0.2	0.1	0.0	0.0	0.1	0.1	0.5
11-20	0.7	0.4	0.1	0.1	0.2	0.2	1.8
21-30	4.9	3.0	1.0	0.6	1.6	1.5	12.7
31-40	10.2	6.3	2.1	1.1	3.4	3.0	26.1
41-50	17.3	10.6	3.6	1.9	5.7	5.1	44.2
51-60	4.9	3.0	1.0	0.6	1.6	1.5	12.7
61-70	0.9	0.6	0.2	0.1	0.3	0.3	2.3
71-80	2.1	1.3	0.4	0.2	0.7	0.6	5.4
81-90	5.3	3.3	1.1	0.6	1.8	1.6	13.7
91-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100+	1.3	0.8	0.3	0.1	0.4	0.4	3.4
All Depths	44.0	29.4	9.7	5.3	19.3	15.0	122.7
Point Conception to Point San Pedro							
1-10	0.2	0.1	0.1	0.1	0.2	0.0	0.9
11-20	0.1	0.1	0.1	0.1	0.1	0.0	0.4
21-30	0.8	0.5	0.4	0.4	0.8	0.2	3.0
31-40	0.4	0.3	0.2	0.2	0.4	0.1	1.7
41-50	2.8	1.8	1.4	1.4	2.7	0.5	10.7
51-60	8.8	5.8	4.6	4.6	8.7	1.7	34.2
61-70	1.8	1.2	0.9	0.9	1.7	0.3	6.8
71-80	0.0	0.0	0.0	0.0	0.0	0.0	0.0
81-90	0.0	0.0	0.0	0.0	0.0	0.0	0.0
91-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100+	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All Depths	14.9	9.7	7.8	7.8	14.6	2.9	57.7
Point San Pedro to Cape Mendocino							
1-10	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11-20	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21-30	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31-40	3.3	2.2	1.8	1.8	3.3	0.7	13.0
41-50	3.0	2.0	1.6	1.6	3.0	0.6	11.7
51-60	6.2	4.1	3.3	3.3	6.1	1.2	24.1
61-70	7.2	4.7	3.8	3.8	7.0	1.4	27.8
71-80	0.0	0.0	0.0	0.0	0.0	0.0	0.0
81-90	0.0	0.0	0.0	0.0	0.0	0.0	0.0
91-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100+	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All Depths	19.7	12.9	10.3	10.3	19.4	3.9	76.6

TABLE F.3. Expected 2004 California recreational **canary rockfish** catch (mt) by region, depth, and period under the **Low OY** and **Medium OY** alternatives **(assumes no retention)**.

Depth range (fm)	Jan-Feb	Mar-Apr	May-Jun	Jul-Aug	Sep-Oct	Nov-Dec	All Periods
U.S.-Mexico Border to Point Conception							
1-10	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11-20	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21-30	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31-40	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41-50	0.1	0.1	0.0	0.1	0.2	0.1	0.5
51-60	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61-70	0.0	0.0	0.0	0.0	0.0	0.0	0.0
71-80	0.0	0.0	0.0	0.0	0.0	0.0	0.0
81-90	0.0	0.0	0.0	0.0	0.0	0.0	0.0
91-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100+	0.1	0.1	0.0	0.1	0.2	0.1	0.5
All Depths	0.1	0.2	0.0	0.2	0.4	0.1	1.1
Point Conception to Pt. San Pedro							
1-10	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11-20	0.0	0.1	0.1	0.1	0.1	0.0	0.5
21-30	0.6	1.1	1.4	1.6	1.6	0.7	7.0
31-40	0.0	0.1	0.1	0.1	0.1	0.0	0.5
41-50	0.1	0.3	0.3	0.4	0.4	0.2	1.6
51-60	0.6	1.2	1.4	1.6	1.6	0.7	7.1
61-70	0.5	1.0	1.2	1.4	1.4	0.7	6.3
71-80	0.0	0.0	0.0	0.0	0.0	0.0	0.0
81-90	0.0	0.0	0.0	0.0	0.0	0.0	0.0
91-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100+	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All Depths	1.8	3.8	4.5	5.2	5.2	2.4	22.9
Point San Pedro to Cape Mendocino							
1-10	0.0	0.0	0.0	0.0	0.0	0.0	0.1
11-20	0.2	0.3	0.4	0.5	0.5	0.2	2.0
21-30	0.2	0.5	0.5	0.6	0.6	0.3	2.8
31-40	0.7	1.3	1.6	1.9	1.9	0.9	8.2
41-50	1.1	2.3	2.7	3.1	3.1	1.4	13.8
51-60	0.7	1.5	1.8	2.0	2.0	0.9	9.0
61-70	0.5	1.1	1.3	1.5	1.5	0.7	6.5
71-80	0.0	0.0	0.0	0.0	0.0	0.0	0.0
81-90	0.0	0.0	0.0	0.0	0.0	0.0	0.0
91-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100+	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All Depths	3.4	6.9	8.3	9.7	9.7	4.4	42.4

TABLE F.4. Expected 2004 California recreational **canary rockfish** catch (mt) by region, depth, and period under the **High OY** alternative **(assumes 1 canary rockfish sublimit).**

Depth ran(	Jan-Feb	Mar-Apr	May-Jun	Jul-Aug	Sep-Oct	Nov-Dec	All Periods
			U.S.-Mexico Border to Point Conception				
1-10	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11-20	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21-30	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31-40	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41-50	0.1	0.1	0.0	0.1	0.2	0.1	0.5
51-60	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61-70	0.0	0.0	0.0	0.0	0.0	0.0	0.0
71-80	0.0	0.0	0.0	0.0	0.0	0.0	0.0
81-90	0.0	0.0	0.0	0.0	0.0	0.0	0.0
91-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100+	0.1	0.1	0.0	0.1	0.2	0.1	0.5
All Depths	0.1	0.2	0.0	0.2	0.4	0.1	1.1
			Point Conception to Pt. San Pedro				
1-10	0.0	0.0	0.0	0.0	0.0	0.0	0.2
11-20	0.1	0.2	0.2	0.3	0.3	0.1	1.1
21-30	0.6	1.1	1.4	1.6	1.6	0.7	7.0
31-40	0.0	0.1	0.1	0.1	0.1	0.0	0.5
41-50	0.1	0.3	0.3	0.4	0.4	0.2	1.6
51-60	0.6	1.2	1.4	1.6	1.6	0.7	7.1
61-70	0.5	1.0	1.2	1.4	1.4	0.7	6.3
71-80	0.0	0.0	0.0	0.0	0.0	0.0	0.0
81-90	0.0	0.0	0.0	0.0	0.0	0.0	0.0
91-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100+	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All Depths	1.9	3.9	4.6	5.4	5.4	2.5	23.7
			Point San Pedro to Cape Mendocino				
1-10	0.0	0.1	0.1	0.1	0.1	0.1	0.5
11-20	0.4	0.8	1.0	1.1	1.1	0.5	4.9
21-30	0.2	0.5	0.5	0.6	0.6	0.3	2.8
31-40	0.7	1.3	1.6	1.9	1.9	0.9	8.2
41-50	1.1	2.3	2.7	3.1	3.1	1.4	13.8
51-60	0.7	1.5	1.8	2.0	2.0	0.9	9.0
61-70	0.5	1.1	1.3	1.5	1.5	0.7	6.5
71-80	0.0	0.0	0.0	0.0	0.0	0.0	0.0
81-90	0.0	0.0	0.0	0.0	0.0	0.0	0.0
91-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100+	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All Depths	3.6	7.5	9.0	10.4	10.4	4.7	45.7

TABLE F.5. Expected 2004 California recreational **cowcod** catch (mt) by region, depth, and period.

Depth range (fm)	Jan-Feb	Mar-Apr	May-Jun	Jul-Aug	Sep-Oct	Nov-Dec	All Periods
U.S.-Mexico Border to Point Conception							
1-10	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11-20	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21-30	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31-40	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41-50	0.1	0.2	0.1	0.0	0.2	0.3	1.0
51-60	0.1	0.1	0.0	0.0	0.1	0.2	0.6
61-70	0.1	0.1	0.0	0.0	0.1	0.2	0.6
71-80	0.0	0.1	0.0	0.0	0.1	0.1	0.3
81-90	0.2	0.3	0.1	0.0	0.2	0.4	1.3
91-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100+	0.0	0.1	0.0	0.0	0.1	0.1	0.3
All Depths	0.6	1.0	0.3	0.2	0.7	1.4	4.1
Point Conception to Pt. San Pedro							
1-10	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11-20	0.0	0.0	0.1	0.1	0.0	0.0	0.2
21-30	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31-40	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41-50	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51-60	0.0	0.0	0.0	0.0	0.0	0.0	0.1
61-70	0.0	0.0	0.0	0.0	0.0	0.0	0.1
71-80	0.0	0.0	0.0	0.0	0.0	0.0	0.0
81-90	0.0	0.0	0.0	0.0	0.0	0.0	0.0
91-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100+	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All Depths	0.1	0.0	0.2	0.2	0.1	0.0	0.4
Point San Pedro to Cape Mendocino							
1-10	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11-20	0.0	0.0	0.1	0.1	0.0	0.0	0.2
21-30	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31-40	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41-50	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51-60	0.0	0.0	0.0	0.0	0.0	0.0	0.1
61-70	0.0	0.0	0.0	0.0	0.0	0.0	0.1
71-80	0.0	0.0	0.0	0.0	0.0	0.0	0.0
81-90	0.0	0.0	0.0	0.0	0.0	0.0	0.0
91-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100+	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All Depths	0.1	0.0	0.2	0.2	0.1	0.0	0.5

TABLE F.6. Expected 2004 California recreational **deeper nearshore rockfish** catch (mt) by region, depth, and period.

Depth range (fm)	Jan-Feb	Mar-Apr	May-Jun	Jul-Aug	Sep-Oct	Nov-Dec	All Periods
U.S.-Mexico Border to Point Conception							
1-10	1.5	1.2	0.6	0.8	0.9	0.9	5.9
11-20	4.8	4.0	2.1	2.7	3.0	2.9	19.5
21-30	5.7	4.7	2.5	3.2	3.6	3.5	23.2
31-40	2.3	1.9	1.0	1.3	1.5	1.4	9.5
41-50	1.2	1.0	0.5	0.7	0.8	0.7	5.0
51-60	0.1	0.1	0.0	0.0	0.0	0.0	0.3
61-70	0.1	0.1	0.0	0.0	0.0	0.0	0.3
71-80	0.1	0.1	0.0	0.0	0.0	0.0	0.3
81-90	0.1	0.1	0.0	0.1	0.1	0.1	0.5
91-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100+	0.1	0.1	0.0	0.0	0.1	0.1	0.4
All Depths	15.9	13.1	7.0	9.0	9.9	9.7	64.6
Point Conception to Pt. San Pedro							
1-10	1.3	1.9	4.9	7.2	6.9	3.2	25.4
11-20	3.0	4.3	11.3	16.5	15.9	7.4	58.4
21-30	2.4	3.5	9.1	13.4	12.9	6.0	47.3
31-40	1.6	2.3	6.0	8.8	8.5	4.0	31.2
41-50	0.7	1.0	2.6	3.8	3.7	1.7	13.4
51-60	0.4	0.6	1.5	2.2	2.1	1.0	7.8
61-70	0.1	0.1	0.3	0.4	0.4	0.2	1.3
71-80	0.0	0.0	0.0	0.0	0.0	0.0	0.0
81-90	0.0	0.0	0.0	0.0	0.0	0.0	0.0
91-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100+	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All Depths	9.4	13.6	35.6	52.4	50.5	23.4	184.9
Point San Pedro to Cape Mendocino							
1-10	2.6	3.7	9.7	14.3	13.8	6.4	50.4
11-20	5.7	8.3	21.7	31.9	30.8	14.3	112.8
21-30	1.2	1.7	4.4	6.5	6.3	2.9	22.9
31-40	0.8	1.1	2.9	4.2	4.0	1.9	14.8
41-50	0.1	0.2	0.5	0.8	0.8	0.4	2.8
51-60	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61-70	0.0	0.0	0.0	0.1	0.1	0.0	0.2
71-80	0.0	0.0	0.0	0.0	0.0	0.0	0.0
81-90	0.0	0.0	0.0	0.0	0.0	0.0	0.1
91-100	0.0	0.0	0.1	0.1	0.1	0.0	0.3
100+	0.0	0.0	0.1	0.1	0.1	0.0	0.3
All Depths	10.4	15.1	39.4	58.0	55.9	25.9	204.6

TABLE F.7. Expected 2004 California recreational **lingcod** catch (mt) by region, depth, and period.

Depth range (fm)	Jan-Feb	Mar-Apr	May-Jun	Jul-Aug	Sep-Oct	Nov-Dec	All Periods
			U.S.-Mexico Border to Point Conception				
1-10	0.2	0.1	0.1	0.1	0.1	0.3	0.9
11-20	0.7	0.3	0.4	0.3	0.5	1.3	3.5
21-30	1.3	0.5	0.7	0.5	0.9	2.4	6.3
31-40	0.6	0.3	0.3	0.3	0.4	1.2	3.2
41-50	0.5	0.2	0.3	0.2	0.4	1.0	2.5
51-60	0.1	0.0	0.0	0.0	0.1	0.2	0.4
61-70	0.0	0.0	0.0	0.0	0.0	0.1	0.2
71-80	0.0	0.0	0.0	0.0	0.0	0.1	0.2
81-90	0.0	0.0	0.0	0.0	0.0	0.1	0.2
91-100	0.0	0.0	0.0	0.0	0.0	0.0	0.1
100+	0.0	0.0	0.0	0.0	0.0	0.1	0.2
All Depths	3.5	1.4	1.9	1.5	2.5	6.8	17.6
			Point Conception to Pt. San Pedro				
1-10	0.5	1.9	2.7	4.6	4.8	2.5	17.1
11-20	1.4	5.1	7.0	12.0	12.5	6.5	44.4
21-30	0.4	1.5	2.1	3.6	3.7	1.9	13.2
31-40	0.2	0.5	0.7	1.3	1.3	0.7	4.8
41-50	0.0	0.0	0.0	0.0	0.0	0.0	0.2
51-60	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61-70	0.0	0.0	0.0	0.0	0.0	0.0	0.0
71-80	0.0	0.0	0.0	0.0	0.0	0.0	0.0
81-90	0.0	0.0	0.0	0.0	0.0	0.0	0.0
91-100	0.0	0.0	0.1	0.1	0.1	0.0	0.3
100+	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All Depths	2.5	9.1	12.5	21.6	22.6	11.6	79.9
			Point San Pedro to Cape Mendocino				
1-10	1.0	3.6	4.9	8.5	8.8	4.6	31.4
11-20	0.9	3.4	4.7	8.0	8.4	4.3	29.7
21-30	0.4	1.5	2.0	3.5	3.6	1.9	12.8
31-40	0.2	0.7	0.9	1.6	1.6	0.8	5.8
41-50	0.7	2.7	3.7	6.4	6.7	3.4	23.7
51-60	0.3	1.2	1.7	3.0	3.1	1.6	11.0
61-70	0.5	1.7	2.3	4.0	4.2	2.1	14.7
71-80	0.0	0.0	0.0	0.0	0.0	0.0	0.1
81-90	0.0	0.0	0.1	0.1	0.1	0.0	0.3
91-100	0.0	0.0	0.0	0.0	0.0	0.0	0.2
100+	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All Depths	4.1	14.8	20.3	35.1	36.6	18.8	129.7

TABLE F.8. Expected 2004 California recreational **California scorpionfish** catch (mt) by region, depth, and period.

Depth range (fm)	Jan-Feb	Mar-Apr	May-Jun	Jul-Aug	Sep-Oct	Nov-Dec	All Periods
			U.S.-Mexico Border to Point Conception				
1-10	3.1	3.1	1.9	1.4	4.2	4.5	18.2
11-20	6.0	5.9	3.6	2.8	8.1	8.5	34.8
21-30	5.4	5.4	3.2	2.5	7.4	7.8	31.7
31-40	3.0	2.9	1.8	1.4	4.0	4.3	17.4
41-50	1.3	1.3	0.8	0.6	1.8	1.9	7.7
51-60	0.8	0.8	0.5	0.4	1.0	1.1	4.5
61-70	0.0	0.0	0.0	0.0	0.0	0.0	0.1
71-80	0.0	0.0	0.0	0.0	0.0	0.0	0.1
81-90	0.0	0.0	0.0	0.0	0.0	0.0	0.1
91-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100+	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All Depths	19.6	19.4	11.7	9.1	26.6	28.2	114.6

TABLE F.9. Expected 2004 California recreational **shallow nearshore rockfish** catch (mt) by region, depth, and period.

Depth range (fm)	Jan-Feb	Mar-Apr	May-Jun	Jul-Aug	Sep-Oct	Nov-Dec	All Periods
U.S.-Mexico Border to Point Conception							
1-10	0.4	0.5	0.6	0.3	0.4	0.3	2.5
11-20	0.7	0.9	1.0	0.6	0.7	0.5	4.4
21-30	0.6	0.7	0.8	0.5	0.5	0.4	3.4
31-40	0.1	0.1	0.1	0.1	0.1	0.1	0.6
41-50	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51-60	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61-70	0.0	0.0	0.0	0.0	0.0	0.0	0.0
71-80	0.0	0.0	0.0	0.0	0.0	0.0	0.0
81-90	0.0	0.0	0.0	0.0	0.0	0.0	0.1
91-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100+	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All Depths	1.8	2.2	2.5	1.5	1.7	1.4	11.0
Point Conception to Pt. San Pedro							
1-10	0.3	0.8	1.9	2.5	3.5	1.2	10.1
11-20	0.8	1.8	4.2	5.6	7.8	2.7	23.0
21-30	0.5	1.3	3.0	4.1	5.6	2.0	16.6
31-40	0.1	0.2	0.5	0.6	0.9	0.3	2.5
41-50	0.0	0.1	0.2	0.3	0.4	0.1	1.2
51-60	0.0	0.0	0.1	0.1	0.1	0.0	0.4
61-70	0.0	0.0	0.0	0.0	0.0	0.0	0.0
71-80	0.0	0.0	0.0	0.0	0.0	0.0	0.0
81-90	0.0	0.0	0.0	0.0	0.0	0.0	0.0
91-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100+	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All Depths	1.8	4.2	9.9	13.2	18.3	6.4	53.8
Point San Pedro to Cape Mendocino							
1-10	0.5	0.7	1.8	2.6	3.2	1.1	9.8
11-20	0.4	0.6	1.7	2.4	3.0	1.0	9.2
21-30	0.0	0.1	0.2	0.3	0.3	0.1	1.0
31-40	0.0	0.1	0.2	0.2	0.3	0.1	0.8
41-50	0.0	0.0	0.0	0.0	0.0	0.0	0.1
51-60	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61-70	0.0	0.0	0.0	0.0	0.0	0.0	0.0
71-80	0.0	0.0	0.0	0.0	0.0	0.0	0.0
81-90	0.0	0.0	0.0	0.1	0.1	0.0	0.2
91-100	0.0	0.0	0.0	0.0	0.1	0.0	0.2
100+	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All Depths	1.0	1.5	3.9	5.7	6.9	2.4	21.4

TABLE F.10. Expected 2004 California recreational **widow rockfish** catch (mt) by region, depth, and period.

Depth range (fm)	Jan-Feb	Mar-Apr	May-Jun	Jul-Aug	Sep-Oct	Nov-Dec	All Periods
U.S.-Mexico Border to Point Conception							
1-10	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11-20	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21-30	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31-40	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41-50	0.0	0.1	0.0	0.0	0.0	0.0	0.1
51-60	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61-70	0.0	0.0	0.0	0.0	0.0	0.0	0.0
71-80	0.0	0.0	0.0	0.0	0.0	0.0	0.0
81-90	0.0	0.0	0.0	0.0	0.0	0.0	0.0
91-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100+	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All Depths	0.0	0.1	0.0	0.0	0.0	0.0	0.1
Point Conception to Pt. San Pedro							
1-10	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11-20	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21-30	0.0	0.0	0.0	0.0	0.1	0.0	0.2
31-40	0.4	0.4	0.1	0.1	0.4	0.1	1.5
41-50	0.3	0.3	0.1	0.1	0.4	0.1	1.3
51-60	0.7	0.7	0.2	0.3	0.8	0.2	3.0
61-70	0.7	0.7	0.2	0.3	0.9	0.2	3.0
71-80	0.0	0.0	0.0	0.0	0.0	0.0	0.0
81-90	0.0	0.0	0.0	0.0	0.0	0.0	0.0
91-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100+	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All Depths	2.3	2.3	0.6	0.8	2.6	0.6	9.1
Point San Pedro to Cape Mendocino							
1-10	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11-20	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21-30	0.0	0.0	0.0	0.0	0.1	0.0	0.2
31-40	0.3	0.3	0.1	0.1	0.4	0.1	1.4
41-50	0.3	0.3	0.1	0.1	0.3	0.1	1.2
51-60	0.7	0.7	0.2	0.2	0.8	0.2	2.7
61-70	0.7	0.7	0.2	0.2	0.8	0.2	2.7
71-80	0.0	0.0	0.0	0.0	0.0	0.0	0.0
81-90	0.0	0.0	0.0	0.0	0.0	0.0	0.0
91-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100+	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All Depths	2.0	2.0	0.6	0.7	2.3	0.6	8.2

TABLE F.11. Expected 2004 California recreational **yelloweye rockfish** catch (mt) by region, depth, and period.

Depth range (fm)	Jan-Feb	Mar-Apr	May-Jun	Jul-Aug	Sep-Oct	Nov-Dec	All Periods
			U.S.-Mexico Border to Point Conception				
1-10	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11-20	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21-30	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31-40	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41-50	0.0	0.0	0.0	0.1	0.1	0.0	0.2
51-60	0.0	0.0	0.0	0.1	0.3	0.0	0.4
61-70	0.0	0.0	0.0	0.1	0.1	0.0	0.2
71-80	0.0	0.0	0.0	0.0	0.0	0.0	0.0
81-90	0.0	0.0	0.0	0.0	0.0	0.0	0.0
91-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100+	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All Depths	0.0	0.0	0.0	0.3	0.5	0.0	0.8
			Point Conception to Pt. San Pedro				
1-10	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11-20	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21-30	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31-40	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41-50	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51-60	0.0	0.0	0.0	0.0	0.0	0.0	0.0
61-70	0.0	0.0	0.0	0.0	0.0	0.0	0.0
71-80	0.0	0.0	0.0	0.0	0.0	0.0	0.0
81-90	0.0	0.0	0.0	0.0	0.0	0.0	0.0
91-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100+	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All Depths	0.0	0.0	0.0	0.0	0.0	0.0	0.0
			Point San Pedro to Cape Mendocino				
1-10	0.0	0.0	0.0	0.0	0.0	0.0	0.1
11-20	0.1	0.0	0.0	0.1	0.1	0.0	0.3
21-30	0.0	0.0	0.0	0.0	0.0	0.0	0.2
31-40	0.0	0.0	0.0	0.0	0.0	0.0	0.2
41-50	0.2	0.1	0.1	0.3	0.4	0.2	1.3
51-60	0.3	0.2	0.2	0.4	0.6	0.3	1.9
61-70	0.4	0.2	0.2	0.5	0.7	0.3	2.3
71-80	0.0	0.0	0.0	0.0	0.0	0.0	0.1
81-90	0.0	0.0	0.0	0.0	0.0	0.0	0.1
91-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100+	0.0	0.0	0.0	0.0	0.0	0.0	0.1
All Depths	1.1	0.6	0.6	1.4	2.0	0.9	6.6

Part G - Issues Involved with Allowing Limited Entry Trawlers to Use Longline Gear to Access Sablefish

As a result of the need to reduce mortality of overfished species, trawl opportunities continue to decrease. Area closures have been implemented to avoid catch of overfished rockfish, forcing trawl vessels that are too small or otherwise unable to carry the gear necessary to access deeper waters, to fish in nearshore areas. Increased trawling in shallow areas has in turn raised concern over adverse impacts on molting Dungeness crab and juvenile groundfish that use nearshore areas as a nursery. As a result, a number of trawlers have requested that they be allowed to use longline gear under the regulations governing the longline fleet, rather than trawl gear to access their trawl cumulative sablefish limit.

This proposal was endorsed by the Ad Hoc Allocation Committee and subsequently by the Council at their June meeting with the request that such a provision be moved forward "as soon as possible." Amendment 4 divides the limited entry fleet between trawl and fixed gear sectors, and stipulates allocations and gear restrictions. Since there is currently no provision for crossover of permits between sectors, this proposal would require an amendment of the Groundfish Fishery Management Plan (FMP). Therefore it is not included in the alternative management measures for 2004 because an FMP amendment process would take more time than is available for final adoption of the 2004 Annual Specifications. However the Annual Specifications Environmental Impact Statement will present this proposal as a potential mitigation measure for 2004.

Allowing trawlers to use longline gear would add complexity to catch monitoring and regulation of the fishery. In order to properly account for catches, as well as to ensure compliance with fishery regulations, it would be necessary to identify trawl vessels that are exercising the sablefish longline option at any point in time. Additionally, this change might weaken the predictive power of the vessel participation model currently employed to fashion cumulative limits. The GMT recommends that the opportunity for fishers to use longline gear to harvest their trawl sablefish limit be in place for at least the full duration of a cumulative period, and that only one gear type (i.e., either trawl or longline) be used per vessel during that period. Practically this might require a formal declaration process, which could increase the administrative workload on management agencies.

This measure could potentially reduce the harvest rate for species that would have otherwise been taken with trawls during the period. Information on bycatch and discard in the line fisheries is not yet available from the federal observer program. Therefore it is not possible to evaluate changes in overall discard mortality that might result from trawlers switching to hook-and-line gear for one or more cumulative periods. To the degree that savings due to discard mortality or targeted fishing for non-sablefish species could be demonstrated, then these savings could increase opportunity for the rest of the fleet. For example, a trawler targeting sablefish with hook-and-line gear would not be expected to harvest significant amounts of flatfish. This would in turn affect the catch of overfished species associated with flatfish targets, as estimated by the bycatch model. This foregone catch could then be available to accommodate other opportunities for the trawl fleet.

This measure might also accelerate attainment of the trawl sablefish quota in the cases where fishers were not already achieving sablefish cumulative limits with their trawl gear. It might be possible to analyze this effect using trawl vessels that would seem most likely to use this provision (e.g., smaller, nearshore trawlers) and determining whether they routinely achieve their sablefish cumulative limit. This measure should not affect the harvest opportunity of the current fixed gear fleet, since sector allocations are fixed.

Although there is still controversy over the lack of specific information on the relative habitat impacts of trawl versus line gear, especially for West Coast waters, there would be a shift from trawl-related impacts to line gear impacts during any period a trawler took advantage of the proposed measure.

Having this measure available as a management option would provide fishery managers with a mechanism to mitigate, at least in part, the socio-economic effects of closing nearshore areas to trawl vessels in order to protect spawning crab or to reduce catch of juvenile groundfish.

Exhibit C.6.c
Public Comment
September 2003

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NATURAL RESOURCES DEFENSE COUNCIL

July 7, 2003

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BY E-MAIL AND POSTAL MAIL

Donald McIsaac
Executive Director
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 200
Portland, OR 97220-1384

Dear Dr. McIsaac:

On behalf of the Natural Resources Defense Council, I am writing to provide scoping comments on the environmental impact statement ("EIS") on the 2004 Pacific Coast groundfish fishery specifications and management measures ("2004 specifications"). A notice of intent to prepare the EIS was published in the Federal Register at 68 Fed. Reg. 33,670 (June 5, 2003).

It is essential that the EIS evaluate fully all potential environmental issues relating to the 2004 specifications and present a full range of alternatives for all important choices faced by the National Marine Fisheries Service ("NMFS") in crafting the specifications. Among other crucial issues, the EIS must present a full analysis on the following issues:

- The current status of the different species managed in the Pacific groundfish fishery, especially those species known or suspected to be overfished.
- A detailed discussion of the management of overfished species over the past several years, including but not limited to a discussion of whether actual mortality levels have exceeded the optimum yields (OYs) set by NMFS in past years. If actual mortality levels have (or may have) exceeded OYs set by NMFS, the EIS must present a detailed analysis of the environmental consequences.
- A detailed discussion of the ability of current management methods to constrain actual mortality to the levels established by NMFS in its annual specifications, and a detailed analysis of alternative management measures that could offer more reliable control over the actual level of fishing harvest.
- A full discussion of bycatch issues, including but not limited to: (a) a full analysis of the amount and sources of bycatch occurring in the fishery, especially for each overfished species; (b) a full analysis of the effects of bycatch on the fishery, especially on overfished species; (c) a full analysis of the effect of current management techniques and

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methods (including allocations) on the amount and type of bycatch occurring in the fishery; and (d) an analysis, for each overfished species, that examines each potentially available bycatch reduction technique and determines whether that bycatch reduction technique is practicable for use in managing that species.

- A full discussion of efforts by NMFS and the Pacific Fishery Management Council to foster and encourage a year-round Pacific groundfish trawl fishery; the environmental consequences of this year-round fishery; and alternatives to a year-round fishery.
- A full discussion of the environmental consequences, including the contributions made to bycatch, of managing the fishery using small trip limits.
- A comprehensive discussion of rebuilding issues, including analysis of a varied range of rebuilding periods and a full discussion for each overfished species of the biological consequences of different harvest levels/rebuilding periods.
- A full discussion of the environmental impacts of different fishing gears and techniques.
- A full discussion of NMFS's ability to enforce the harvest limits it selects for the 2004 fishing season given its current fishery management techniques.
- A full discussion of the value of area closures for protecting groundfish species and their habitat, especially overfished species, and full consideration of a range of closure alternatives.
- A comprehensive discussion of cumulative impacts.
- A full discussion of the impact on Pacific groundfish of other fisheries, such as state-managed fisheries and non-groundfish fisheries prosecuted in federal waters.
- A full discussion of observer coverage issues, including a full analysis of the adequacy of coverage levels for assessing bycatch and for administering and/or enforcing management measures and catch limits.

This list of issues is not comprehensive. The EIS must discuss fully all issues relating to potential environmental impacts of the 2004 specifications and must present a full range of alternatives on all relevant issues.

Sincerely,

Drew Caputo

Drew Caputo
Attorney

Advocates for Wild, Healthy Oceans

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Formerly the Center for Marine Conservation

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The Ocean Conservancy

July 7, 2003

Sent via facsimile and U.S. mail
Dr. Donald McIssac, Executive Director
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 200
Portland, OR 97220-1384

RE: 2004 Groundfish Specifications EIS

Dear Dr. McIssac:

The Ocean Conservancy is writing to provide comments on the scope of the Pacific Fishery Management Council's (PFMC) preparation of an Environmental Impact Statement (EIS) analyzing proposed management measures for the groundfish fishery in 2004. Pursuant to the National Environmental Policy Act (NEPA), this EIS serves as a key decision making tool for federal officials to assess the impacts of proposed federal actions on the environment. Furthermore, it provides a vehicle for exploring alternative management approaches that can provide better avenues for restoring badly depleted populations of groundfish. We urge the PFMC to take full advantage of this process by analyzing a broad range of alternatives that will improve the condition of groundfish on the West Coast.

In selecting and analyzing a range of alternatives for 2004 mortality levels for managed species, it is critical that the PFMC's proposed actions comply with the requirements of the Magnuson Stevens Fishery Conservation and Management Act (FCMA) governing key elements of successful management of Pacific groundfish species including: ending overfishing, rebuilding depleted species, achieving optimum yields, accounting for and minimizing bycatch of managed and prey species, and protecting habitats essential to the well being of managed and prey species. With this in mind we request that the EIS include and analyze the following issues:

(1) for the nine identified overfished groundfish species under management, provide a range of alternatives for rebuilding time periods that are as short a period as possible;
(2) consistent with the *Technical Guidance on the Use of the Precautionary Approaches to implementing National Standard 1 of the Magnuson-Stevens Fishery Conservation and Management Act*[1] (Technical Guidance), provide a range of alternatives for probability values associated with successfully

[1] Restrepo, V.R. (convener), et. al. 1998. *Technical Guidance on the Use of the Precautionary Approaches to implementing National Standard 1 of the Magnuson-Stevens Fishery Conservation and Management Act.* NOAA Technical Memorandum NMFS-F/SPO-31, NOAA/NMFS, Washington, D.C.

The Ocean Conservancy strives to be the world's foremost advocate for the oceans. Through science-based advocacy, research, and public education, we inform, inspire and empower people to speak and act for the oceans.

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rebuilding the species within the maximum allowable and target time period, including the recommended ninety percent probability level[2];

(3) include a full range of management strategies for returning depleted species to healthy levels and managing non-depleted species at optimum yield;
(4) consider management measures designed to return depleted species back to healthy levels and manage non depleted species at optimum yield including capacity reduction, total mortality caps, measures that reduce bycatch of managed and prey species, and measures that reduce fishing impacts on marine habitats;
(5) consider management measures designed to reduce bycatch of managed and prey species including capacity reduction, bycatch caps on a fleetwide, sector wide or vessel by vessel basis, the use of a network of no take marine protected areas, gear modifications, and a system for accurately counting bycatch and bycatch mortality;
(6) consider management measures designed to reduce the adverse impacts of fishing operations on essential fish habitat including the bycatch measures listed above, a network of no take marine protected areas, gear modifications or prohibitions, and area closures by gear types; and
(7) consider data collection and enforcement measures necessary to better manage the groundfish fishery.

Ending Overfishing, Achieving Optimum Yield and Rebuilding Depleted Species

The FCMA provides a comprehensive framework for defining reference points associated with the health of fish populations to meet required management goals including achieving optimum yield, ending the overexploitation of fish populations and rebuilding those species that are depleted. The FCMA requires any fishery management plan prepared by the PFMC or the Secretary of Commerce must specify criteria to determine a maximum sustainable yield (MSY) and optimum yield (OY) of each fishery and specify objective and measurable criteria for identifying when a fishery is overfished (identified as a minimum stock size threshold (MSST)) and if overfishing is occurring (identified as a maximum fishing mortality rate threshold (MFMT)).[3]

These "status determination criteria" form the basis for management of marine fish species including identifying and rebuilding overfished species to MSY, preventing overfishing and achieving OY on a continuing basis.[4] The PFMC has adopted values of forty percent of virgin biomass as a proxy for MSY and values of twenty-five percent of virgin biomass as a proxy for MSST. There are currently nine species with biomass values below the MSST, three species with biomass levels above MSST but below MSY, and twelve species with a value above MSY. The status of the remaining species has not been assessed. Accordingly, management strategies for 2004 should fall into two classes: rebuilding species with biomass values below MSST back to MSY consistent with the FCMA and its accompanying guidance; and achieving OY on a continuing basis for the remaining species.

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[2] *Id.* at 38
[3] 16 U.S.C. §1853(a); 50 CFR §600.310.
[4] 16 U.S.C. §1851(a), §1853(a), §1854(e).

Rebuilding Depleted Species

For those species identified as overfished, the FCMA requires that the PFMC prepare a fishery management plan, plan amendment or proposed regulations to rebuild the species within one year of being identified as overfished by the NMFS.[5] Rebuilding measures must meet a number of criteria including specifying a time period for ending overfishing and rebuilding the stock, rebuilding the fishery in as short a time as possible, not to exceed ten years, except in certain prescribed instances and allocate restrictions and recovery benefits fairly and equitably among sectors of the fishery.[6] In the absence of formal rebuilding plans (currently under various stages of development), the annual specifications process serves as the vehicle for rebuilding these depleted species.

There are two key components in rebuilding overfished species with particular applicability to Pacific groundfish. The first is defining rebuilding time periods with high probabilities of success. According to the Technical Guidance, rebuilding plans for those species that cannot be rebuilt within ten years in the absence of any fishing mortality should use a timeframe that is as short as possible with a target date for rebuilding at the midpoint between the time needed to rebuild a species in the absence of fishing mortality (Tmin) and the maximum allowable timeframe pursuant to the national standard guidelines (Tmax).[7] The probability of achieving rebuilding by Tmax should be ninety percent or higher for those species whose assessments involve uncertainty, the case in groundfish stock assessments. The upper boundary of the target date should then be the midpoint of the Tmin and this computed Tmax value. The PFMC currently uses a range of probabilities of achieving rebuilding for depleted groundfish though none are at the recommended ninety percent level considering the uncertainty contained in the stock assessments. For those species with biomass values well below the MSST (less than or equal to half of MSST) the Technical Guidance recommends setting the fishing mortality rate as close to zero as possible.[8] This recommendation is particularly applicable to bocaccio, cowcod and canary rockfish.

The second issue is rebuilding depleted species in light of the magnitude and variability of future recruitment. The technical guidance speaks specifically to the issue of strong year classes within the rebuilding time period. According to the Technical Guidance it is key that a rebuilding control rule be established that guides rebuilding so that the occurrence of a strong year class does not create a management response where short term yields are increased in response to a strong recruitment event.

With FCMA requirements and guidance in mind, the proposed EIS must present a full range of rebuilding time period alternatives for depleted species that are as short as

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5 16 U.S.C. §1854(e)
6 *Id.*
7 pg. 38
8 We note that the PFMC has adopted a policy consistent with the Technical Guidance through its use of the "40-10" rule. However, this rule was not adhered to in the 2003 specification process.

possible considering a number of factors.[9] Mortality levels (fishing and bycatch related) of zero should be considered for rebuilding cowcod, bocaccio and canary rockfish consistent with the PFMC's 40-10 policy and the Technical Guidance. A range of rebuilding strategy and probability alternatives should be presented for successfully achieving rebuilding within allowable time frames with accompanying analysis of direct, indirect and cumulative environmental impacts. The range of alternatives must include a target rebuilding time set in relation to achieving Tmax with a ninety percent probability with a target date as the mid point between the Tmin and Tmax serving as the upper bounds of the rebuilding timeframe. Analysis of the rebuilding times and strategies must include both short and long term economic and ecological implications.

Achieving OY on a Continuing Basis

The second case involves managing those species above MSST to achieve OY on a continuing basis, the management target established by the FCMA. According to the FCMA, optimum yield is defined as the amount of fish which:

(A) will provide the greatest overall benefit to the Nation, particularly with respect to food production and recreational opportunities, and taking into account the protection of marine ecosystems;
(B) is prescribed as such on the basis of the maximum sustainable yield from the fishery, as reduced by any relevant economic, social or ecological factor; and
(C) in the case of an overfished fishery provides for rebuilding to a level consistent with producing the maximum sustainable yield in such fishery.[10]

Further direction is provided by the national standard guidelines which state that:

> Target reference points, such as OY should be set safely below limit reference points, such as the catch level associated with the fishing mortality rate or level defined by the status determination criteria.

This approach is consistent with the trend in fisheries management of treating MSY as a management limit that should rarely be exceeded and using OY as a management target safely below the MSY threshold. This change in approach is based on past experiences of overfishing occurring despite MSY based management.[11]

For those groundfish species not identified as overfished via the stock assessment process, management measures must achieve OY on a continuing basis. In order to accomplish this, an OY, or process for determining an annual OY should be detailed in

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[9] 16 U.S.C. §1854(e)
[10] 16 U.S.C. §1802 (28).
[11] Goodman, et. al, 2002. *Draft Scientific Review of the Harvest Strategy Currently Used in the BSAI and GOA Groundfish Fishery Management Plans*. Report prepared for the North Pacific Fishery Management Council.

developing 2004 catch specifications. The national standard guidelines recommend expressing OY in terms of numbers or weights of fish but provide other options for determining this parameter.[12] For those groundfish species without a formal stock assessment, the Technical Guidance provides a number of proxies that can be utilized for an OY value. These include an OY of seventy-five percent of recent catch for those species above biomass at MSY; fifty percent of recent catch for those species with a biomass above MSST but below MSY and twenty-five percent of recent catch for those species below MSST.[13]

With the FCMA requirements in mind, the EIS should provide a range of options for managing these species at optimum yield with varying probabilities of success for obtaining the target. OY values and proxies recommend by the Technical Guidance should be included in the range of alternatives with accompanying analysis of both short and long term environmental and economic impacts.

The EIS Must Explore a Full Range of Management Measures Necessary to Ensure a High Probability of Successfully Rebuilding Depleted Species Within the Rebuilding Target Time

Essential to the success of any management plan is ensuring that annual mortality levels of a depleted species are consistent with target goals, that abundant levels of prey species exist and that habitats used by depleted species and their prey are protected. Thus, the issues we recommend for analysis include management measures that will rebuild depleted populations by limiting total mortality (via direct catches and bycatch) to levels consistent with proposed rebuilding targets, management measures that will achieve OY on a continuing basis for those species with a biomass level above MSST, measures that will minimize the incidental catch of a depleted species' prey species, and measures that will reduce impacts of fishing gears on the marine environment including an analysis of the past, present and reasonably foreseeable adverse impacts of fishing and non-fishing operations on habitats utilized by the depleted species.

In completing the EIS we recommend the analysis of the following management tools in meeting management goals: limiting fishing effort via capacity reduction, time and area closures, a network of no take marine protected areas, trip or bag limits, and caps on total mortality ("hard" total allowable mortality levels).

Counting and Minimizing Bycatch

Considering the depleted nature of many groundfish species and the resulting fishing management scheme utilizing depth and trip restrictions, effectively controlling regulatory discards is crucial to meeting applicable management goals. The FCMA requires that any fishery management plan amendment must establish a standardized reporting methodology to assess the amount and type of bycatch occurring in the fishery

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[12] 50 CFR §600.310(f)(4).

[13] *Technical Guidance* at pg. 36.

and include measures that minimize bycatch and unavoidable bycatch mortality to the extent practicable.[14]

With these FCMA requirements in mind, the EIS should contain a range of alternatives for minimizing bycatch of both depleted species which are the subject of this amendment and prey species and other marine life through measures including, but not limited to, capacity reduction, time and area closures, a network of no take marine protected areas, trip or bag limits, caps on total mortality (bycatch caps on a fleet wide, sector wide and vessel level), and gear modifications. The EIS should also analyze current data collection systems for assessing bycatch and bycatch mortality and identify needed improvements to current data collection that will meet the requirements of the FCMA and ensure annual total mortality goals are met.

Protecting Essential Fish Habitat

Another key tenet of the FCMA is the requirement that managers minimize, to the extent practicable, the adverse impacts of fishing operations on essential fish habitat.[15] The current management regime uses a combination of trip limits and depth based measures to keep catches within annual guidelines. As a result of this management scheme, fishing effort has shifted based on the particulars of the depth based closures. The EIS should fully analyze this effort shift to determine the resulting real and potential habitat impacts and methods to reduce these impacts consistent with the FCMA.

In achieving the habitat protection requirements, we recommend analyzing a full suite of management measures. These measures may include, but are not limited to, reducing effort via capacity reduction or trip or bag limit reduction, time and area closures, a network of no take marine protected areas, gear modifications and prohibitions on fishing practices that adversely impact important habitats or prey species.

Data Collection and Enforcement Mechanisms

With the reliance on trip and depth based management measures to constrain the fishery consistent with annual catch levels, it is critically important that management tools are utilized that will ensure the effectiveness of such a strategy. Accordingly, an accounting system must be established which accurately measures appropriate catches (including landed catch and bycatch) relative to limits of all species. Additionally, a monitoring system must be established which measures the depths at which species are caught and tools must be utilized to ensure that areas closed to certain gear types or methods of fishing are adequately enforced.

There are several means by which the NMFS and the PFMC can improve data collection. First, a method currently under consideration by the PFMC is the use of vessel monitoring systems (VMS) aboard commercial vessels. The Ocean Conservancy fully endorses the use of this technology immediately in the fishery and requests that the

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14 16 U.S.C. §1853(a)(11) and 16 U.S.C. §1851(a)(9).
15 16 U.S.C. §1853.

PFMC and the NMFS require VMS systems which can provide better data on location of catches for both enforcement and data collection purposes. Second, the PFMC and NMFS should require logbook data to include not only landed fish, but discards at sea, in order to provide some measure of mortality of overfished groundfish, while acknowledging and accounting for underestimations of bycatch in logbook data (see, for instance, Sampson, David. Analysis of Data from the At-Sea Data Collection Project. Final report to the Oregon Trawl Commission. 2002.). Finally, we request that the NMFS review current sources of data for fishing related mortality in all fisheries and update the groundfish fishery management plan to specify the pertinent data necessary to identify catch types and amounts, areas where fish are caught, time of fishing and other information needed to obtain the data necessary for proper application of the proposed 2003 management regime as required by the FCMA[16].

Conclusion

Consistent with NEPA, the EIS for 2004 management specifications for the West Coast groundfish fishery provides an important opportunity for the PFMC to adequately analyze a range of alternative management strategies that can help move the current management system towards long term sustainability. We hope that the PFMC will take full advantage of this process by assessing a full range of options to achieve the requirements of the FCMA.

We thank the PFMC for considering our comments and look forward to future work in protecting the marine life of the Pacific Ocean.

Sincerely,

Chris Dorsett
Pacific Fish Conservation Manager

[16] 16 U.S.C. §1853(a)(5).

JL Services
Jamie Swafford
866 Dean Creek Road
Reedsport, OR 97467

Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 200
Portland, OR 97220-1384

RECE
PFMC

To the Pacific Fisheries Management Council:

As a local business person I am greatly concerned about any pending recreational groundfish closures outside of the 50 fathom line.

We are located in the Oregon Dunes National Recreation Area. The Oregon Dunes are a unique geological situation. The dune structure does not stop at the ocean's edge but continues for miles offshore. We do not have any coastal reefs that support groundfish. The closest reefs to Winchester Bay are beyond the 50 fathom line both North and South of the mouth of the Umpqua River.

These reefs, one offshore of Ten Mile Creek to the South and off Takenitch Creek to the North, provide our recreational fishermen opportunities to fish for groundfish. If areas outside of the 50 fathom line are closed to recreational anglers, they would not have any opportunity to fish for groundfish.

Recreational angling provides a great economic stimulus for Winchester Bay and the surrounding area. If recreational angling for groundfish were stopped, we would experience the ripple effect from the loss of fishing. We experienced this in the 80's and 90's with the closure of coho salmon fishing on the Oregon coast. Many fishing related businesses closed and we lost all our charter fishing businesses. We currently have only four charter offices that provide offshore angling opportunities for our visitors.

We do not feel that recreational angling for groundfish in the Winchester Bay area has had a detrimental effect on the groundfish population. Recent ODFW statistics show that the port of Winchester Bay have about a 1% impact on all the sport groundfish caught in Oregon.

If Winchester Bay were allowed to be able to land fish similar to the "bubble salmon fisheries" allowed for Tillamook Bay or Port Orford, it would restore some fairness in the allocation of the groundfish quota. Winchester Bay would not be handicapped because of the unique geologic conditions of the area.

We would ask that the PFMC consider the economic and geologic conditions of the port of Winchester Bay and allow this port to have a sport groundfish season.

Sincerely,

Jamie Swafford

SALMON HARBOR MARINA

A Department of Douglas County
and Port of Umpqua

"SERVING OUR COMMUNITY WITH PRIDE"

August 21, 2003

RECEIVED

PFMC

Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 200
Portland, OR 97467

Dear Vice Chair Don Hansen and Council Members:

This letter is to express our great concern about any pending recreational groundfish closures outside of the 50-fathom line and to request that a sport groundfish season be allowed for Winchester Bay, Oregon.

Salmon Harbor Marina, near the mouth of the Umpqua River in Winchester Bay, Oregon, is located adjacent to the Oregon Dunes National Recreation Area. The Oregon Dunes are a unique geological situation that does not stop at the ocean's edge but continues for miles offshore. The nearest reefs to Winchester Bay are beyond the 50-fathom line both north and south of the mouth of the Umpqua River.

These reefs, one offshore of Ten Mile Creek to the south and off Tahkenitch Creek to the north, provide our recreational fishermen opportunities to fish for groundfish. If areas outside of the 50-fathom line were closed to recreational anglers, they would not have any opportunity to fish for groundfish.

Recreational angling provides a great economic stimulus for Winchester Bay and the surrounding Coastal Douglas County area. If recreational angling for groundfish were stopped, we would experience the ripple effect from the loss of fishing. We experienced this in the 1980's and 1990's with the closure of coho salmon fishing on the Oregon coast. Many fishing related businesses closed and we lost all our charter-fishing businesses. Currently there are only four charter offices that provide offshore angling opportunities for our visitors.

We do not feel that recreational angling for groundfish in the Winchester Bay area has had a detrimental effect on the groundfish population. Recent Oregon Department of Fish & Wildlife statistics show that Winchester Bay has only about a 1% impact on all the sport groundfish caught in Oregon.

P.O. Box 1007, Winchester Bay, Oregon 97467 - Office (541) 271-3407 • FAX (541) 271-2060

If Winchester Bay were allowed to be able to land fish similar to the "bubble salmon fisheries" allowed for Tillamook Bay or Port Orford, it would restore some fairness in the allocation of the groundfish quota. Winchester Bay would not be handicapped because of the unique geologic conditions of the area.

We respectfully request that the Pacific Fishery Management Council consider the economic and geologic conditions of the area and allow a sport groundfish season for Winchester Bay.

Yours truly,

Jeff Vander Kley

Jeff Vander Kley, Harbor Manager

C: Douglas County Board of Commissioners
Port of Umpqua Board of Commissioners
Salmon Harbor Management Committee

WINCHESTER BAY MERCHANTS ASSOCIATION
C/O COYNE
20 Eighth Street
P. O. Box 1663
Winchester Bay, Oregon 97467
541-271-2103

RECEIVED

PFMC

August 22 2003

Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 200
Portland, OR 97467 FAX Number 503-820-2299

Re: <u>Groundfish Fisheries - Winchester Bay Area</u>

Dear Sir or Madam,

This letter is written in support of a waiver of the current pending rules prohibiting fishing for goundfish inside of the 50 fathom line beacuse of its unique geological makeup. Winchester Bay is located in the Oregon Dunes National Recreation Area and has some of the highest dunes in the state. The dune structure does not stop at the ocean's edge but continues for miles offshore. The area within the 50 fathom line does not have any coastal reefs which support groundfish. The closest reefs to Winchester Bay are beyond the 50 fathom line both North and South of the mouth of the Umpqua River. These reefs, one offshore of Ten Mile Creek to the South, the other off the Takenitch Creek area to the North, provide our recreational fishermen opportunities to fish for groundfish.

If areas outside of the 50 fathom line are closed to recreational anglers, we would not have any opportunity to fish for groundfish.

Recreational angling provides a great economic stimulus for Winchester Bay and the surrounding area. If recreational angling for groundfish were stopped, we would experience the ripple effect from the another loss of fishing species. We experienced this in the 80's and 90's with the closure of coho salmon fishing along the Oregon coast. Many fishing related businesses closed and this area lost all our charter fishing businesses. We currently have only four charter offices providing offshore angling opportunities for our visitors.

Recreational angling for groundfish in the Winchester Bay area has not had a detrimental effect on the groundfish population. Recent ODFW statistics show that the port of Winchester Bay has about a 1% impact on all the sport groundfish caught in Oregon.

If Winchester Bay were allowed to be able to land fish similar to the "bubble salmon fisheries" allowed for Tillamook Bay or Port Orford, it would restore some fairness in the allocation of the groundfish quota. Winchester Bay would not be handicapped because of the unique geologic conditions of the area.

We would ask the PFMC to consider the economic and geologic conditions of the port of Winchester Bay and allow this port to have a sport groundfish season.

Sincerely,

Joe Coyne, President
Winchester Bay Merchants

WM. WARNER 5412716947 P.02

PORT OF SIUSLAW 1499 Bay Street, P.O. Box 1220, Florence, OR 97439
Phone: 541-997-3426 Fax: 541-997-9407 Email: portofsiuslaw@oregonfast.net

August 22, 2003

VIA FACSIMILE

Pacific Fisheries Management Council
7700 NE Ambassador Place, Suite 200
Portland, OR 97220-1384

RE: 2004 Oregon Recreational Groundfish Fishery

Dear Council Members:

The Port of Siuslaw, serving the Florence, Oregon area, is greatly concerned about any pending recreational groundfish closures outside of the 50 fathom line.

We are located in the Oregon Dunes National Recreation Area. The Oregon Dunes are a unique geological situation. The dune structure does not stop at the ocean's edge, but continues for miles offshore. We do not have any coastal reefs that support groundfish. The closest reefs to Florence are at the Heceta Banks thirty miles offshore, far beyond the 50 fathom coastal depths.

The Heceta Banks provides our recreational fishermen opportunities to fish for groundfish, halibut and salmon. If areas outside of the 50 fathom line are closed to recreational anglers, they would not have any opportunity to fish for groundfish.

Recreational angling provides a great economic stimulus for Florence and the surrounding area. If recreational angling for groundfish were stopped, we would experience the ripple effect from the loss of fishing. We experienced this in the 80's and 90's with the closure of coho salmon fishing on the Oregon coast. Many fishing related businesses closed and we lost all our charter fishing businesses.

We do not feel that recreational angling for groundfish in the Florence area has had a detrimental effect on the groundfish population. Recent ODFW statistics show that Florence (Port of Siuslaw) and Winchester Bay (Salmon Harbor) have about a 1% impact on all the sport groundfish caught in Oregon.

We would ask that the PFMC consider the economic and geologic conditions of the Florence and Winchester Bay areas and allow these two ports to have a sport groundfish season.

Respectfully submitted,

PORT OF SIUSLAW COMMISSION

Leonard VanCurler

By: Leonard VanCurler
Commission President

LV/tw

DRAFT

2004 Canary and Lingcod Allocation Options

Canary Rockfish - 50:50			OY= 42
Total Commercial		20.5	
Trawl	59%	12.1	
LE FG	3%	0.6	
OA	12%	2.5	
Tribal	26%	5.3	
Total Recreational		20.5	
WA	6%	1.2	
OR	34%	6.9	
CA	60%	12.4	

Canary Rockfish - 61:39			OY= 46
Total Commercial		27.4	
Trawl	59%	16.2	
LE FG	3%	0.8	
OA	12%	3.3	
Tribal	26%	7.1	
Total Recreational		17.6	
WA	6%	1.1	
OR	34%	5.9	
CA	60%	10.6	

Lingcod - 31:69			OY= 735
Total Commercial		227.9	
Trawl	49%	111.6	
LE FG	12%	27.3	
OA	32%	72.9	
Tribal	7%	15.9	
Total Recreational		507.2	
WA	13%	65.9	
OR	22%	111.6	
CA	65%	329.6	

Table M1.--Scenario: Council OY-1. Management parameters for the Council-approved OY scenario

Period	Shallow line (fm)	Deep line (fm)	Bi-monthly trip limits sablefish	longspine	shortspine	dover	arrowtooth	petrale	otr. flatfish
N. of 40°10'									
1	75	150	7,500	10,000	2,000	26,000	999,999	999,999	100,000
2	60	150	7,500	10,000	2,000	26,000	999,999	100,000	100,000
3	60	150	7,500	10,000	2,000	26,000	150,000	100,000	100,000
4	75	150	7,500	10,000	2,000	26,000	150,000	100,000	100,000
5	75	150	7,500	10,000	2,000	26,000	150,000	100,000	100,000
6	75	150	7,500	10,000	2,000	26,000	999,999	999,999	100,000
If small footrope used in period									
1	75	150	3,500	3,000	1,000	15,000	5,000	20,000	50,000
2	60	150	3,500	3,000	1,000	15,000	5,000	20,000	50,000
3	60	150	3,500	3,000	1,000	15,000	5,000	20,000	50,000
4	75	150	3,500	3,000	1,000	15,000	5,000	20,000	50,000
5	75	150	3,500	3,000	1,000	15,000	5,000	20,000	50,000
6	75	150	3,500	3,000	1,000	15,000	5,000	20,000	50,000
38°-40°10'									
1	100	150	7,500	10,000	2,000	26,000	999,999	999,999	100,000
2	100	150	7,500	10,000	2,000	26,000	10,000	20,000	100,000
3	100	150	7,500	10,000	2,000	26,000	10,000	20,000	100,000
4	100	150	7,500	10,000	2,000	26,000	10,000	20,000	100,000
5	100	150	7,500	10,000	2,000	26,000	10,000	20,000	100,000
6	100	150	7,500	10,000	2,000	26,000	999,999	999,999	100,000
S. of 38°									
1	75	150	7,500	10,000	2,000	26,000	999,999	999,999	100,000
2	75	150	7,500	10,000	2,000	26,000	10,000	20,000	100,000
3	100	150	7,500	10,000	2,000	26,000	10,000	20,000	100,000
4	100	150	7,500	10,000	2,000	26,000	10,000	20,000	100,000
5	75	150	7,500	10,000	2,000	26,000	10,000	20,000	100,000
6	75	150	7,500	10,000	2,000	26,000	999,999	999,999	100,000

Note: a trip limit of amount of 999,999 represents no limit on the amount of the species that may be landed during that period

Table M2.--Scenario: Council OY-1. Projected catch, landings, and discard of major target species.

	sablefish	longspine	shortspine	dover	arrowtooth	petrale	otr. flatfish
Total catch/mortality (mt)							
N. of 40°10'	2,636	1,225	631	5,008	2,496	1,571	2,611
38°-40°10'	479	288	190	1,334	24	425	1,299
S. of 38°	362	262	120	972	3	105	193
Coastwide	3,477	1,776	942	7,313	2,522	2,102	4,103
Retained catch (mt)							
N. of 40°10'	1,447	993	412	4,306	1,682	1,521	1,615
38°-40°10'	278	234	124	1,156	15	391	804
S. of 38°	249	212	78	840	2	102	120
Coastwide	1,974	1,439	614	6,302	1,699	2,014	2,539
Discard mortality (mt)							
N. of 40°10'	1,189	232	219	701	814	50	996
38°-40°10'	201	55	67	178	9	34	495
S. of 38°	113	50	42	132	1	4	73
Coastwide	1,503	337	328	1,011	823	88	1,564

Table M3.--Scenario: Council OY-1. Projected total bycatch of rebuilding species.

	period	lingcod	canary	POP	darkblotched	widow	yelloweye	bocaccio	cowcod
N. of 40°10'									
	1	2.4	0.4	21.2	24.2	0.2	0.0	0.0	0.0
	2	3.6	0.5	23.3	26.6	0.3	0.0	0.0	0.0
	3	10.4	1.1	18.6	21.4	0.4	0.0	0.0	0.0
	4	18.4	4.0	22.3	25.0	0.4	0.2	0.0	0.0
	5	11.0	2.4	19.6	22.1	0.3	0.1	0.0	0.0
	6	2.5	0.5	12.7	14.4	0.1	0.0	0.0	0.0
	Total	48.3	8.9	117.7	133.8	1.6	0.3	0.0	0.0
S. of 40°10'									
	1	3.3	0.1	0.1	4.8	0.1	0.0	1.3	0.0
	2	3.9	0.1	0.1	4.6	0.1	0.0	1.6	0.0
	3	7.6	0.3	0.1	4.0	0.1	0.0	8.7	0.2
	4	8.1	0.2	0.1	5.4	0.1	0.0	8.0	0.2
	5	4.2	0.1	0.1	5.9	0.1	0.0	1.6	0.0
	6	3.3	0.1	0.1	6.1	0.1	0.0	1.2	0.0
	Total	30.5	0.9	0.3	30.9	0.5	0.1	22.5	0.6
Coastwide									
	1	5.6	0.6	21.3	29.1	0.3	0.0	1.3	0.0
	2	7.6	0.6	23.3	31.3	0.3	0.0	1.6	0.0
	3	18.1	1.4	18.6	25.5	0.4	0.0	8.7	0.2
	4	26.5	4.3	22.4	30.4	0.5	0.2	8.0	0.2
	5	15.2	2.5	19.7	28.0	0.4	0.1	1.6	0.0
	6	5.8	0.6	12.7	20.5	0.2	0.0	1.2	0.0
	Total	78.8	9.8	118.0	164.7	2.1	0.4	22.5	0.6

TABLE B-2. Black rockfish allocation and OY options (grey cells are those values that would not accommodate the low end of the range of options for state caps specified for each alternative shown in TABLE B-3).

		OY Level			Change from Historic Harvest (2003 Cap)											
		Low	Med	High	1998			2002			2003 (Cap)			1994-2003 Average		
	Allocation Shares	729 mt	775 mt	861 mt	Low	Med	High	Low	Med	High	Low	Med	High	Low	Med	High
					Mt											
Oregon	0.63	459	488	542	-166	-137	-83	91	120	174	6	35	89	-55	-26	28
California	0.37	270	287	319	68	85	117	21	38	70	139	156	188	23	40	72
Oregon	0.58	423	449	499	-202	-176	-126	55	81	131	-30	-4	46	-92	-65	-15
California	0.42	306	326	362	104	124	160	57	77	113	175	195	231	60	79	115
Oregon	0.56	408	434	482	-217	-191	-143	40	66	114	-45	-19	29	-106	-81	-33
California	0.44	321	341	379	119	139	177	72	92	130	190	210	248	74	95	132
Oregon	0.49	357	380	422	-268	-246	-203	-11	12	54	-96	-73	-31	-157	-135	-93
California	0.51	372	395	**439**	170	193	237	123	147	190	241	264	308	125	149	193
Oregon	0.65	474	504	**560**	-151	-122	-66	106	136	192	21	51	107	-41	-11	45
California	0.35	255	271	301	53	69	99	6	23	53	124	140	170	9	25	55
Oregon																
Max Alloc	0.65	474	504	560	-151	-122	-66	106	136	192	21	51	107	-41	-11	45
Min Alloc	0.49	357	380	422	-268	-246	-203	-11	12	54	-96	-73	-31	111	133	176
California																
Max Alloc	0.51	372	395	439	170	193	237	123	147	190	241	264	308	-143	-119	-76
Min Alloc	0.35	255	271	301	53	69	99	6	23	53	124	140	170	9	25	55

DraFL

Estimated groundfish impacts for selected species under various options for the 2004 Oregon recreational fishery

9/9/03

Option	Canary	Yelloweye	Lingcod	Widow	Black rk	Other nearshore rk
	Estimated Impacts in mt					
1. Status quo	9.5	3.9	97.3	2.9	316.2	41.7
2. Closed outside of 50-fathoms in July	9.0	3.8	96.0	2.4	321.4	42.2
3. Closed outside of 40-fathoms June-Sept	6.5	2.8	88.9	0.9	334.9	44.0
4. Closed outside of 40-fathoms except March-May	6.0	2.7	87.5	0.7	337.5	44.5
5. Closed outside of 50-fathoms all year	5.9	3.0	87.7	0.4	346.0	45.4
6. Closed outside of 40-fathoms all year	5.2	2.5	84.5	0.4	346.0	45.4
7. Closed outside of 30-fathoms all year	5.1	2.5	84.5	0.2	346.0	45.4
8. Closed outside of 40-fathoms all year and no yelloweye and canary retention June	5.0	2.5	84.5	0.4	346.0	45.4
9. Closed outside of 40-fathoms all year and no canary retention all year	4.3	2.5	84.5	0.4	346.0	45.4

Note:
1..Options arranged in order of reducing canary rk impacts
2. Assumes all-depth halibut fishery with non-retention of canary and yelloweye rk
3. Estimates are soft and depend on limited onboard observations, uncertain effects of other fisheries (i.e., salmon opportunities for 2004), and angler response to offshore closures
4. Other nearshore rk includes blue rk

5

Tribal Groundfish Fisheries Proposals for 2004

Black Rockfish - The 2004 tribal harvest guidelines will be set at 20,000 pounds for the management area between the US/Canada border and Cape Alava, and 10,000 pounds for the management area located between Destruction Island and Leadbetter Point. No tribal harvest restrictions are proposed for the management area between Cape Alava and Destruction Island.

Sablefish - The 2004 tribal set aside for sablefish will be set at 10 percent of the Monterey through Vancouver area OY minus 3 % to account for expected discard mortality. This represents 728.5 mt based on the harvest levels approved by the Council for 2004. Allocations among tribes and among gear types, if any, will be determined by the tribes.

Lingcod - The tribes propose an overall harvest guideline of 25 mt for all tribal fisheries. Tribal fisheries will be restricted to 450 pound per day and 1350 pound per week limits for all fisheries, which may be adjusted inseason to stay within the overall harvest guideline.

For all other tribal groundfish fisheries the following trip limits will apply:

Thornyhead rockfish - Tribal fisheries will be restricted to a 300 pound per trip limit. This trip limit will be for short and longspine thornyheads combined.

Canary rockfish - Tribal fisheries will be restricted to a 300 pound per trip limit.

Other Minor Nearshore, Shelf and Slope Rockfish - Tribal fisheries will be restricted to a 300 pound per trip limit for each species group, or the limited entry trip limits if they are less restrictive than the 300 pound per trip limit.

Yelloweye Rockfish – The tribes will continue developing depth, area, and time restrictions in their directed Pacific halibut fishery to minimize impacts on yelloweye rockfish. Tribal fisheries will be restricted to 100 pounds per trip.

Full Retention- The tribes will allow full retention of all rockfish species during open competition fisheries for Pacific halibut.

Makah Trawl fisheries proposals for 2004

Pacific Whiting - For the 2004 Pacific whiting fishery, the tribal set aside will be as provided in the Makah tribe's proposed allocation framework.

Mid-water Trawl Fishery- Treaty mid-water trawl fishermen will be restricted to a cumulative limit of yellowtail rockfish, based on the number of vessels participating, not to exceed 150,000 pounds per two month period for the entire fleet. Their landings of widow rockfish must not exceed 10% of the poundage of yellowtail rockfish landed in any given period. The tribe may adjust the cumulative limit for any two-month period to minimize the incidental catch of canary and widow rockfish, provided the average cumulative limit does not exceed 150,000 pounds for the fleet.

Bottom Trawl Fishery - Treaty fishermen using bottom trawl gear will be subject to the trip limits applicable to the limited entry fishery for Pacific cod, English sole, rex sole, arrowtooth flounder, and other flatfish. For petrale sole, fishermen would be restricted to 30,000 lbs/2 month period for the entire year. Because of the relatively small expected harvest, the trip limits for the tribal fishery will be those in place at the beginning of the season in the limited entry fishery and will not be adjusted downward, nor will time restrictions or closures be imposed, unless in-season catch statistics demonstrate that the tribes have taken ½ of the harvest in the tribal area. Fishermen will be restricted to PFMC approved trawl gear.

Observer Program – The Makah tribe has an observer program in place to monitor and enforce the limits proposed above.

Exhibit C.6.n
Supplemental Attachment 4
September 2003

COMMERCIAL FISHERY REVENUE PROJECTIONS FOR ENVIRONMENTAL IMPACT STATEMENT ALTERNATIVES

TABLE ComRev-1. Projected groundfish revenue for the low, medium, and high OY options ($ millions).

	2002	Projected 2003 (Status Quo)	Low OY	Medium OY	High OY
All Groundfish	47.3	47.5	35.5	46.8	57.5
Whiting (as constrained by widow)	11.3	12.6	4.9	10.1	19.8
Trawl Groundfish Nonwhiting	23.9	22.8	21.1	23.4	23.8
Nontrawl Groundfish	12.1	12.2	9.6	13.4	13.9

Notes: Results based on output for the trawl model, sablefish OY, black rockfish caps, and adjustments for shelf closures based on performance of the 2003 fishery relative to the 2002 fishery. The 2003 projection does not take into account this week's inseason management actions.

TABLE ComRev-2. Projected groundfish revenue by period and landing area for the low, medium, and high OY options ($ millions).

	Jan-Feb	Mar-Apr	May-June	July-Aug	Sept_Oct	Nov-Dec	Total
Washington							
Status Quo (2003 Proj)	0.4	0.6	1.1	1.8	1.1	0.3	5.3
Low OY Option	0.4	0.5	1.0	1.6	1.0	0.3	4.8
Medium OY Option	0.4	0.6	1.3	2.1	1.4	0.3	6.1
High OY Option	0.4	0.6	1.4	2.2	1.5	0.3	6.3
Oregon							
Status Quo (2003 Proj)	2.0	2.0	2.6	2.2	2.7	1.3	12.8
Low OY Option	1.9	1.9	2.2	1.9	2.3	1.1	11.3
Medium OY Option	2.0	2.2	2.8	2.4	3.0	1.2	13.7
High OY Option	2.1	2.3	2.9	2.5	3.2	1.3	14.2
California - North							
Status Quo (2003 Proj)	0.6	0.8	0.7	0.7	1.0	0.6	4.4
Low OY Option	0.6	0.8	0.7	0.7	0.9	0.5	4.1
Medium OY Option	0.6	0.9	0.8	0.8	1.1	0.5	4.6
High OY Option	0.6	0.9	0.8	0.8	1.2	0.5	4.7
California - South							
Status Quo (2003 Proj)	1.8	1.6	2.2	2.5	2.1	2.1	12.4
Low OY Option	1.7	1.4	1.9	2.0	1.7	1.7	10.4
Medium OY Option	1.9	1.8	2.2	2.3	2.1	2.0	12.4
High OY Option	1.7	1.9	2.2	2.4	2.2	2.0	12.4
Coastwide							
Status Quo (2003 Proj)	4.7	5.1	6.7	7.2	7.0	4.2	35.0
Low OY Option	4.5	4.6	5.8	6.3	5.9	3.5	30.6
Medium OY Option	4.9	5.5	7.1	7.6	7.6	4.0	36.7
High OY Option	4.8	5.6	7.3	7.8	8.0	4.2	37.7

-DRAFT-

Draft Proposed California Recreational Nearshore Management Measures for 2004

Recreational fisheries data south of 40^0 10^0 N. lat. have been analyzed to provide four management options that do not exceed expected sector catch limits for target species and overfished groundfish. The same methodology that was presented at the June PFMC meeting (re: Exhibit B.8.b, Supplemental GMT Report 2, June 2003) was employed to estimate total catch by depth, area, and wave. As noted in the June GMT report, CPUE (or effort shift) is not included in the analyses, and the current methodology would be improved if information were available to account for effort shift. Consequently, it is likely that the available estimated impacts represent minimum values.

Under all listed scenarios, scorpionfish would be expected to be overharvested, and therefore additional measures would be necessary to constrain the scorpionfish take within the available catch limits. Since scorpionfish do not possess a swim bladder, it is possible to release captured fish with high survival, estimated at 83% based on a tagging study of nearshore rockfish by CDFG. Thus, 4-month or 6-month periods of zero scorpionfish retention are proposed in order to constrain total mortality to within available catch limits. Although the mortality analysis for the 4-month scorpionfish non-retention options exceeds the earlier estimate of what the fishery would take by a small amount (<2mt), recent reductions in bag limit (from 10 to 5 in 2003) and the initiation of a 10 inch size limit in 2000 would be expected to provide some additional catch savings that are not reflected in the management option analysis for 2004. Consequently, the GMT believes that the 4-month non-retention options should be retained for consideration.

One of the proposed options also exceeds the current scorecard catch for widow rockfish by 0.1mt, and if that option were adopted, it would be necessary to make a corresponding adjustment to the scorecard to accommodate the increase. For other overfished species, the estimated catch is less than the expected CA recreational catch limit, and it is unclear how this difference should be reflected in the scorecard.

Bag limits and size limit measures would be used in concert with the proposed depth and season limits as described in the Draft EIS. One other proposed measure is to prohibit fishing in waters around the Farallon Islands from 0-10fms, in addition to other depth and season restrictions that would otherwise be in effect. This final depth restriction is expected to reduce the take of shallow nearshore rockfish.

Considering that the proposed options move back and forth inseason between the 20 fm contour and the 30 fm waypoints to define the open fishing area, enforceability of the proposals is an issue for the Enforcement Consultants.

DRAFT
Alternatives for 2004 California Recreational Nearshore Fishing Seasons and Depth restrictions

Option A-1

	Jan - Feb	Mar - Apr	May - Jun	Jul - Aug	Sep - Oct	Nov – Dec
Mendocino to Conception	30 fm	Closed	30 fm	20 fm	20 fm	30 fm
Conception to Mexico	60 fm	Closed	60 fm	60 fm	60 fm	60 fm

Species	Difference Between OY and Estimated Catch	Expected Rec OY	Estimated Catch		
			Total	North	South
Shallow NS	11.1	66	54.9	47.3	7.7
Deeper NS	43.9	349.1	305.2	254.7	50.4
Scorpionfish	(31.0)	63.9	94.9	0.0	94.9
Bocaccio	20.7	97.5	76.8	2.4	74.4
Canary – 9.1 MT OY	2.8	9.1	6.3	5.9	0.4
Canary - 10.5 MT OY	4.2	10.5	6.3	5.9	0.4
Cowcod	0.7	2.4	1.7	0.5	1.2
Lingcod	19.8	152.6	132.8	117.3	15.5
Widow	0.1	0.3	0.2	0.2	0.0
Yelloweye	0.1	1.2	1.1	0.5	0.6

Option A-2

	Jan - Feb	Mar - Apr	May - Jun	Jul - Aug	Sep - Oct	Nov - Dec
Mendocino to Conception	30 fm	Closed	30 fm	20	20	30 fm
Conception to Mexico	Closed	60 fm	60 fm	60 fm	60 fm	60 fm

Species	Difference Between OY and Estimated Catch	Expected Rec OY	Estimated Catch		
			Total	North	South
Shallow NS	**10.7**	66	55.3	47.3	8.0
Deeper NS	**46.7**	349.1	302.4	254.7	47.7
Scorpionfish	(30.7)	63.9	94.6	0.0	94.6
Bocaccio	**35.4**	97.5	62.1	2.4	59.7
Canary - 9.1 MT OY	**2.7**	9.1	6.4	5.9	0.5
Canary - 10.5 MT OY	**4.1**	10.5	6.4	5.9	0.5
Cowcod	**0.6**	2.4	1.8	0.5	1.3
Lingcod	**21.8**	152.6	130.8	117.3	13.5
Widow	**0.0**	0.3	0.3	0.2	0.1
Yelloweye	**0.1**	1.2	1.1	0.5	0.6

Option B-1

	Jan - Feb	Mar - Apr	May - Jun	Jul - Aug	Sep - Oct	Nov - Dec
Mendocino to Conception	Closed	30 fm	30 fm	20 fm	20 fm	30 fm
Conception to Mexico	Closed	60 fm	60 fm	60 fm	60 fm	60 fm

Species	Difference Between OY and Estimated Catch	Expected Rec OY	Estimated Catch		
			Total	North	South
Shallow NS	8.0	66	58.0	50.0	8.0
Deeper NS	39.3	349.1	309.8	262.1	47.7
Scorpionfish	(30.7)	63.9	94.6	0.0	94.6
Bocaccio	35.8	97.5	61.7	2.0	59.7
Canary – 9.1 MT OY	1.7	9.1	7.4	6.9	0.5
Canary - 10.5 MT OY	3.1	10.5	7.4	6.9	0.5
Cowcod	0.7	2.4	1.7	0.4	1.3
Lingcod	9.6	152.6	143.0	129.5	13.5
Widow	0.0	0.3	0.3	0.2	0.1
Yelloweye	0.1	1.2	1.1	0.5	0.6

Option B-2

	Jan - Feb	Mar - Apr	May - Jun	Jul - Aug	Sep - Oct	Nov - Dec
Mendocino to Conception	Closed	30 fm	20 fm	20 fm	30 fm	30 fm
Conception to Mexico	Closed	60 fm	60 fm	60 fm	60 fm	60 fm

Species	Difference Between OY and Estimated Catch	Expected Rec OY	Estimated Catch		
			Total	North	South
Shallow NS	5.6	66.0	60.4	52.4	8.0
Deeper NS	33.7	349.1	315.4	267.7	47.7
Scorpionfish	(30.7)	63.9	94.6	0.0	94.6
Bocaccio	35.5	97.5	62.0	2.4	59.7
Canary – 9.1 MT OY	1.4	9.1	7.7	7.2	0.5
Canary - 10.5 MT OY	2.8	10.5	7.7	7.2	0.5
Cowcod	0.7	2.4	1.7	0.4	1.3
Lingcod	6.3	152.6	146.3	132.8	13.5
Widow	(0.1)	0.3	0.4	0.3	0.1
Yelloweye	0.1	1.2	1.1	0.5	0.6

Scorpionfish
No Retention Scenarios for Option A-1

	Jan - Feb	Mar - Apr	May - Jun	Jul - Aug	Sep - Oct	Nov - Dec
4 Month No Retention	60 fm	Closed	60 fm	No Retention	No Retention	60 fm
6 Month No Retention	60 fm	Closed	No Retention	No Retention	No Retention	60 fm

	Difference Between OY and Estimated Catch	Expected Rec OY	Estimated Catch		
			Total	North	South
4 Month No Retention	(1.5)	63.9	65.4	65.4	0.0
6 Month No Retention	8.2	63.9	55.7	55.7	0.0

Scorpionfish
No Retention Scenarios for Options A-2, B-1, and B-2

	Jan - Feb	Mar - Apr	May - Jun	Jul - Aug	Sep - Oct	Nov - Dec
4 Month No Retention	Closed	60 fm	60 fm	No Retention	No Retention	60 fm
6 Month No Retention	Closed	60 fm	No Retention	No Retention	No Retention	60 fm

	Difference Between OY and Estimated Catch	Expected Rec OY	Estimated Catch		
			Total	North	South
4 Month No Retention	(1.2)	63.9	65.1	65.10	0.0
6 Month No Retention	8.5	63.9	55.4	55.4	0.0

AMENDMENT 10
TO THE PACIFIC COAST GROUNDFISH FISHERY MANAGEMENT PLAN

IMPLEMENTING A MONITORING PROGRAM TO PROVIDE A FULL RETENTION OPPORTUNITY IN THE SHORE-BASED PACIFIC WHITING FISHERY

PRELIMINARY DRAFT ENVIRONMENTAL ASSESSMENT

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	Carrie Nordeen or Matthew Harrington National Marine Fisheries Service 7600 Sand Point Way, NE Seattle, WA 98115 (206) 526-6140

Abstract: This preliminary Environmental Assessment (EA) provides an initial analysis of the effects of implementing a monitoring program to provide a full retention opportunity in the shore-based Pacific whiting fishery off the coasts of Washington, Oregon, and California. A full retention opportunity will enable the shore-based whiting fleet to land unsorted catch at processing plants while the monitoring program will improving the ability of fishery management agencies to track the incidental catch of prohibited species (i.e., Pacific salmon) and overfished groundfish species (i.e., widow rockfish, darkblotched rockfish, Pacific ocean perch, canary rockfish, bocaccio, lingcod), as well as tracking the forfeiture and/or donation of groundfish caught in excess of Pacific Coast groundfish trip limits by the shore-based whiting fleet. The effects of different types of monitoring programs on the socioeconomic, biological, and physical environment of the Pacific Coast groundfish fishery were given a preliminary analysis and areas needing further analysis were identified.

The purpose of this document is to present and discuss the different types of monitoring programs that could be implemented to provide a full retention opportunity in the shore-based whiting fishery and the effects of those monitoring programs. At its September 8 - 12, 2003, meeting in Seattle, Washington, the Pacific Fishery Management Council (Pacific Council) will review this EA and adopt a range of alternatives for public review. The Pacific Council is scheduled to select a preferred alternative (i.e., a preferred monitoring program) at their November 3 - 7, 2003, meeting in San Diego, California. After the Pacific Council's November meeting, a proposed rule describing the proposed monitoring program and requesting public comment will be published in the Federal Register. After receiving public comment on the proposed rule, a final rule will implement a monitoring program into federal regulation prior to the start of the 2004 primary whiting season. Implementing a monitoring program for the shore-based whiting fleet will aid in sustainable management of Pacific Coast salmon and groundfish stocks while providing an important economic opportunity to those associated with the harvest, processing, and selling of whiting taken by the shore-based whiting fleet.

SEPTEMBER 2003

TABLE OF CONTENTS

1.0 PURPOSE OF AND NEED FOR ACTION

1.1 Introduction

The groundfish fishery in the Exclusive Economic Zone (EEZ), offshore waters between 3 and 200 miles, off the coasts of Washington, Oregon, and California (WOC) is managed under the Pacific Coast Groundfish Fishery Management Plan (FMP). The Pacific Coast Groundfish FMP was prepared by the Pacific Fishery Management Council (Pacific 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 has been in effect since 1982.

Actions taken to amend FMPs or to implement regulations to govern the groundfish fishery must meet the requirements of several 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.

The regulations which implement NEPA allow NEPA documents to be combined with other agency documents to reduce duplication and paperwork (40 CFR§§1506.4). Therefore, this EA will ultimately become a combined regulatory document to be used for compliance with not only NEPA but also E.O. 12866 and RFA. 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 problem. The purpose and need and general background materials are included in Chapter One of this document. Chapter Two describes a reasonable range of alternative management actions that may be taken under the proposed action. In accordance with NEPA requirements, Chapter Three contains a description of the socioeconomic, biological, and physical characteristics of the affected environment and Chapter Four examines the socioeconomic, biological, and physical impacts of the management options as required by NEPA, E.O. 12866 and the RFA. Chapter Five provides the list of references and an appendix is attached.

In the final EA, Chapter Five will contain the NEPA conclusions, Chapter Six will addresses the consistency of the proposed actions with the FMP, Magnuson-Stevens Act, ESA, MPA, CZMA, PRA, E.O. 12866, E.O. 13175 and the Migratory Bird Treaty Act. The Regulatory Impact Review required by E.O. 12866 to address the economic significance of the action, and the Regulatory Flexibility Analysis required by the RFA to addresses the impacts of the proposed actions on small businesses will be found in Chapters Seven and Eight, respectively.

1.2 Summary of Proposed Action

The proposed action is to implement a monitoring program to provide for a full retention opportunity in the shore-based Pacific whiting (whiting) fishery in the EEZ off the coasts of Washington, Oregon, and California.

1.3 Purpose of and Need for Action

The need for implementing a permanent monitoring program in the shore-based whiting fishery is to provide for a full retention fishery by enabling the shore-based whiting fleet, comprised exclusively of catcher vessels, to deliver unsorted catch to processing plants, a practice necessary to ensure that whiting landings are of market quality, while abiding by federal groundfish regulations and those implementing the Pacific Coast salmon and groundfish fishery management plans (FMPs), thereby, providing an important economic opportunity to those associated with the harvest, processing, and selling of whiting taken by the shore-based whiting fleet.

The purposes of the proposed action are as follows:

% Provide for a full retention opportunity within in the Pacific Coast groundfish fishery.

% Meet the terms and conditions of the "Section 7 Consultation - Biological Opinion: Fishing conducted under the Pacific Coast Groundfish Fishery Management Plan for California, Oregon, and Washington Groundfish Fishery" by accurately tracking salmon species incidentally taken in the shore-based whiting fishery and collecting morphological information from salmon species.

% Maintain the integrity of Pacific Coast groundfish rebuilding plans for overfished species by accurately tracking overfished species taken in the shore-based whiting fishery to manage the total mortality of overfished species.

% Reduce bycatch by allowing for the landing of prohibited species and groundfish taken in excess of cumulative trip limits and accurately tracking the forfeiture and/or donation of these fish to state or charitable donation agencies.

1.4 Background to the Purpose and Need

The need for the proposed action is linked to the treatment and disposition of prohibited species and groundfish taken in excess of cumulative trip limits in the Pacific Coast groundfish trawl as specified by federal regulations and those implementing the Pacific Coast salmon and groundfish FMPs.

% In section 6.5.2.2 “Catch Restrictions” of the 2002 groundfish FMP, it specifies that salmon caught in trawl nets are classified as a prohibited species. As specified under federal regulation at 50 CFR 660.306 and in section 6.5.5.4 “Prohibited Species” of the 2002 groundfish FMP, salmon captured in trawl nets and brought aboard must be returned to the sea as soon as practicable, after allowing for sampling by an observer, with a minimum of injury (PFMC 2002). [Note: Because of the high mortality rate for trawl caught salmon, all salmon discards are presumed dead.]

% In section 6.6.2 “Net Prohibition” of the 2003 salmon FMP, it specifies that the use of nets to capture salmon, with the exception of a hand-held net used to lift hooked salmon on board a vessel, is prohibited (PFMC 2003).

% Under federal regulation at 50 CFR 660.306, the taking, retaining, possessing, or landing of groundfish in excess of cumulative trip limits is prohibited without an exempted fishing permit.

Trawl fisheries regulated by the Pacific Coast groundfish FMP include those using either bottom trawl gear, a type of gear routinely fished with the footrope in contact with the ocean floor, or those using midwater trawl gear, a type of gear that is routinely fished above the ocean floor. In general, bottom trawl gear is used to harvest flatfish, rockfish, and some roundfish species while midwater trawl gear is primarily used to capture whiting.

Relatively low numbers of salmon are incidentally taken during trawl fishing operations for groundfish. Between September 2001 and August 2002, 9,413 lbs of salmon were incidentally taken by the limited entry groundfish trawl fleet with observer coverage during that period (about 10% of landings) off the Pacific Coast (NMFS 2003). The incidental capture of salmon is generally an unusual occurrence with most tows containing no salmon and a few tows containing many salmon. Variation in the incidental take of salmon appears to be influenced by the time of year, area, depth of fishing, and general salmon abundance. Knowledge of these variations shared between fishers can sometimes be used to help limit the incidental take of salmon in the groundfish fishery, especially in the whiting fishery. The salmon species predominantly taken in the whiting fishery is chinook. Pink, chum, and coho salmon may also contribute to a significant proportion of the catch in the midwater trawl fishery, depending on the year and location of the fishery. In 2002, 2,741 salmon were incidentally taken in the non-tribal whiting fishery (S. Parker, Marine Resources Program, ODFW, 2003, personal communication).

The 1992 Biological Opinion analyzing the effects of the Pacific Coast groundfish fishery on salmon stocks listed under the ESA, requires the Pacific Council to provide for monitoring of the salmon incidentally taken in the midwater trawl whiting fishery but not in the bottom trawl fishery (NMFS 1992). Gear is fished within the water column in the midwater trawl whiting fishery and it is fished near and/or on the ocean floor in the bottom trawl fishery. Because salmon are most often present in the water column, as opposed to being associated with the ocean floor, and because there is a spatial/temporal overlap between the whiting fishery and salmon distribution, there is an opportunity to take more salmon in the whiting fishery than in the bottom trawl fishery. For the bottom trawl fishery, the Pacific Council must provide an annual summary which characterizes that fishery and which can be used to assess any changing trends in that fishery that may jeopardize a listed salmon stock. Currently, the need for monitoring in the whiting fishery is based on not jeopardizing the existence of listed salmon species, including the Snake River fall chinook, lower Columbia River chinook, upper Willamette River chinook, and Puget Sound chinook (NMFS 2002). Monitoring needs could change if additional salmon species are listed or additional incidental take data are needed for other management purposes.

The whiting stock is the most abundant of any managed fishery resource off the coasts of Washington, Oregon, and California. Whiting landings in 2002 represented approximately 81% of the total groundfish landings by weight for the year (PacFIN 2002). The primary value of whiting lies in its conversion to a protein paste known as "surimi" which is used as the base for many analog products such as imitation crab, shrimp, and scallops. The conversion of fish flesh to an acceptable quality of surimi is highly dependent on the freshness of the raw product and demands careful handling and immediate cooling or processing to be economically feasible. Processing of whiting into surimi is more critical than with some other fish species because whiting contains a parasite which releases an enzyme that begins to soften the flesh of the fish soon after it dies. Rapid cooling of the whiting catch can retard this deterioration should whiting need to be stored for any duration prior to processing (PFMC 1996).

At present, the whiting fishery consists of at-sea and shore-based components. In the at-sea fishery, the trawl nets are emptied on the deck of either a mothership or catcher-processor, the catch is sorted, and the whiting are quickly processed to retain freshness and prevent loss of quality. During this time, incidentally caught salmon can be removed from the catch by an observer, either on deck or during processing of the catch, counted, and thrown overboard. Therefore, owing to vessel configuration and 100 % observer coverage, disposition of the salmon incidentally taken with midwater trawl gear by the at-sea whiting fleet satisfies the requirements of both the salmon and groundfish FMPs. In the shore-based fishery, catcher vessels must store the whiting, for up to several hours as they transit from the fishing grounds to shore-based plants where the fish are processed. In this situation, it is imperative for the catch to be cooled as rapidly as possible, often by immediately emptying the contents of the trawl net into refrigerated seawater holds below deck, to retain product freshness and quality. The shore-based fleet’s rapid dumping of catch into refrigerated seawater holds below deck precludes immediate sorting, sampling, and removing prohibited species from the catch. Consequently, this handling of salmon species and groundfish species taken in excess of cumulative trip limits by the shore-based whiting fleet is not in accordance with the Pacific Coast salmon or groundfish FMPs or under federal regulation at 50 CFR 660.306.

The sorting, sampling, and immediate release of salmon incidentally taken in the whiting fishery is possible for the at-sea component of the fishery, but it is not practical for the shore-based component of the whiting fishery because of their need to rapidly cool the fish in refrigerated seawater holds to preserve freshness and quality. As a temporary means to meet the monitoring requirements of the 1992 Biological Opinion and allow for efficient utilization of the whiting resource, the Pacific Council implemented an exempted fishing permit (EFP) process for the shore-based component. Through the initial use of on-board observers and the continued use of dock-side monitors, this EFP process authorized the retention of incidentally caught salmon in the shore-based whiting fishery until the catch is sorted at the processing plant. At the plants, incidentally taken salmon are counted, sampled, and either forfeited to the state or donated to charitable institutions. EFPs are intended to provide for limited testing of a fishing strategy, gear type, or monitoring program that may eventually be implemented on a larger fleet-wide scale and are not a permanent solution to the monitoring needs of the shore-based whiting fishery. Because the results of the shore-based whiting EFP indicate that it is feasible to retain and monitor the incidental take of salmon in the shore-based whiting fishery, it is now appropriate to implement a permanent monitoring system for salmon and other non-target species incidentally taken in the shore-based whiting fishery.

The harvest of Pacific Coast groundfish species is managed under a cumulative trip limit system. Trip limits are the specified quantity of groundfish that can be taken, retained, possessed, or landed on either a daily, weekly, monthly, or two month schedule. Because non-whiting species are sometimes captured during directed fishing for whiting and because sorting catch at sea is difficult for the shore-based whiting fleet, adherence to a trip limit management regime is not practical for the shore-based whiting fleet. In the fall of 2001, the West Coast Groundfish Observer Program (Observer Program) was implemented in the Pacific Coast groundfish fishery. The purpose of the Observer Program is to provide accurate accounts of total catch, bycatch, and discard under the cumulative trip limit management system. Vessels with limited entry permits carry observers on a random schedule and the Observer Program's initial goal was to provide coverage for trips resulting in about 10% of the limited entry trawl fleet's coastwide landings (NMFS 2003). Because of the shore-based whiting fleet's difficulty with sorting catch at sea, they have been able to take, retain, possess, and land groundfish species taken in excess of groundfish cumulative trip limits through the EFP process. Without an EFP, shore-based whiting vessels would be prohibited from retaining and landing groundfish in excess of trip limits under federal regulation at 50 CFR 660.306. Through the EFP process, the shore-based whiting fishery has been acting as a full retention fishery. Because the Observer Program is not designed to provide coverage for a full retention fishery, there is a need for a monitoring program in the shore-based whiting fishery that is designed to provide the higher level of coverage necessary for a full retention fishery.

In addition to tracking salmon incidentally taken in the shore-based whiting fishery, there is an increasing need to accurately track other aspects of the shore-based whiting fishery. There are currently nine overfished groundfish species along the Pacific Coast and at least six of these species (widow rockfish, darkblotched rockfish, Pacific ocean perch, canary rockfish, bocaccio, and lingcod) are incidentally taken in the shore-based whiting fishery. In 2002, the incidental catch of overfished species was as follows: 5,319 kg of widow rockfish, 432 kg of canary rockfish, 221 kg of Pacific ocean perch, 216 kg of lingcod, 24 kg of bocaccio, and 10 kg of darkblotched rockfish (Wiedoff and Parker 2002). The take of these species by the shore-based whiting fleet should be closely tracked for two reasons. It is important to not underestimate the total mortality of overfished species because that may result in harvest levels exceeding the rebuilding optimum yields (OYs) for those species, potentially slowing the rebuilding of those stocks. It is also important not to overestimate the catch of overfished species by the shore-based whiting fleet as that may result in other sectors of the Pacific Coast groundfish fishery being unnecessarily constrained in order to limit the incidental take of overfished species.

Additionally, as both state and federal agencies are experiencing budget reductions that affect the presence of enforcement personnel and dock-side samplers in and around processing plants, it is important to closely monitor what becomes of groundfish taken in excess of cumulative trip limits. Because of the shore-based whiting fleet's difficulty with sorting catch at sea, they have been able to take, retain, and land groundfish species taken in excess of groundfish cumulative trip limits through the EFP process. Groundfish taken in excess of trip limits are either forfeited to state agencies or donated to charitable agencies. Whether these fish are forfeited to the state or surrendered as charitable donations, a monitoring system is necessary to track these activities.

The proposed action is to implement a permanent monitoring program that provides for a full retention opportunity in the shore-based whiting fishery. The different monitoring programs for the shore-based whiting fishery analyzed in this EA are based on the existing monitoring program for shore-based whiting EFP, they are intended to meet the coverage needs of a full retention fishery, and will aid in the sustainable management of Pacific Coast salmon and groundfish fisheries.

1.5 Environmental Review Process

The purpose of the environmental review process is to determine the range of issues that the NEPA document (in this case the EA) needs to address. This allows the preparation of the document to be effectively managed. The environmental review process 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 environmental review process should identify the public and agency concerns; clearly define the environmental issues and alternatives to be examined in the NEPA document including, the elimination of non-significant issues; identify related issues; and identify state and local agency requirements that must be addressed.

1.5.1 Public Scoping

To address the treatment and disposition of salmon in the groundfish trawl fisheries, specifically the shore-based component of the whiting fishery, an EA to amend both the groundfish and salmon FMPs was drafted in 1996 by Pacific Fishery Management Council (PFMC) staff. Amendments to the FMPs numbered 10 and 12 for groundfish and salmon, respectively. The 1996 EA analyzed two management measures (alternatives) regarding the retention of salmon taken with groundfish trawl gear. The first alternative (status quo) was to maintain the current salmon and groundfish FMPs, therefore, retention of salmon in the trawl fisheries would not have been permitted and the practice of retaining salmon in the shore-based whiting fishery was only authorized as a temporary experimental measure under the authority of the EFP process. The second alternative (proposed action) maintained salmon as a prohibited species in the groundfish FMP. However, it added trawl gear to the list of gears which may retain salmon if allowed under other pertinent regulations (such as salmon fishing regulations at 50 CFR Part 660, Subpart H). Under the second alternative, the salmon FMP would be amended to allow retention of salmonids in the trawl fishery, when a Pacific Council approved monitoring program, one that meets certain minimum guidelines, is established in the shore-based whiting fishery (PFMC 1996). At their October 21 - 25, 1996, meeting in San Francisco, California, the Pacific Council discussed the retention of salmon in groundfish trawl fisheries, specifically the shore-based whiting fishery, and took final action implementing the second alternative (proposed action) to maintain a viable shore-based whiting fishery while using EFPs to temporarily monitor the incidental take of salmon until a permanent monitoring program could be implemented. Interested members of the public had the opportunity to comment on the retention of salmon in groundfish trawl fisheries at that same meeting in San Francisco, California.

In keeping with the Pacific Council's recommendation, to maintain a viable shore-based whiting fishery using EFPs to temporarily monitor the incidental take of salmon until a Pacific Council approved monitoring and disposition program is established, NMFS is proceeding with implementing a monitoring program for the shore-based whiting fishery. A preliminary EA is to be brought before the Pacific Council at their September 8 - 12, 2003, meeting in Seattle, Washington. The Pacific Council will review this preliminary EA and adopt a range of alternatives for public review. At their November 3 - 7, 2003, meeting in San Diego, California, the Pacific Council will review a final EA and select a preferred alternative (i.e., a preferred monitoring program).

On April 18, 2003, NMFS Northwest Region staff met with Northwest Fisheries Science Center (NWFSC) and West Coast Observer Program (Observer Program) staff to discuss implementing a monitoring program for the shore-based whiting fishery. Meeting discussion focused on what types of monitoring programs would be appropriate for the shore-based whiting fishery, what NWFSC and Observer Program resources, if any, would be available for monitoring the shore-based whiting fishery, and identifying an Observer Program staff member available to serve as a contact individual for the development and implementation of a shore-based whiting monitoring program.

On May 22, 2003, NMFS Northwest Region staff met with personnel from Washington Department of Fish and Wildlife (WDFW), Oregon Department of Fish and Wildlife (ODFW), and California Department of Fish and Game (CDFG) to discuss implementing a monitoring program for the shore-based whiting fishery. Meeting discussion focused on identifying state issues and concerns associated with different types of monitoring systems and identifying a contact individual from each state for the development and implementation of a monitoring system in shore-based whiting fishery.

1.5.2 Issues and Concerns Raised Through Scoping

While the initial purpose of the proposed action was to develop and implement a monitoring program for the treatment and disposition of incidentally taken salmon in the shore-based whiting fishery, the importance of developing and implementing a monitoring program capable of tracking multiple aspects of the shore-based whiting fishery became apparent through the scoping process.

Issues and concerns identified by staff from the NWFSC and Observer Program staff on April 18, 2003, include: the merits of a full retention program, allowing discard at sea would require observers/monitors to be aboard shore-based vessels, placing federal observers aboard shore-side is an inefficient use of resources, perhaps this shore-based fishery is a candidate for testing hard bycatch caps, video cameras may have insurance/liability concerns for industry, and valuable data could be collected dock-side but logistics of port sampling is difficult for the Observer Program.

Issues and concerns identified by staff from state (Washington, Oregon, and California) agencies on May 22, 2003, include: the relative economic importance of the shore-based whiting fishery varies by state, the resources available to implement a monitoring program differ by state, the monitoring program should be relatively consistent across states and build on the existing EFP monitoring infrastructure, currently monitoring is funded by industry, NMFS, and the states, there should be port specific market values for overage fish, the monitoring program could use a "penalty box" concept, and the monitoring program could implement individual vessel bycatch caps.

1.6 Decision to be Made

From the information in this EA, the Regional Administrator of NMFS, Northwest Region must decide which monitoring program should be implemented in the shore-based whiting fishery. The Regional Administrator must also determine if the selected alternative (monitoring program) would or would not be a major federal action, significantly affecting the quality of the human environment. If the Regional Administrator determines that the proposed action would not significantly affect the quality of the human environment, then a Finding of No Significant Impact (FONSI) can be prepared and a monitoring program can be implemented in the shore-based whiting fishery. If the Regional Administrator determines that the action would significantly affect the Pacific Coast groundfish fishery, then preparation of an Environmental Impact Statement will be required.

1.7 Applicable Federal Permits, Licences, or Authorizations Needed in Conjunction with Implementing this Proposal

No additional federal permits, licences, or authorizations are needed to implement a monitoring program in the shore-based whiting fishery.

2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1 Introduction

This chapter describes the different monitoring options or alternatives that may be implemented in the shore-based whiting fishery to meet the purpose and need of the proposed action. When deciding what type of a monitoring system is appropriate for the shore-based whiting fishery, the advantages and disadvantages associated with three different components of a monitoring program in the shore-based whiting fishery and four different monitoring options for the shore-based whiting fishery should be considered. The three different components of a monitoring program for shore-based whiting fishery that should be considered include: monitoring the harvesting and dock-side aspects of the fishery, tracking the overage/donation fish and the money paid for these fish, and the funding sources for a shore-based monitoring program. These three different components of the shore-based whiting fishery are termed “issues” in this EA. The four different monitoring options to provide for a full retention fishery include: the EFP process, a federal monitoring program, a state monitoring program, and a combination monitoring program. These four different monitoring options are referred to as the “alternatives” in this EA. The relationship between the issues and alternatives is explored in this EA.

2.2 Development of Alternatives and How the Alternatives are Structured

Because of the treatment and disposition of salmon incidentally taken in groundfish trawl fisheries specified in federal regulation and the Pacific Coast salmon and groundfish FMPs, as well as the conditions specified in the 1992 Biological Opinion analyzing the effects of the groundfish fishery on salmon stocks listed under the ESA, there is a need to implement a permanent monitoring program in the shore-based whiting fishery (PFMC 2003; PFMC 2002; NMFS 1992). The issue of salmon retention in the groundfish trawl fisheries has already been brought before the Pacific Council in 1996 in the form of Amendment 10 to the Pacific Coast Groundfish FMP. Based on the EA drafted to analyze Amendment 10, the Pacific Council recommended that the EFP process be used temporarily until a permanent monitoring program could be developed and implemented in the shore-based whiting fishery. In addition, the Pacific Council also recommended that both the groundfish and salmon FMPs be amended to allow the retention of salmon in certain groundfish trawl fisheries once an approved monitoring program is implemented in the shore-based whiting fishery (PFMC 1996).

Analysis of the alternatives will weigh the effects of the alternatives, specifically the different types of monitoring programs, on the human environment. For the purpose of this analysis, the human environment is defined as the Pacific Coast groundfish fishery. It is important for the preferred monitoring program to adequately provide for monitoring during the harvesting and dock-side aspects of the fishery, the tracking of overage/donation fish and the money paid for these fish, and a source of funding for such monitoring activities. Additionally, the preferred monitoring program should be capable of tracking salmon incidentally taken in the shore-based whiting fishery, tracking the incidental take of overfished groundfish species in the shore-based whiting fishery, as well as tracking overage/donation fish taken in the shore-based whiting fishery and the money paid for those fish.

2.3 Alternatives Eliminated from Detailed Study

There are two issues relevant to the retention of salmon in groundfish trawl fisheries and the shore-based whiting fleet that were not analyzed in this EA. The first issue relates to the treatment and disposition of salmon in groundfish trawl fisheries. Currently, the salmon FMP prohibits the use of nets to capture salmon and the groundfish FMP classifies salmon caught in trawl nets as a prohibited species (NMFS 2003; NMFS 2002). Therefore, salmon taken in trawl nets and brought aboard must be returned to the sea as soon as practicable, after allowing for sampling by an observer, with a minimum of injury. Both FMPs could be amended to allow retention of salmon with groundfish trawl gear without developing and implementing a monitoring program for the shore-based whiting fleet. However, based on the analysis in the 1996 Amendment 10 EA, the Pacific Council recommended revising both FMPs only after a Pacific Council approved monitoring program was developed and implemented in the shore-based whiting fishery (PFMC 1996). Allowing salmon retention without a monitoring program would make it difficult to track the amount of salmon incidentally taken in the shore-based whiting fishery. Additionally, allowing retention of salmon in groundfish trawl fisheries would likely create incentives for groundfish fishers to target salmon making it increasingly difficult for NMFS to manage for sustainable fisheries. Therefore, this action will not consider further revisions to either the salmon and groundfish FMPs without first implementing a monitoring program in the shore-based whiting fishery because doing so would not be in accordance with the purposes of the proposed action, including accurately tracking the amount of salmon incidentally taken in the shore-based whiting fishery and managing for sustainable fisheries.

The second issue not fully analyzed in this EA relates to the EFPs that are annually issued to participants in the shore-based whiting fishery. It is possible to discontinue issuing EFPs to the shore-based whiting fleet without implementing any type of permanent monitoring program. In that case, the shore-based whiting fleet would be forced to either sort their catch on deck, returning all salmon immediately to the sea, or to simply not harvest whiting. Sorting on deck would compromise the freshness and quality of the catch, due to the enzyme released by a whiting parasite that softens the flesh soon after death, diminishing the market value of the fish and, perhaps, rendering the catch valueless. Eliminating the shore-based whiting fleet's ability to harvest whiting would have significant economic impacts for those who had participated in the fishery and for coastal communities and business that rely on the shore-based whiting harvest. Additionally, the whiting fishery has always had a relatively low incidental take of other marine organisms and overfished groundfish species. Therefore, the action of discontinuing the EFP process without implementing a permanent monitoring program in the shore-based whiting fishery will not be considered any further because it does not satisfy the need for this proposed action which is managing for sustainable fisheries.

2.4 No Action Alternative

Alternative 1 (No Action Alternative): The annual process of issuing EFPs to participants in the shore-based whiting fleet would continue as has for over a decade. However, EFPs are intended to provide for limited testing of a fishing strategy, gear type, or monitoring program that may eventually be implemented on a larger, fleet-wide scale and not for the long-term purpose of providing a harvest opportunity which may otherwise be prohibited. Terms and conditions of the EFPs would be similar to the terms and conditions of years past, but they may be modified to reflect new issues or concerns in the shore-based whiting fishery. [See appendix for a 2003 shore-based whiting EFP.]

The EFP process would continue to be funded by the shore-based whiting fishery along with state and federal management agencies.

2.5 Alternatives

Alternative 2 (Federal Monitoring): The new permanent monitoring program for the shore-based whiting fleet would be a federal monitoring program.

Observer Program observers would monitor both the harvesting and dock-side aspects of the shore-based whiting fishery. While aboard the vessel, observers would verify whether the vessel retained all their catch or if any catch was discarded at sea. If catch was discarded at sea, observers would estimate catch quantity and species composition. Observers may also collect sighting/interaction data for marine mammals and seabirds. Dock-side at the processing plants, observers would sample salmon and overfished groundfish species incidentally taken in the shore-based whiting fishery. All shore-based whiting deliveries would be sampled. The groundfish FMP addresses observers placed on vessels but does not address observers placed at processing plants. Therefore, regulatory language would need to be developed for observer protocol at plants and the plants' responsibilities to observers.

Overage and donation fish would be forfeited to the state in which catch was landed. Federal enforcement personnel would track overage/donation fish and the money paid for those fish.

Alternative 2A: The federal monitoring program would be federally funded. However, the Observer Program only has a limited number of observers, during the whiting primary season (April - July) few observers would be available to provide observer coverage in other sectors of the groundfish fishery. In 2002, the Observer Program deployed approximately 40 observers and participation in the shore-based whiting fishery included 29 shore-based catcher vessels and 8 plants participated in the shore-based whiting fishery.

Alternative 2B: The federal monitoring program would be industry funded through a direct pay system (similar to the funding for the observers in the at-sea whiting fishery) and would use Observer Program observers. Under this system, shore-based whiting vessels would pay either the federal government or an independent observer contractor the costs associated with an observer collecting data aboard their vessel (e.g., salary, travel). As with Alternative 2A, observer training, certification, and data collection would be controlled by NMFS.

Alternative 3 (State Monitoring): The new permanent monitoring program for the shore-based whiting fleet would be a state monitoring program.

State monitors would be trained by the Observer Program and would monitor both the harvesting and dock-side aspects of the shore-based whiting fishery. While aboard the vessel, state monitors would verify whether the vessel retained all their catch or if any catch was discarded at sea. If catch was discarded at sea, monitors would estimate catch quantity and species composition. Dock-side at the processing plants, state monitors would sample salmon and overfished groundfish species incidentally taken in the shore-based whiting fishery. Based on sampling done by the state port samplers under the Alternative 1 (No Action Alternative), between 10% - 50% of shore-based whiting deliveries would be sampled.

Overage and donation fish would be forfeited to the state in which catch was landed. State enforcement personnel would track overage/donation fish and the money paid for those fish.

Alternative 3A: The state monitoring program would be funded by each state.

Alternative 3B: The state monitoring program would be industry funded through a tax system, whereby, processing plants pay for their participation in the shore-based whiting fishery. For example, if the shore-based monitoring program is projected to cost $100,000 to operate in 2004 and one plant processed 25% of the whiting taken by the shore-based fleet during 2003. Then to fund the monitoring program in 2004, that plant would pay 25% of the projected operating costs for 2004 or $25,000.

Alternative 4 (Combination Monitoring): The new permanent monitoring program for the shore-based whiting fleet would be a combination of electronic monitoring, state monitors, and federal/state enforcement personnel.

Electronic monitoring equipment is automated monitoring equipment to provide accurate, timely and verifiable fisheries data of equivalent or better quality and lower cost than that provided by an at-sea observer. The electronic monitoring system integrates an assortment of available electronic components with a software operating system to create a unique and powerful data collection tool. The system operates on either DC or AC voltage and autonomously logs video and vessel sensor data during the fishing trip. The system automatically restarts and resumes program functions following power interruptions. The electronic monitoring system is designed to independently monitor fishing activities on the vessel (McElderry et al. 2002). Electronic monitoring has been tested in various fisheries, including the shore-based whiting fishery, and has been found to be able to address specific fishery monitoring objectives. The installation, maintenance, and data analysis necessary for implementing an electronic monitoring system would likely be contracted out to a private company. [See appendix for the report "Electronic Monitoring for Shoreside Hake Fishing: A Pilot Study."]

Electronic monitoring would monitor all the shore-based whiting trips and would be used to verify full retention. Dock-side at the processing plants, state monitors would sample salmon and overfished groundfish species incidentally taken in the shore-based whiting fishery. Based on sampling done by the state port samplers under Alternative 1 (No Action Alternative), between 10% - 50% of shore-based whiting deliveries would be sampled.

Overage and donation fish would be forfeited to the state in which catch was landed. Federal and state enforcement personnel would share the tracking of overage/donation fish and the money paid for those fish.

The combination monitoring program would be funded by the shore-based whiting fishery along with state and federal management agencies, similar to the funding under Alternative 1 (No Action Alternative).

2.6 Comparison of the Alternatives

Table 2.6.1. A comparison of different monitoring programs to implement full retention in the shore-based whiting fishery.

Issues	Alternative 1 (No Action Alternative)	Alternative 2 (Federal Monitoring)	Alternative 3 (State Monitoring)	Alternative 4 (Combination Monitoring)
Issue 1 - Staffing the Monitoring Program for the Shore-based Whiting Fishery	*State port samplers track and sample salmon and overfished groundfish species at processing plants.	* Federal observers would monitor for full retention versus discard at sea. * Federal observers would sample salmon and overfished groundfish species at processing plants.	* State monitors would monitor for full retention versus discard at sea. * State monitors would sample salmon and overfished groundfish species at processing plants.	* Electronic monitoring would monitor all shore-based whiting trips for full retention versus discard at sea. * State monitors would sample salmon and overfished groundfish species at processing plants.
Issue 2 - Disposition of Overage/Donation Fish Taken by the Shore-based Whiting Fishery	* State and federal enforcement staff share the tracking of overage/donation fish and the money paid for those fish.	* Federal enforcement personnel would track overage/donation fish and the money paid for those fish.	* State enforcement personnel would track overage/donation fish and the money paid for those fish.	* State and federal enforcement staff would share the tracking of overage/donation fish and the money paid for those fish.
Issue 3 - Funding the Monitoring Program for the Shore-based Whiting Fishery	* Monitoring program is funded by the shore-based whiting fishery and state and federal management agencies.	**Alternative 2A** * Monitoring program would be federally funded. Therefore, there would be fewer observers to cover other sectors of groundfish fleet during the primary whiting season. **Alternative 2B** * Monitoring program would be funded by the shore-based whiting fleet through a direct pay system, much like the at-sea whiting monitoring program.	**Alternative 3A** * Monitoring program would be funded by each state. **Alternative 3B** * Monitoring program would be funded through a tax system.	* Monitoring program is funded by the shore-based whiting fishery and state and federal management agencies.

3.0 AFFECTED ENVIRONMENT

3.1 Introduction

This chapter describes the Pacific Coast groundfish fishery and the resources that would be affected by the proposed action. Resources are discussed in the order they are affected by the proposed action. In other words, those resources that are most affected by the proposed action are discussed first followed by those least affected by the proposed action. Socioeconomic resources are discussed in Chapter 3.2, biological resources are discussed in Chapter 3.3, and physical resources are discussed in Chapter 3.4.

3.2 Socioeconomic Characteristics of the Affected Resource

History of the Whiting Fishery
During the late 1970s and 1980s, the whiting fishery was conducted primarily by foreign fishing vessels and by joint venture partnerships between foreign and U.S. firms. Joint ventures were arrangements between U.S. catcher vessels and foreign companies during which the U.S. fishers would catch and deliver whiting to foreign processing vessels. Fishing operations during this period were low intensity compared to those of the 1990s and fishing typically lasted from April through September or October. In the late 1980s, surimi technology was introduced and the fishery immediately changed to a fast-paced competition for the available quota. Surimi is a thick, paste-like or gel product made from washing and de-watering fish flesh that is further processed to create such products as artificial crab and shrimp. This accelerated whiting fishery continued in the early 1990s when U.S. firms preempted all foreign fishing and processing activities (NMFS 2002).

By 1991, surimi technology and market conditions for whiting were sufficiently developed to allow for large-scale production. This resulted in an influx of high capacity domestic catcher/processors and mothership processors which were capable of fully harvesting the whiting allocation. As these high volume domestic processors joined the fishery, the fishing pattern of the 1980s and early 1990s was replaced by a fast-paced fishery concentrated earlier in the season and further south along the coast (PFMC 1996). The pattern of fishing earlier in the year and further south changed in 1992 with the implementation of regulations designed to minimize the bycatch of salmon and rockfish in the whiting fishery.

Currently, the whiting fishery occurs primarily during April - November along the coasts of northern California, Oregon, and Washington. The fishery is conducted almost exclusively with midwater trawls. Most fishing activity occurs over bottom depths of 100 - 500 m, but offshore extensions of fishing activity have occurred. Whiting is a high volume species, but commands a relatively low price per pound. The whiting industry is composed of the tribal and non-tribal commercial fisheries each of which has their own allocations. The tribal whiting fishery has an allocation of 25,000 mt. The non- non-tribal commercial fishery is composed of the shore-based sector, and the at-sea sector which includes both the catcher/processor and mothership sectors.

These sectors are not completely distinct. Separate allocations of the commercial OY have been effective since 1997 and they are 42 % to the shore-based, 34 % to the catcher/processor, and 24 % to the mothership sectors.

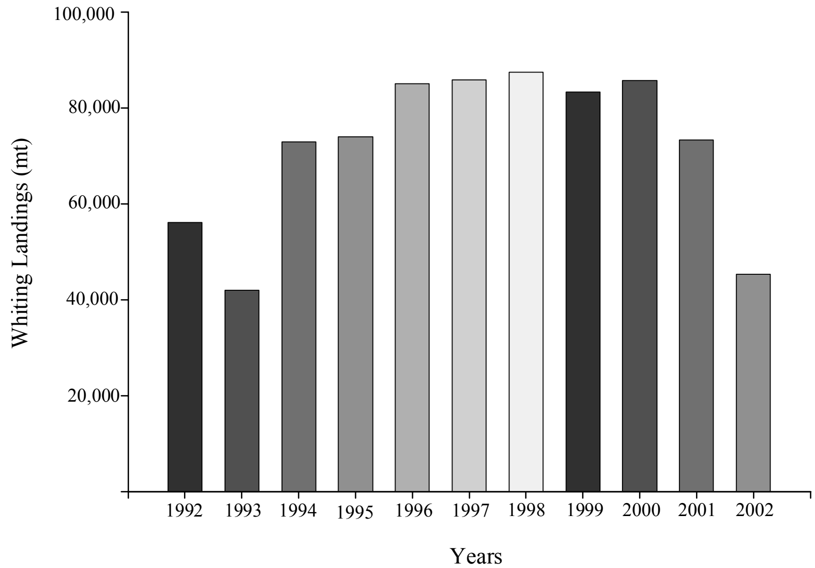

Figure 3.2.1. Landings (mt) of whiting by the shore-based fleet during 1992 - 2002 (Wiedoff and Parker 2002).

Shore-based Sector of the Whiting Fishery

This proposed action concerns the shore-based sector, which is made up of processing plants, catcher vessels that deliver to the processing plants, and the support network that supplies goods and services to the vessels and plants.

Table 3.2.2. The number of catcher vessels and processing plants participating in the shore-based whiting fishery between 1994 - 2002.

Year	Number of Catcher Vessels	Number of Processing Plants
1994	33	8
1995	35	15
1996	43	11
1997	40	12
1998	38	13
1999	36	14
2000	35	14
2001	29	13
2002	29	8

Data are taken from the annual "Shoreside Whiting Observer Program" summary reports compiled by Oregon Department of Fish and Wildlife and available on the web at http://hmsc.oregonstate.edu/odfw/finfish/wh/index.html.

The type of catcher vessel participating in the shore-based whiting fishery is varied. Some catcher vessels harvest whiting almost exclusively, while others primarily target other Pacific Coast groundfish species and only occasionally land whiting. Some catcher vessels alternate between the Pacific Coast and Alaska fisheries while some vessels only fish off Washington, Oregon, and California.

The type of processing plant that participates in the shore-based whiting fishery is also diverse. Some plants process a variety of species and produce a variety of products, while others concentrate exclusively on whiting products or even a single whiting product. Companies may own one or more processing plants that process other groundfish such as rockfish and flatfish, and non-groundfish species such as salmon, crab, and shrimp.

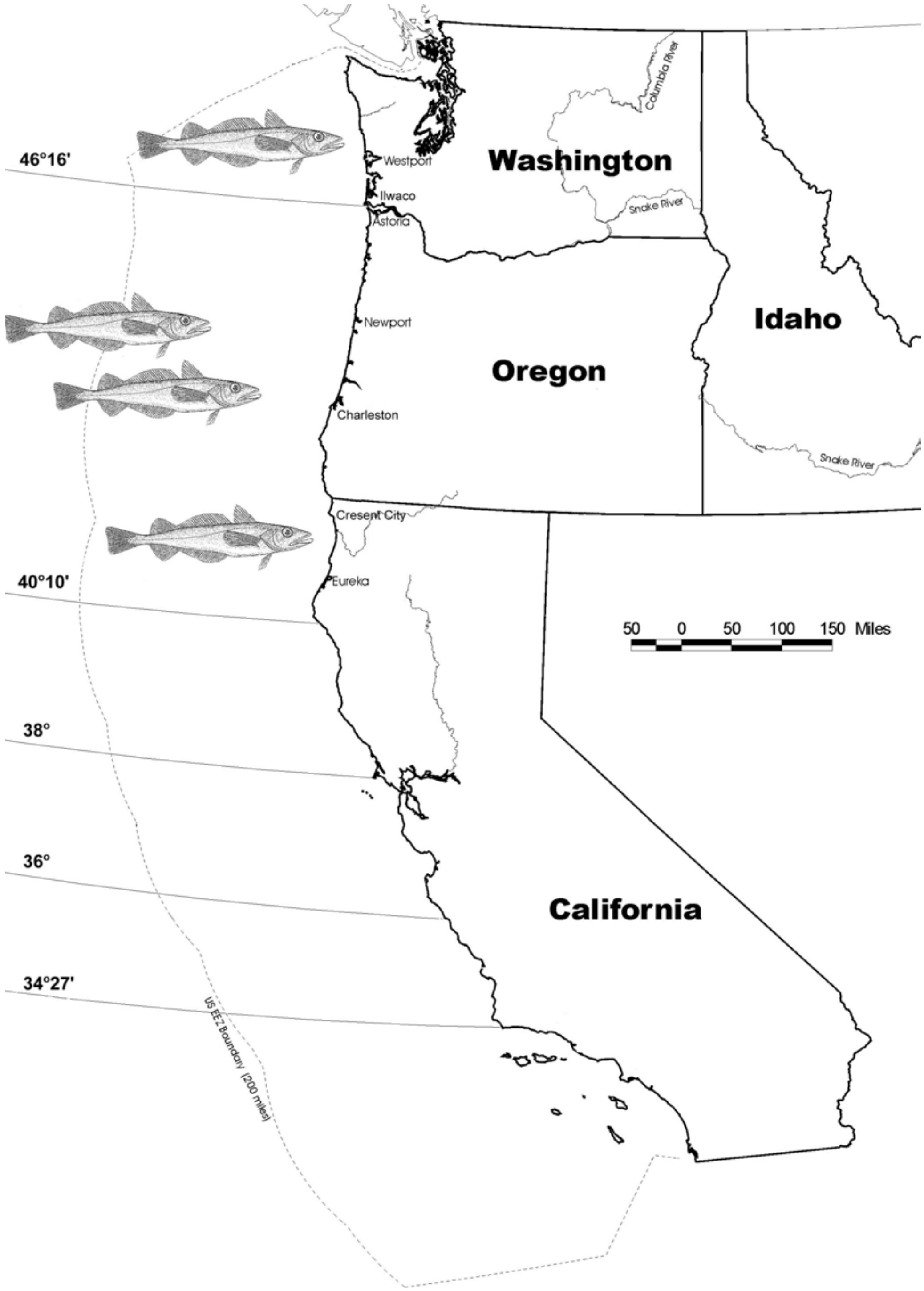

Figure 3.2.3. Map of the Pacific Coast showing important ports for the processing of whiting taken by the shore-based whiting fishery.

As is evident in Figure 3.2.3 and Table 3.2.4, landings of whiting by the shore-based fishery are not evenly distributed along the coast but concentrated in areas in Oregon, southern Washington, and northern California. In recent years, the ports that have been involved in the shore-based fishery have remained relatively consistent. In Oregon, whiting landings by the shore-based fleet are typically made in Newport, Astoria, and Charleston. Westport and Ilwaco are the two ports in Washington that have traditionally handled landings by the shore-based whiting fleet, while Crescent City and Eureka are the California ports that have handled landings by the shore-based whiting fleet.

Table 3.2.4. Location and seasonality of landings in the shore-based whiting fishery between 1998 - 2002.

Year	Percentage of Total Landings by State			Duration of the Shore-based Season
	Washington	Oregon	California	
1998	11.8%	81.7%	6.5%	April 1 (CA) and June 15 (WA & OR) - October 13, 2003
1999	10.9%	87.6%	1.6%	April 1 (CA) and June 15 (WA & OR) - September 13, 1999
2000	14.0%	80.2%	5.8%	April 1 (CA) and June 15 (WA & OR) - September 15, 2000
2001	24%	72.9%	3.1%	April 1 (CA) and June 15 (WA & OR) - September 26, 2001[1]
2002	23%	71%	6%	April 1 (CA) and June 15 (WA & OR) - July 17, 2002

1. In 2001, the fishery closed on 8/21/03, shortly there after the Makah tribe returned 10,000 mt of its allocation to NMFS and it was re-allocated to other fishery sectors. The shore-based fishery was reopened from 9/17/01 - 9/26/01.

Data are taken from the annual "Shoreside Whiting Observer Program" summary reports compiled by Oregon Department of Fish and Wildlife and available on the web at http://hmsc.oregonstate.edu/odfw/finfish/wh/index.html.

The shore-based whiting season has also remained fairly consistent over time; it always occurs during summer months and usually starts between the 1st and 15th of April off California and the 15th of June off Oregon and Washington. Recently, the shore-based whiting season has been shorten because vessels attain their allocation more quickly than in past years. This can be attributed, in part, to lower allocations, due to lower whiting OYs, and more efficient fishing practices.

Shoreside Observer Program

The Shoreside Whiting Observation Program (SWOP) was established in 1992 to provide information for evaluating incidental catch in the shore-based whiting fishery and conservation measures adopted to protect salmon and other prohibited species. The program is a cooperative effort between the fishing industry and state and federal management agencies conducted on an annual basis to account for total catch and accommodate the landing of non-sorted catch in the shore-based whiting fishery. Participating vessels apply for and carry EFPs, issued by NMFS, that allow them to land unsorted catch at designated processing plants. Additionally, the EFPs allow vessels to land prohibited species (i.e., Pacific salmon, Pacific halibut, Dungeness crab) and groundfish in excess of trip limits without penalty, provided catch is forfeited to the state. Participants in the SWOP include: catcher vessels carrying EFPs, designated processing plants along the Pacific Coast, PFMC, NMFS, Pacific States Marine Fisheries Commission (PSMFC), ODFW, California Department of Fish and Game (CDFG), and Washington Department of Fish and Wildlife (Wiedoff and Parker 2002).

Over time, the goals of the SWOP and associated sampling methodologies have changed in response to the data needs and funding of state and federal fishery management agencies. During the first few years of the program, SWOP's goals were a high target rate of observation (50% of the landings) and a focus on prohibited species. In 1995, the SWOP changed its emphasis to a lower rate of observation (10% of the landings) and an increased collection of biological information (length, weight, age, maturity) from whiting and selected bycatch species (yellowtail rockfish, widow rockfish, sablefish, Pacific mackerel, jack mackerel, and prohibited species)(Weeks and Hutton 1998). The required observation rate was decreased as studies indicated that fish tickets were a good representation of the species composition of landed catch. In 1997, sampling protocols changed again in response to an increased bycatch rates of yelloweye and yellowtail rockfish. Since then, the bycatch of yellowtail and widow rockfish in the shore-based fishery has dramatically decreased because of fishers' increased awareness of bycatch and allocation issues in the shore-based whiting fishery. In 2002, there was some concern about sablefish bycatch in the shore-based whiting fishery because of increased numbers of juvenile sablefish found along the Pacific Coast (Wiedoff and Parker 2002).

Much like program goals, the costs associating with operating the SWOP have also changed since the program began in 1992. The cost was approximately $60,000 (approximately $30,000 for coordination/data processing costs and approximately $30,000 for observers) in 1996 (Weeks and Hutton 1997) as compared to approximately $82,508 (approximately $46,738 for coordination/data processing costs and an estimated $35,770 for observers) in 2001 (Parker 2001). Because of a shorter season in 2002, the cost was approximately $68,121 (approximately $38,318 for coordination/data processing coast and an estimated $29,808 for observers) (Wiedoff and Parker 2002). Government costs, which are not included in the above estimates, cover state agencies providing sampling personnel, infrastructure, data summary and analysis during winter months, data tracking, and Pacific Council support on bycatch issues have also changed over time. In the past, these costs were relatively minor. However, these costs have become increasingly substantial over time, as management agencies are increasing their focus on bycatch issues, and they are now quite considerable, resulting in months of staff time and costing more than $20,000. In 2002, Oregon processing plants hired five observers to make observations at six processing plants while WDFW and CDFG provided minimal landings coverage at the plants using existing staff. Additionally, eight processing plants contributed to the cost of the SWOP in 2002 (Wiedoff and Parker 2002).

Salmon

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 River

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 River; Northern California

3.3 Biological Characteristics of the Affected Resource

Salmon Resources

As discussed in Chapter 1, the first objective for the proposed action is to track and collect morphological information from those salmon species incidentally taken in the shore-based whiting fishery. Several species of salmon found along the Pacific Coast have been listed under the Endangered Species Act (ESA) and data from the SWOP indicate that some of these species are incidentally taken in the shore-based whiting fishery.

Review of SWOP data in Table 3.3.1 indicates that the sockeye, chum, and pink are rarely encountered in the shore-based whiting fishery. Coho is caught in relatively low numbers and chinook is the most common salmonid encountered in the shore-based whiting fishery.

Because several chinook salmon runs are listed under the ESA, the incidental catch of chinook salmon in the shore-based whiting fishery is a concern. The 1999 Biological Opinion analyzing the effects of the groundfish fishery on Pacific Coast salmon specifies a threshold for the incidental take of 0.05 mt chinook for all the sectors of the whiting fishery (at-sea, tribal, and shore-based) (NMFS 1999).

Chinook salmon is the largest of the Pacific salmon with a distribution ranging from the Ventura River in California to Point Hope, Alaska in North America, and in northeastern Asia from Hokkaido, Japan to the Anadyr River in Russia (Healey 1991). Additionally, chinook salmon have been reported in the Mackenzie River area of northern Canada (McPhail and Lindsey 1970). Of the Pacific salmon, chinook salmon exhibit arguably the most diverse and complex life history strategies. Healey (1986) described 16 age categories for chinook salmon, 7 total ages with 3 possible freshwater ages. This level of complexity is roughly comparable to sockeye salmon, although sockeye salmon have a more extended freshwater residence period and utilize different freshwater habitats (Miller and Brannon 1982; Burgner 1991). Two generalized freshwater life-history types were initially described by Gilbert (1912): “stream-type” chinook salmon reside in freshwater for a year or more following emergence, whereas “ocean-type”chinook salmon migrate to the ocean within their first year. Healey (1983; 1991) has promoted the use of broader definitions for “ocean-type” and “stream-type” to describe two distinct races of chinook salmon. This racial approach incorporates life history traits, geographic distribution, and genetic differentiation and provides a valuable frame of reference for comparisons of chinook salmon populations.

The generalized life history of Pacific salmon involves incubation, hatching, and emergence in freshwater, migration to the ocean, and subsequent initiation of maturation and return to freshwater for completion of maturation and spawning. Juvenile rearing in freshwater can be minimal or extended. Additionally, some male chinook salmon mature in freshwater, thereby foregoing emigration to the ocean. The timing and duration of each of these stages is related to genetic and environmental determinants and their interactions. Salmon exhibit a high degree of variability in life-history traits; however, there is considerable debate as to what degree this variability is the result of local adaptation or the general plasticity of the salmonid genome (Ricker 1972; Healey 1991; Taylor 1991).

In 2000, the incidental take of chinook salmon in the shore-based whiting fishery was almost double that of past years. The incidental take of chinook salmon in the other sectors of the whiting fishery was also high and resulted in a combined bycatch rate of 0.057. This incidental take exceeded the chinook threshold for the whiting fishery and led to a re-evaluation of the biological opinion that sets the allowable chinook salmon threshold. Discussions with fishers did not reveal any change in fishing behavior that would have accounted for the increased chinook catch. One possible explanation for the increased catch was that there were simply more chinook available to the whiting fishery than in past years (Hutton and Parker 2000).

Table 3.3.1. Salmon incidentally taken in the shore-based whiting fishery during 1991 - 2003.											
Year	**Whiting (mt)**	**Number of Chinook**	**Rate of Chinook (#/mt of whiting)**	**Number of Coho**	**Rate of Coho (#/mt of whiting)**	**Number of Pink**	**Rate of Pink (#/mt of whiting)**	**Number of Chum**	**Number of Sockeye**	**Total Number of Salmon**	**Total Rate of Salmon**
1991	20,359	41	0.002							41	0.002
1992	49,092	491	0.010							491	0.010
1993	41,926	419	0.010							419	0.010
1994	72,367	581	0.008	4		0		0	0	585	0.008
1995	73,397	2,954	0.040	2		15		1	0	2,972	0.040
1996	84,680	651	0.008	0		0		0	0	651	0.008
1997	87,499	1,482	0.017	2		0		0	0	1,484	0.017
1998	87,627	1,699	0.019	8		0		5	1	1,713	0.020
1999	83,388	1,696	0.020	5		11		0	0	1,712	0.021
2000	85,653	3,321	0.039	23		0		1	0	3,345	0.039
2001	73,326	2,634	0.036	35		304	0.004	32	0	3,005	0.041
2002	45,276	1,062	0.023	14		0		72	0	1,148	0.025
2003	50,964	425	0.008	0		0		0	0	425	0.008
Data are complied from an ODFW report "Salmon Bycatch in the Pacific Whiting Fisheries" (Weeks and Kaiser 1997) and unpublished ODFW data (B. Wiedoff, Marine Resources Program, ODFW, 2003, personal communication).											
Note: The numbers for 1991 - 1993 are based on observer bycatch rates (approximately 50% observer coverage) and rates for 1994 - 1996 represent salmon that was provided by processors.											

Groundfish Resources
The Pacific Coast groundfish FMP manages over 80 species, many of which are caught in multi-species fisheries. These species, which include an array of flatfish, rockfish, and roundfish, occur throughout the EEZ and occupy diverse habitats during all stages of life history. Information on the interactions between 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 and many groundfish species have never been comprehensively assessed.

Each fishing year, the Pacific Council assesses the biological condition of the Pacific Coast groundfish fishery and develops estimates of the allowable biological catch (ABC) for major groundfish stocks. Species and species groups with ABCs in 2002 include: lingcod, Pacific whiting, sablefish, POP, shortbelly rockfish, shortspine thornyhead, longspine thornyhead, widow rockfish, chilipepper rockfish, splitnose rockfish, cowcod, darkblotched rockfish, yellowtail rockfish, bocaccio, canary rockfish, yelloweye rockfish, Dover sole, and the minor rockfish complexes (northern and southern for nearshore, continental shelf, and continental slope species). The following nine groundfish stocks have been designated as "overfished" (less than 25% of its B_{MSY}): POP, bocaccio, lingcod, canary rockfish, cowcod, darkblotched rockfish, widow rockfish, and yelloweye rockfish, and Pacific whiting (hake).

Pacific Whiting
The shore-based fleet targets Pacific whiting (*Merluccius productus*), also known as Pacific hake, a semi-pelagic merlucciid (a cod-like fish species) that range from Sanak Island in the western Gulf of Alaska to Magdalena Bay, Baja California Sur. They are most abundant in the California Current System (Bailey 1982; Hart 1973; Love 1991; NOAA 1990). Smaller populations of Pacific whiting occur in several of the larger semi-enclosed inlets of the northeast Pacific Ocean, including the Strait of Georgia, Puget Sound, and the Gulf of California (Bailey et al. 1982; Stauffer 1985). The highest densities of Pacific hake are usually between 50 and 500 m, but adults occur as deep as 920 m and as far offshore as 400 km (Bailey 1982; Bailey et al. 1982; Dark and Wilkins 1994; Dorn 1995; Hart 1973; NOAA 1990; Stauffer 1985). Hake school at depth during the day, then move to the surface and disband at night for feeding (McFarlane and Beamish 1986; Sumida and Moser 1984; Tanasich et al. 1991). Coastal stocks spawn off Baja California in the winter, then the mature adults begin moving northward and inshore, following food supply and Davidson currents (NOAA 1990). Hake reach as far north as southern British Columbia by fall. They then begin the southern migration to spawning grounds and further offshore (Bailey et al. 1982; Dorn 1995; Smith 1995; Stauffer 1985).

Spawning occurs from December through March, peaking in late January (Smith 1995). Pacific hake are oviparous with external fertilization. Eggs of the Pacific hake are neritic and float to neutral buoyancy (Bailey et al. 1982; NOAA 1990). Hatching occurs in 5 - 6 days and within 3 - 4 months juveniles are typically 35 mm (Hollowed 1992). Juveniles move to deeper water as they get older (NOAA 1990). Females off mature at 3 - 4 years (34 - 40 cm,) and nearly all males are mature by 3 years (28 cm). Females grow more rapidly than males after four years; growth ceases for both sexes at 10 - 13 years (Bailey et al. 1982).

Mathematical models that use a variety of survey and observer data to assess stock size, harvest levels, and recruitment are used to estimate a single ABC for the entire U.S. Canadian coastal stock. The whiting stock biomass increased to a historical high of 5.8 million metric tons (mt) in 1987 due to exceptionally large 1980 and 1984 year classes, then declined as these year classes passed through the population and were replaced by more moderate year classes. The stock size stabilized briefly between 1995-1997, but has declined continuously over the past several years to its lowest point in 2001.

The 2002 stock assessment estimated that the biomass in 2001 was 0.7 million mt, and that the female spawning biomass was less than 20 % of the unfished biomass. Because the overfished threshold under the FMP is 25 % of the unfished biomass, the whiting stock was overfished in 2001. The female spawning biomass is estimated to increase over the next 3 years due to the incoming 1999 year-class, but the increase will be dependent upon the magnitude of that cohort as well as the exploitation rate (NMFS 2002).

Incidental take in the Shore-based Whiting Fishery

Pacific whiting undertake a diurnal vertical migration and tend to form extensive midwater aggregations during the day. These dense schools occur between the depths of 100 and 250 meters (Stauffer 1985). Because whiting disperse throughout the water column at dusk and remain near the surface at night, fishing has traditionally occurred during daylight hours. The results of fishing on concentrated midwater schools results in almost pure catches, with incidental catch typically amounting to less than 3 % of the total catch by weight. Species that are incidentally taken in the whiting fishery may be commingled with whiting or merely in the vicinity of whiting schools, depending on the relationships between the various species. Major factors affecting bycatch are area, depth, season, time of day, environmental conditions, and species abundance (NMFS 2002).

One objective of the proposed action is to track the incidental catch of overfished groundfish species in the shore-based whiting fishery. In 2002, this fishery had an incidental take of widow rockfish, canary rockfish, lingcod, Pacific ocean perch (POP), bocaccio, and darkblotched rockfish. While this fishery has relatively low takes of non-whiting groundfish species, the most common groundfish species, by weight, incidentally taken in the 2002 shore-based whiting are sablefish, yellowtail rockfish, and widow rockfish. Table 3.3.2 shows the 2002 incidental take of overfished groundfish species as well as those groundfish species most commonly in the shore-based fishery during 2002.

Table 3.3.2. Catch of prohibited species and groundfish in the 2002 EFP shore-based whiting fishery.					
Species	**Catch (kg)**	**Bycatch Rate (kg/mt of whiting)**	**Species**	**Catch (kg)**	**Bycatch Rate (kg/mt of whiting)**
Pacific halibut	9 (# of fish)	0.000 (#/mt)	POP	221	0.005
Dungeness crab	207 (# of fish)	0.002 (#/mt)	Darkblotched	10	<0.001
Yellowtail	41,368	0.748	Bocaccio	24	0.001
Widow	5,319	0.189	Lingcod	216	0.004
Sablefish	128,218	2.608	Misc. Rockfish	327	0.008
Canary	432	0.008	In 2002, there was an EFP harvest of 45,276 mt of whiting and 35% of EFP deliveries were observed.		
Data were taken from an ODFW report "Shoreside Whiting Observation Program: 2002" (Wiedoff and Parker 2002) available on the web at http://hmsc.oregonstate.edu/odfw/finfish/wh/index.html.					

Widow Rockfish

Widow rockfish (*Sebastes entomelas*) range from Albatross Bank of Kodiak Island to Todos Santos Bay, Baja California (Eschmeyer et al. 1983; Miller and Lea 1972; NOAA 1990). Widow rockfish occur over hard bottoms along the continental shelf (NOAA 1990). Widow rockfish prefer rocky banks, seamounts, ridges near canyons, headlands, and muddy bottoms near rocks. Large widow rockfish concentrations occur off headlands such as Cape Blanco, Cape Mendocino, Point Reyes, and Point Sur. Adults form dense, irregular, midwater and semi-demersal schools deeper than 100 m at night and disperse during the day (Eschmeyer et al. 1983; NOAA 1990; Wilkins 1986). All life stages are pelagic, but older juveniles and adults are often associated with the bottom (NOAA 1990). All life stages are fairly common from Washington to California (NOAA 1990). Pelagic larvae and juveniles co-occur with yellowtail rockfish, chilipepper, shortbelly rockfish, and bocaccio larvae and juveniles off central California (Reilly et al. 1992).

Widow rockfish are viviparous, have internal fertilization, and brood their eggs until released as larvae (NOAA 1990; Ralston et al. 1996; Reilly et al. 1992). Mating occurs from late fall to early winter. Larval release occurs from December - February off California, and from February - March off Oregon. Juveniles are 21-31 mm at metamorphosis, and they grow to 25-26 cm over 3 years. Age and size at sexual maturity varies by region and sex; size generally increases with age, for females, and the further north the fish are found. Some widow rockfish mature in 3 years (25-26 cm), 50% are mature by 4-5 years (25-35 cm), and most are mature in 8 years (39-40 cm) (NOAA 1990). The maximum age of widow rockfish is 28 years, but rarely over 20 years for females and 15 years for males (NOAA 1990). The largest size is 53 cm, about 2.1 kg (Eschmeyer et al. 1983; NOAA 1990).

Widow rockfish are carnivorous, with adults feeding on small pelagic crustaceans, midwater fishes (such as age-1 or younger Pacific hake), salps, caridean shrimp, and small squids (Adams 1987; NOAA 1990). During spring, the most important prey item is salps, during the fall fish are more important, and during the winter widow rockfish primarily eat sergestid shrimp (Adams 1987). Feeding is most intense in the spring after spawning (NOAA 1990). Pelagic juveniles are opportunistic feeders and their prey consists of various life stages of calanoid copepods, and euphausiids (Reilly et al. 1992).

Canary Rockfish

Canary Rockfish (*Sebastes pinniger*) are found between Cape Colnett, Baja California, and southeastern Alaska (Boehlert 1980; Boehlert and Kappenman 1980; Hart 1973; Love 1991; Miller and Lea 1972; Richardson and Laroche 1979). There is a major population concentration of canary rockfish off Oregon (Richardson and Laroche 1979). Canary primarily inhabit waters 91 - 183 m deep (Boehlert and Kappenman 1980). In general, canary rockfish inhabit shallow water when they are young and deep water as adults (Mason 1995). Adult canary rockfish are associated with pinnacles and sharp drop-offs (Love 1991). Canary rockfish are most abundant above hard bottoms (Boehlert and Kappenman 1980). In the southern part of its range, the canary rockfish appears to be a reef-associated species (Boehlert 1980). In central California, newly settled canary rockfish are first observed at the seaward, sand-rock interface and farther seaward in deeper water (18 - 24 m).

Canary rockfish are ovoviviparous and have internal fertilization (Boehlert and Kappenman 1980; Richardson and Laroche 1979). Off California, canary rockfish spawn from November - March and from January - March off Oregon and Washington (Hart 1973; Love 1991; Richardson and Laroche 1979). The age of 50% maturity of canary rockfish is 9 years; nearly all are mature by age 13. The maximum length canary rockfish grow to is 76 cm (Boehlert and Kappenman 1980; Hart 1973; Love 1991). Canary rockfish primarily prey on planktonic creatures, such as krill, and occasionally on fish (Love 1991). Canary rockfish feeding increases during the spring-summer upwelling period when euphausiids are their dominant prey (Boehlert et al. 1989).

Lingcod

Lingcod (*Ophiodon elongatus*), a top order predator of the family Hexagrammidae, ranges from Baja California to Kodiak Island in the Gulf of Alaska. Lingcod is demersal at all life stages (Allen and Smith 1988; NOAA 1990; Shaw and Hassler 1989). Adult lingcod prefer two main habitat types: slopes of submerged banks 10 - 70 m below the surface with seaweed, kelp and eelgrass beds and channels with swift currents that flow around rocky reefs (Emmett et al. 1991; Giorgi and Congleton 1984; NOAA 1990; Shaw and Hassler 1989). Juveniles prefer sandy substrates in estuaries and shallow subtidal zones (Emmett et al. 1991; Forrester 1969; Hart 1973; NOAA 1990; Shaw and Hassler 1989). As the juveniles grow they move to deeper waters. Adult lingcod are considered a relatively sedentary species, but there are reports of migrations of greater than 100 km by sexually immature fish (Jagielo 1990; Mathews and LaRiviere 1987; Mathews 1992; Smith et al. 1990).

Mature females live in deeper water than males and move from deep water to shallow water in the winter to spawn (Forrester 1969; Hart 1973; Jagielo 1990; LaRiviere et al. 1980; Mathews and LaRiviere 1987; Mathews 1992; Smith et al. 1990). Mature males may live their whole lives associated with a single rock reef, possibly out of fidelity to a prime spawning or feeding area (Allen and Smith 1988; Shaw and Hassler 1989). Spawning generally occurs over rocky reefs in areas of swift current (Adams 1986; Adams and Hardwick 1992; Giorgi 1981; Giorgi and Congleton 1984; LaRiviere et al. 1980). After the females leave the spawning grounds, the males remain in nearshore areas to guard the nests until the eggs hatch. Hatching occurs in April off Washington but as early as January and as late as June at the geographic extremes of the lingcod range. Males begin maturing at about 2 years (50 cm), whereas females mature at 3+ years (76 cm). In the northern extent of their range, fish mature at an older age and larger size (Emmett et al. 1991; Hart 1973; Mathews and LaRiviere 1987; Miller and Geibel 1973; Shaw and Hassler 1989). The maximum age for lingcod is about 20 years (Adams and Hardwick 1992).

Lingcod are a visual predator, feeding primarily by day. Larvae are zooplanktivores (NOAA 1990). Small demersal juveniles prey upon copepods, shrimps and other small crustaceans. Larger juveniles shift to clupeids and other small fishes (Emmett et al. 1991; NOAA 1990). Adults feed primarily on demersal fishes (including smaller lingcod), squids, octopi and crabs (Hart 1973; Miller and Geibel 1973; Shaw and Hassler 1989). Lingcod eggs are eaten by gastropods, crabs, echinoderms, spiny dogfish, and cabezon. Juveniles and adults are eaten by marine mammals, sharks, and larger lingcod (Miller and Geibel 1973; NOAA 1990).

Pacific Ocean Perch

Pacific ocean perch (*Sebastes alutus*) are found from La Jolla (southern California) to the western boundary of the Aleutian Archipelago (Eschmeyer et al 1983; Gunderson 1971; Ito 1986; Miller and Lea 1972), but are common from Oregon northward (Eschmeyer et al. 1983). Pacific ocean perch primarily inhabit waters of the upper continental slope (Dark and Wilkins 1994) and are found along the edge of the continental shelf (Archibald et al. 1983). Pacific ocean perch occur as deep as 825 m, but usually are at 100 - 450 m and along submarine canyons and depressions (NOAA 1990). Larvae and juveniles are pelagic; subadults and adults are benthopelagic. Adults form large schools 30 m wide, to 80 m deep, and as much as 1,300 m long (NOAA 1990). They also form spawning schools (Gunderson 1971). Juvenile Pacific ocean perch form ball-shaped schools near the surface or hide in rocks (NOAA 1990). Throughout its range, Pacific ocean perch is generally associated with gravel, rocky or boulder type substrate found in and along gullies, canyons, and submarine depressions of the upper continental slope (Ito 1986).

Pacific ocean perch winter and spawn in deeper water (>275 m), then move to feeding grounds in shallower water (180-220 m) in the summer (June-August) as their gonads ripen (Archibald et al. 1983; Gunderson 1971; NOAA 1990). Pacific ocean perch are a slow-growing and long-lived species. The maximum age for Pacific ocean perch has been estimated at about 90 years (ODFW, personal communication). Largest size is about 54 cm and 2 kg (Archibald et al. 1983; Beamish 1979; Eschmeyer et al. 1983; Ito 1986; Mulligan and Leaman 1992; NOAA

1990; Richards 1994). Pacific ocean perch are carnivorous; larvae eat small zooplankton. Small juveniles eat copepods, and larger juveniles feed on euphausiids. Adults eat euphausiids, shrimps, squids, and small fishes. Immature fish feed throughout the year, but adults feed only seasonally, mostly April-August (NOAA 1990). Predators of Pacific ocean perch include sablefish and Pacific halibut.

Bocaccio

Bocaccio rockfish (*Sebastes paucispinis)* ranges from Kodiak Island, Alaska to Sacramento Reef, Baja California. It is abundant off southern and central California and uncommon between Cape Mendocino and Cape Blanco, although a second population exists near the Oregon-Washington border and extends north to Cape Flattery. They are found at depths ranging from 50 to 300 m (Ralston et al. 1996) and are classified as a middle shelf-mesobenthal species.

Bocaccio frequent a exceptional variety of habitats including, kelp forests, rocky reefs, midwater, and open, low relief bottoms. Larvae and small juveniles are pelagic and are commonly found in the upper 100 m of the water column. In central California, post-pelagic larvae are associated with the giant kelp canopy and also seen throughout the water column. Moser et al. (2000) found relatively high average abundances of bocaccio larvae when surveying stations in the Point Conception and Channel Islands areas, in addition to, a station southwest of Santa Rosa, a station northeast of San Nicholas Island, and a station southwest of Point Conception.

Bocaccio have been categorized as both a nearshore and offshore species because they occupy different habitats depending on life stage. After spending their first year in shallow areas along the coast, bocaccio move into deeper habitats as they age. Large juvenile and adult bocaccio are semi-demersal, found in both rocky and non-rocky habitats, and have been known to occur around artificial structures. Love et al. (2000) found the highest density of adult bocaccio (10.5 fish/100 m^2) around an oil platform was greater than the highest density of bocaccio around a natural reef (4.4 fish/100 m^2).

While adult bocaccio are usually associated with rocky vertical relief, they are also found occurring over firm sand-mud bottom, in eelgrass beds, or congregated around floating kelp beds. In Soquel Canyon, California, adults were associated with mud-boulder, rock-mud, rock-ridge, and rock-boulder habitats (Yoklavich et al. 2000). Adult bocaccio have been known to aggregate and disperse quickly and may travel more than two km per day. Bocaccio movements may also have a seasonal component, as bocaccio disappear from traditional commercial fishing areas during winter spawning and return in the spring.

All life stages of bocaccio are found in euhaline waters and they may congregate in local areas of high salinity. Warm temperatures are preferred by larvae and high larval densities have been observed in waters of 12^0C and higher. However, average larval abundance declined abruptly during the shift from the cool regime (1951 - 1976) to the warm regime (1977 - 1998) of the Pacific Decadal Osillation (PDO) in the Southern California Bight region (Moser et al. 2000).

Darkblotched Rockfish
Darkblotched rockfish (*Sebastes crameri*) has a distribution extending from the Bering Sea to Santa Catalina Island, California (Allen and Smith 1988). Based on the location of commercial landings and NMFS triennial survey data, darkblotched rockfish are frequently encountered along the central Pacific Coast (Oregon and northern California). Because they can be found at depths ranging from 29 - 549 m (Rodgers et al. 2000), usually deeper than 76 m, they are managed in the FMP as part of the slope rockfish complex. Darkblotched rockfish are an important component of the commercial groundfish trawl fishery (Nichol and Pikitch 1994; Weinburg 1994). For this fishery, they comprise the deep-water assemblage, along with shortspine thornyhead, Pacific ocean perch, and splitnose rockfish (Weinburg 1994).

Darkblotched rockfish move into deeper water as they increase in size and age. Older larvae and pelagic juveniles are found closer to the surface than many other rockfish species (Love 2002). Off Oregon, benthic juveniles are taken at depths of 55 - 200 m. Adults have been found in water as shallow as 29 m, but are most abundant in the deeper portion of their range. In 1999, NMFS triennial survey data found that 91% of the estimated darkblotched rockfish biomass was found at depths between 180 - 360 m, with the remaining balance between 360 - 540 m (Rodgers et al. 2000).

Throughout their range, darkblotched rockfish are associated with mud and rock habitats. The greatest numbers of darkblotched larvae and pelagic juveniles are found 83 - 93 km offshore; juvenile darkblotched can be taken as far offshore as 194 km. Off central California, young darkblotched rockfish recruit to soft substrate and low relief. Demersal juveniles are often found perched on the highest structure in the benthic habitat (Love 2002). Adults are typically observed resting on mud, near cobble and boulders and do not often rise above the bottom (Love 2002). In Soquel Canyon, California, adults were most frequently associated with mud boulder, mud rock, rock mud, and mud cobble habitats (Yoklavich et al. 2000). Darkblotched rockfish make limited migrations once they recruit to the adult stock.

Darkblotched rockfish are viviparous (Nichol and Pickitch 1994). Insemination of female darkblotched rockfish occurs from August to December, fertilization and parturition occurs from December to March off Oregon and California, primarily in February off Oregon and Washington (Hart 1973; Nichol and Pickitch 1994; Richardson and Laroche 1979). Females attain 50% maturity at a greater size (36.5 cm) and age (8.4 years) than males (29.6 cm and 5.1 years) (Nichol and Pickitch 1994). Adults can grow to 57 cm (Hart 1973). Pelagic young are food for albacore (Hart 1973).

Sablefish
Sablefish (*Anoplopoma fimbria*) are abundant in the north Pacific, from Honshu Island, Japan, north to the Bering Sea, and southeast to Cedros Island, Baja California. There are at least three genetically distinct populations off the West Coast of North America: one south of Monterey characterized by slower growth rates and smaller average size, one that ranges from Monterey to the U.S./Canada border that is characterized by moderate growth rates and size, and one ranging off British Columbia and Alaska characterized by fast growth rates and large size. Large adults

are uncommon south of Point Conception (Hart 1973; Love 1991; McFarlane and Beamish 1983a; McFarlane and Beamish 1983b; NOAA 1990). Adults are found as deep as 1,900 m, but are most abundant between 200 and 1,000 m (Mason et al. 1983). Off southern California, sablefish were abundant to depths of 1500 m. Adults and large juveniles commonly occur over sand and mud (McFarlane and Beamish 1983a; NOAA 1990) in deep marine waters.

Spawning occurs annually in the late fall through winter in waters greater than 300 m (Hart 1973; NOAA 1990). Sablefish are oviparous with external fertilization (NOAA 1990). Eggs hatch in about 15 days (Mason et al. 1983; NOAA 1990) and are demersal until the yolk sac is absorbed (Mason et al. 1983). After yolk sac is absorbed, juveniles become pelagic. Older juveniles and adults are benthopelagic. Larvae and small juveniles move inshore after spawning and may rear for up to four years (Boehlert and Yoklavich 1985; Mason et al. 1983). Older juveniles and adults inhabit progressively deeper waters.

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

Yellowtail Rockfish
Yellowtail rockfish (*Sebastes flavidus*) range from San Diego, California, to Kodiak Island, Alaska (Fraidenburg 1980; Gotshall 1981; Lorz et al. 1983; Love 1991; Miller and Lea 1972; Norton and MacFarlane 1995). The center of yellowtail rockfish abundance is from Oregon to British Columbia (Fraidenburg 1980). Yellowtail rockfish are a common, demersal species abundant over the middle shelf (Carlson and Haight 1972; Fraidenburg 1980; Tagart 1991; Weinberg 1994). Yellowtail rockfish are most common near the bottom, but not on the bottom (Love 1991; Stanley et al. 1994). Yellowtail rockfish adults are considered semi-pelagic (Stanley et al. 1994; Stein et al. 1992) or pelagic, which allows them to range over wider areas than benthic rockfish (Pearcy 1992). Adult yellowtail rockfish occur along steeply sloping shores or above rocky reefs (Hart 1973). They can be found above mud with cobble, boulder and rock ridges, and sand habitats; they are not, however, found on mud, mud with boulder, or flat rock (Love 1991; Stein et al. 1992). Yellowtail rockfish form large (sometimes greater than 1,000 fish) schools and can be found alone or in association with other rockfishes (Love 1991; Pearcy 1992; Rosenthal et al. 1982; Stein et al. 1992; Tagart 1991). These schools may persist at the same location for many years (Pearcy 1992).

Yellowtail rockfish are viviparous (Norton and MacFarlane 1995) and mate from October to December. Parturition peaks in February and March and from November to March off California (Westrheim 1975). Young-of-the-year pelagic juveniles often appear in kelp beds beginning in April and live in and around kelp in midwater during the day, descending to the bottom at night (Love 1991; Tagart 1991). Male yellowtail rockfish are 34 cm to 41 cm in length (five years to nine years) at 50% maturity, females are 37 cm to 45 cm (six years to ten years) (Tagart 1991). Yellowtail rockfish are long-lived and slow-growing; the oldest recorded individual was 64 years old (Fraidenburg 1981; Tagart 1991). Yellowtail rockfish have a high growth rate relative to other rockfish species (Tagart 1991). They reach a maximum size of about 55 cm in approximately 15 years (Tagart 1991). Yellowtail rockfish feed mainly on pelagic animals, but are opportunistic, occasionally eating benthic animals as well (Lorz et al. 1983). Large juveniles and adults eat fish (small Pacific whiting, Pacific herring, smelt, anchovies, lanternfishes, and others), along with squid, krill, and other planktonic organisms (euphausiids, salps, and pyrosomes) (Love 1991; Phillips 1964; Rosenthal et al. 1982; Tagart 1991).

Non-Groundfish Species

Several species managed under the Coastal Pelagic Species Fishery Management Plan, were also incidentally taken in 2002 shore-based whiting fishery, these include jack mackerel, Pacific mackerel, and Pacific herring. Like whiting, these are schooling fish, not associated with the ocean bottom, that migrate in coastal waters. The incidental catch of these species in the 2002 shore-based whiting fishery is as follows: 7,257 kg of jack mackerel, 107 kg of Pacific mackerel, and 6 kg of Pacific herring. American shad were also incidentally taken in the 2002 shore-based fishery (4,353 kg). Additionally, there was incidental take of other species (i.e., spiny dogfish and "other species") (Wiedoff and Parker 2002).

Endangered Species

Pacific Coast marine species listed as endangered or threatened under the ESA are discussed in the salmon resources, marine mammal, seabird, and sea turtle sections. 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.

Marine Mammals

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

> **Species Listed as Threatened Under the ESA**
> Steller sea lion (*Eumetopias jubatus*)Eastern Stock,
> Guadalupe fur seal (*Arctocephalus townsendi*), and
> Southern sea otter (*Enhydra lutris*) California Stock.
>
> **Species Listed as Depleted under the MMPA**
> Sperm whale (*Physeter macrocephalus*) WOC Stock,
> Humpback whale (*Megaptera novaeangliae*) WOC - Mexico Stock,
> Blue whale (*Balaenoptera musculus*) Eastern North Pacific Stock, and
> Fin whale (*Balaenoptera physalus*) WOC Stock.

The Marine Mammal Protection Act (MMPA) and the ESA are the Federal legislation that guide marine mammal species protection and conservation policy. Under the MMPA on the

West Coast, NMFS is responsible for the management of cetaceans and pinnipeds, while the U.S. Fish and Wildlife Service (USFWS) manages sea otters. Stock assessment reports review new information every year for strategic stocks (those whose human-caused mortality and injury exceeds the potential biological removal (PBR)) and every three years for non-strategic stocks. Marine mammals whose abundance falls below the optimum sustainable population (OSP) are listed as "depleted" according to the MMPA.

Fisheries that interact with species listed as depleted, threatened, or endangered may be subject to management restrictions under the MMPA and ESA. NMFS publishes an annual list of fisheries in the Federal Register separating commercial fisheries into one of three categories, based on the level of serious injury and mortality of marine mammals occurring incidentally in that fishery. The categorization of a fishery in the list of fisheries determines whether participants in that fishery are subject to certain provisions of the MMPA, such as registration, observer coverage, and take reduction plan requirements. The WOC groundfish fisheries are in Category III, indicating a remote likelihood of, or no known serious injuries or mortalities, to marine mammals.

Seabirds

The highly productive California Current System, an eastern boundary current that stretches from Baja Mexico to southern British Columbia, supports more than two million breeding seabirds and at least twice that number of migrant visitors. Tyler et al. (1993) reviewed seabird distribution and abundance in relation to oceanographic processes in the California Current System and found that over 100 species have been recorded within the EEZ including: albatross, shearwaters, petrels, storm-petrels, cormorants, pelicans, gulls, terns and alcids (murres, murrelets, guillemots, auklets and puffins). In addition to these "classic" seabird, millions of other birds are seasonally abundant in this oceanic habitat including: waterfowl, waterbirds (loons and grebes), and shorebirds (phalaropes). Not surprisingly, there is considerable overlap of fishing areas and areas of high bird density in this highly productive upwelling system. The species composition and abundance of birds varies spatially and temporally. The highest seabird biomass is found over the continental shelf and bird density is highest during the spring and fall when local breeding species and migrants predominate.

Species Listed as Endangered Under the ESA

Short-tail albatross (*Phoebastria albatrus*),
California brown pelican (*Pelecanus occidentalis*), and
California least tern (*Sterna antillarum browni*).

Species Listed as Threatened Under the ESA

Marbled murrelet (*Brachyramphs marmoratus*).

Seabirds Listed by the USFWS as Birds of Conservation Concern

Black-footed albatross (*Phoebastria nigripes*)
Ashy storm-petrel (*Oceanodroma homochroa*)
Gull-billed tern (*Sterna nilotica*)
Elegant tern (*Sterna elegans*)
Arctic Tern (*Sterna paradisaea*)
Black skimmer (*Rynchops niger*)
Xantus's murrelet (*Synthliboramphus hypoleucus*)

The USFWS is the primary Federal agency responsible for seabird conservation and management. Under the Magnuson-Stevens Act, NMFS is required to ensure fishery management actions comply with other laws designed to protect seabirds. NMFS is also required to consult with USFWS if fishery management plan actions may affect seabird species listed as endangered or threatened.

Sea Turtles

Sea turtles are highly migratory and four of the six species found in U.S. waters have been sighted off the Pacific Coast. Little is known about the interactions between sea turtles and West Coast commercial fisheries. The directed fishing for sea turtles in WOC groundfish fisheries is prohibited, because of their ESA listings, but the incidental take of sea turtles by trawl gear may occur. The management and conservation of sea turtles is shared between NMFS and USFWS.

Species Listed as Endangered Under the ESA
Green turtle (*Chelonia mydas*),
Leatherback turtle (*Dermochelys coriacea*), and
Olive ridely turtle (*Lepidochelys olivacea*).

Species Listed as Threatened Under the ESA
Loggerhead turtle (*Caretta caretta*)

3.4 Physical Characteristics of the Affected Resource

California Current System

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

Essential Fish Habitat. The 80 plus groundfish species managed by the FMP occur throughout the EEZ and occupy diverse habitats at all stages in their life histories. Some species are widely dispersed during certain life stages, particularly those with pelagic eggs and larvae; the essential fish habitat (EFH) for these species/stages is correspondingly large. On the other hand, the EFH of some species/stages may be comparatively small, such as that of adults of many nearshore rockfishes which show strong affinities to a particular location or type of substrate.

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. Descriptions of groundfish fishery EFH for each of the 80 plus groundfish species and their life stages result in over 400 EFH identifications. When these EFHs 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, along the coasts of Washington, Oregon, and California seaward to the boundary of the U.S. EEZ.

The FMP groups the various EFH descriptions into seven major habitat types called “composite” EFHs. This approach focuses on ecological relationships among species and between the species and their habitat, reflecting an ecosystem approach in defining EFH. The seven “composite” EFH identifications are as follows:

1. Estuarine - Those waters, substrates and associated biological communities within bays and estuaries of the EEZ, from mean higher high water level (MHHW, which is the high tide line) or extent of upriver saltwater intrusion to the respective outer boundaries for each bay or estuary as defined in 33 CFR 80.1 (Coast Guard lines of demarcation).

2. Rocky Shelf - Those waters, substrates, and associated biological communities living on or within ten meters (5.5 fathoms) overlying rocky areas, including reefs, pinnacles, boulders and cobble, along the continental shelf, excluding canyons, from the high tide line MHHW to the shelf break (~200 meters or 109 fathoms).

3. Nonrocky Shelf - Those waters, substrates, and associated biological communities living on or within ten meters (5.5 fathoms) overlying the substrates of the continental shelf, excluding the rocky shelf and canyon composites, from the high tide line MHHW to the shelf break (~200 meters or 109 fathoms).

4. Canyon - Those waters, substrates, and associated biological communities living within submarine canyons, including the walls, beds, seafloor, and any outcrops or landslide morphology, such as slump scarps and debris fields.

5. Continental Slope/Basin - Those waters, substrates, and biological communities living on or within 20 meters (11 fathoms) overlying the substrates of the continental slope and basin below the shelf break (~200 meters or 109 fathoms) and extending to the westward boundary of the EEZ.

6. Neritic Zone - Those waters and biological communities living in the water column more than ten meters (5.5 fathoms) above the continental shelf.

7. Oceanic Zone - Those waters and biological communities living in the water column more than 20 meters (11 fathoms) above the continental slope and abyssal plain, extending to the westward boundary of the EEZ.

Life history and habitat needs for the 80 plus species managed under the FMP are described in the EFH appendix to Amendment 11, which is available online at http://www.nwr.noaa.gov/1sustfsh/efhappendix/page1.html

The shore-based whiting fishery typically occurs off the coasts of Washington, Oregon, and northern California. Because the proposed action is a monitoring program, it is not predicted to involve the physical characteristics of the Pacific Coast groundfish fishery.

4.0 ANALYSIS OF THE ALTERNATIVES

4.1 Introduction

This chapter describes the effects of the proposed action, implementing a monitoring program in the shore-based whiting fishery, on the Pacific Coast groundfish fishery. Effects are analyzed in the order that they are affected by the proposed action. Therefore, those resources most affected are discussed first, followed by those resources that are least affected. Effects on the socioeconomic environment are analyzed in Chapter 4.2, effects on the biological environment are analyzed in Chapter 4.3, and effects on the physical environment are analyzed in Chapter 4.4.

4.2 Effects on the Socioeconomic Environment

The primary socioeconomic effects of implementing a monitoring program to provide for full retention in the shore-based whiting fishery on the Pacific Coast groundfish fishery are the costs associated with the different types of monitoring programs and how the costs are absorbed by the different participants in the shore-based fishery.

Monitoring System Coverage Levels
Coverage levels play an important role in determining the effectiveness of a monitoring program as well as the cost of monitoring program. Appropriate coverage levels for the different aspects of the shore-based whiting fishery are still under discussion, however, this EA attempts to analyze a range of coverage levels under the different alternatives. Even though coverage levels affect both the biological and socioeconomic resources of the Pacific Coast groundfish fishery, coverage levels will only be discussed at length in this section because of their direct influence on the cost associated with the different monitoring systems.

Under Alternative 1 (No Action Alternative), the Shoreside Whiting Observer Program (SWOP) has adjusted their sampling goals and coverage requirements over time to meet the needs of fishery managers and keep costs within the available budget. The SWOP does not provide coverage aboard the shore-based whiting vessels but does sample 10% - 35% of shore-based deliveries to processing plants. State and federal enforcement personnel track overage/donation fish and the money paid for those fish. Coverage levels under Alternative 1 would be less than under all other Alternatives.

Under Alternative 2 (Federal Monitoring), the proposed coverage levels are based on observer coverage in the at-sea sector of the whiting fishery and desired coverage levels at processing plants. Under Alternative 2, federal observers would cover 100% of shore-based whiting trips (approximately 600 - 700) per season to verify full retention of catch. Because several groundfish species have been declared overfished, including whiting and several species incidentally taken in the shore-based whiting fishery (e.g., widow rockfish, canary rockfish, Pacific ocean perch, darkblotched rockfish, bocaccio, and lingcod), tracking the total mortality of these species is important. Additionally, providing observer coverage on some but not all whiting trips may result in differential fishing strategies. For example, if catch were sometimes discarded at sea when an observer was not onboard as compared to catch never being discarded at sea when an observer is aboard. Therefore, 100% observer coverage on shore-based whiting trips would aid in quantifying the total mortality of overfished species as well as ensuring accurate data. The proposed coverage levels at processing plants under Alternative 2 would be to sample 100% of deliveries. Having 100% of deliveries sampled would ensure that both salmon and overfished groundfish species are accurately quantified and sampled. Federal enforcement personnel would track overage/donation fish and the money paid for those fish. Coverage levels under Alternative 2 would be more than under all other Alternatives.

Under Alternative 3 (State Monitoring), the proposed coverage levels are based on current coverage levels of the SWOP (Alternative 1) with a few exceptions. Under Alternative 3, state monitors would observe a portion of the shore-based whiting trips. Vessels would be randomly selected on a rotating basis and observers would verify the full retention of catch and total mortality of overfished groundfish species. Under Alternative 3, state monitors would observe a portion of deliveries shore-based whiting deliveries made to plants. Similar to Alternative 1, that portion would likely be at least 10% and less than 50% of the deliveries. State enforcement personnel would track overage/donation fish and the money paid for those fish. Coverage levels under Alternative 3 would be greater than Alternative 1 but less than Alternative 2 and Alternative 4.

Under Alternative 4 (Combination Monitoring), the proposed coverage levels would be a combination of the different alternatives. Under Alternative 4, an electronic monitoring system would be installed on each shore-based whiting vessel for the duration of the shore-based whiting primary season. This electronic monitoring system would observe 100% of shore-based whiting trips and verify full retention of catch. While an electronic monitoring system could be used to verify whether catch was dumped at sea, it probably could not be used to quantify the amount of catch dumped or estimate the species composition of catch dumped. Under Alternative 4, state monitors would observe a portion of deliveries shore-based whiting deliveries made to plants. Similar to Alternative 1 and Alternative 3, that portion would likely be at least 10% and less than 50% of the deliveries. State and federal enforcement personnel would track overage/donation fish and the money paid for those fish. Coverage levels under Alternative 4 would be greater than Alternative 1 and Alternative 3 but less than Alternative 2.

The Cost of Monitoring Programs
The cost of the different monitoring programs is an important issue to consider when implementing a full retention monitoring program in the shore-based whiting fishery, as well as how those costs are paid. The cost associated with implementing a monitoring program is not expected to be substantial, but the cost of a monitoring program and how costs are paid will vary with alternatives.

Under Alternative 1 (No Action Alternative), the cost of the SWOP in 2004 is estimated at about $148,000. This cost is based on SWOP costs over the last few years and provides for coordination/data analysis, observer coverage, and administrative costs (see Table 4.2.2 for a preliminary break-down of costs). Over the last decade, the cost of this program has been shared between management agencies and the shore-based whiting fishery. Budget reductions in 2003 and projected budget reductions in 2004 are expected to affect the money that would be available to fund this program. Both state and federal budgets for fisheries management have been reduced from historical levels and these reductions may make it difficult for continuing funding from these management agencies. The cost of the monitoring program under Alternative 1 is less than under all other Alternatives.

Under Alternative 2 (Federal Monitoring), the cost of a federal monitoring program for the shore-based whiting fleet in 2004 is estimated at greater than two million dollars. The cost provides for 100% observer coverage on all shore-based whiting trips, 100% of shore-based deliveries being sampled at the processing plants, and federal enforcement personnel tracking overage and donation fish (see Table 4.2.2 for a preliminary break-down of costs). Under Alternative 2A, the cost of a federal monitoring program would be covered by the federal government. At the present time, the West Coast Groundfish Observer Program (Observer Program) does not have the necessary funding or staff to cover the shore-based whiting fishery. If the Observer Program provided monitoring for the shore-based whiting fishery, resources would be diverted from other sectors of the Pacific Coast groundfish fishery during the shore-based whiting primary season and may comprise the collection of data necessary for effective management of the Pacific Coast groundfish fishery. Under Alternative 2B, the shore-based whiting fleet would fund the federal monitoring program in the shore-based whiting fishery through a direct pay system, much like the industry funded system presently in place for the at-sea whiting fleet. While whiting is a high volume species, it commands a relatively low price per pound. The annual estimated revenue over the last five years of whiting landed by the shore-based fleet is approximately 6 million dollars and per catcher vessel is approximately $181,000. If the shore-based whiting fleet would be responsible for funding a federal monitoring program, the costs associated with the monitoring program may represent a substantial portion of their annual income. The cost of the monitoring program under Alternative 2 is greater than under all other Alternatives.

Table 4.2.1. Estimated revenue ($1,000) of whiting landed by the shore-based fleet and documented by state agencies during 1998 - 2002.

Year	CDFW	ODFW	WDFW	Total
1998	393.3	3,756.5	617.5	4,767.8
1999	115.6	5,912.6	802.5	6830.7
2000	765.5	6,081.3	1,121.8	7,968.6
2001	171.9	4,132.0	1,438.7	5,742.6
2002	274.3	3,219.3	1,061.4	4,554.9

Using the estimated revenue averaged over the last five years ($5,972,920) divided by the average number of catcher vessels participating in the shore-based fishery over the last five years (33) equals an estimated annual revenue of $180,998 per catcher vessel. Source: PacFIN.

Under Alternative 3 (State Monitoring), the cost of a state monitoring program for the shore-based whiting fleet in 2004 is estimated at about one million dollars. The cost is based on coverage levels similar to the SWOP and provides for coverage on a portion of shore-based whiting trips, coverage for a portion of shore-based whiting deliveries, and state enforcement personnel tracking overage and donation fish (see Table 4.2.2 for a preliminary break-down of costs). The portion is likely greater than 10% of trips and deliveries but less than 50%. Under Alternative 3A, the states of Washington, Oregon, and California would provide the funding for the shore-based whiting monitoring program. The states have experienced severe budget reductions in 2003 and budgets for 2004 are expected to be similarly restrictive. At the present time, the states do not have the financial resources to solely fund this program. Under Alternative 3B, the shore-based whiting fleet would fund the state monitoring program in the shore-based whiting fishery through a tax system. The cost of the monitoring program under Alternative 3 is less than Alternative 2 and more than under Alternative 1 or Alternative 4.

Under Alternative 4 (Combination Monitoring), the cost of a combination monitoring program for the shore-based whiting fleet in 2004 is estimated at about $600,000. The cost provides for an electronic monitoring system providing 100% coverage on all shore-based whiting trips for the duration of the whiting primary season, state monitors sampling 10% - 50% of shore-based whiting deliveries, and a combination of federal and state enforcement personnel tracking overage and donation fish (see Table 4.2.2 for a preliminary break-down of costs). The responsibility of funding this program would be shared between management agencies (both federal and state) and the shore-based whiting fishery, much like the funding under Alternative 1. Budget reductions in 2003 and projected budget reductions in 2004 are expected to affect the money that would be available to fund this program. Both state and federal budgets have been reduced from historical levels and these reductions may make it difficult for continuing funding from these management agencies. The cost of the monitoring program under Alternative 4 is less than Alternative 2 and Alternative 3 but more than under Alternative 1.

Table 4.2.2. Preliminary estimate of costs associated with the full retention monitoring programs for the shore-based whiting fishery.				
Aspects of the Monitoring System	Alternative 1 (No Action Alternative)	Alternative 2 (Federal Monitoring)	Alternative 3 (State Monitoring)	Alternative 4 (Combination Monitoring)
Tracking full retention of catch versus discard at sea	No sampling = $0	$900 / sea day 1,500 sea days 100% trips covered = $1,350,000	$900 / day 700 sea days 10% - 50% trips covered = $630,000	$1,500 / month to lease a camera 30 cameras for 60 days $60,000 labor & $20, 000 data analysis = $170,000
Tracking landings of prohibited species (salmon) and overfished groundfish species	$150 / day 10 port samplers 60 days 10% - 35% of deliveries sampled = $90, 000	$550 / day 2 observers @ 10 plants (20 observers) 60 days 100% deliveries sampled = $660,000	$550 / day 10 port samplers 60 days 10% - 50% of deliveries sampled = $330, 000	$550 / day 10 port samplers 60 days 10% - 50% of deliveries sampled = $330,000
Tracking Overage/Donation Fish	$20,000	Unknown at this time	$50,000	$50,000
Administrative Support	$38,000	Unknown at this time	$50,000	$50,000
Total	$148,000	greater than $2,010,000	$1,060,000	$600,000

Another socioeconomic effect of implementing a monitoring system in the shore-based fishery is a monitoring program's ability to track the money exchanged for and/or donation of landings of groundfish taken in excess of trip limits and the prohibited species (i.e., salmon). With an effective monitoring system in place to track the money associated with the sale of these fish and the donation of these fish, there would be less incentive for fishers to target and land groundfish in excess of trip limits or prohibited species in order to receive a profit.

Need for Further Socioeconomic Analysis
The socioeconomic analysis presented in this EA thus far is only a qualitative discussion of the costs associated with the different types of monitoring programs and how the costs are absorbed by the different participants in the shore-based fishery. Before the Pacific Council takes action and selects a preferred alternative for implementing a monitoring program in the shore-based whiting fishery, further socioeconomic analysis is necessary. Specifically, the following socioeconomic issues need to be addressed:

% At the time of drafting this preliminary EA, not all the cost information associated with each of the alternatives to implement a monitoring program in the shore-based fishery was available. Therefore, the total cost associated with each of the alternatives needs to be determined.

% Both federal and state budgets for fisheries management have been reduced from historical levels and these reductions may make it difficult to provide federal and/or state funding for a monitoring program in the shore-based whiting fishery. Therefore, the total cost associated with each of the alternatives needs to be analyzed in the context of the projected federal and state budgets for 2004 and beyond.

% While whiting is a high volume species, it commands a relatively low price per pound. This preliminary EA discussed the costs associated with the range of alternatives and compared them to the estimated average annual revenue generated by a shore-based whiting fleet over the last five years, but did not project the ability of the shore-based whiting fleet to cover monitoring program costs into the future. Additionally, the ability of the shore-based whiting fleet to cover monitoring costs was not considered in light of the additional financial obligations that they are subject to (e.g., the cost of purchasing and operating a vessel monitoring system, an increase in landings taxes, costs associated with the vessel buy-back program). Therefore, the shore-based whiting fleet's ability to fund a monitoring program should be projected into the future and should consider cumulative effects.

4.3 Effects on the Biological Environment

The biological effects of implementing a monitoring program in the shore-based whiting fishery on the Pacific Coast groundfish fishery includes such things as the tracking and sampling of salmon incidentally taken in the shore-based fishery rebuilding and the tracking and sampling of overfished species incidentally taken in the shore-based fishery. Implementing a monitoring program in the shore-based fishery will also affect what is known about interactions between non-groundfish species, marine mammals, seabirds, and sea turtles and the shore-based whiting fishery.

Salmon Resources

As discussed in Chapter 1, the need for the proposed action is to track and sample salmon species incidentally taken in the shore-based whiting fishery. The August 1992 Biological Opinion analyzing the effects of the Pacific Coast groundfish fishery on salmon stocks listed under the ESA requires the Pacific Council to provide for monitoring of the salmon incidentally taken in the midwater trawl whiting fishery (NMFS 1992). Currently, the need for monitoring in the whiting fishery is based on not jeopardizing the existence of threatened Snake River fall chinook, lower Columbia River chinook, upper Willamette River chinook, and Puget Sound chinook (NMFS 2002). Monitoring needs could change if additional salmon species are listed or as additional incidental take data are needed for other management purposes.

The effects of the alternatives (i.e., different monitoring programs for the shore-based whiting fishery) on salmon resources include both direct and indirect effects. The direct effects would include the acquired knowledge and understanding of salmon incidentally taken in the shore-based fishery. For example, knowledge about whether salmon are discarded at sea or whether all captured salmon are delivered to the processing plants. Having this type of information would enable fishery managers to make informed management decisions with respect to managing the total mortality of salmon. Additionally, sampling the salmon at processing plants would provide such information as species, age, length, weight , number, and maturity of those salmon that are incidentally taken in the shore-based whiting fishery. The indirect effects of the proposed action on salmon resources will depend on how the information collected by the monitoring program is used. For example, if the incidental take of salmon, specifically chinook salmon, in the shore-based whiting fishery is higher than originally thought, it may result in a re-evaluation of the biological opinion that set the allowable chinook salmon threshold. This information may also result in an effort to minimize the total mortality of chinook salmon, perhaps by reducing the directed harvest of chinook salmon or reducing the season length for the whiting fishery.

Because the proposed action is a monitoring program, all alternatives are predicted to have minimal effects on Pacific Coast salmon species. However, the effects on knowledge and understanding of salmon incidentally taken in the shore-based whiting may vary with the type of monitoring program implemented in the shore-based whiting fishery.

It is expected that Alternative 1 (No Action Alternative) would generate the least amount of information on salmon incidentally taken in the shore-based whiting fishery. Without any coverage on shore-based whiting trips, there is no way to verify whether all captured salmon were retained to be sampled at the plant or whether salmon were discarded at sea. The SWOP currently samples between 10% - 35% of shore-based whiting deliveries at processing plants along the Pacific Coast.

Alternative 2 (Federally Monitoring) would result in the greatest amount of information being generated on salmon incidentally taken in the shore-based whiting fishery. This is because there would be 100% observer coverage on shore-based whiting trips to verify whether all captured salmon were retained and sampled at the plant or whether salmon were discarded are sea. If salmon were discarded at sea, it may be possible for observers to determine which salmon species were discarded and to estimate the quantity discarded. Additionally, Alternative 2 would provide 100% observer coverage at the processing plants, therefore, all shore-based deliveries would be sampled.

Alternative 3 (State Monitoring) would generate less information on salmon incidentally taken in the shore-based fishery than Alternative 2, but more information than Alternative 1, and a similar about of information as Alternative 4. Monitors would be aboard a portion (likely to be greater than 10% but less than 50%) of the shore-based whiting trips to verify whether all salmon were retained to be sampled at the plant or whether some salmon were discarded at sea. If salmon were discarded at sea, it may be possible for monitors to determined which salmon species were discarded and what quantity of salmon were discarded. Monitors would also be sampling a portion (likely to be greater than 10% but less than 50%) of deliveries at the processing plant.

Alternative 4 (Combination Monitoring) would generate more information on salmon incidentally taken in the shore-based fishery than Alternative 1, less information than Alternative 2, and a similar amount of information as Alternative 3. An electronic monitoring system would be used to monitor 100% of shore-based whiting trips. It is expected that the electronic monitoring system would be able to document if a large amount of catch was discarded at sea but it is not expected that the electronic monitoring would always be able to document whether a small amount of catch was discarded at sea. It is also not expected that the electronic monitoring would be able to document the species composition of catch dumped at sea. To monitor the dock-side aspect of the shore-based whiting fishery, state monitors would be sampling a portion (likely to be greater than 10% but less than 50%) of the deliveries.

Groundfish Resources

As discussed in Chapter 1, there is an increasing need to accurately track other aspects of the shore-based whiting fishery. There are currently nine overfished groundfish species along the Pacific Coast and at least six of these species (widow rockfish, darkblotched rockfish, Pacific ocean perch, canary rockfish, bocaccio, and lingcod) are incidentally taken in the shore-based whiting fishery. Additionally, other groundfish species, sablefish and yellowtail rockfish, are commonly incidentally taken in the shore-based whiting fishery.

The effects of the alternatives (i.e., different monitoring programs for the shore-based whiting fishery) on groundfish resources include both direct and indirect effects The direct effects would include the acquired knowledge and understanding of groundfish incidentally taken in the shore-based fishery. For example, knowledge about whether groundfish are discarded at sea or whether all captured groundfish are delivered to the processing plants. Having this type of information would enable fishery managers to make informed management decisions with respect to managing the total mortality of groundfish, specifically overfished groundfish species. Additionally, sampling groundfish at the processing plants would provide such information as species, age, length, weight , number, and maturity for those groundfish that are incidentally taken in the shore-based whiting fishery. The indirect effects of the proposed action on groundfish resources will depend on how the information collected by the monitoring program is used. For example, if the incidental take of groundfish species, specifically overfished groundfish species, in the shore-based whiting fishery is linked to the location, seasonality, or time of day of fishing activities, efforts may be made to adjust fishing strategies in an effort to avoid capturing non-whiting groundfish species.

Because the proposed action is a monitoring program, all alternatives are predicted to have minimal effects on Pacific Coast groundfish species. However, the effects on knowledge and understanding of groundfish, specifically overfished groundfish species, incidentally taken in the shore-based whiting may vary with the type of monitoring program implemented in the shore-based whiting fishery.

It is expected that Alternative 1 (No Action Alternative) would generate the least amount of information on groundfish incidentally taken in the shore-based whiting fishery. Without any coverage on shore-based whiting trips, there is no way to verify whether all captured groundfish were retained to be sampled at the plant or whether groundfish were discarded at sea. The SWOP currently samples between 10% - 35% of shore-based whiting deliveries at processing plants along the Pacific Coast.

Alternative 2 (Federally Monitoring) would result in the greatest amount of information being generated on groundfish incidentally taken in the shore-based whiting fishery. This is because there would be 100% observer coverage on shore-based whiting trips to verify whether all captured groundfish were retained and sampled at the plant or whether groundfish were discarded are sea. If groundfish were discarded at sea, it may be possible for observers to determined which groundfish species were discarded and what quantity of groundfish were discarded. Additionally, Alternative 2 would provide 100% observer coverage at the processing plants, therefore, all shore-based deliveries would be sampled.

Alternative 3 (State Monitoring) would generate less information on groundfish incidentally taken in the shore-based fishery than Alternative 2, more information than Alternative 1, and a similar amount of information as Alternative 4. Monitors would be aboard a portion (likely to be greater than 10% but less than 50%) of the shore-based whiting trips to verify whether all groundfish were retained to be sampled at the plant or whether some groundfish were discarded at sea. If groundfish were discarded at sea, it may be possible for monitors to determined which groundfish species were discarded and what quantity of groundfish were discarded. Monitors would also be sampling a portion (likely to be greater than 10% but less than 50%) of deliveries at the processing plant.

Alternative 4 (Combination Monitoring) would generate more information on groundfish incidentally taken in the shore-based fishery than Alternative 1, less information than Alternative 2, and a similar amount of information as Alternative 3. An electronic monitoring system would be used to monitor 100% of shore-based whiting trips. It is expected that the electronic monitoring system would be able to document if a large amount of catch was dumped at sea but it is not expected that the electronic monitoring would always be able to document whether a small amount of catch was discarded at sea. It is also not expected that the electronic monitoring would be able to document the species composition of catch dumped at sea. To monitor the dock-side aspect of the shore-based whiting fishery, state monitors would be sampling a portion (likely to be greater than 10% but less than 50%) of the deliveries.

Non-Groundfish Species
The effects of the alternatives (i.e., different monitoring programs for the shore-based whiting fishery) on non-groundfish resources include both direct and indirect effects The direct effects would include the acquired knowledge and understanding of non-groundfish species incidentally taken in the shore-based fishery. Having this type of information would enable fishery managers to make informed management decisions with respect to managing the total mortality of non-groundfish species, specifically coastal pelagic species groundfish species. The indirect effects of the proposed action on groundfish resources will depend on how the information collected by the monitoring program is used. For example, if the incidental take of non-groundfish species, specifically coastal pelagic species, in the shore-based whiting fishery is linked to the location, seasonality, or time of day of fishing activities, efforts may be made to adjust fishing strategies in order to avoid capturing non-groundfish species.

Because the proposed action is a monitoring program, all alternatives are predicted to have minimal effects on non-groundfish species. However, the effects on knowledge and understanding of non-groundfish species incidentally taken in the shore-based whiting may vary with the type of monitoring program implemented in the shore-based whiting fleet. The amount of information generated by this proposed action on non-groundfish species is expected to be the greatest under Alternative 2 (Federal Monitoring), slightly less under Alternative 3 (State Monitoring) and Alternative 4 (Combination Monitoring), and the least under Alternative 1 (No Action Alternative).

Endangered Species
The effects of this proposed action and the differences between alternatives on endangered and/or threatened salmon, marine mammals, seabirds, and sea turtles is discussed in the salmon resources section, the marine mammal section, the seabird section, and the sea turtle section.

Marine Mammals
There is limited information documenting the interactions of groundfish fisheries and marine mammals, but marine mammals are probably affected by many aspects of groundfish fisheries. The incidental take of marine mammals, defined as any serious injury or mortality resulting from commercial fishing operations, is reported to NMFS by vessel operators. In the Pacific Coast groundfish fisheries, incidental take is infrequent and primarily occurs in trawl fisheries (Forney et al. 2000). Additional effects of groundfish fisheries on marine mammals are more difficult to quantify due to a lack of behavioral and ecological information about marine mammals. However, marine mammals may be affected by increased noise in the oceans, change in prey availability, habitat changes due to fishing gear, vessel traffic in and around important habitat (i.e., areas used for foraging, breeding, raising offspring, or hauling-out), at-sea garbage dumping, and diesel or oil discharged into the water associated with commercial fisheries.

Based on its Category III status, the incidental take of marine mammals in the Pacific Coast groundfish fisheries does not significantly impact marine mammal stocks. To date, there are no documented marine mammals takes in the shore-based whiting fishery (B. Wiedoff, Marine Resources Program, ODFW, 2003, personal communication).

Marine mammals species found off the Pacific Coast are either year around residents or transients traveling to feeding/breeding grounds. Because the proposed action is a monitoring program, all alternatives are predicted to have minimal effects on marine mammal species. However, the effects on knowledge and understanding of marine mammals interactions with the shore-based whiting may vary with the type of monitoring program implemented in the shore-based whiting fleet.

The amount of information generated by this proposed action on marine mammal interactions with the shore-based whiting fleet is expected to be the greatest under Alternative 2 (Federal Monitoring), slightly less under Alternative 3 (State Monitoring) and Alternative 4 (Combination Monitoring), and the least under Alternative 1 (No Action Alternative).

Seabirds
Interactions between seabirds and fishing operations are wide-spread and have led to conservation concerns in many fisheries throughout the world. Abundant food in the form of offal (discarded fish and fish processing waste) and bait attract birds to fishing vessels. Of the gear used in the Pacific Coast groundfish fisheries, seabirds are occasionally taken incidentally by trawl and pot gear, but they are most often taken by longline gear. Besides entanglement in fishing gear, seabirds may be affected by commercial fisheries in various ways. Change in prey availability may be linked to directed fishing and the discarding of fish and offal. Vessel traffic may affect seabirds when it occurs in and around important foraging and breeding habitat and increases the likelihood of bird storms. In addition, seabirds may be exposed to at-sea garbage dumping and the diesel and oil discharged into the water associated with commercial fisheries.

To date, there are no documented seabird takes in the shore-based whiting fishery (B. Wiedoff, Marine Resources Program, ODFW, 2003, personal communication).

Because the proposed action is a monitoring program, all alternatives are predicted to have minimal effects on seabird species. However, the effects on knowledge and understanding of seabird interactions with the shore-based whiting may slightly vary with the type of monitoring program implemented in the shore-based whiting fleet.

The amount of information generated by this proposed action on seabird interactions with the shore-based whiting fleet is expected to be the greatest under Alternative 2 (Federal Monitoring), slightly less under Alternative 3 (State Monitoring) and Alternative 4 (Combination Monitoring), and the least under Alternative 1 (No Action Alternative).

Sea Turtles
There is limited information about interactions between sea turtles and Pacific Coast commercial fisheries. Sea turtles are known to be taken incidentally by the California-based pelagic longline fleet and the California halibut gillnet fishery. Because of gear and fishing strategies differences between those fisheries and the groundfish fisheries, the expected take of sea turtles by groundfish gear is minimal. In addition to being incidentally taken in fishing gear, turtles are vulnerable to collisions with vessels and can be killed or injured when struck, especially if struck

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

To date, there are no documented sea turtle takes in the shore-based whiting fishery (B. Wiedoff, Marine Resources Program, ODFW, 2003, personal communication).

Because the proposed action is a monitoring program, all alternatives are predicted to have minimal effects on sea turtle species. However, the effects on knowledge and understanding of sea turtle interactions with the shore-based whiting may vary with the type of monitoring program implemented in the shore-based whiting fleet.

The amount of information generated by this proposed action on sea turtle interactions with the shore-based whiting fleet is expected to be the greatest under Alternative 2 (Federal Monitoring), slightly less under Alternative 3 (State Monitoring) and Alternative 4 (Combination Monitoring), and the least under Alternative 1 (No Action Alternative).

4.4 Effects on the Physical Environment

The effects of fishery management practices on the physical environment typically include such things as fishing gear effects on the ocean floor, changes in water quality associated with vessel traffic, and fish processing discards as a result of fishing practices. Because the proposed action is a monitoring program, all alternatives are predicted to have minimal effects on the California Current System and essential fish habitat.

4.5 Effects of the Alternatives

Table 4.5.1 The effects of the alternatives on the shore-based whiting fishery.

Issues	Alternative 1 (No Action Alternative)	Alternative 2 (Federal Monitoring)		Alternative 3 (State Monitoring)		Alternative 4 (Combination Monitoring)
Issue 1 - Staffing the Monitoring Program for the Shore-based Whiting Fleet	* There is no monitoring for shore-based whiting trips to verify full retention versus discard at sea. *State port samplers sample 10% - 35% of shore-based whiting deliveries at processing plants. * Generates the least amount of fisheries data.	* Federal observers would monitor 100% of shore-based whiting trips to verify full retention versus discard at sea. * Federal observers would sample 100% of shore-based whiting deliveries at processing plants. * Generates the greatest amount of fisheries data.		* State monitors would monitor more than 10% and less than 50% of shore-based whiting trips to verify full retention versus discard at sea. * State monitors would monitor more than 10% and less than 50% of shore-based whiting deliveries at processing plants. * Generates more fisheries data than Alt. 1 but less than Alt 2. Generates a similar amount of data as Alt. 4.		* Electronic monitoring would monitor 100% of shore-based whiting trips for full retention versus discard at sea. * State monitors would monitor more than 10% and less than 50% of shore-based whiting deliveries at processing plants. * Generates more fisheries data than Alt. 1 but less than Alt 2. Generates a similar amount of data as Alt. 3.
Issue 2 - Disposition of Overage/Donation Fish Taken by the Shore-based Whiting Fleet	* There is tracking of overage/donation fish and the money paid for those fish by state and federal enforcement personnel.	* There would be tracking of overage/donation fish and the money paid for those fish by federal enforcement personnel.		* There would be tracking of overage/donation fish and the money paid for those fish by state enforcement personnel.		* There would be tracking of overage/donation fish and the money paid for those fish by state and federal enforcement personnel.
Issue 3 - Funding the Monitoring Program for the Shore-based Whiting Fleet	* Funding is provided by the shore-based whiting fishery and state and federal management agencies. * Estimated cost is $148,000.	**Alternative 2A** * Funding would be provided by NMFS and the West Coast Observer Program. Currently, there are not adequate federal resources to provide for this program. * Estimated cost is greater than $2,010,000.	**Alternative 2B** * Funding would be provided by the shore-based whiting fleet, much like funding for the at-sea whiting monitoring program. * Estimated cost is greater than $2,010,000.	**Alternative 3A** * Funding would be provided by each state. * Estimated cost is $1,060,000.	**Alternative 3B** * Funding would be provided by the shore-based whiting fleet, through a tax system. *Estimated cost is $1,060,000.	* Funding would be provided by the shore-based whiting fishery and state and federal management agencies. * Estimated cost is $600,000.

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PACIFIC COAST GROUNDFISH FISHERY EXEMPTED FISHING PERMIT
AUTHORITY: Title 50, Code of Federal Regulations
Sections 600.745 and 660.406, and Subpart G of part 660

MONITORING INCIDENTAL CATCH IN THE PACIFIC WHITING FISHERY

F/V **Vessel name**

PERMIT # **03-HAK-XX**
Pacific Coast Groundfish
Limited Entry Permit # xx

The Administrator of the Northwest Region of the National Marine Fisheries Service (NMFS), acting on behalf of the Secretary of Commerce, hereby permits the master and owner of the fishing vessel **[insert vessel name]**, documentation number **XXXXXX**, to engage in the exempted harvest of Pacific Coast groundfish over which the United States exercises fishery management authority under the Magnuson-Stevens Fishery Conservation and Management Act, 16 United States Code 1801 et seq. (Magnuson-Stevens Act), and implementing groundfish regulations at 50 CFR Part 660, Subpart G and section 600.745, and under salmon regulations at 50 CFR 660.406. The exempted fishing must be conducted in accordance with the provisions of the Magnuson-Stevens Act and 50 CFR Parts 600 and 660, Subpart G except as provided in the attached terms and conditions incorporated herein.

This permit implements a cooperative state/federal/industry observation program to monitor the bycatch of salmon and groundfish in the shore-based component of the Pacific whiting fishery. This permit is valid when signed by both the Regional Administrator and the authorized representative of the vessel (hereinafter referred to as the "permit holder"). It expires 24 hours after notification by the Regional Administrator of termination of this permit, or on December 31, 2003, whichever is earlier. It also may be terminated or modified earlier by regulatory action pursuant to 50 CFR Part 660, Subpart G, or revocation, suspension, or modification pursuant to 15 CFR Part 904, or successor regulations, or by the terms and conditions of this permit. The Regional Administrator will notify the vessel owner of the conclusion of the observation program and the termination of the permit if other than December 31, 2003.

Signature	Date Signed	Signature	Date Signed

D. Robert Lohn, Acting Regional Administrator
Northwest Region
National Marine Fisheries Service

XX, permit holder.

By signing this document, the permit holder agrees to comply with the intent and the terms and conditions of this permit, and is responsible for seeing that this information is understood by the vessel's crew.

Vessel Owner's Name/Address:
name, address, phone, fax XX

EXEMPTED FISHING PERMIT

MONITORING INCIDENTAL CATCH IN THE PACIFIC WHITING FISHERY

TERMS AND CONDITIONS

A. PURPOSE. The purpose of this program is to determine levels of incidental catch of salmon and groundfish in the shore-based primary season fishery for Pacific whiting. Target fishing on any species other than whiting (particularly yellowtail and widow rockfish) is contrary to the intent of this program and may result in unrealistically high estimates of incidental catch. This would reflect on the entire shore-based whiting fleet, and may result in additional restrictions.

Incidental species caught while fishing for whiting are counted against a vessel's cumulative trip limit for the incidental species. Although landings in excess of a trip limit currently are allowed under this EFP, the proceeds from the sale of overages are abandoned to the State where landed or NMFS. Any overages are deducted from the optimum yield and therefore reduce the amount of fish available to non-whiting fishers.

B. SCOPE.

1. This permit implements a cooperative observation program with the states of California, Oregon, and Washington to monitor the incidental catch of salmon and groundfish caught in Pacific whiting trawl operations on vessels that deliver shoreside.

2. This permit applies to all fishing activities by the permitted vessel targeting on Pacific whiting during the effective dates of the permit. The permit holder is responsible for instructing all vessel operators and crew members concerning the terms and conditions of this permit.

3. This permit authorizes, for limited purposes as described in this permit, the following activities which would otherwise be prohibited by 50 CFR 660.306 (b) and (f); 50 CFR 600.725 (p); and 50 CFR 660.405:

    a. Retention, until offloading, of prohibited species including, salmonids incidentally caught in a pelagic trawl, only if the prohibited species are turned over to the State or NMFS for disposition; and

    b. Retention, until offloading, of groundfish (except Pacific whiting) in excess of trip limits, only if the overage proceeds are turned over to the State or NMFS.

4. All other provisions of 50 CFR Part 660, Subpart G, including restrictions specified by or pursuant to 50 CFR 660.323, apply to fishing conducted under this permit.

5. NMFS sponsors the EFP program. The States of Oregon, Washington, and California are the EFP applicants, and as such have the authority to select which vessels and processors are allowed to participate in the program. The State(s) where the whiting are or will be landed may decline to approve a vessel or processor and may choose not to forward the processor's name to NMFS for inclusion in Appendix A, designated processor list (DPL), on an EFP permit. The States may modify Appendix A to an EFP to add or delete a processor from the DPL, provided such changes are promptly communicated to the NMFS Fisheries Permit Office staff and the communications occur before EFP fish are landed at the processing facility.

C. <u>EXEMPTED FISHING</u>.

1. This permit is valid only for fishing with pelagic trawl gear targeting on Pacific whiting during the primary whiting season, for shoreside delivery under the States' observation program.

2. All fishing trips by the permitted vessel targeting on Pacific whiting during the effective dates must be conducted in accordance with this permit.

3. A fishing trip targeting on Pacific whiting is defined for the purposes of this permit as a fishing trip resulting in the landing of 10,000 pounds or more of Pacific whiting.

4. If a vessel lands less than 10,000 pounds of Pacific whiting from a fishing trip, then that trip will not be considered as "targeting on Pacific whiting," and therefore that trip will not be governed by this permit. Consequently, all fish landed from such a trip will count toward otherwise applicable trip limits in effect at the time in the Pacific coast groundfish fishery. Trip limits shall apply to all trips within a cumulative trip limit period that fail to target on whiting.

D. <u>EFFECTIVE DATES</u>.

1. This permit is valid from the date signed by the Regional Administrator, NMFS, and the permit holder.

2. This permit applies only to the primary whiting season, as announced in the <u>Federal Register</u> and terminates on December 31, 2003, unless terminated at an earlier date by one of the following actions: at the request of the vessel owner or the permit holder, in which case the permit is terminated on the date requested and no further notification from the Regional Administrator or State is required; at the request of the cooperating State, when the State observation program ends, or when the processing plant(s) designated in Appendix A are no longer included in the sampling program conducted by the State, in which case written notification from the State to the vessel owner is required and termination occurs no sooner than 24 hours after delivery of the notification; when the Regional Administrator determines it is necessary to issue amended permits containing additional restrictions under F.4.b, in which case

termination occurs no sooner than 24 hours after delivery of the notice of termination from the Regional Administrator to the vessel owner; when the whiting fishery is closed because of achievement of the shore-based allocation, commercial harvest guideline, or species' harvest guideline, in which case termination occurs concurrent with the closure, as announced in the Federal Register, in which case further written notification of the vessel owner is not required.

3. The vessel owner is responsible for advising the permit holder of the termination of the permit.

E. LANDINGS.

1. This permit is valid only for landings made at processing plants that have been designated by the States as participants in the observation program. The States will require a written agreement to be signed by a representative of a processing plant before that processing plant is accepted as a "designated processor" to ensure that the purposes of the EFP program are implemented.

    a. Designated processing plants are listed in Appendix A to this permit. The DPL in Appendix A may be revised by NMFS or the State observation program coordinator. The revised DPL must be attached to this permit. The State may decline issuance of an EFP to a vessel if the designated processor is in a different state, if there is reason to believe the vessel's catch cannot or will not be sorted according to current laws, cannot be monitored under reasonable conditions, if there is not an adequate facility for storing prohibited species, or if there is no designated processor for that vessel. The State agency may decline listing a processor as a designated processor if the processing plant's representative did not sign a written agreement with the State or if the processor is not, or has not been, in compliance with a signed written agreement with the State.

    b. The States will provide instructions to each participating processing plant specifying the plant's role and responsibilities in the observation program and procedures for abandoning the market value of any groundfish trip limit overages to NMFS. Designated processing plants have agreed to: (1) allow State personnel and program observers to sample whiting landings and all associated incidental catch; (2) set-aside all salmonids, Pacific halibut, and Dungeness Crab for biological sampling and disposition by State agency personnel; and (3) remit to the State of landing or NMFS the market value of any groundfish trip limit overages.

2. The permit holder must contact the appropriate State coordinator listed below to make arrangements for observations of offloading of catch at a designated processing plant.

In California: Mike Fukushima, California Dept. of Fish and Game, 707- 441-5797.
In Oregon: Brett Wiedoff, Oregon Dept. of Fish and Wildlife, 541-867-0300
In Washington: Brian Culver, Wash. Dept. of Fish and Wildlife, 360-249-4628

3. All fish caught during an exempted fishing trip must be offloaded at only one designated processing plant (i.e. the offloading of catch from one trip cannot be split between processing plants). Once offloading has commenced at a designated processing plant, all fish onboard the vessel must be offloaded at that plant.

F. FISHING RESTRICTIONS.

1. Discards. At-sea discarding of any catch is prohibited.

   a. All fish caught during a tow under this permit **must** be brought onboard the vessel unless the entire contents of the tow are discarded as a result of vessel or crew safety concerns. Any discarded fish must be recorded according to paragraph I. 1. c.

   b. All fish brought on board the vessel under this permit must be retained onboard the fishing vessel and delivered shoreside for sampling under the State observation program.

2. Disposition of salmon. Salmon caught under this permit shall be retained and landed, but cannot be sold. Salmon will be set aside for disposition in accordance with State instructions to processing plants, which may include providing salmon to a food bank or food bank resource coordinator authorized by the State coordinator.

3. Disposition of Pacific halibut and Dungeness crab. The permit holder agrees that Pacific halibut caught while fishing under this permit are voluntarily abandoned. Pacific halibut will be set aside for disposition in accordance with State instructions to processing plants.

4. Groundfish trip limits.

   a. Groundfish trip limits will apply to vessels operating under this permit except that overages in trip limits will not be in violation of 50 CFR 660.323 so long as such overage is surrendered to the State of landing or NMFS.

   b. The Regional Administrator may place limits on the overages of groundfish trip limits during the course of the exempted fishery. If such restrictions are necessary, the Regional Administrator will terminate this permit and issue an amended permit containing the additional restrictions on groundfish trip limits as determined necessary by NMFS in consultation with the states.

5. Fishing inside the 100-fathom contour in the Eureka area: This permit **does not** authorize a vessel to take and retain more than 10,000 pounds of whiting caught shoreward of the 100-fathom contour in the Eureka area (43/00' - 40/30' N. lat.).

G. GEAR RESTRICTIONS. Only pelagic trawl gear authorized under 50 CFR Part 660, Subpart G may be used.

H. REPORTING REQUIREMENTS.

1. The permit holder must provide, to the State or observer program coordinator, departure and arrival notification, including reasonable notice of unexpected changes in fishing plans, as required by the States to allow for the sampling of the catch at offloading and for deployment of at-sea observers, if any.

2. For landings at processing plants in California, the vessel operator must notify CDFG at least 12 hours before departing port to commence fishing under this permit.

I. DATA REQUIREMENTS. It is unlawful to fail to report catches as required while fishing pursuant to an exempted fishing permit (50 CFR 600.725(l)).

1. Trawl Logs. Trawl logbooks as required by the applicable state law must be maintained by the vessel operator. "Exempted Fishing Trip" (or "Experimental Fishing Trip") shall be written on the log for each trip conducted under this permit.

   a. Estimated pounds of all species caught in each tow must be recorded in the logbook.

   b. If salmon, Pacific halibut, or Dungeness crab are observed at-sea, the numbers observed, by species, are to be recorded by tow in the logbook. The total number of salmon, ~~or~~ Pacific halibut, or Dungeness crab landed must be recorded, by species, in the "remarks" section of the log.

   c. If fish are discarded (see paragraph F. 1.), an estimate of the amount discarded, the species (list the 3 most prevalent species, if possible), location of the tow, and reason for discarding (such as "bag too full to safely pull on board") shall be recorded (and labeled "discard") on a separate line in the logbook required by the State of landing.

2. Other Reports. This permit does not relieve the vessel operator from any other state or federal reporting requirements.

3. Public Release of Information. The fishing activities carried out under this permit, which are otherwise prohibited, are for the purpose of collecting information. The vessel owner, operator, and permit holder agree to the public release of any and all information obtained as a result of activities conducted under this permit. Data from individual vessels may be released for purposes of examining incidental catch levels and rates of non-whiting species and prohibited species.

J. OBSERVER REQUIREMENTS.

1. Shoreside monitors. The state coordinators will make necessary arrangements to ensure achievement of the observation program objective for randomly selected coverage of at least 10 percent of the landings by vessels participating in the exempted fishery. The State will review coverage rates on a monthly basis and advise the permit holder of any deficiencies in observer coverage that must be resolved to meet program objectives. A State may deny issuance of an EFP if necessary to assure adequate coverage.

2. At-sea observers. A state-sponsored at-sea observer may be assigned to a vessel to monitor discard and incidental catch levels, to determine fishing practices that may result in high or low incidental catch levels, and to compare incidental catch from vessels that carry observers and those that do not. The vessel owner, operator and permit holder shall allow an observer to accompany the vessel during fishing under this permit when an observer is assigned under the states' observation programs. If an at-sea observer is assigned, the vessel operator or owner shall abide by groundfish observer regulations at 50 CFR 660.306, and 50 CFR 660.360 (d) & (j).

3. Any state observer must be approved by the State coordinator before deployment.

4. NMFS Observer coverage requirements at 50 CFR 660.360 are independent of state observer requirements. Vessels that carry a state-sponsored observer may also be required to carry a NMFS observer. A state observer is not a substitute for a NMFS observer and a vessel carrying a state observer is not exempt from federal observer requirements. However, a state may choose to waive state observer coverage for vessels that are carrying federal observers.

K. SANCTIONS.

Failure of the vessel owner, operator, or permit holder to comply with the terms and conditions of this permit, a notice issued under 50 CFR Part 660, Subpart G, any other applicable provision of 50 CFR Parts 600 and 660 Subpart G, the Magnuson-Stevens Act, or any other regulations promulgated thereunder, may be grounds for revocation, suspension, or modification of this permit as well as civil or criminal penalties under the Magnuson-Stevens Act with respect to all persons and vessels conducting activities under the EFP (50 CFR 600.745(b)(8)).

L. WAIVER.

The permit holder on his/her own behalf, and on behalf of all persons conducting activities authorized by the permit under his/her direction, waives any and all claims against the United States or the State, and its agents and employees, for any liability whatsoever for personal injury, death, or damage to property directly or indirectly due to activities under this permit.

Electronic Monitoring for Shoreside Hake Fishing

A Pilot Study

DRAFT

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TABLE OF CONTENTS

ABSTRACT

McElderry, H., D. McCullough, J. Illingworth, and J. Schrader. 2002. Electronic Monitoring for Shoreside Hake Fishing – A Pilot Study. Unpublished report prepared for the National Marine Fisheries Service, Northwest Fisheries Science Center by Archipelago Marine Research Ltd., Victoria BC Canada. 23 pp.

Archipelago Marine Research Ltd. has been developing electronic monitoring equipment in an effort to provide an alternative to at-sea observers, currently the only onboard monitoring method available. This pilot study was funded as part of the 2002 Shoreside Hake Fisheries Program as an industry led initiative to examine the feasibility of electronic monitoring to provide on board monitoring for the midwater hake fishery. A prototype electronic monitoring system, installed aboard the F/V *Excalibur* for June, 2002, provided continuous record of GPS (time, date, position, speed and heading), hydraulic pressure (net drum activity), and closed circuit television imagery of the fishing deck. The system was aboard for 16 days and monitored 13 days of fishing operations for a total of 16 fishing sets. A rare video boot failure resulted in no imagery from eight days of fishing. Despite this issue, results from this study demonstrated that electronic monitoring was an effective tool for monitoring retention of hake caught for shoreside delivery. The monitoring system provided the same or better data quality as an at-sea observer for a number of information objectives including time and location of hauling events, and ensuring that all catch was retained aboard. The use of electronic monitoring for species identification was limited. In considering the use electronic monitoring for a fishery monitoring application, the specific requirements of these programs as compared to at-sea observer programs should be considered. For example, electronic monitoring has different program delivery requirements and should involve more specific protocols concerning the use and distribution of information than currently exists with at-sea observer programs.

INTRODUCTION

Many commercial fisheries in British Columbia, Canada utilize monitoring programs to ensure compliance with fishery regulations and collect important information supporting in-season fishery management, stock assessment and scientific research. Most monitoring programs are costly because of the high labour component associated with the field data collection by at-sea observers. Thus, the benefits afforded by these programs generally fall to fisheries that have the ability to bear such costs.

Archipelago Marine Research Ltd. has been active in developing electronic monitoring equipment to provide a lower cost alternative to at-sea observer programs. The goal is to create automated monitoring equipment to provide accurate, timely and verifiable fisheries data of equivalent or better quality and lower cost than that provided by an at-sea observer. Recent technology developments enable data capture for many routine fishery operations and Archipelago has been testing this equipment in various fisheries to determine if it could be used to address the specific fishery monitoring objectives.

The Northwest Fisheries Science Center of the National Marine Fisheries Service contracted with Archipelago to examine the use of electronic monitoring in various commercial fisheries applications. The Oregon shoreside hake fishery was identified as an appropriate opportunity to conduct a pilot test of the technology. The project included the following objectives:

- Field test a prototype monitoring equipment,
- Determine reliability of equipment in recording events of interest,
- Determine the level of analysis required to reliably detect events of interest,
- Identify circumstances where monitoring equipment fails to detect events of interest, and
- Contemplate how electronic monitoring could be applied on a fleet-wide application.

METHODOLOGY

Description of Monitoring System

The electronic monitoring system integrates an assortment of available electronic components with a proprietary software operating system to create a unique and powerful data collection tool. The system operates on either DC or AC voltage and autonomously logs video and vessel sensor data during the fishing trip. The system automatically restarts and resumes program functions following power interruptions. The data storage capacity of the monitoring system depends on the rate of data capture and the size of storage devices. The electronic monitoring system is designed to independently monitor fishing activities on the vessel. The system components are graphically depicted in Figure 1 and described in the following text.

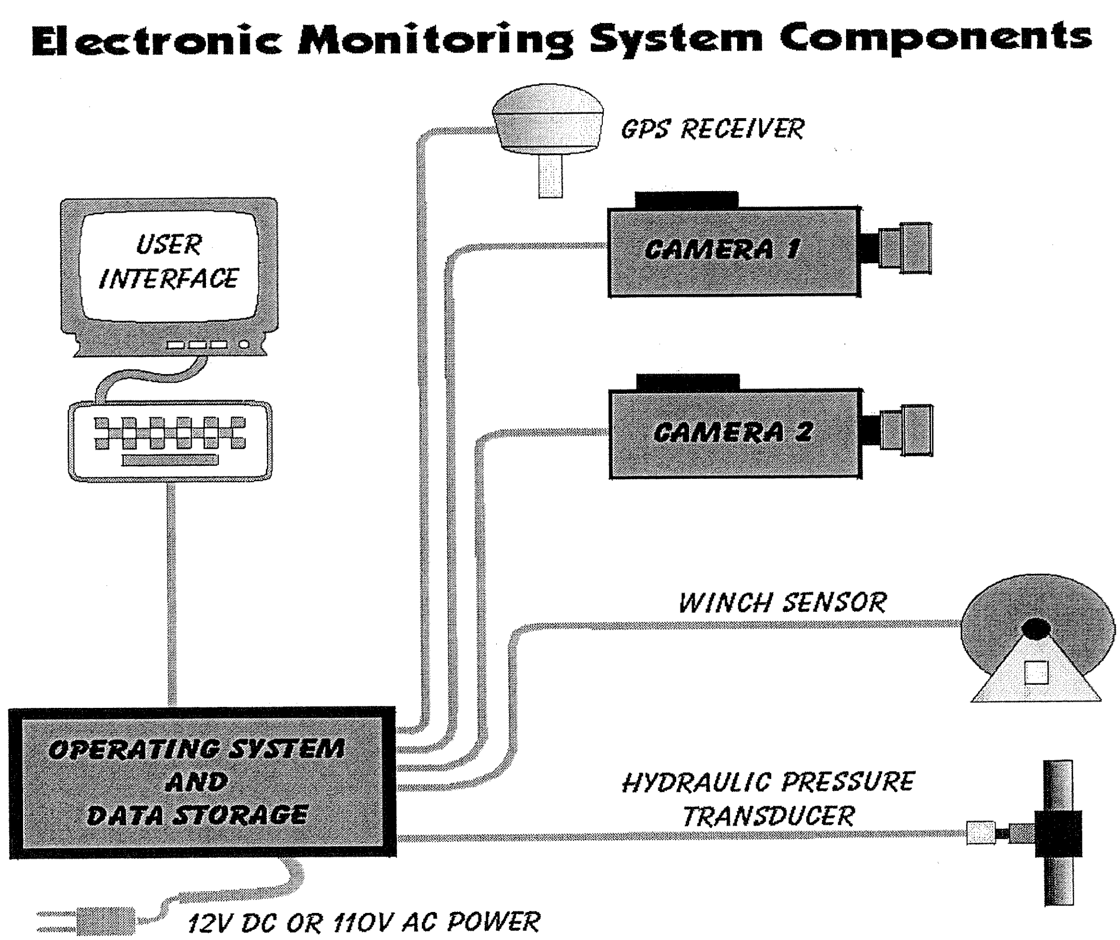
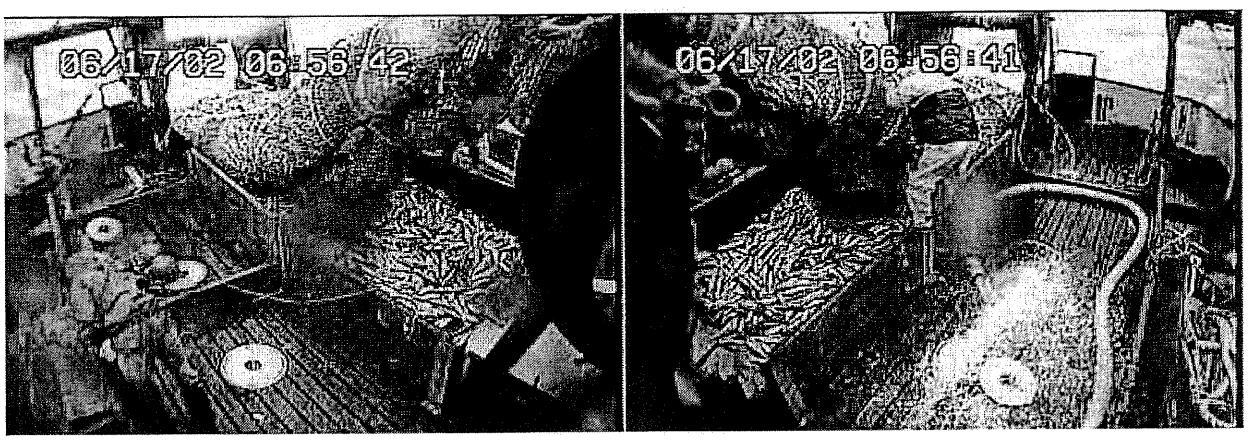


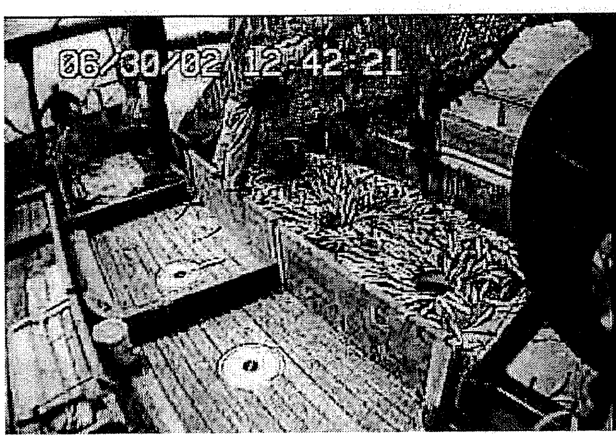
Figure 1. Schematic of electronic monitoring system

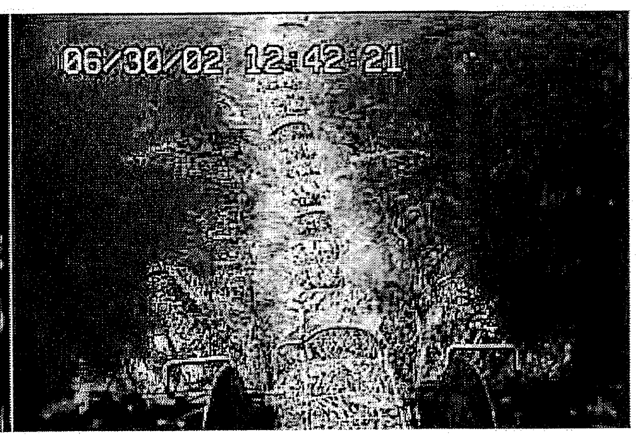
- **Control Box** – A robust aluminum box containing the digital video and data logging computers was mounted, in an out of the way location, beneath the vessel control console on the bridge. 120 volt AC power was delivered to the control box from a DC inverter located beneath the adjacent console. The control box consumes about half of a cubic foot of interior space and about 500 watts of AC power. The box could be removed from the storage location and placed on the console top for service access. The video and sensor signal leads were brought to the control box through a sealed wiring gland located on the aft starboard quarter of the wheelhouse. The video computer in the control box digitizes the incoming analog camera signals and stores the video imagery on a removable computer hard disk. The video computer was set to collect digital images at a timelapse rate of 2 frames per second from each camera. The hard disk capacity would allow 25 days of continuous video data collection. Information from the other vessel sensors was sampled and stored on the data logging computer hard disk once every ten seconds. Sensor data files stored on the hard disk are transferred from the control box computer to a data processing computer on a diskette.

- **Closed Circuit TV (CCTV) Cameras** – For the majority of the test period the waterproof, colour, CCTV cameras were mounted on the bridge afterdeck handrail, four metres above the working deck. One camera provided a view of the deck along the starboard side rail to the stern gantry and across the centerline of the vessel. The other camera offered a similar view of the port side working deck (Figure 2a - below). The cameras provided redundant views, each from



a different aspect, of net handling operations on the vessel centerline. Camera lenses were chosen to provide the widest view of the working deck that would maintain good image resolution. On June 29th the port camera was moved from the bridge deck to the top of the trawl gantry. The camera view was centered on the stern ramp and extended to approximately 20 metres behind the vessel (Figure 2b – next page). The starboard deck camera was left in its original position.





- **GPS** – An independent GPS receiver was installed on the cabin roof and connected to the EM system control box. The GPS receiver delivers a digital data stream to the data logging computer that provides an accurate time base (Pacific Standard Time) as well as vessel position, speed and heading. The GPS information was updated and stored on the data logger at a ten second sample rate and was also captioned at the bottom of each digital video image to provide a "burned in" geo-reference for each frame.

- **Hydraulic Pressure** – An electronic transducer to monitor hydraulic pressure was installed on the input side of the starboard trawl winch. When the winch was activated, to deploy the trawl doors and the net, the corresponding pressure increase was recorded in the data set. Pressure variance during net deployment, towing and recovery, when displayed graphically, provides a repeatable digital signature of the trawling activities.

- **Drum Rotation Counter** – A magnetically activated drum rotation counter was installed on the forward net drum of the vessel. The number of drum rotations that occurred during each ten second data sample interval was stored with the GPS and hydraulic pressure values on the data logger.

Installation of Electronic Monitoring Equipment

The electronic monitoring system was installed on the Hake Trawler F/V *Excalibur* on June 12th in Newport, Oregon. This was the first time an Archipelago electronic monitoring system had been installed on a trawler. Familiarization with the vessel and the trawling techniques employed started with discussions with the captain and crew. Net deployment and recovery routines were explained and a description of the crew deck activities during catch processing and dispensation was provided. At this time the components of the EM system were shown to the vessel operators and advice was given regarding install locations that would allow autonomous data collection without interfering their operations.

A ventilated cupboard with ready access to AC power was identified in the wheelhouse as a suitable location for the control box. The camera locations were tested for deck view and cleared with the captain regarding possible disturbance of the cameras or hindrance to fishing activities. The GPS was mounted and tested in a location that was well below the vessel radar and away from the vessel GPS and broadcast antennae, the main sources of GPS interference on a boat. The pass through port for the deck sensor and camera wiring was located at the base of the wheelhouse wall ahead of the starboard trawl winch. This winch was chosen for the pressure sensor installation to take advantage of the short wire run to the through port. A hydraulic fitting was installed on the pressure side of the winch motor to accept the sensor. The winch was hydraulically activated after installation to verify correct sensor operation.

Although the hydraulic signal recorded during winch operation usually provides a comprehensive picture of fishing activity, wherever possible on a vessel equipped with a gear storage drum, a revolution counter is installed to complement and backup the hydraulic record. When the revolution counter data is temporally correlated to the hydraulic signal, confidence in the digital interpretation of fishing activity is increased. The *Excalibur* crew confirmed during EM system installation that the trawl net was always stored on and deployed from the forward net drum on the working deck. A rotation counter installed there would record drum rotations on the EM system data logger whenever the net was set or hauled. It was expected that the net drum rotation record, as the net was reeled on and off the drum, would "bookend" the hydraulic signal that was being recorded during the setting, towing and hauling operations.

The drum counter worked well for the four net deployments made on the 15th and 17th of June. At the end of the days fishing activities on June 17th the trawl net overlapped the side plate of the drum, became tangled in the counter switch mounts and destroyed the sensor. In hindsight, installing the counter on the net drum was a mistake caused by unfamiliarity with the process of net handling on the trawler. Before this trial, EM rotation sensors had only been installed on line handling winches and the dangers of net handling, on a large storage drum, were not clearly understood when the *Excalibur* system was installed. In retrospect, a safer location for the counter would have been the trawl winch where the pressure sensor was located.

Data from the GPS, pressure sensor and drum rotation counter are received and stored on the data logging computer in the control box. The video signals coming from the deck cameras are processed in the control box by a separate video computer. This computer receives the incoming analog camera signal, converts the imagery, at pre-selected timelapse rates, to digital imagery and records the information on a computer hard disk. The advantage of collecting timelapse digital video on computer hard disks, rather than on less costly analog tape recorders, becomes apparent during video post-processing.

Video post processing starts with a review of the vessel sensor data. The sensor data time series, when graphically displayed, identifies the locations of fishing activity in time. A chronological list of fishing events is developed from the graphs and the time series database. Using the video hard disk record and the system processing software the video reviewer can access and review time matched video segments anywhere on the drive in a matter of seconds. The combination of random search and virtual instant access to the digital video record provides an advantage to the video reviewer that is not available in less expensive timelapse tape systems.

Video tests during system installation helped determine that a timelapse record rate of two frames per second (FPS) on each camera would provide the best combination of image motion display and storage media conservation. This frame rate would supply at least a 50% disk space safety buffer over the expected period of the pilot project. On many Archipelago EM system deployments the video computer is controlled by the data logging computer to reduce the amount of incidental video capture. On most EM deployments the onboard fishing activity is the target for image collection, video generated during transit, at dockside or at anchor is not. Collecting less video data allows selection of faster frame rates, smaller drives and reduces post-processing labour. To reduce the amount of video capture the data logger software can be set to activate the video computer only when certain sensor events are recognized. These events could be represented by increases in hydraulic pressure, vessel speed change or drum rotation. Autonomous video control, however, can only be safely implemented after careful study of several days of fishing data has been completed and sensor events, identifying fishing activity, have been positively confirmed. The timing for this was not available on the short pilot project in Newport so autonomous video control was not considered an option.

To reduce the amount of incidental dockside video the captain of the *Excalibur* was instructed to power up the control box when the vessel was leaving the dock and turn the system off as they tied up at days end. This process of control would insure all vessel transit and fishing activities would be captured on video. The first day of fishing was June 15th, the season opening day. Video and sensor data was successfully recorded on the 15th, 17th, and 18th. On the afternoon of the 18th, when the vessel had returned from the fishing grounds, the EM system was serviced by Howard McElderry of Archipelago. During servicing the video and sensor data was reviewed. It was clear from this review that the EM system was being activated when the vessel was offshore and not when it was leaving the dockside. There was a concern that some valuable at sea data could be lost if the dockside startup and shutdown routine was not adhered to.

When the video disk free space and quantity of video recorded up to the 18th was accessed it was clear that the system could run 24 hours per day for the remaining term of the pilot study without filling the video drive. The inverter that powered the EM system was operational 24 hours per day without interruption so it was decided that the box would be powered up before departing for the next fishing trip and stay on for the remainder of the program. The control box was switched on, to begin 24 hour data collection, at 03:50 on June 19th, about a hour before trawling operations for that day commenced.

Unfortunately when the EM control box was powered up on June 19th the video computer operating system suffered a rare boot failure. The boot fault prevented the video data collection program from starting up. A power off restart would have cured the problem but no restarts were planned until system service 10 days hence. The failure of the video operating software and lack of power up restarts between June 19th and June 29th resulted in the loss of all video data for 9 days of fishing during this period. The data logging computer and vessel sensors functioned correctly during the 10 days so it was not a vessel related power supply problem.

On June 28th the EM system was serviced by Dale McCullough, it was running and appeared to be fully operational on first inspection. The system was shutdown to attach the service instruments then re-booted for data download. At this time a large discrepancy was noted between the amount of sensor data and the expected amount of video data. The video system log was examined and the boot errors from the 19^{th} were identified. The system was stopped and restarted several more times to try to replicate the problem. The system cycled without fault and no reason could be found to explain the intermittent nature of the failure. This type of malfunction has only been witnessed a couple of times in many thousands of hours of at sea EM system operation. It is unfortunate that this rare failure resulted in significant video loss in this pilot project.

When the EM system was verified to be operational the port camera was moved from the bridge deck rail to the top of the stern gantry to provide a view of the net launch and recovery at the stern chute. On June 30^{th}, the last day of the project, the vessel departed the dock at 05:00 with Dale McCullough onboard to observe the fishing activities. A single trawl was made at a location about 60 kilometres southwest of Newport. The trawl net was launched, towed, and recovered in about one hour. The catch from the tow filled the vessel to capacity. The EM system was shut down at 16:00 as the vessel returned to Newport. The data integrity was checked and then the system was disassembled and packed for transport.

Data Analysis Procedures

Electronic monitoring system captures a large volume of data. A typical data set from a month of vessel operations can be more than a few hundred thousand records of sensor data and over 800 hours of imagery. This large volume of data is difficult to handle and interpret without well designed software tools. Analysis of the sensor data was facilitated with three software tools and data presentation techniques:

- **MS Access Database** – The raw ASCII sensor data were imported into an Access database. The application performed a variety of tasks including reformatting data and examining related records for anomalies in the data series (eg, power interruptions or poor GPS signal quality).

- **Time Series Plotting** – Selected variables from the monitoring system data were displayed in a time series graph. The sensor data presented in this format clearly distinguish vessel activities including transit, anchor, fishing and periods when the system power was off.

- **Geographic Plotting** – Selected variables from the data set were also displayed in Arcview, a geographic information system (GIS) software tool. These plots enable the geographic positioning of fishing activity with a hydrographic chart and fishing boundaries.

With over 800 hours of image storage capacity, it was necessary to use these analytical procedures to identify imagery for viewing. Interpretation of the time series graphs and GIS plots enabled creation of a list of specific events for CCTV image analysis. These events, referenced by date and time, were then used to directly access the imagery. The ability for direct access of imagery was facilitated by digital imagery stored on a hard drive as opposed to the slow and tedious process of accessing analog imagery on the tape-based predecessor.

In order to evaluate the use of electronic monitoring system for compliance monitoring, data were examined for the following compliance issues.

Time and Location of Fishing – Fishery openings may be time and area restricted, and the ability to identify fishing activity within these parameters is important to control the fishery and ensure fairness between fishery participants. The time series graphs were used to approximate start times of hauling events and count the number of hauls per day. Associated CCTV imagery was then reviewed to confirm start and end time for each tow, as defined by the time when the net was deployed and the time when the trawl drum started to rotate for retrieval. Location of fishing in relation to the specified management area boundaries was determined by displaying the vessel cruise track, a hydrographic chart and the area boundaries in GIS.

Retention of Catch – The shoreside hake fishery involves the catch at sea and delivery of catch to shore-based processing plants. The ability to ensure that fish caught are retained onboard and not presorted at sea is important. CCTV imagery was reviewed for the codend emptying procedures of each hauling event. The reviewer watched until the entire codend was brought on board and all fish were transferred into the holds.

RESULTS

General System Performance

The electronic monitoring system was in operation on the *Excalibur* from the season opening on June 15th until the 30th of June. During this time the vessel was based in Newport, Oregon and participated in 13 days of fishing operations (Table 1). In total, the monitoring system recorded 16 fishing sets.

Table 1. Summary of Excalibur Fishing Activity

Date	Number of Hauls	Fishing Occurred	Video Available	Hours of Operation
6/15/2002	2	Yes	Yes	9:04
6/16/2002	0	No	No	0:00
6/17/2002	2	Yes	Yes	8:05
6/18/2002	1	Yes	Yes	9:04
6/19/2002	1	Yes	Yes	20:11
6/20/2002	1	Yes	No	24:00
6/21/2002	1	Yes	No	24:00
6/22/2002	0	No	No	24:00
6/23/2002	2	Yes	No	24:00
6/24/2002	1	Yes	No	24:00
6/25/2002	1	Yes	No	24:00
6/26/2002	1	Yes	No	24:00
6/27/2002	1	Yes	No	24:00
6/28/2002	1	Yes	No	24:00
6/29/2002	0	No	No	12:27
6/30/2002	1	Yes	Yes	12:10
	16			

During the first four days of the program the skipper was instructed to turn the monitoring system on when they left the dock and off when they returned. For the remainder, with the exception of the last day the skipper left the system running all the time. This measure was taken to conserve data storage capacity as, at the time when the vessel was serviced after the first four days it was realized that there would be sufficient capacity to capture data for all the fishing events (Table 2). Other than the periods where the equipment was intentionally shutdown, the electronic monitoring system provided a very complete data set of good quality. The quality of the data set is primarily attributed to good quality of electrical power available to power the monitoring system.

Table 2. Summary of Excalibur Fishing Activity

Tow #	Date	Doors Out	Doors In	Tow Duration	Codend Start	Codend Finish	Codend Processing
1	6/15/2002	6:25	7:27	1:02	7:27	8:37	1:10
2	6/15/2002	8:22	9:09	0:47	9:09	10:58	1:49
3	6/17/2002	5:39	6:26	0:47	6:26	7:22	0:56
4	6/17/2002	7:39	8:20	0:41	8:20	9:21	1:01
5	6/18/2002	4:50	8:36	3:46	8:36	9:44	1:08
6	6/19/2002	5:02	5:40	0:38	5:40	6:47	1:07
7	6/20/2002	5:50	7:16	1:26	7:16	9:00	1:44
8	6/21/2002	6:28	7:52	1:24	7:52	8:53	1:01
9	6/23/2002	5:12	6:20	1:08	6:20	7:00	0:40
10	6/23/2002	7:01	8:06	1:05	8:06	8:53	0:47
11	6/24/2002	7:05	9:28	2:23	9:28	10:02	0:34
12	6/25/2002	6:28	7:05	0:37	7:05	8:11	1:06
13	6/26/2002	7:36	8:50	1:14	8:50	9:43	0:53
14	6/27/2002	6:03	7:10	1:07	7:10	8:12	1:02
15	6/28/2002	5:11	6:31	1:20	6:31	7:36	1:05
16	6/30/2002	11:23	12:20	0:57	12:20	13:08	0:48

Time Series Analyses

Time series graphs for the complete data set are provided in Appendix I with a two day time interval for each graph page. An example of the time series display is shown in Figure 3 with hydraulic pressure, winch rotations, vessel speed, vessel heading and data logging interval shown over time. The start and end of fishing activity was evident by a sharp spike in hydraulic pressure corresponding with an abrupt drop in vessel speed. While the midwater net was towed, there was a steady hydraulic pressure around 400 psi and slow vessel speed (~2 knots). These distinctive sensor patters could be used to reliably identify midwater trawling events and towing time. The annotations on the graphs were made during the analysis process and provide more specific vessel activity information.

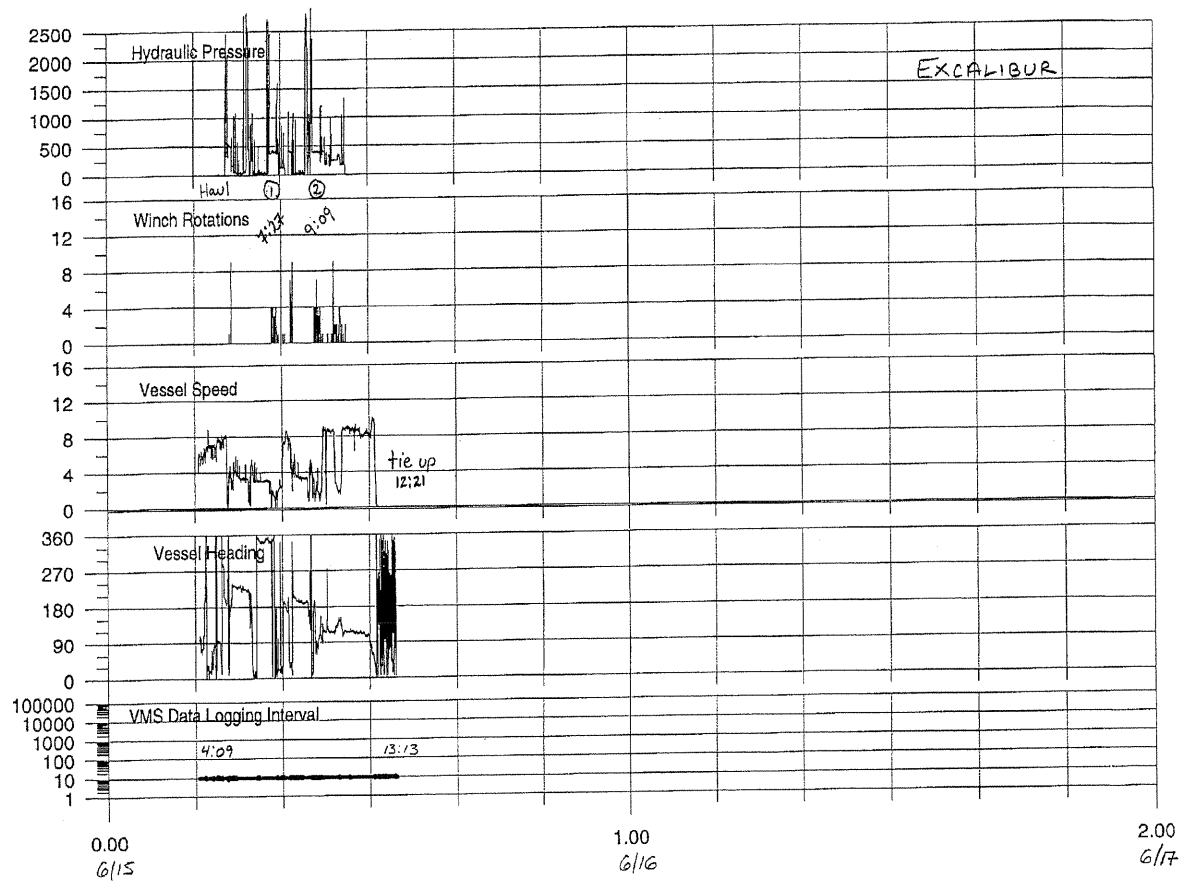


Figure 3. Example of Time Series Graph Showing Fishing Vessel Activities

GIS Plots

GIS plots for all fishing days are presented in Appendix II. An example GIS plot is shown in Figure 4, showing the cruise track of the vessel overlaid on a hydrographic chart. The GIS plot corresponds to data in the time series graph of Figure 3, showing the cruise track and location of fishing activity. The beginning and end of the midwater trawling event (high pressure/slow speed) is shown in black while the towing duration is shown in red. The vessel cruise track is shown in green when no fishing was taking place.

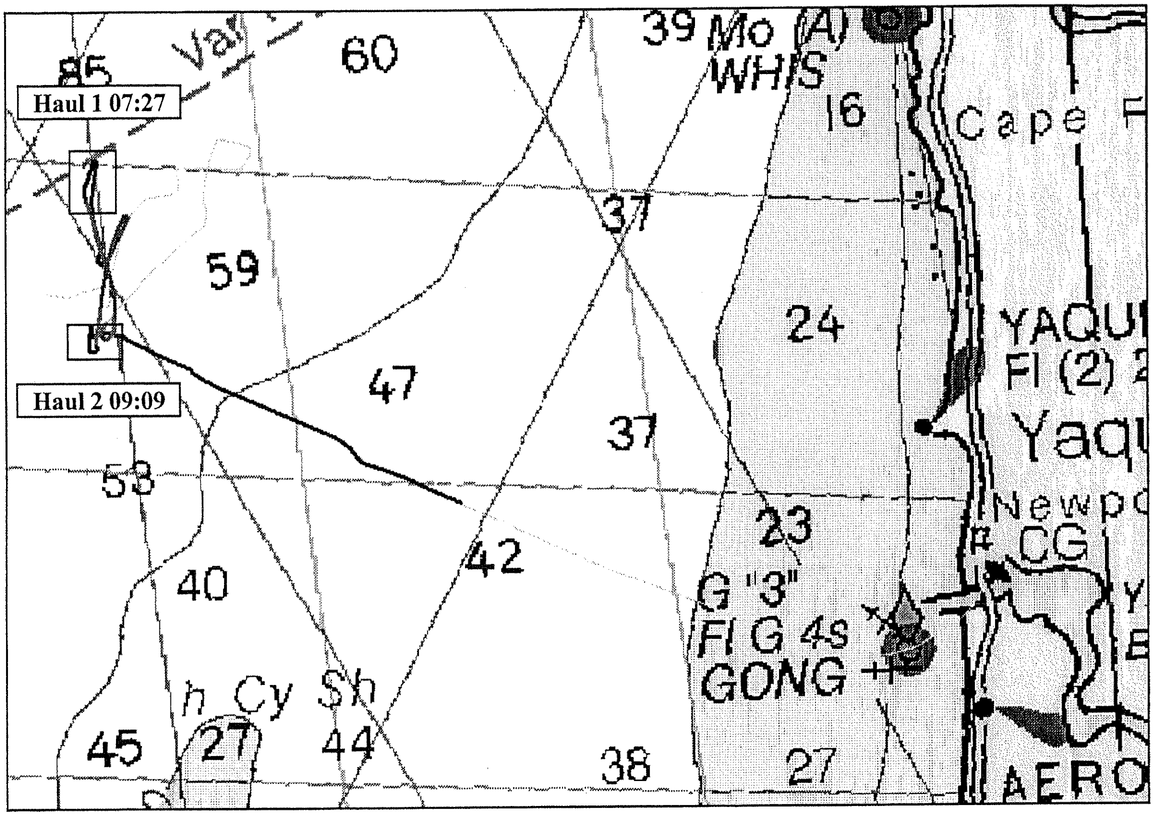


Figure 4. Example GIS Plot of Vessel Cruise Track for June 15. Red denotes deployment and towing of the codend and the black indicates hauling and fish processing on deck. Cruise track shown in green.

The CCTV camera reliably provided imagery of sufficient quality to view and evaluate fishing operations. Table 2 provides a summary of the sensor data analysis results from each fishing operation. The CCTV imagery provided confirmation of seven hauling events. The CD-ROM supplement to this report includes CCTV imagery of fish retrieval operations for five of thirteen days of fishing (7 of 16 hauls). The imagery is provided in its' native DFV format, which requires loading the free-ware viewer software to access (also included on the CD-ROM). The CD-ROM supplement also contains a few sample clips translated to AVI format which can be viewed with any standard media player software. This latter format, while more generic, is lower in quality and the viewer software has poorer frame control.

There were a total of 16 fishing hauling events made and 7 were captured and reviewed. The total time required to review the hauling imagery was about 1 - 2 hours and the average time per haul about 15 minutes to review imagery and record observations. In general, CCTV imagery could be reviewed at one-half to one-third the actual event time (ie, 15 minutes of imagery required between 5 and 7.5 minutes to review).

The imagery clearly established whether catch was being presorted when the codend was emptied and whether the entire contents of the codend were brought aboard the vessel. The codend was released on deck by straps and flushed/shoveled into the holds through various deck hatches. On one occasion (June 18th), the end portion of the codend was lowered back over the stern and fish were released into the ocean. On one other occasion (June 17th second set), the video ended before the entire codend was brought aboard.

DISCUSSION

An Evaluation of the Electronic Monitoring System

The ultimate goal of any monitoring program is to provide accurate data that satisfies the stakeholder requirements of objectivity. While the electronic monitoring equipment used in this study performed well and appeared to be effective in monitoring the issues of interest, the real test will be in how the users perceive how well it addresses the monitoring issues. Electronic monitoring data would be questioned if the analysis fails to detect events of interest (false negatives) or incorrectly identifies events of interest (false positives). These detection problems could occur as a result of incomplete data capture, such as activities occurring outside the field of camera view, or by intentional interference, such as crew tampering with the system. Interestingly, data provided by at-sea observer programs are subject to the same credibility issues although they are seldom critiqued in this manner - observer data are often accepted as accurate without question.

Electronic monitoring program has unique capabilities not possible with at-sea observers. Foremost is the ability to capture a continuous and comprehensive data record from many sensors and cameras. The real strength electronic monitoring is with the ability to replay imagery and control viewing speed. In the present study this capability was particularly useful during high catch rates where fish sorting was fast and involved several crew. The use of CCTV cameras requires careful planning: use of a wide field of view camera provides a broad overall perspective but poor close up definition; using a narrow field of view camera provides good close up definition but poor peripheral information. Very often, multiple cameras with different view and field of view are necessary to gather the necessary imagery. Digital video storage devices are well suited to this requirement with synchronized image capture from several CCTV cameras, gathering both close-up and wide-view imagery. However, increased CCTV imagery results in greater data storage requirements and increased analysis time.

With the increased demand for monitoring in many fisheries, there are incentives to consider electronic monitoring as an alternative to at-sea observers. The two approaches, electronic monitoring and at-sea observers, need to be considered as separate methods and assessed according to the monitoring criteria of interest. The efficacy of the two monitoring approaches was evaluated according to the monitoring issues of the shoreside hake fishery. An overall assessment of the monitoring issues is summarized in Table 3 with the rational provided below.

Table 3. Comparison of Electronic Monitoring and At-Sea Observing for Various Monitoring Issues in the Shoreside Hake Fishery.

Monitoring Issue	Electronic Monitoring	At-Sea Observer
Time and Location of Fishing	+++	++
Catch and By-CatchHandling	+++	++
Catch Enumeration	+	++
Bycatch Enumeration	+	++
Catch Speciation	--	+++

Time and Location of Fishing – Electronic monitoring provides a superior method of monitoring the time and location of fishing activities. The continuous data record, the accuracy time and location information, and the ability to detect fishing activity from sensor information, proves to be an effective means to determine where and when fishing occurs. An at-sea observer can perform the same functions although this requires recording the information from the bridge. This may not be possible if recording position information conflicts with other observer duties.

Fish Sorting and Handling Practices – At-sea observers have a better close up view of fish sorting and handling but may have difficulty if there are several events occurring at the same time, or if they happen to overlook an event. In some cases the crew could intentionally distract an observer in order that the observation is missed. In this study the CCTV imagery provided a good view of fish on deck as the codend was emptied by strap. During hauling events, the imagery could be replayed at reduced speed in order to separately view and evaluate if catch sorting was taking place or whether the entire codend was brought on board.

Catch Enumeration – Catch enumeration was not an objective of this pilot project although could be estimated by counting the number of codend straps brail containing fish. An at-sea observer would have a better opportunity to determine catch by volume piece sampling methods.

By-Catch Enumeration – Given the large quantity of target species, the low incidence of by-catch species, by-catch enumeration would not be very reliable with electronic monitoring. At-sea observers have a better close up view but could miss an event if they are not looking in the right direction.

Catch Speciation – The camera imagery in this study was inadequate to clearly distinguish species, unless they were distinguishable on gross morphological differences (eg, hake, skates, salmon, etc.).

Feasibility of Electronic Monitoring For the Shoreside Hake Fishery

Electronic monitoring would be an appropriate means of monitoring certain fishery issues in the shoreside hake fishery, although industry support would clearly be necessary. In order to provide guidance in considering the suitability of electronic monitoring for this fishery, it is useful to look further at the capabilities and requirements of an electronic monitoring program. Very often, electronic monitoring and at-sea observer programs are considered in the same light when they differ in key ways. The specific requirements will need to be considered in order for an electronic monitoring program to be successful in delivering accurate, timely and verifiable fisheries data of equivalent or better quality and lower cost than that provided by an at-sea observer. These issues are summarized in Table 4 with the rational provided below.

Table 4. Comparison of Electronic Monitoring and At-Sea Observer for Various Program Issues.

Program Issue	Electronic Monitoring	At-Sea Observer
Technological Complexity	higher	lower
Versatility	lower	higher
Capacity	higher	lower
Data Processing	greater	less
Data Privacy	greater	less
Data Archiving	higher	lower
Program Logistics	lower	higher
Intrusiveness	lower	higher
Cost	lower	higher
Program Governance	higher	lower

Technological Complexity – Electronic monitoring is technologically complex, requiring sophisticated electronics and programming. The equipment and programming takes time to develop and implement. In contrast, at-sea observer programs generally involve trained samplers using simple data recording tools. As compared with electronic monitoring the development period and up front development is low.

Versatility – The versatility of monitoring is reflected in the diversity of sampling activities and the ability for these activities to be adaptive. At-sea observer programs generally provide much more versatile data collection opportunities than electronic monitoring. For example, the methods employed by an at-sea observer vary according to a variety of circumstances such as catch contents, weather, sampling space, crew cooperation and other needs. As a result, at-sea observers can generally deal with more complex sampling, choosing the best method for the situation. The protocols for electronic monitoring are comparatively simple, providing observations at specific control points, and are generally fixed (ie, not adaptive) for the entire fishing trip.

Capacity – Without multiple observers, at-sea observer programs are unable to provide continuous monitoring on vessels fishing twenty-four hours a day. In this aspect, electronic monitoring excels by non-stop data collection for days at a time, limited only by the data storage capacity. The data capacity of an at-sea observer is limited by the supply of data forms and the rate at which data can be recorded. Electronic monitoring data capacity is limited by the amount of data storage, rate of recording and the quantity of information recorded. In this study the data capacity was about 25 days.

Data Processing – Electronic monitoring and at-sea observer programs differ considerably in the manner in which data are processed. At-sea observers generally compile their data in a format for direct key-punching after the trip. More timely information (ie, compliance issues) may be transmitted real time. Some of Archipelago's larger at-sea observing projects use forms that can be scanned and the data obtained using an optical character reading utility. In contrast, electronic monitoring programs capture a comprehensive set of fishing vessel data after the trip, from which pertinent fishery data are extracted. While the information is already in electronic format, a potentially time consuming aggregation and interpretation process may be required to extract and translate fishery data to a format compatible with at-sea observer data. The electronic monitoring systems used in this study stored data onboard and did not have the capability to report data real time. Real time transmission is technically possible but economically impractical unless the volume of transmitted information was substantially reduced.

Privacy Issues - The comprehensive nature of data collected by electronic monitoring systems makes it more likely that analyses could occur for purposes outside the fishery monitoring objectives with potentially adverse or unexpected outcomes. At-sea observer programs are different because very little collateral data is collected and observer duties are confined to meet specific fishery objectives. The risk of electronic monitoring data abuse is mainly with CCTV imagery which could be examined and compromise the privacy expectations of vessel crew or learn about various techniques, work practices, safety procedures, etc. In establishing an electronic monitoring program it would be important to ensure that the use of the information be confined to the specific objectives that fishermen accept in allowing the electronic equipment on-board. It is unlikely that any fishing vessel would agree to the use of electronic monitoring (as a substitute for at-sea observers) without limitations on the use of their vessel information. In the present study, this issue was managed by the "infomediary" role performed by Archipelago. The data were analyzed according to established information objectives and distribution of the information was controlled. In this way the fishery monitoring information was obtained and the privacy expectations of the vessel were protected.

Date Archiving - Once the specific monitoring objectives are met, it is important to consider the long term needs and the possible risks of warehousing the information. Keeping in mind that the information could be used for purposes outside its' original intent, it may be advisable to delete the raw CCTV imagery once the analysis has been completed. In practical terms, this makes sense as the data storage requirements of video imagery are large and it becomes very costly to store. For example, the CCTV imagery in this study takes up about 120 gigabytes of storage space, costing less than $2 per gigabyte.

Program Logistics - The logistics of fielding effective at-sea observing program for the shoreside hake fishery is problematic. Particularly when there are several observers required, it is costly to deploy them for the entire fishing season and logistically impractical to deploy them for the one-day fishing trips. With electronic monitoring it is more practical to place equipment on board for the entire season duration. As well, technical service facilities for electronic monitoring could be staged from the main fishing ports to access the fleet during offloading operations.

Intrusiveness – Fishermen are often concerned about the intrusiveness of having an at-sea observer aboard their vessel. This problem is exacerbated on smaller vessels where personal space is more limited. In discussions with fishermen, there is generally more support for electronic monitoring since it is less obtrusive and soon forgotten.

Cost - In the short term, electronic monitoring is more expensive than an at-sea observer program, owing to the significant capitalization requirements. Over the long term, with equipment cost amortized over the life of the equipment, electronic monitoring becomes a much cheaper option, ranging from 20-60 percent of an at-sea observer program depending upon various issues including program structure and size and the data analysis requirements. The requirements for analysis of electronic monitoring data for shoreside hake do not appear to be large (15 - 30 minutes per hauling event) and would be more influenced by the frequency and timeline for data delivery. Analysis would be more costly if data sets were retrieved several times per season as opposed to once.

Program Governance – Electronic monitoring programs may require a different program organizational structure for program delivery than is used with at-sea observer programs. While government agencies have the authority to require fishing vessels to take at-sea observers it is uncertain whether they could use this authority to require video surveillance. A fishing vessel may have to volunteer to accept this equipment on board as a replacement for an at-sea observer. This may not be an issue in monitoring applications where the two methods are substitutable. In applications where electronic monitoring is preferred, fisheries authorities may have difficulty requiring its use. As well, electronic monitoring programs require certain compliance controls that are not required of at-sea observer programs. Fishing vessels could easily circumvent the monitoring effect of electronic monitoring equipment by not keeping the system continuously powered and interfering with the sensors. The most effective means to ensure compliance would be with administrative controls such as fines, performance bonds, requiring the vessel to take an at-sea observer. Controls through charges under fisheries legislation may not be as timely or as effective.

CONCLUSIONS

Results from this study demonstrated that electronic monitoring was an effective tool for monitoring key fishery issues in the shoreside hake fishery. The monitoring system provided the same or better data quality as an at-sea observer for a number of information objectives including time and location of fishing, ensuring that all catch was retained on-board, and procedures used for handling catch and by-catch. The use of electronic monitoring for catch and by-catch enumeration, and species identification was limited. In considering the use electronic monitoring for a fishery monitoring application, the specific requirements of these programs as compared to at-sea observer programs should be considered. For example, electronic monitoring has different program delivery requirements and should involve more specific protocols concerning the use and distribution of information than currently exists with at-sea observer programs.

ACKNOWLEDGEMENTS

The authors would like to thank the captain Mike Retherford and the crew of the F/V Excalibur should be recognized for their cooperation in the project and willingness to submit to video surveillance. Ms. Janell Majewski of the Northwest Fisheries Science Center of the National Marine Fisheries Service provided useful advice throughout the study.

PROPOSED MONITORING PROGRAM FOR THE SHORE-BASED PACIFIC WHITING FISHERY

Situation: A permanent monitoring program for the shore-based Pacific whiting fleet needs to be developed and implemented, because of the specification in the Pacific Coast salmon and groundfish fishery management plans (FMPs) and the 1992 Biological Opinion analyzing the effects of the groundfish fishery on salmon stocks listed under the Endangered Species Act (ESA). The issue of salmon retention in the groundfish trawl fisheries was brought before the Council in 1996 in the form of Amendment 10 to the Pacific Coast Groundfish FMP and Amendment 12 to the Pacific Coast Salmon FMP. Based on an Environmental Assessment drafted to analyze these amendments, the Council recommended the exempted fishery permit (EFP) process be used temporarily until a permanent monitoring program could be developed and implemented in the shore-based Pacific whiting fishery. EFPs are intended to provide for limited testing of a fishing strategy, gear type, or monitoring program that may eventually be implemented on a larger fleet-wide scale and are not a permanent solution to the monitoring needs of the shore-based Pacific whiting fishery. Results of the shore-based Pacific whiting EFPs indicate that it is feasible to retain and appropriately monitor the incidental take of salmon and groundfish other than Pacific whiting in the shore-based Pacific whiting fishery. It is now appropriate to implement a permanent monitoring program for salmon and other non-target species incidentally taken in the shore-based Pacific whiting fishery.

The National Marine Fisheries Service (NMFS) developed a preliminary draft Environmental Assessment which includes a range of alternative monitoring systems for the shore-based Pacific whiting fishery. The alternatives currently focus on three major issues: 1) staffing the monitoring program (i.e., federal observers, state monitors, video cameras, or a combination thereof); 2) tracking and disposition prohibited species and groundfish overages; and 3) funding of the monitoring program (i.e., federal, state, industry).

The Council needs to consider and adopt for public review the preliminary range of alternatives for a monitoring program for the shore-based Pacific whiting fishery. Final Council action on this matter is scheduled for November, when the Council identifies a preferred alternative. NMFS will then prepare a proposed rule for public comment followed by a final rule implementing a monitoring program before the start of the 2004 primary Pacific whiting season.

Council Action:

1. Adopt Alternatives for Public Review.

Reference Materials:

1. Exhibit C.7, Attachment 1, Preliminary Environmental Assessment, Implementing a Monitoring Program to Provide a Full Retention Opportunity in the Shore-based Pacific Whiting Fishery, NMFS, Northwest Region.

Agenda Order:

a. Agendum Overview — Mike Burner
b. NMFS Preliminary Environmental Assessment — Bill Robinson
c. Reports and Comments of Advisory Bodies
d. Public Comment
e. **Council Action:** Adopt Alternatives for Public Review

PFMC
08/22/03

Exhibit C7.b
Supplemental NMFS PowerPoint Presentation
September 2003

Preliminary Draft Environmental Assessment

Amendment 10 to the Pacific Coast Groundfish FMP

Implementing a Monitoring Program to Provide a Full Retention Opportunity in the Shore-based Whiting Fishery

History of Monitoring in the Shore-based Whiting Fishery

- 1992 - Biological Opinion analyzing the effects of the Pacific Coast groundfish fishery on salmon stocks listed under the ESA
- 1992 - Shoreside Whiting Observer Program
- 1996 - Amendment 10 to the Groundfish FMP and Amendment 12 to the Salmon FMP

Monitoring Needs in the Shore-based Whiting Fishery

- Sampling and immediate release of salmon incidentally taken in the whiting fishery
- EFPs provide for limited testing of a technique that may eventually be implemented on a fleet-wide scale
- Trip limit management difficult for shore-based whiting fleet
- Monitoring program should be designed for a full retention fishery

Purpose of the Proposed Action

- Provide for a full retention fishery
- Meet the terms and conditions of the 1992 Salmon Biological Opinion
- Maintain the integrity of Pacific Coast groundfish rebuilding plans
- Reduce discard by allowing the landing of prohibited species and groundfish in excess of cumulative trip limits

Need for the Proposed Action

- Groundfish FMP specifies that salmon caught in trawl nets are a prohibited species
- 50 CFR 660.306 and Groundfish FMP specifies that salmon must be returned to the sea as soon as practicable
- Salmon FMP specifies that the use of nets to capture salmon is prohibited
- 50 CFR 660.306 specifies that landing groundfish in excess of trip limits is prohibited

Components of a Monitoring Program (Issues)

- Monitoring the harvesting and dock-side aspects of the shore-based fishery
- Tracking the overage/donation fish and the money paid for those fish
- Funding sources for a shore-based monitoring program

Monitoring Options (Alternatives)

- No Action Alternative (EFP process)
- Federal Monitoring Program
- State Monitoring Program
- Combination Monitoring Program

Alternative 1 – EFP Process

- Issue 1 - State port samplers track and sample salmon and overfished groundfish species at processing plants
- Issue 2 - State and federal enforcement staff share the tracking of overage/donation fish and the money paid for those fish
- Monitoring program is funded by the shore-based whiting fishery and state and federal management agencies

Alternative 2 - Federal Monitoring

- Issue 1 - Federal observers would monitor for full retention at sea and sample salmon and overfished groundfish species at processing plants
- Issue 2 - Federal enforcement personnel would track overage/donation fish and the money paid for those fish
- Issue 3 - Monitoring program would be federally funded (2A) or funded by the shore-based whiting fleet through a direct pay system (2B)

Alternative 3 – State Monitoring

- Issue 1 - State monitors would monitor for full retention at sea and would sample salmon and overfished groundfish species at processing plants
- Issue 2 - State enforcement personnel would track overage/donation fish and the money paid for those fish
- Issue 3 - Monitoring program would be funded by each state (3A) or funded through a tax system (3B)

Alternative 4 – Combination Monitoring

- Electronic monitoring would monitor all shore-based whiting trips for full retention and state monitors would sample salmon and overfished groundfish species at processing plants
- State and federal enforcement staff would share the tracking of overage/donation fish and the money paid for those fish
- Monitoring program is funded by the shore-based whiting fishery and state and federal management agencies

Analysis of the Alternatives

- Effects of implementing a monitoring program on the Pacific Coast groundfish fishery
- Most alternatives predicted to have a minimal effect on the groundfish fishery
- Alternatives vary by cost and the quality of the data produced

Alternative 1 – EFP Process

- No monitoring at sea to document full retention or discard at sea
- State port samplers sample 10% - 35% of shore-based whiting deliveries
- Preliminary cost estimate is $148,000
- Program is funded by industry and management agencies
- Generates the least amount of fisheries data

Alternative 2 – Federal Monitoring

- Federal observers document full retention or discard at sea on 100% of shore-based whiting trips
- Federal observers sample 100% of shore-based whiting deliveries
- Preliminary cost estimate is greater than $2,000,000
- Program is either federally funded (2A) or funded by industry (2B)
- Generates the greatest amount of fisheries data

Alternative 3 – State Monitoring

- State monitors document full retention or discard at sea on a portion of shore-based whiting trips
- State monitors sample a portion of shore-based whiting deliveries
- Preliminary cost estimate is $1,060,000
- Program is either state funded (3A) or funded by industry (3B)
- Generates more fisheries data than Alt. 1, less than Alt. 2, and a similar amount as Alt. 4

Alternative 4 – Combination Monitoring

- Electronic monitoring system documents full retention or discard at sea on a 100% of shore-based whiting trips
- State monitors sample a portion of shore-based whiting deliveries
- Preliminary cost estimate is $600,000
- Program is funded by industry and management agencies
- Generates more fisheries data than Alt. 1, less than Alt. 2, and a similar amount as Alt. 3

Need for Further Analysis

- Total cost associated with each of the alternatives needs to be determined
- Projected federal and state budgets for 2004 and beyond should be considered
- Shore-based whiting fleet’s funding ability should be projected into the future and consider cumulative effects

STOCK ASSESSMENT OF CANARY ROCKFISH

Situation: The Council recently adopted a canary rockfish rebuilding plan under the auspices of fishery management plan amendment 16-2. The rebuilding plan specifies conservative harvest levels to rebuild the stock within the required time with the consequence of significantly constrained fishing opportunities on the West Coast continental shelf to reduce canary rockfish bycatch. These constraints come at a high cost of foregone harvest of healthy marine stocks and difficult allocation decisions to equitably bear the burden of rebuilding canary rockfish. Canary rockfish are often viewed as the single most constraining stock in management of the groundfish fishery.

As the Council embarks on a new multi-year groundfish management process, where new assessments and management specifications are adopted every other year for the subsequent two year management cycle, concern was expressed the existing canary rockfish stock assessment would be used for 2004 as well as the first multi-year management cycle in 2005-2006. The next canary rockfish assessment would be contemplated for delivery in November 2005 when 2007-2008 management measures would first be deliberated. Because of the constraining nature of the stock and the length of time until the next assessment, the Council scheduled consideration of a new canary rockfish stock assessment for use in the 2005-2006 biennial management period.

There are a number of issues to consider before scheduling a new assessment. This assessment would have to be conducted, reviewed, and adopted by the April 2004 Council meeting to be available for use in 2005-2006 management decision-making. The Council should first explore whether the necessary resources are available to conduct a new assessment and what a re-prioritization of those resources might cost. Secondly, there are apparently significant data issues to consider before deciding whether there is enough new useable data available to be informative. These include: 1) how the recent change in the NMFS West Coast trawl survey methodology would affect a new assessment, 2) the availability of other data sources such as the Delta submersible survey that would be useful, 3) the availability of new fishery-dependent data given the non-retention regulations and/or small limits that were specified for canary rockfish in 2003, and 4) the availability of new data from the federal groundfish observer program and their effect on assessment data inputs. The advice of NOAA scientists, the Scientific and Statistical Committee, and Groundfish Management Team will be particularly useful in sorting out these data issues.

The Council task is to decide whether to recommend conducting a new canary rockfish stock assessment in time for the 2005-2006 management period.

Council Action:

1. **Consider establishing a new stock assessment process for canary rockfish for use in the 2005-2006 biennial management period.**

Reference Materials:

1. None.

Agenda Order:

a. Agendum Overview — John DeVore
b. NMFS Report — Elizabeth Clarke
c. Reports and Comments of Advisory Bodies
d. Public Comment
e. **Council Action:** Consider Establishing a New Stock Assessment Process for Canary Rockfish for use in the 2005-2006 Biennial Management Period

PFMC
08/22/03

SCIENTIFIC AND STATISTICAL COMMITTEE REPORT ON STOCK ASSESSMENT OF CANARY ROCKFISH

The most recent stock assessment of canary rockfish was conducted during 2002. Given the change to multi-year management and the current schedule for stock assessments, this assessment will be the most recent until the next assessment of canary rockfish is presented to the Council in November 2005. The 2002 assessment will form the scientific basis on which management arrangements for the 2005-2006 fishing season will be based. Moreover, conducting an assessment of canary rockfish in 2003-2004 would lead to the situation in which the results of an assessment are not available by the first of three meetings (November 2003) envisaged under the multi-year management process.

There are several potential new sources of data, so any new assessment of canary rockfish would necessarily be a “full” assessment, and hence, require a review by a Stock Assessment Review Panel. However, both the data from the Delta submersible and from the changed NMFS West Coast trawl survey could not be incorporated easily into a new assessment. This is because the information from the Delta submersible is only for a single year, and the methodology for including the data from the shelf component of NMFS survey in the assessment has yet to be developed. In addition, the survey index for this survey will only become available in January 2004, constraining the time any potential assessment author has to conduct an assessment for canary rockfish.

The Scientific and Statistical Committee concluded that accelerating the timing of the canary stock assessment will, therefore, be both resource and time consuming, possibly detrimental to the multi-year management process, and unlikely to provide a better assessment.

PFMC
09/11/03

Exhibit C.9
Attachment 1
September 2003

West Coast Groundfish

Bycatch Program Environmental Impact Statement

Initial Public Review Draft

Prepared for the Pacific Fishery Management Council

For Initial Review and Consideration
in September 2003

August 2003

Table of Contents

Table of Contents

Table of Contents

1.0 Purpose of and Need for Action

Words printed in **bold** are defined in the glossary.

Bycatch: "fish which are harvested in a fishery, but which are not sold or kept for personal use, and includes economic discards and regulatory discards." - Magnuson-Stevens Act Section 3(2) (1996)

Bycatch: "Discarded catch of any living marine resource plus retained incidental catch and unobserved mortality due to a direct encounter with fishing gear." –*Managing the Nation's Bycatch* (NMFS, 1998)

"**Fish**" means finfish, mollusks, crustaceans, and all other forms of marine animal and plant life other than marine mammals and birds.

1.1 The Proposed Action: What, Why, and Who?

INTRODUCTION

Bycatch is a major issue in fisheries management worldwide, and the 1996 **Sustainable Fisheries Act** elevated the mandate that "Conservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch." [**National Standard 9**, **Magnuson-Stevens Fishery Conservation and Management Act** (**Magnuson-Stevens Act**)]. To achieve this National Standard, section 303(a)(11) requires each **fishery management plan** (**FMP**) "establish a standardized reporting methodology to assess the amount and type of bycatch occurring in the **fishery**, and include conservation and management measures that, to the extent practicable and in the following priority –

(A) minimize bycatch; and
(B) minimize the mortality of bycatch which cannot be avoided.

Together, the bycatch management policies, reporting methodologies, and reduction measures make up a bycatch management program. "Bycatch," as the term is defined in the Magnuson-Stevens Act, refers specifically to fish. "**Fish**" is defined broadly to include nearly all species of marine organisms except seabirds and marine mammals; however, these non-target marine animals may also be affected by federally-managed fisheries, and impacts on them must also be considered in order to be consistent with other federal laws.

The Pacific Coast **groundfish** fishery management plan, prepared by the **Pacific Fishery Management Council** (**Council**), constitutes the fundamental policies and lays out the fishery management program. The Council prepared the original FMP in the late 1970s and early 1980s during a period when foreign nations took the majority of the annual groundfish harvest. (Prior to that, **NMFS** had prepared a "Preliminary Management Plan" and **Environmental Impact Statement** (**EIS**) that applied only to foreign fishing.) U.S. fishery policy focused primarily on development of American fishing and processing capacity so the entire harvest could be used by U.S. citizens. Bycatch was considered to be mainly a social and economic issue; the main concerns were bycatch of **salmon**, Pacific halibut, and high valued groundfish by foreign **trawl** fishing operations targeting Pacific whiting, and catch of salmon and halibut by trawl gear. Foreign catch of Pacific ocean perch was considered a conservation issue because this species had been severely depleted by earlier foreign fishing. Bycatch of salmon and Pacific halibut by U.S. trawl fishers was also considered a problem because it could reduce the target fishery quotas for these species. (The International Pacific Halibut Convention prohibits the use of trawls to harvest halibut; harvest of salmon with trawls is also prohibited in U.S. and Canadian waters. Dungeness crab is another **prohibited species** in most **commercial** groundfish fishing operations.) When certain salmon populations were listed as **threatened** or **endangered** under the **Endangered Species Act** (**ESA**), NMFS evaluated the impact of the groundfish fisheries on these populations and prepared a series of **Biological Opinions**. Amendment 7 to the groundfish FMP acknowledged that groundfish fishing may directly impact non-groundfish species and authorized implementation of measures to control groundfish fishing to share conservation burdens to protect those stocks.

> "The practice of discarding is a common feature of many fisheries around the world. Records of discarding unwanted catch date back to biblical times. As a wide variety of fish species occupy the same habitat, fishers are generally unable to catch individual species without some unintended catch of other species. This incidental catch is known as bycatch." *FAO Fisheries Technical Paper No. 370, 1997*

The groundfish resource includes 83 species of **finfish** that inhabit a wide variety of marine habitats. Many of these species occupy the same **habitats** and are caught together, either intentionally or unintentionally. While some species may be more desirable from a **commercial** or **recreational** standpoint, fishing methods are rarely selective enough to catch only the most desirable species. Other groundfish species are typically caught incidentally, and many considered valuable for human consumption, bait or other uses. This **incidental catch** has always been considered a part of fishing, and fishers typically keep what they can use; bycatch (**discard**) of groundfish is the portion of the catch that cannot be used, whether due to regulations, markets, or edibility (or palatability). Incidental catch and bycatch in the groundfish fishery were initially considered an unavoidable "cost of doing business." The main concerns were the cost of sorting the catch, damage to more valuable fish, lack of storage space, or lack of markets. In fact, the original FMP defined the **optimum yield** (**OY**) to exclude all groundfish discarded by U.S. fishermen and fishing vessels. A single OY was established for the entire groundfish resource, defined as "all the groundfish that can be taken under the regulations, specifications, and management measures authorized by the FMP and promulgated by the **Secretary** (of Commerce)." This OY was not a predetermined or specified

> "Bycatch concerns stem from the apparent waste that discards represent when so many of the world's marine resources either are utilized to their full potential or are overexploited. These issues apply to fishery resources as well as to marine mammals, sea turtles, seabirds, and other components of marine ecosystems." - *Managing the Nation's Bycatch*

numerical amount, but rather whatever harvest (landed catch) resulted under the regulatory program and economic conditions. As U.S. harvesting capacity grew and exceeded sustainable harvest levels, retention limits were established for commercial fishing vessels to prevent excessive harvest of certain groundfish species. These vessel limits, called **trip limits**, initially limited the amount of fish a vessel could catch and retain during a single fishing trip. Later, trip limits were applied to a period of time such as a week or two-week period; more recently the time periods were extended to monthly or two-month periods. Much of the management process each year is focused on monitoring the rate of commercial landings and adjusting trip limits maintain a relatively consistent product flow throughout the year. This system requires commercial vessel operators to cull (discard) any catches that exceed specified limits. The system worked relatively well as long as trip limits were so large (tens or hundreds of thousands of pounds) that few vessels reached them. However, as various species were "fished down," trip limits were reduced correspondingly to the point where many vessels reach them frequently. Trawl gear designed to catch large amounts of fish often captures too much, especially late in a period when the vessel is trying to catch just enough to fill its limit. This became more acute as trip limits were established for more species, and as trip limits became smaller (for example, a few thousand pounds). Since 1999, with development of **rebuilding plans** for **overfished** groundfish species, some trip limits have been reduced to a few hundred pounds. Fishers must now avoid these species as much as possible, although they are allowed to keep overfished species up to the limits.

In 1996, Congress responded to the increasing national concerns about bycatch and included amendments to the Magnuson-Stevens Act that require all regional fishery management councils to amend their FMPs to monitor the amount of bycatch and to reduce it to the extent practicable. The Council prepared Amendment 11, which included provisions intended to bring the groundfish FMP into compliance with the Act. However, NMFS found the provisions to be inadequate and disapproved the bycatch sections, sending them back to the Council for reconsideration and improvement. The Council then prepared Amendment 13, expanding the discussion of bycatch and measures that had been or could be implemented to reduce bycatch. NMFS approved this amendment, but the amendment was subsequently challenged in federal district court by a group of environmental organizations that charged the environmental impact analysis was insufficient and the bycatch measures were inadequate. The Court agreed with the plaintiffs and remanded Amendment 13 to the Council and NMFS. The Court also identified certain alternative bycatch reduction methods that must be evaluated before NMFS approves a new bycatch amendment. Thus, the FMP is not yet in compliance with the bycatch requirements of the Magnuson-Stevens Act. However, bycatch reduction, monitoring and reporting measures are currently in effect and will remain in effect until modified.

"**NEPA**" stands for the National Environmental Policy Act. This federal law requires every federal agency to prepare an analysis of environmental effects before it takes a major action that may affect the environment. The agency must "specify the alternative or alternatives ... considered to be environmentally preferable" and "whether all practicable means to avoid or minimize environmental harm from the alternative selected have been adopted, and if not, why they were not."

Federal agencies are required to comply with the **National Environmental Policy Act (NEPA)** when a major federal action may be taken by an agency. Federal decision-makers are to use NEPA to assist them with making the appropriate decision for a **proposed action**, including fishery management plans and regulations. NEPA requires agencies, in this case the Council and NMFS, to consider reasonable alternatives to achieve the identified purpose and need, to evaluate the environmental consequences of the alternatives, and to provide for public participation in the decision-making process.

The proposed action is to amend the FMP and its implementing regulations to comply with section 303(a)(11) of the Magnuson-Stevens Act. Changes to the bycatch program may require revisions to the catch and bycatch reporting and monitoring systems and/or to conservation and management measures. In considering this action, the Council and NMFS will evaluate the effects of bycatch on other non-target species to ensure that fishery management does not result in conflicts with other legal mandates. This action is being undertaken to ensure the conservation and management as required under the Magnuson-Stevens Act , **Marine Mammal Protection Act (MMPA)**, **Migratory Bird Act**, **Endangered Species Act (ESA)** and other applicable federal laws.

This Environmental Impact Statement (EIS) addresses the issue of bycatch and other incidental catch in the Pacific Coast groundfish fishery. Specifically, this EIS analyzes the expected environmental **impacts** of various alternative methods to reduce bycatch taken by commercial and recreational fishers fishing for groundfish and associated species and methods of collecting bycatch information.

1.1 The Purpose of and Need for the Proposed Action

The bycatch provisions of the Groundfish FMP were "overturned" and sent back to NMFS and the Council. The FMP must be amended to comply with the bycatch management requirements specified in the Magnuson-Stevens Act.

Effective fishery management programs include several smaller programs such as stock assessment, policy and regulation development, decision-making, monitoring, information collection, and enforcement. These sub-programs must be designed, matched and integrated to achieve the overall program goals and objectives. The Magnuson-Stevens Act provides the Nation's overall goals and policies and describes the contents of fishery management plans, authorizing regional fishery management councils to prepare FMPs for stocks in need of federal management. The **Pacific Coast Groundfish FMP** is one of four FMPs prepared by the Pacific Council. The fishery management program established by the groundfish FMP is one of the most complex and complicated in the Nation, covering 83 species over the entire West Coast of the U.S. Thousands of commercial fishing vessels harvest groundfish each year, and many more thousands of recreational fishers fish for many of the same species. The catching capacity ("fishing power") of each of these sectors far exceeds the capacity of many species to sustain themselves, and regulations to limit catch have become more stringent and complex. Nine groundfish stocks have been classified as overfished, and efforts to rebuild them require that harvest be minimized to the extent practicable. Along with this, it is critical that rebuilding efforts be closely monitored to ensure the regulations are effective and catches are reduced as intended. In addition, effects of fishing on other fish, birds and marine mammals should be monitored and mitigated as appropriate.

Groundfish species are important components of the marine **ecosystem** off the Pacific coast of North America, and fishing for groundfish affects other components of the marine environment. Non-groundfish species may be captured and/or killed directly by groundfish fishing gears or fishing methods. Even some groundfish species may be subjected to additional mortality, such as being captured and released. Groundfish fishing may reduce food sources (**forage**) for other marine animals. In some cases, groundfish species may be the forage. In other cases, the forage may be other species that are affected by groundfish fishing.

Harvest includes all fish that are captured, whether intentional or not, and all fish that are killed, whether retained by the fisher. Fish that are captured and released or discarded are called bycatch. Bycatch also includes fish that are injured or killed but not captured (for example, "dropouts" and fish that become unhooked) and fish killed by lost and discarded gear (ghost fishing). In addition, groundfish fishing could directly or indirectly affect other marine animals such as marine mammals, seabirds and turtles. The EIS evaluates certain potential effects and could indicate the need for management measures to **mitigate** such impacts.

The initial goals of the bycatch management program, developed by the Council's ad hoc Environmental Impact Statement Oversight Committee (Committee) are

- **account for total fishing mortality by species**
- **establish monitoring and accounting mechanisms to keep total catch of each groundfish stock from exceeding the specified limits**
- **reduce unwanted incidental catch and bycatch of groundfish and other species**
- **reduce the mortality of animals taken as bycatch**
- **provide incentives for fishers to reduce bycatch and flexibility/opportunity to develop bycatch reduction methods**
- **monitor incidental catch and bycatch in manner that is accurate, timely, and not excessively costly**
- **reduce unobserved fishing-caused mortalities of all fish**
- **gather information on unassessed and/or non-commercial species to aid in development of ecosystem management approaches**

These bycatch program goals are intended to be consistent with the overall fishery management goals of sustainable fisheries and allowing fishing. The primary focus of the bycatch management program reducing waste, discard, collateral bycatch damage to marine plants and animals by groundfish fishing activities, and ensuring the information system is appropriate and adequate to support the conservation and management mandates.

The current bycatch program includes a mix of indirect measures to control bycatch and a combination of methods to report and assess catch and bycatch amounts. Some management policies and measures tend to increase regulatory bycatch. Overall, the current bycatch program provides little individual bycatch accountability or opportunity or incentives for individuals to reduce bycatch.

1.2 Scoping: Key Issues Focused On in this EIS as Raised Through Scoping

1.3 History of Bycatch Management in the Groundfish Fishery, Including Previous NEPA Documents

When the FMP went into effect in 1982, winter weather was the only obstacle to a year-round groundfish fishery, and the FMP set the fishing year at January 1 through December 31. One of the original objectives of the FMP was to, "Provide a favorable climate for existing domestic commercial and recreational groundfish fisheries within the limitations of other objectives and guidelines. When change is necessary, institute the regulation which accomplishes the change while minimizing disruption of current domestic fishing practices, marketing procedures and environment." This objective of "minimizing disruption of current domestic fishing practices" has remained a management objective through various iterations of the FMP, and has been combined with current objectives to ". . . promote year round availability of quality seafood to the consumer," and ". . . promote year round marketing opportunities and establish management policies that extend those sectors (for which year round marketing is beneficial) fishing and marketing opportunities as long as practicable during the fishing year" (PFMC, 1982.) Taken together, these objectives have resulted in the Council's enduring policy of year-round trip limit management for most groundfish fisheries.

Active groundfish management essentially began in 1983, when the Council introduced the first numerical OYs for several managed species, and trip limits for widow rockfish, the ***Sebastes* complex**, and sablefish. The first landings limits the Council used were "per trip" limits, which were intended to slow landings somewhat so that the fleet would not achieve species'' annual harvest guidelines early in the year. Almost all domestic discards in the early years of groundfish management were market-induced discards, where fishers were throwing away unmarketable species or unmarketable sizes of targeted species. Domestic fisheries management did not account for these discards; targets for landed catch were set equal to **ABC**. For the foreign and joint venture fisheries, the Council set incidental catch allowances for non-target species.

Over time, foreign and joint venture fisheries dwindled, and the Council introduced trip limits for a greater number of species taken in the domestic fisheries. **Effort** increased in the domestic fishery, and trip limits became more restrictive to control harvest rates. The Council realized that managing a variety of species under trip limits could lead to increased rates of discards for some species. Bycatch and discards can result from a regime of multiple trip limits because a fisher might target gear on a complex of species, and then find that in order to catch the full limit on one species, he has to exceed the limit on other species, and then discard that excess. To address this issue, the Council shifted away from per trip limits for most species and towards monthly cumulative limits. Cumulative limits were preferable to per trip limits because a fisher could accumulate species at different rates over different trips, without having to discard fish each trip because of exceeding per trip limits. Once the Council had seen that monthly landings limits would continue to allow a year-round fishery, it introduced two-month cumulative limits to again reduce the likelihood that fishermen would have to discard overages of particular species within a multi-species complex fishery.

In addition to these efforts to craft the cumulative landings limit regime to reduce discards, the Council used several regulatory measures to reduce incidental catch of **juvenile** fish that would be discarded as unmarketable, and to reduce bycatch of protected salmon species. In the early 1990s, the Council experimented with different combinations of gear regulations, first requiring larger trawl mesh sizes in net **codend**s, and then moving to requirements for larger mesh sizes throughout trawl nets. By 1995, bottom trawl nets were required to have a minimum of 4.5 inch mesh, double-walled (lined) codends were prohibited, and the use of chafing gear was restricted (60 FR 13377, March 13, 1995, codified at 50 CFR 660.322.) All of these measures were intended to give smaller-size fish the opportunity to escape from the trawl net, reducing the likelihood that those fish would be caught and then discarded unused.

Beyond measures to protect small and juvenile groundfish, the Council brought salmon and whiting fishers together to address salmon bycatch in the whiting fishery. Reducing bycatch of threatened and endangered salmon species was particularly important to the Council as it looked for ways to reduce at sea catch and interception of protected salmon stocks to soften management restrictions for the directed salmon fisheries. In 1993, the Council established Klamath River and Columbia River salmon conservation zones and Eureka area trip limit restrictions to prohibit or reduce whiting fishing in areas of high salmon interception rates (58 FR 21261, codified at 50 CFR

660.323.) The whiting fleets now also work to keep their chinook salmon interception below a voluntary threshold of 0.05 chinook salmon per metric ton of whiting.

At the same time that the Council was experimenting with more flexible cumulative landings limit regimes, gear restrictions, and closed areas to reduce bycatch, domestic fishing capacity in the groundfish fleet was growing and outstripping resource productivity. We now also know that stock assessment information in the 1980s and early 1990s was not adequate to draw a clear picture of west coast rockfish productivity. Harvest rates that had seemed reasonable given then-current scientific information are now proving to have been too aggressive for **sustainable** harvest on the very low productivity west coast rockfish stocks (Myers, et al, 1999; Ralston et al, PFMC, 2000.) The combination of increasing fishing capacity and decreasing OYs led to ever more restrictive cumulative landings limits. The Council's **Groundfish Management Team (GMT)** became concerned about the effects of a restrictive cumulative landings limit regime on rates of bycatch and discard, and announced in April 1990 its plans to begin to factor discards into setting ABCs for the 1991 fishing year (PFMC GMT, 1990.) In August 1990, the Council finalized Amendment 4 to the FMP, which introduced the practice of distinguishing between ABCs and **harvest guidelines** to, among other things, account for fishing mortality beyond landed catch numbers (PFMC, August 1990.)

In 1991 and 1992, the Council's bycatch accounting policies took shape. For 1991, the Council recommended ABCs that accounted for discards for sablefish, Dover sole, and widow rockfish. The widow rockfish coastwide ABC of 7,000 mt was set equal to the landed catch OY, but in setting the ABC, 1,000-1,200 mt discard was assumed above the 7,000 mt landed catch. The sablefish coastwide ABC was reduced by 12.7% to account for discards, and the OY was set equal to landed catch. Although Dover sole was managed under a coastwide ABC in 1991, only the contributing ABCs for the Eureka and Columbia areas were reduced for discards, with the Eureka ABC reduced by 5.7% and the Columbia ABC reduced by 13% (56 FR 465, January 8, 1991.)

In 1992, the Council expanded its list of species with ABCs set to account for discard to include yellowtail rockfish. Widow rockfish again had a coastwide ABC/landed catch of 7,000 mt, with a 1,000-1,200 mt discard assumed above the ABC (14-

17%). Similarly, the 1991 sablefish landed catch was the same amount that it had been in 1991 (8,900 mt), with no change to the 12.7% reduction for discards. Dover sole in the Eureka area was reassessed in 1991, resulting in a change in the Eureka area ABC, and a change in the discard reduction for Eureka area Dover sole from 5.7% in 1991 to 9.6% in 1992. Dover sole ABCs for other statistical areas were unchanged. Yellowtail rockfish discards were assumed to be 16% of the ABC, and were factored inseason, as the fisheries progressed. The assumption that yellowtail rockfish was discarded at a rate of 16% of the ABC was based on a 1988 study (Pikitch, et al, "An evaluation of the effectiveness of trip limits as a management tool,") which had estimated the widow rockfish discard rate at 16% (57 FR1654, January 15, 1992.)

Discard rates for the years 1993-2000 are described in a table, below. In addition to the discard reductions described in the table, discarded bycatch in the at-sea Pacific whiting fishery is measured by **observers** and is counted towards the harvest guidelines of the incidentally-caught species inseason. Inseason accounting for groundfish discards in the whiting fishery began in 1994 (***Federal Register*** citations for annual specifications 1993-2000 cited in Section 9.0.)

In addition to measures taken to account for bycatch and discards in the setting of ABCs and OYs, annual management measures have incorporated a variety of strategies to reduce bycatch in the groundfish fishery. For trawl vessels, cumulative landings limits for the "**DTS complex**" have been based on catch ratios between the four species in the complex -- Dover sole, thornyheads (shortspine and longspine), and sablefish. Often, harvest of the more abundant species in the DTS complex is curtailed to prevent overharvest of the less abundant species (shortspine thornyhead.) Similar species complex management was used for *Sebastes* complex species prior to 2000, with some particular *Sebastes* species managed by harvest and trip limits within the overall *Sebastes* complex harvest and trip limits. As described above, the Council also set two-month cumulative landings limit periods for some species, which reduced the number of cumulative limit periods in the year as well as the number of opportunities for meeting and exceeding landings limits.

Management measures for 2000 include new and creative ways of particularly reducing the interception of overfished species (65 FR 221, January 4, 2000.) The Council has acknowledged that simply lowering the overall harvest limits of overfished and depleted species is not adequate to protect and rebuild those species. Landings of lingcod, are prohibited for the months of January through April and November through December. These closures are expected to protect lingcod during the spawning and nesting period. When lingcod are caught by hook-and-line methods, they can often be released alive. Complete prohibition of landings is a reasonable management measure for lingcod, because it discourages directed targeting and requires release of fish that may still be viable after having been caught.

Other overfished and depleted species are rockfish, which generally cannot be released alive, regardless of the method of catch. Thus, the Council's challenge with these species has been to reduce fisher incentives to target depleted species and to reduce opportunities where fishers might incidentally catch large amounts of depleted species, while still allowing small landings of these species when they are caught incidentally. Rockfish landings limits were set to minimize discards by distributing species cumulative landings limits at levels that encourage fishers to direct fishing effort on healthy species when those species are most concentrated, or when bycatch of other species is expected to be relatively low. In particular, cumulative landings limits are set to move fishing effort away from the continental shelf, which is the primary habitat of several of the overfished species. Rockfish cumulative landings limits have also been set higher in the summer months, when directed targeting on healthy stocks is less likely to result in incidental harvest of depleted and overfished stocks. South of Cape Mendocino, open access, limited entry non-trawl, and recreational fisheries were closed for two months in 2000, allowing higher commercial landings limits and recreational bag limits for the remaining ten months in the fishing season. The Council expected that a shorter season and higher landings and bag limits would reduce incidental take of overfished and depleted species.

The 2000 management measures also introduce differential landings limits for limited entry trawlers operating with different trawl gear configurations (bottom trawling with **footropes** greater than 8 inches in diameter, bottom trawling with footropes smaller than 8 inches in diameter, and **midwater** or **pelagic trawling.**) Trawling with footropes that have roller gear or other devices designed to bounce over rough rock piles tends to allow those vessels greater access to prime rockfish and lingcod habitat. Therefore, landings of **shelf** rockfish have been prohibited if large footrope trawls (roller gear) are used; small amounts of shelf rockfish bycatch are allowed to be landed if small footrope trawls are used, and; targeting healthy shelf rockfish stocks is encouraged only if midwater trawls are used. These gear requirements have not been tested for whether they will reduce directed and incidental harvest of overfished species. There are no discard records for historic fishing practices, and new management changes not been tested through scientific observation.

Finally, at the GMT's recommendation, the Council revised its historical practice of managing the *Sebastes* complex as simply northern and southern units. In recent years, rockfish species without assessments and those with less rigorous assessments were managed under generic *Sebastes* complex landings limits. The GMT had been concerned that this approach provided opportunity to harvest lower-abundance, higher-valued species at unsustainable rates. In response to these concerns, the Council separated the ABCs/OYs for chilipepper and splitnose rockfishes from the southern *Sebastes* complex for the 1999 fishery. Conversely, concerns also developed that rebuilding plans for overfished species could result in unnecessarily severe restrictions for the entire complex than would be the case if sub-groups of these species could be developed. For 2000, the GMT developed species lists for three sub-groups of rockfish -- **nearshore, shelf**, and **slope**--for the northern (U.S. Vancouver, Columbia and Eureka subareas combined) and Southern (Monterey and Conception subareas combined) areas. Organizing *Sebastes* species into groups based on the most common catch associations is expected to equalize the harvest rates for most rockfish stocks, and to reduce the likelihood of overharvesting both overfished and depleted species, and species for which there is relatively little stock assessment information.

All of the new measures taken in 2000, and measures taken in prior years to manage for multi-species interactions, illustrate that regulatory efforts to reduce bycatch tend to have multiple management goals -- from protecting overfished and depleted species, to preventing overharvest of species of unknown abundance, to acknowledging that vessels using different gear types require different harvest strategies, to matching within-year harvest rates to within-year abundance and congregation habits of managed species. For a multi-species fishery, the catching of species other than the particularly targeted species is not necessarily a problem. Discard of non-targeted species, whether for economic or regulatory reasons, is a problem, and one that the Council has worked to reduce in its ongoing efforts to address a wide range of management issues. There is, however, no scientific confirmation for the effectiveness of these management activities in meeting the Council's policy goals.

1.4 Criteria for Selecting a Preferred Alternative

The Council and NOAA Fisheries will consider how each alternative addresses the following objectives identified by the Council's ad hoc EIS Oversight Committee. They will weigh the expected or potential benefits and costs of each alternative and decide which, if any, alternative, provides the optimal balance. While six alternatives have been proposed, there are a variety of management measures that could be included (or excluded) from any alternative. The Council and/or NOAA Fisheries may find that by revising an alternative they may be able to achieve greater benefits or better mitigate anticipated negative effects. Finally, the Council and NOAA Fisheries will determine if and how each alternative reduces bycatch to the extent practicable and, for bycatch that cannot be avoided, reduces bycatch mortality to the extent practicable.

- account for total fishing mortality by species
- establish monitoring and accounting mechanisms to keep total catch of each groundfish stock from exceeding the specified limits
- reduce unwanted incidental catch and bycatch of groundfish and other species
- reduce the mortality of animals taken as bycatch
- provide incentives for fishers to reduce bycatch and flexibility/opportunity to develop bycatch reduction methods
- monitor incidental catch and bycatch in manner that is accurate, timely, and not excessively costly
- reduce unobserved fishing-caused mortalities of all fish
- gather information on unassessed and/or non-commercial species to aid in development of ecosystem management approaches

The Council will adopt its preferred alternative and forward that recommendation to NOAA Fisheries for concurrence. NOAA Fisheries will complete a draft EIS (DEIS), including the

Council's preferred alternative, and make it available for public comment. NOAA Fisheries will make its decision based on the analysis of impacts, the Council's recommendations, public comments received on the DEIS, and any other relevant information available. A Final EIS will be prepared that responds to public comments received on the DEIS, identifies the final preferred alternative, and provides the rationale for its final decision. The alternative that is determined to be the "environmentally preferred" may or may not be same as the final preferred alternative. Any difference will be clearly explained.

1.5 How This Document is Organized

This EIS follows the standard organization established by the **CEQ** regulations. Chapter 1 identifies the issue of bycatch reduction and reporting as the focus of the proposed action and describes why action is needed. Previous Council and **NOAA Fisheries** actions relating to bycatch are described to help set the context for the proposed action. Chapter 1 also lays out the criteria the Council and NOAA Fisheries will use for making their final decision.

Chapter 2 presents the six alternatives to reduce bycatch and bycatch mortality, and to establish a standardized reporting methodology. It describes how the alternatives were developed, and provides a summary of the anticipated environmental impacts of the each alternative. It briefly describes the management "tools" available to the Council and NOAA Fisheries for reducing bycatch and for monitoring the effects and effectiveness of the various tools, and how the alternatives apply the tools. It identifies the direct, indirect and cumulative impacts so the decision-makers can make a reasoned and informed decision, and the public can understand the conclusions and how they were reached.

Chapter 3 describes the current human environment as it relates to bycatch and incidental catch. The current condition of particularly important groundfish and other species of marine animals are described, and how they are affected by bycatch in the groundfish fisheries. The social and economic conditions relating to bycatch, bycatch reduction methods, and bycatch monitoring are described.

Chapter 4 presents the analysis. First, the management tools are described, that is, the available management measures and adjustments to control bycatch and achieve other objectives. Next, the general effects or each tool are described in detail. These include direct and indirect effects, where applicable, whether positive or negative. A ranking of each tool's effectiveness is also proposed. Finally, each alternative is analyzed to determine the combined effects of all the tools used (or anticipated) under that alternative. In this analysis, important groundfish stocks, other stocks, and assemblages are addressed.

2.0 Alternatives, Including the Status Quo

Words printed in **bold** are defined in the glossary at the end of this document.

2.1 Introduction

2.1.1 How this Chapter is Organized

Chapter 2 presents the alternatives that have been developed to resolve bycatch issues and to ensure the **FMP** complies with the bycatch reduction mandates of the **Magnuson-Stevens Act**. Each **alternative** describes a **bycatch** management program and includes all the parts of the program: the overall objectives, the methods to achieve the objectives, and the reporting and monitoring requirements that would be required. The six alternatives represent a variety of policies, approaches, and methods to reduce bycatch. The alternatives range from the current (2003) methods of reducing bycatch (Alternative 1, the status quo) to more aggressive and comprehensive bycatch reduction policies and methods.

Section 2.1.1 describes the **scoping** process and how the Council developed the alternatives. Section 2.1.2 presents the management "**toolbox**," that is, the variety of regulatory measures available to the **Council** and Agency to implement a bycatch monitoring, reporting and reduction program. Each tool is described in terms of its usefulness, effectiveness, effects, etc. Not all of the available tools have been used to manage the Pacific **groundfish** fisheries.

Section 2.1.3 describes how the alternatives are structured so they can be compared and understood more clearly.
Sections 2.2 - 2.7 describe each alternative in detail. Section 2.8 summarizes the anticipated effects or impacts or each alternative in comparison to current conditions.

2.1.1 How the Alternatives were Developed

The Council established an ad hoc Groundfish EIS Oversight Committee that developed the alternatives.

In June 2001, NMFS concluded the initial scoping process for a Programmatic **EIS** (PEIS) on Federal management of the Pacific Coast groundfish fishery and published a summary report. Scoping was initiated on April 10, 2001, and an initial scoping report was published in August 2001. The report provided a summary of all comments received and key issues identified during the scoping process. In February 2002, NMFS separated the PEIS into two separate EISs, one focusing specifically on designation of **essential fish habitat** (EFH) and associated management measures, including measures to reduce effects of fishing on EFH. This separation was intended to improve public understanding and participation in the **NEPA** process, to make each EIS more useful in future management decisions, and to more clearly distinguish between programmatic groundfish fishery management and specific EFH issues.

The Council established an ad hoc Groundfish EIS Oversight Committee (Committee) shortly after **NMFS** began preparation of the draft PEIS. The Committee met twice during 2002 to advise the drafting team and help develop a range of alternatives for managing the Pacific Coast groundfish fishery. The Council adopted the alternatives recommended by the Committee in October 2002. The Committee met again on April 22-23, 2003, and reviewed the status of the PEIS and the alternatives under consideration. The Committee reviewed the events leading up to initiation of the PEIS and subsequent to the initial scoping period. The consensus of the Committee was to narrow the scope of the PEIS to deal with the more pressing issue of bycatch reduction and reporting. The Committee prepared a revised set of alternatives to encompass the range of approaches to reduce bycatch and to address **incidental catch** monitoring and reporting issues. NMFS reopened scoping on the PEIS and conducted an additional scoping meeting on June 16, 2003 in conjunction with the Council meeting in Foster City, California (just south of San Francisco). These alternative were presented to the Council at its meeting, along with a summary of comments received during the scoping period. The Council provided comments in concurrence with the revised scope and suggested improvements to the alternatives its committee had prepared. NMFS has adopted those alternatives in this EIS.

2.1.2 Available Management Measures (The "Toolbox")

> The "toolbox" describes all the management measures (fishing regulations) that can be used to reduce bycatch to the extent practicable, and unavoidable bycatch mortality to the extent practicable.

A variety of management measures are used for controlling the West Coast groundfish fishing activities to ensure sustainable groundfish resources, habitats and fisheries.. These include harvest limits, restrictions on fishing gears and fishing locations, reporting requirements and species **retention limits**. They are the tools for managing groundfish **harvest**s. In this EIS, these management tools are collectively described as the "toolbox" which is available to the Council and NOAA Fisheries. Not all of the available tools are used for managing the groundfish fishery. The decisions about which tools to use or not use have been made over a number of years to address the variety of problems and issues that have come up. The main categories of

FISHERY MANAGEMENT TOOLS

Harvest Levels
- ABC/OY
- sector allocations
- trip (landing) limits
- catch limits
- individual quotas

Gear Restrictions
- **Trawl**
  - mesh size
  - footrope diameter/length
  - net height
  - codend mesh and dimensions
  - design: on-bottom or pelagic
  - bycatch reduction devices (BRDs)
- **Line**
  - number of hooks
  - hook size
  - line length
  - retrieval requirements
- **Pot/trap**
  - number of pots
  - pot size
  - escape panel in net/pot
  - retrieval requirements
- **Other**
  - setnets (gill and trammel nets)

Time/Area Restrictions
- seasons
- area closures
- depth closures
- marine reserves

Capacity (number of participants)
- permits/licenses/endorsements
- limited entry

Capacity (Vessel Restrictions)
- vessel size
- engine power
- vessel type

Monitoring/Reporting Requirements
- permits/licenses
- registrations
- Fish tickets (commercial landings/ sales receipts)
- Vessel logbooks
- Surveys
- Punch cards/tags (recreational)
- Port sampling/on-shore observers
- On-board observers
- Vessel monitoring systems (VMS)
- Onboard video recording devices
- Enforcement

tools in the toolbox are harvest level specifications, gear restrictions, time/area restrictions, capacity restrictions, and reporting/monitoring requirements.

Most management measures affect bycatch directly or indirectly; some tend to reduce bycatch, and some tend to increase bycatch. Chapter 3 of this EIS provides an evaluation of the relative **effect**s and effectiveness of the various tools for reducing bycatch and fulfilling the bycatch reporting requirements specified in the Magnuson-Stevens Act.

2.1.3 Structure of the Alternatives

Each alternative includes general goals and/or objectives and the management tools to achieve them. Five alternatives to the **status quo** have been developed to provide a range of approaches to reducing bycatch and incidental catch. Some alternatives are more comprehensive than others, representing a different balance between regulatory burden, costs and other considerations. Some provide more information than others, thus reducing some of the uncertainty about status of groundfish stocks, **ecosystem** condition, and management program effectiveness. Some alternatives are more costly than others, both to fishers and to the management agencies (both state and federal). The alternatives have been structured to clearly show the **impacts** (effects) of different management approaches and combinations of management tools.

2.2 The Alternatives

2.2.1 Alternative 1 (The Status Quo)

Alternative 1 reduces incidental catch and bycatch through a combination of indirect measures: Optimum Yield (OY) specifications, area closures, gear restrictions, variable trip limits and bag limits, seasons and other measures. High priority to minimize cost of catch monitoring. Vessel trip limits are calculated using a computer model and incidental catch ratios from past years.

The status quo minimizes bycatch through a combination of **Optimum Yield** (OY) specifications, gear restrictions, area closures, variable **trip limit**s and **bag limit**s, seasons and other measures, while minimizing cost of bycatch monitoring. The primary focus of this bycatch program is groundfish species. Negative **incentive**s include requirements to sort groundfish catches into established categories (species or species group), discard **prohibited species** (salmon, halibut, Dungeness crab), and discard all groundfish that exceed the trip (retention) limits. In addition, estimated bycatch mortalities are deducted from the annual allowable catch levels. Positive incentives include larger trip limits in areas where encounters with **overfished** species are expected to be low. In addition, a sablefish species **endorsement** has been established for limited entry **fixed-gear** vessels, along with **permit stacking**, individual permit sablefish catch allowances, and a longer season, which greatly reduces the "**race for fish**" that occurred in past years. In the Pacific whiting fishery, OY is allocated among four sectors and vessels voluntarily practice bycatch reduction methods that focus on salmon as well as incidental catch of certain groundfish species.

The current bycatch management program uses indirect measures such as setting an overall OY (catch limit) for various groundfish species and, in some cases, sub-limits or **allocation**s for each fishery **sector**. A variety of measures such as area closures, seasons, gear modifications, etc., are established to ensure groundfish catches do not exceed the specified limits.

Since 1998, groundfish management measures have been shaped by the need to rebuild overfished groundfish stocks. There are more than 80 species in the West Coast groundfish complex, and many of these species co-occur to different degrees in different areas. Each species has its own habitat "affinity" associated with depth, substrate, temperature, portion of the water column, etc. Some have fairly restricted distributions, while others are widespread. Over the past several years, groundfish management measures have been more carefully crafted to recognize the tendencies of overfished species to co-occur with healthy stocks in certain times and areas.

In 2000, the Council refined the management program on the understanding that certain types of **trawl** gear cannot be effectively fished in areas where the seafloor is rocky or uneven. Specifically, only **bottom trawl**s with large diameter **footrope**s can pass along this type of seafloor without snagging or hanging up on the multitude of obstructions. Use of large footrope trawls was not prohibited, but trip limits were set at such small levels that the economic incentives favored small footrope gear. Allowances were made for use of large footrope gear for deepwater stocks found primarily outside the range of most overfished species. In 2002 the Council introduced a new "bycatch" analysis model that allowed managers to set trip limits so that more abundant stocks were strongly **target**ed in times when they were less likely to co-occur with overfished stocks. The 2002 management measures primarily varied by time (two-month period) and by north-south management area (north of Cape Mendocino, between Cape Mendocino and Point Conception, south of Point Conception, etc.). Beginning in 2003, the Council began using a new management tool, depth-based areas where fishing is restricted. Depth-based areas are intended to prevent vessels from fishing in depths where overfished species commonly occur, while still allowing some fishing for more abundant stocks in the open areas. The "edges" of these closed areas are adjusted seasonally; the boundaries may be expanded during periods when overfished stocks are distributed more widely. Conversely, the boundaries may be narrowed when the overfished species are more concentrated or to allow access to other stocks that are more available at certain times. Different closed areas are provided for different gear types, as not all gear types encounter each overfished species at the same rate or in similar areas.

Participation in the **commercial** groundfish fisheries is limited by a federal permit system established in 1994. This program limited the number of trawl, **longline** and **pot** (fish trap) permits and established a number of conditions and requirements. The permits specify the gear type that permitted vessel may use to participate in the limited entry fishery, and the vessel length associated with the permit. A vessel may only participate in the fishery with the gear designated on its permit(s) and may only be registered to a permit appropriate to the vessel's length. Since 1994, the Council has created further license restrictions for the **limited entry** fixed gear (longline and fish pot gear) fleet that restrict the number of permits useable in the primary sablefish fishery and that allow up to three sablefish-endorsed permits to be used per vessel. The number of trawl permits was reduced in the mid-1990s when seven large **factory-trawl** vessels purchased and consolidated a number of permits in order to participate in the Pacific whiting fishery. A federally-supported trawl **buy-back** program is being developed in 2003 that may reduce the number of permits by up to 50%. Vessels remaining in the fishery would pay the costs of the reduction program.

Certain gear types and fisheries were exempted from the limited entry program and remain "**open access**." Trip limits for these vessels are set to allow retention of incidentally-caught groundfish and limited intentional groundfish harvest.

Recreational fisheries off Washington, Oregon, and California are managed by a combination of bag limits, gear requirements, size limits, seasons and area closures. In 2003, most **recreational fishing** was restricted to relatively shallow waters (generally less than 20-27 fathoms).

Bycatch management in 2000 and 2001 was a major departure from previous years, as different trip limits were based on the type of trawl gear used. In order to reduce fishing in rocky areas of the **continental shelf**, trip limits for vessels using trawls configured with large footropes (those with footrope diameter greater than 8 inches) were set at minimal levels. This created strong disincentives for vessels using **bottom trawl** gear to avoid prime **rockfish** habitat areas, while not prohibiting the use of such trawls or closing specific areas. In 2001, two large areas off southern California were closed to most fishing activities as part of the plan to rebuild overfished cowcod, a species of rockfish . The closed areas (referred to as the Cowcod Conservation Areas or CCAs) encompass the primary habitat of cowcod and were intended to reduce the possible encounter with this species.

Management of the 2002 groundfish fishery was an even more radical departure from previous bycatch management practices. Trip limits and area closures were developed based on incidental catch rates and fishing patterns through the use of a NMFS "**bycatch**" **model**. The model estimates the total amounts of overfished species that would be caught coincidentally with available target species. The new management approach structures the amount and timing of trip limits (cumulative landings limits) for "target" species so that the expected total catch of both target and overfished groundfish species will not exceed their allowable annual harvests. NMFS believes this new approach better accounts for the total mortality of the overfished stocks taken incidentally than the previous method of applying estimated discard rates to the annual OY to calculate landed catch **harvest guidelines**.

This new bycatch and discard analysis calculated the co-occurrence of each of five overfished species with healthy targeted stocks. To make these co-occurrence calculations, the analysis evaluated data on a suite of trawl fishery target strategies (for example, targeting the **DTS complex**, targeting arrowtooth flounder, etc.). Each target strategy was separated into six two-month periods to set a baseline of co-occurrence rates of overfished stocks throughout an entire calendar year. The analysis found seasonal variations in the co-occurrence rates between healthy and overfished stocks. The Council used these baseline co-occurrence rates to set the discard rates for each of the overfished species that were deducted from their respective OYs. Management measures included combinations of trip limits and seasons intended to concentrate targeting on healthy stocks during times when incidental catches of overfished species were lowest in recent years. **Inseason** adjustments to management measures were also guided by this analysis so that projected catches of overfished species would not exceed the specified limits.

For 2003, this approach to minimizing incidental catch and discard was further refined by recognizing the areas where various species are caught. Most species have limited depth and latitudinal (north-south) distributions, that is, they are mostly found within a limited depth range and a limited north-south range. By preventing fishing in the areas where overfished species are most commonly encountered, the overall incidental catch rates are reduced. By factoring this into the 2003 management program, greater fishing opportunities could be provided outside these "Rockfish Conservation Areas" (RCAs). This approach increases monitoring requirements and increases the complexity of the regulations.

Expected catch amounts for each major fishing sector are calculated before the season opens. Groundfish trip limits for commercial sectors are set based on previously observed ratios with various other species; these trip limits may vary by season if previously observed ratios show seasonal patterns. State fishery management and enforcement personnel monitor commercial **landings** throughout the year by tabulating state fish landings receipts (**fish tickets**). Although landings of many species are monitored inseason, the landings data for overfished species may not be not used for inseason management. Due to the strong economic incentives to avoid reaching an overfished groundfish species OY or cap, coupled with the opportunity to discard fish prior to their being counted, managers assume fish tickets will tend to underestimate the actual catches. There is currently no way to verify this inseason. However, onboard **observers** ride selected vessels and collect information on amounts and rates of fish discarded at sea. Observer data are not tabulated during the season but are compiled in annual summaries after being matched with fish ticket and trawl **logbook** records. The new observed groundfish catch ratios are compared to the previous rates that were used to set the current trip limits. If the trip limit ratios differ substantially from the new observations, subsequent trip limits will be adjusted and other management measures may also require adjustments.

2.2.2 Alternative 2

> Alternative 2 would reduce groundfish bycatch by increasing the size of trip limits. This would be achieved by reducing the trawl fleet by 50%; the goal of maintaining a year-round fishery would continue. The focus on fleet reduction is based on the Council's *Strategic Plan for Groundfish*. This alternative includes the area/depth management and modeling approach of Alternative 1.

Alternative 2 would reduce groundfish **regulatory bycatch** by increasing groundfish trip limit sizes and reducing the number of commercial fishing vessels, while maintaining as long a fishing season as practicable. Regulatory bycatch (that is, groundfish discard that is required to avoid penalty) of groundfish, and particularly the rate of discard, increases as trip limits become smaller.

This alternative differs from the status quo in that the number of commercial groundfish trawl vessels would be reduced by 50% from the number that landed groundfish during 2002. Trip limits would be larger because the total allowable catch would be shared among fewer participants.

The method of fleet reduction is not specified in this alternative. The preferred method of fleet reduction is an industry-sponsored buy-back program. If the buy-back program fails to achieve a 50% reduction in the number of trawl permits, the number of trawl permits will be further reduced to the 50% level. The Council has limited alternatives to reduce the number of trawl permits: eliminate permits by establishing eligibility criteria (for example, a minimum amount of groundfish landed in previous years, a minimum number of years of participation in the fishery, etc), require vessels to hold more than one trawl permit, or allow trawl permits to be converted to fixed-gear permits.

In establishing the current vessel license limitation program, the Council established minimum landing requirements for eligibility. Vessels that met the minimum requirements received licenses (permits). Only the most recent entrants and vessels with the smallest catch histories did not receive permits. It is likely that in further reducing the number of eligible vessels, criteria based on amounts of groundfish landed landings would tend to eliminate those vessels that have caught the fewest groundfish in recent years or participated less than other vessels. This reduction method would result in reducing effective fishing power of the trawl fleet by less than 50%.

2.2.3 Alternative 3

Alternative 3 would reduce groundfish bycatch by increasing the size of trip limits. This would be achieved by eliminating the goal of maintaining a year-round fishery and establishing a short season or series of seasons. This alternative reflects one of the conclusions in the Council's *Strategic Plan for Groundfish* that, if fleet size is not reduced, *"(m)aintaining a year-round fishery may not be a short-term priority."* This alternative includes the area/depth management and modeling approach of Alternative 1.

Alternative 3 would reduce groundfish regulatory bycatch by increasing groundfish trip limit size and reducing fishing time (shortening seasons), without reducing the number of commercial fishing vessels. As with Alternative 2, this is based on the understanding that regulatory bycatch of groundfish, and particularly the rate of discard, increases as trip limits become smaller.

In contrast to Alternative 2, the number of commercial fishery participants would not be reduced under Alternative 3. Instead, the commercial fishing season would be shortened as the method to create larger trip limits.

Methods of reducing fishing time are not specified in this alternative but are critical to the effects. For example, if the current 2-month periods are reduced to 1 month, larger vessels would not be affected much, and trip limits might not be much larger than current, because actual fishing time per vessel is already less than one month. Vessels could be restricted to fishing only 3 of the 6 2-month periods.

A different way of reducing commercial fishery fishing time to six months would be to allow limited entry sector fishing for six months and open access fishing for six months while the limited entry sector is closed. For example, the limited entry fishery (except the whiting fishery) could operate during two 3-month periods, one in the spring (some period between February and June) and one in the fall (perhaps September, October and November). These open seasons fall mainly outside the shrimp and crab seasons. Open access fisheries might fill in between, i.e., summer and winter.

2.2.4 Alternative 4

Alternative 4 would reduce bycatch by establishing **catch** limits for various fishery sectors, rather than **landing/ retention** limits. Inseason (real-time) monitoring procedures would be established, and sectors would be closed when the sector catch limit is reached. This alternative includes the area/depth management and modeling approach of Alternative 1.

Alternative 4 would reduce bycatch by assigning a catch limit for each overfished groundfish species to each fishing sector, making each sector of the fishery responsible and accountable for all groundfish caught, rather than the amounts retained. It would establish an in-season catch monitoring or verification program to ensure sector catch limits are not exceeded. When a sector reaches any catch limit, further fishing by that sector would be prohibited.

The definition of "sector" is critical to this alternative, but are not defined. The sectors that can be identified under the current regulations are limited entry bottom trawl, limited entry fixed gear, three whiting sectors (**catcher/processor**, **mothership** and **shore-based**), and open access. **Tribal** fisheries and recreational fisheries could also be identified. Each sector would be monitored separately with stratified, partial observer coverage. Catch rates and closure dates for each sector would be projected based on observer reports.

This alternative would use both indirect (vessel trip limits) and direct bycatch controls (sector catch caps) for each sector. Direct measures affect bycatch by placing specific limits on the amount of groundfish caught (rather than the amount landed). Vessels would no longer be required to discard groundfish, although they could choose to discard. Thus, regulatory bycatch of groundfish would be effectively eliminated.

Economic (that is, non-regulatory) bycatch/discard could also be addressed under this alternative by prohibiting discard or limiting the amount of groundfish that may be discarded. If allowed, discard would be measured as accurately as possible. If discard were prohibited, economic (non-regulatory) bycatch of groundfish would be greatly reduced.

It is likely some form of catch control or **capacity restriction** will be necessary to prevent a race for fish among vessels in a sector. Trip limits would be established as under Alternative 1.

The option of creating more sectors could reduce the need for other controls to limit fishing activities. To accomplish this, vessels would be assigned to one or more sectors, perhaps through an endorsement attached to the limited entry permit. When a sector limit is reached, further fishing by those vessels would be prohibited or severely curtailed. Bycatch (discard) under such an approach could be controlled by requiring **full retention** or placing limits on discards. The primary differences between Alternative 4 and the previous three alternatives are (1) Alternative 4 would set catch caps rather than retention limits; (2) every vessel would be assigned to one or more sectors; (3) each sector would have a set of catch caps for overfished groundfish species and other stocks; (4) vessels in a sector would have to stop fishing when any cap for the sector is reached, while vessels in other sectors would continue fishing. Catches by each sector would be monitored inseason, with actual catch statistics available quickly (either inseason or before the next season) so that adjustments could be made. Total catch OYs and discard caps would be set for overfished **stocks**, and sub caps would be set for each sector. Initial groundfish catch limits would be calculated based on previously observed joint catch ratios of various groundfish species (similar to the method under status quo). Onboard observers would monitor a subset of vessels, recording and compiling catch and discard of overfished groundfish species (and other specified species) inseason. This catch data would be expanded to the entire sector. Each sector would be managed to its groundfish caps based on this expanded "real time" information rather than based on ratios from previous years.

Observers could be placed on a subset of each sector, and observed catch rates extrapolated (expanded) to the entire sector. This process would occur weekly, biweekly, or at some other appropriate frequency.

Under Alternative 4, a **reserve** could be set aside for vessels with low incidental catch and/or bycatch rates to provide incentive for individual vessels to fish more selectively. However, this would require mechanisms to ensure fair access. One mechanism might be for vessels to carry an observer (or observers) at the vessel's expense so the vessel's catch and bycatch could be monitored intensively.

> Alternative 5 would reduce bycatch by establishing **groundfish catch quotas** for individual commercial fishers. Monitoring would be focused at the individual vessel level rather than at the sector level.

2.2.5 Alternative 5

Alternative 5 would reduce bycatch by assigning a **catch limit** for each overfished groundfish species to each limited entry commercial fisher/vessel, making each responsible and accountable for his/her bycatch, and providing flexibility to develop bycatch avoidance methods. **Individual quotas** of other groundfish stocks would also be assigned. Certain gear restrictions and other regulations would be relaxed to allow fishers/vessels to develop their own best practices to catch healthy groundfish stocks while avoiding the catch of overfished groundfish stocks. This alternative is based on establishment of **individual catch allowances** of overfished groundfish (which could be referred to as "restricted species catch quotas" or **RSQs**) and also individual fishing quotas (**IQs/IFQs**) of other groundfish species.

An RSQ would be considered an authorization to catch a specified share or amount of the OY for an overfished stock, while an IQ/IFQ would be an authorization to catch a portion of a stock that is not overfished. A portion of some or all overfished stock OYs would be reserved for vessels with the best bycatch performance. (The Council will define "best performance" or **performance standards** at a later date. It could, for example, be based on low catch or catch rates of overfished species, low bycatch of non-groundfish species, or other factors.) A robust monitoring or catch verification program would be established to ensure incidental catch caps are not exceeded.

Certain regulations could be relaxed to allow fishers to modify their fishing operations and/or gear to keep from exceeding their individual vessel caps. For example, gear endorsements could be modified to allow trawl vessels to use nontrawl gear, or to exchange their trawl endorsement for a longline, pot or generic gear endorsement. Quota holders would be allowed to buy and sell incidental catch allowances (RSQs) and individual transferable fishing quotas (IQs/IFQs) for other (non-overfished) groundfish.

Alternative 5 would use direct incidental catch and bycatch controls at the level of the individual vessel. To reduce economic (non-regulatory) bycatch, discard of groundfish could be prohibited or restricted; if discarding were allowed, it would be measured as accurately as possible. All groundfish catch, whether retained or discarded, would be charged against the appropriate RSQ/IQ. Fewer controls would be needed to limit fishing activities, except that when a vessel reaches any catch limit it would have to stop all fishing until it acquired additional IQ or RSQ. Also, if a groundfish OY were reached, further fishing would be prohibited or severely curtailed. Bycatch (discard) under this approach could be controlled by requiring **increased retention** or placing limits on discards.

Alternative 5 is similar to Alternative 4 except that each commercial limited entry permit would be assigned individual caps (RSQs) for overfished groundfish stocks and IQs/IFQs for other groundfish species.

Initially, RSQs would be set for all limited entry commercial vessels. Catch limits for other species would be calculated based on previously observed joint catch ratios of various groundfish species.. Onboard observers would monitor catch and discard of overfished groundfish species (and other specified species) inseason. Each vessel would be managed to its caps based on its own performance, using "real time" catch information rather than relying on ratios from previous years.

A reserve of various groundfish species would be set aside for vessels with the lowest catches or catch ratios of overfished species. Also, any unused OYs of non-overfished groundfish would be made available to those vessels that had not taken their overfished species allowances.

Alternative 5 would require that every commercial groundfish vessel be closely monitored so all catch of overfished species would be observed and recorded. This close scrutiny would likely mean placement of fishery observers on every vessel. Alternative monitoring processes could be allowed if they resulted in the same level of data accuracy and completeness. For example, some vessels might be able to meet the standard by retaining all groundfish in conjunction with a video system to verify that no discard occurred.

2.2.6 Alternative 6

Alternative 6 would reduce bycatch to near zero by closing large areas where overfished groundfish are most likely to be encountered and other areas of high bycatch of non-groundfish species, establishing individual vessel catch allowances (caps) for overfished groundfish species, and requiring every commercial vessel to carry onboard observers. This alternative would include expanded area/depth closures (MPAs) and bycatch limits or discard prohibitions. Certain gear regulations would be relaxed to allow vessels to improve bycatch reduction methods. As in Alternative 5, vessels could continue fishing until any cap was reached, and vessels with low incidental or bycatch rates would have additional fishing opportunities.

Alternative 6 would reduce bycatch of all species to very low levels by establishing long term closed areas where overfished groundfish and other sensitive species are most likely to be encountered, establishing incidental catch limits for individual vessels, prohibiting or severely restricting discard of groundfish species (and perhaps other species), and accurately accounting for all catch. The alternative would emphasize the identification and use of alternative fishing gears and methods that avoid capture of restricted species.

This alternative would use both indirect controls (**marine protected areas** or MPAs) and direct bycatch controls of each individual vessel. The areas encompassing most of the distribution of all overfished groundfish stocks would be established as long-term marine protected areas to reduce the possibility those fish could be caught.

Alternative 6 is similar to Alternative 5 except the focus would be on reducing bycatch of groundfish and other identified species to near zero by closing areas where encounters of those species are most likely. These areas would be designated as long term closed areas that could be reopened only through a deliberative process based on the **best scientific information** available. In addition, individual commercial groundfish vessels would be assigned a catch allowance of overfished groundfish species. These would be mortality limits or caps. Certain regulations would be relaxed to allow fishers to modify their fishing operations and/or gear to keep from exceeding their individual vessel caps.

A portion of the total allowable groundfish catch could be held in reserve for access by vessels with the lowest catch (or catch rates) of overfished species or bycatch rates of non-groundfish species. Initial groundfish catch limits for other species would be calculated based on previously observed joint catch ratios of various groundfish species. Discarding of groundfish would be prohibited or greatly restricted. Discarding of other species could be prohibited or restricted also. Onboard observers would monitor all vessels' catches of all species.

2.3 Summary of Environmental Impacts

[This section will be completed when the analysis and Chapter 4 have been completed.]

3.0 The Affected Environment

3.0 The Affected Environment

Introduction Groundfish **bycatch** and its characteristics (e.g., species, extent of harm, quantity, distribution in time and space) result from the dynamic and complex interaction of attributes of the species, the fisheries, and the affected environment, both physical and biological. Life history strategies can influence vulnerability to bycatch at the level of an individual, a population, or group of species. For example, fish morphology (e.g., size, shape, presence of spines, large gill cover), distribution (e.g., preferred temperature, in deepwater, along cliffs) and behavior (e.g., schooling, inhabiting crevices, fast-swimming) affect how vulnerable a fish or species is to capture or harm by a particular gear. Fishers continuously adjust their gears, fishing practices and areas, to the extent allowed by regulation, to take advantage of these attributes in order to efficiently maximize the harvest of targeted species, as well as to reduce the harvest of unwanted species. The physical and biological environment also influences the distribution and abundance of species, largely through the availability and abundance of suitable habitat, prey, predators, competitors, and reproductive opportunities.

Chapter 3 describes various components of the coastal marine ecosystem and how people and communities use and rely on the groundfish resources of this region. The groundfish **FMP** and management regime covers groundfish stocks off Cape Flattery, Washington to the California border with Mexico. Hundreds of plant and animal species occur along the west coast and groundfish-related bycatch related may affect many of them. To make this chapter easier to read and understand, much of the detail on the biology of species has been placed in an appendix (See Appendix A).

This chapter describes the affected environment, which is the baseline environmental condition. The baseline represents the status of environmental attributes at a time before the proposed action is implemented, and in Chapter 4 serves as a point of comparison to evaluate possible significant impacts.

How The Chapter Is Organized

How The Chapter Is Organized The chapter begins with a brief description of the physical environment, including marine geology, climate and currents. This is followed by descriptions of the biology of selected species, including important groundfish species, protected species, and other relevant fish and shellfish species. Several species or species groups are appendix (available online at http://www.nwr.noaa.gov/1sustfsh/efhappendix/page1.html. Groundfish EFH is currently being re-evaluated in a separate EIS.

> The geological structure and ocean environment affect the distribution of fish, which affects catch, incidental catch, and bycatch.

Geology Bathymetry and physical topography help determine habitat by influencing its physical structure and also the **co-occurrence** of other species. Groundfish species are harvested in the **pelagic** zone, close to the bottom, or on the bottom, mostly within 50 miles of the shoreline where maturing and adult stages are found. Mud, sand, gravel, and exposed rocky areas, along with associated biological **communities**, make up the varied benthic habitats for groundfish on the continental margin.

> The continental shelf off the West Coast is relatively narrow. It is generally widest from Oregon north and narrow off California.

The continental margin and waters out to 200 miles, the seaward boundary of the **EEZ**, are important habitat for groundfish and other marine species affected by groundfish fishing. The continental margin is composed of the **continental shelf** and **continental slope** - the steeper, deeper part of the continental margin. The U.S. West Coast is characterized by a relatively narrow continental shelf. The 100 fathom (200 m) depth contour shows a shelf break closest to the shoreline off Cape Mendocino, Point Sur, and in the Southern California Bight; and widest from central Oregon north to the Canadian border, as well as off Monterey Bay. Deep submarine canyons pocket the EEZ, with depths greater than 4,000 m south of Cape Mendocino. Major estuaries along the coast include San Francisco Bay, Columbia River, Willapa Bay, Grays Harbor, and the Strait of Juan de Fuca. A number of small estuaries occur all along the west coast.

California Current System Biological characteristics of species, combined with physiographic features, are important determinants of changes in distribution. More mobile and schooling species, such as Pacific whiting, may vary in location *en masse* as they move in response to environmental conditions and prey availability. Current regimes may also control the distribution of larvae, helping to determine the location of adult populations. As mentioned earlier, fish distribution is an influential factor in determining bycatch, and thus, currents and changes to them can affect bycatch.

> The West Coast marine environment is part of the California Current ecosystem. The current is a major influence on the all marine plants and animals in the region.

The West Coast marine environment is part of the California Current ecosystem. Large scale ocean currents, the North Pacific and Alaska gyres in particular, create a dynamic coastal upwelling and plankton production was reduced by El Niño events.

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

> Some species thrive in colder water, while others do better in warmer water. Both short term and long term climate events influence survival and reproduction.

El Niño and **La Niña** events are examples of short-scale climate change, six-month to two-year disruptions in oceanic and atmospheric conditions in the Pacific region. An El Niño is a climate event with trends such as a slowing in Pacific Ocean equatorial circulation, resulting in warmer sea surface conditions and decreased coastal upwelling. Conversely, a La Niña is a short-scale climate events characterized by cooler ocean temperatures (NOAA, 2002). In years of poor upwelling or when El Niño warms the waters off the West Coast, ocean productivity is reduced. Under severe El Niño conditions, species distributions can change radically (Wooster and Fluharty, 1985)

Recently, scientists have concluded that large scale regime shifts overlay shorter term El Niño and La Niña events, creating longer term changes in productivity associated with decades-long warm or cold periods. In the past decade a still longer period cycle, termed the **Pacific Decadal Oscillation** or **PDO**, has been identified. Although similar in effect, instead of the 1 year to 2 year periodicity of ENSO, PDO events affect ocean conditions for 15 years to 25 years (Mantua in press). The PDO

3.2.3 Groundfish

3.2.3 Groundfish

The Pacific Coast groundfish FMP manages more than 80 species. These species occur throughout the EEZ and occupy diverse habitats at all stages in their life history. While a few species have been intensively studied, there is relatively little information on the life history, habitat, and stock status of most groundfish species.

More detailed information about groundfish and other species can be found in Appendix A.

The life history, distribution, and stock status of each important groundfish species are summarized in Appendix A. More detailed information on the status of each of the groundfish species or species groups is available in the stock assessments associated with the annual SAFE report, as well as in the Environmental Assessment/Regulatory Impact Review/Initial Regulatory Flexibility Analysis for Proposed Groundfish ABC and OY Specifications and Management Measures for the 2002 Pacific Coast Groundfish Fishery.

This EIS highlights nine overfished groundfish stocks and 11 other groundfish stocks.

In addition to the individual species descriptions in Appendix A, generalized descriptions are provided below for the following groundfish species groups: rockfishes, thornyheads, gadids, flatfishes, sharks, and skates. These generalized descriptions are followed by information on the stock status for each overfished species and "emphasis species." The term "overfished" describes a groundfish stock whose abundance is below its overfished/rebuilding threshold. Nine groundfish species are below the overfished threshold in 2003: bocaccio, canary rockfish, cowcod (south of Point Conception), darkblotched rockfish, lingcod, Pacific whiting, Pacific ocean perch, widow rockfish, and yelloweye rockfish. We are using the term "emphasis species" to describe a groundfish stock (other than an overfished stock) that is particularly relevant to bycatch issues and specifically incorporated in analyses of the alternatives in this EIS. Our groundfish emphasis species are black, yellowtail and chilipepper rockfish, shortspine and longspine thornyhead, sablefish, cabezon, English, Dover, and Petrale sole and arrowtooth flounder. The impacts of the alternatives described in Chapter 4 on these species should be representative of the impacts on species with similar life histories and distributions.

This section presents some basic groundfish biology facts, starting with rockfish.

Generalized Rockfish (*Sebastes* spp.) Biology

Rockfishes are a very diverse group of over 55 species that occur along the west coast. Adults of many species are most common in nearshore areas, whereas others (e.g., yellowtail juveniles is important in the life history of thornyheads. Sablefish commonly prey on longspine thornyhead.

> "Flatfish" includes 12 species of flounders and soles. They are typically found on sandy bottom areas. Some species are shallower than others, and some make seasonal migrations from deep to shallow water.

Generalized Flatfish Biology Twelve species of flatfishes are classified as West Coast groundfish: arrowtooth flounder, butter sole, curlfin sole, Dover sole, English sole, flathead sole, Pacific sanddab, Petrale sole, rex sole, rock sole, sand sole, and starry flounder. (Pacific halibut and California halibut are not classified as West Coast groundfish, and are considered in Section **XXX** below.) Flatfish are demersal, inhabiting sandy, muddy, or gravelly bottoms from estuarine areas seaward over the shelf and onto the continental shelf. Starry flounder is common in estuarine areas and shallow nearshore areas and Dover sole and arrowtooth flounder are common on the outer shelf and slope. Others are most common nearshore and on the shelf. Individuals of the same species often occur together in large, non-random associations. Some may make extensive migrations, especially between feeding and spawning grounds. Spawning is most common during late winter and early spring. Except for rock sole, flatfish spawn many pelagic eggs, from hundreds of thousands to a few million, depending on species and size of the fish. Rock sole reportedly spawn over a variety of substrates, from rocky banks to sand and mud; their eggs are demersal and adhesive. For many species, eggs rise in the water column and are carried shoreward with the currents as they develop, although rex sole settle mainly on the outer continental shelf. As they age and grow, most flatfish move from shallow nursery areas into deeper waters. Age of maturity varies from 2 to 10 years, depending on species and sex. Longevity varies from 10 to 20 years with Dover sole living potentially twice as long. Juveniles and adults are carnivorous.

> "Gadid" means members of the cod family. Pacific whiting is the most abundant groundfish in the West Coast region.

Generalized Gadid Biology Two species of gadids are classified as groundfish off the West Coast: Pacific whiting (*Merluccius productus*) and Pacific cod (*Gadus macrocephalus*). (Another gadid, walleye pollock, is not classified as a West Coast groundfish under the FMP, but its biology is described in Section **XXX** below.) Pacific Whiting, also known as Pacific hake, range from Sanak Island in the western Gulf of Alaska to Magdalena Bay, Baja California Sur. Off the west coast, Pacific cod are at the southern end of their range, which extends from northern China along the Pacific rim to the Bering Sea and southward to Santa Monica, California. Smaller populations of cod and whiting occur in several of the larger semi-enclosed inlets, such as the Strait of Georgia and Puget Sound. Whiting are semi-pelagic. The highest densities about 10 to 20 years for females. These sharks are long-lived, from 30 to 70 years, depending on species and sex.

> Three species of skates are classified as groundfish. They live on sandy bottom areas at various depths.

Generalized Skate Biology Three species of skates are classified as West Coast groundfish: big skate, California skate, and longnose skate. Adults inhabit mud or sand bottom on the shelf, although California skate is more common in shallower areas, especially off California. They are oviparous, with fertilization occurring internally, and eggs are deposited on the bottom in egg cases. Young hatch and inhabit level, sandy or muddy bottoms. Age of maturity ranges from six to12 years and adults live for 20-30 years.

> Lingcod is an overfished species that appears to be rebuilding quickly. They spawn in rocky reef areas during the winter, and male lingcod guard the eggs until they hatch. They do not have swim bladders, so many live if they are caught and released quickly and carefully.

Lingcod Biology Lingcod (*Ophiodon elongatus*), a top order predator of the family Hexagrammidae, ranges from Baja California to Kodiak Island in the Gulf of Alaska. Lingcod is demersal at all life stages. Adult lingcod prefer two main habitat types: slopes of submerged banks 10-70 m below the surface with seaweed, kelp and eelgrass beds and channels with swift currents that flow around rocky reefs. Juveniles prefer sandy substrates in estuaries and shallow subtidal zones. As the juveniles grow they move to deeper waters. Adult lingcod are considered a relatively sedentary species, but there are reports of migrations of greater than 100 km by sexually immature fish. Mature females live in deeper water than males and move from deep water to shallow water in the winter to spawn. Mature males may live their whole lives associated with a single rock reef, possibly out of fidelity to a prime spawning or feeding area. Spawning generally occurs over rocky reefs in areas of swift current. After the females leave the spawning grounds, the males remain in nearshore areas to guard the nests until the eggs hatch. Hatching occurs in April off Washington but as early as January and as late as June at the geographic extremes of the lingcod range. Males begin maturing at about 2 years (50 cm), whereas females mature at 3+ years (76 cm). In the northern extent of their range, fish mature at an older age and larger size. The maximum age for lingcod is about 20 years. Lingcod are a visual predator, feeding primarily by day. Larvae are zooplanktivores. Small demersal juveniles prey upon copepods, shrimps and other small crustaceans. Larger juveniles shift to clupeids and other small fishes. Adults feed primarily on demersal fishes (including smaller lingcod), squids, octopuses and crabs. Lingcod eggs are eaten by gastropods, crabs, echinoderms, spiny dogfish, and cabezon. Juveniles and adults are eaten by marine mammals, sharks, and larger lingcod.

Sablefish is one of the most valuable groundfish to the commercial fishery. They are widespread, both shallow and deep, north to south, and may migrate seasonally.

Sablefish Biology Sablefish (*Anoplopoma fimbria*) are abundant in the north Pacific, from Honshu Island, Japan, north to the Bering Sea, and southeast to Cedros Island, Baja California. There are at least three genetically distinct populations off the West Coast of North America: one south of Monterey characterized by slower growth rates and smaller average size, one that ranges from Monterey to the U.S./Canada border that is characterized by moderate growth rates and size, and one ranging off British Columbia and Alaska characterized by fast growth rates and large size. Large adults are uncommon south of Point Conception. Adults are found as deep as 1,000 fm (1,900 m), but are most abundant between 100-500 fm (200 and 1,000 m). Off southern California, sablefish were abundant to depths of 1,500 m. Adults and large juveniles commonly occur over sand and mud in deep marine waters. They were also reported on hard-packed mud and clay bottoms in the vicinity of submarine canyons. Spawning occurs annually in the late fall through winter in waters greater than 300 m . Sablefish are oviparous with external fertilization. Eggs hatch in about 15 days and are demersal until the yolk sac is absorbed. After yolk sac is absorbed, the age-0 juveniles become pelagic. Older juveniles and adults are benthopelagic. Larvae and small juveniles move inshore after spawning and may rear for up to four years. Older juveniles and adults inhabit progressively deeper waters. The best estimates indicate that 50% of females are mature at 5-6 years (24 inches), and 50% of males are mature at 5 years (20 inches). Sablefish larvae prey on copepods and copepod nauplii. Pelagic juveniles feed on small fishes and cephalopods, mainly squids. Demersal juveniles eat small demersal fishes, amphipods and krill. Adult sablefish feed on fishes like rockfishes and octopus. Larvae and pelagic juvenile sablefish are heavily preyed upon by sea birds and pelagic fishes. Juveniles are eaten by Pacific cod, Pacific halibut, lingcod, spiny dogfish, and marine mammals, such as Orca whales. Sablefish compete with many other co-occurring species for food, mainly Pacific cod and spiny dogfish.

Cabezon is a type of sculpin that lives in shallow water.

Cabezon Biology Cabezon (*Scorpaenichthys marmoratus*) are found from central Baja California north to southeast Alaska. This species inhabits inshore waters from the intertidal out to depths of about 42 fm (76 m). It is most common at depths of 2.5 fm to 30 fm (5-59 m). Cabezon are found on rocky, sandy and muddy bottoms, and in kelp beds. They inhabit restricted home ranges. Age of maturity ranges from 3 to 6 years. Spawning takes place from late October to March in California, and from November through September in

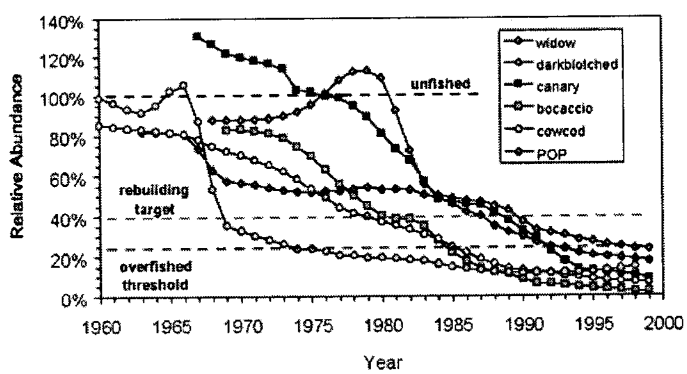
Washington. Fecundity ranges from 50,000 to 150,000 eggs, depending on size of the female. Eggs are deposited in clusters in shallow waters or in the low intertidal on bedrock, or in crevices. Males guard the nest after spawning and nest sites may be re-used from year to year. Eggs hatch two to three weeks after spawning. Small juveniles spend three to four months in the water column feeding on small crustaceans and other zooplankton. At about 1.5 inches (approximately 4 cm) they take up a demersal lifestyle. Adult cabezon primarily eat crustaceans (crabs, small lobster) but also mollusks (squid, octopus, abalone), smaller fishes, and fish eggs. Small cabezon are eaten by larger fishes including rockfishes, lingcod, adult cabezon, and other sculpins. Adults are eaten by pinnipeds.

This section talks about populations size and trends, starting with overfished groundfish.

Status of Overfished Groundfish Species

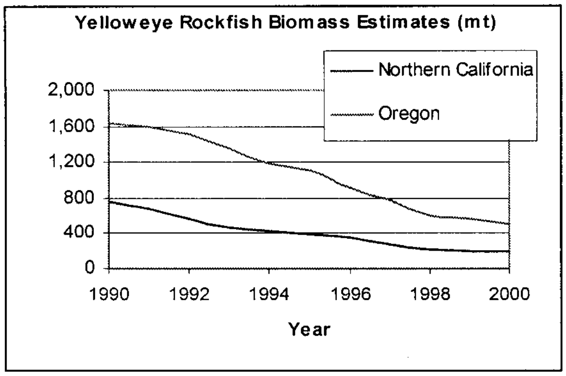
Nine groundfish species on the West Coast have been designated as overfished, based on estimates of their population abundance. A species is overfished if its abundance is less than 25% of its unfished population size. The rebuilding target for overfished species is 40% of its unfished population level. Historical estimates of relative abundance for seven rockfish species are shown in the following figure (adapted from S. Ralston, personal communication). Trends in relative abundance of darkblotched rockfish, bocaccio and cowcod show relatively long, steady declines during the 1970s and 1980s to very low levels in1990s. Trends in relative abundance for Pacific ocean perch, widow rockfish and canary rockfish are more variable, but abundance generally declined during the late 1980s and through the1990s. More detailed information about the status of these species, including biomass estimates, are provided in Appendix A.

Some Key Overfished Groundfish Stocks

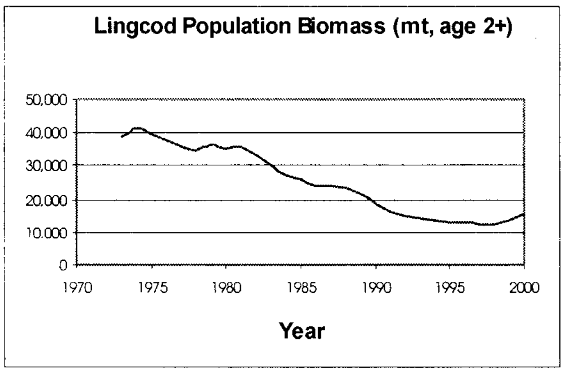


Adopted from Steve Ralston; NOAA/NMFS/SW Fisheries Science Center

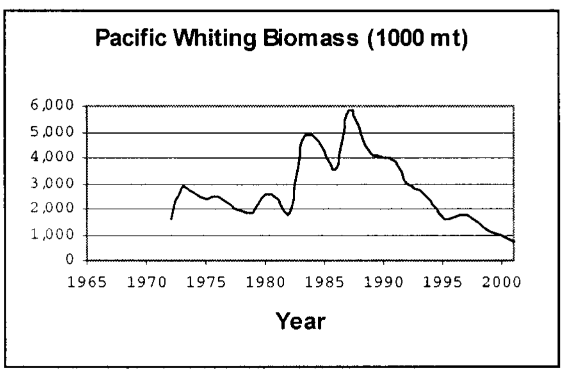
Yelloweye rockfish, lingcod and Pacific whiting have also been designated as overfished. Their population status is not incorporated in the previous figure, but is presented separately.



Yelloweye rockfish biomass estimates show a steady decline during the 1990s. The population was considerably below the unfished level when assessed in 2001, although there is relatively little information about yelloweye rockfish and uncertainties remain in the assessment. Regulations have severely restricted landings of yelloweye rockfish in recent years.



In 1997, lingcod was estimated to be at about 9% of its estimated unfished spawning potential. The estimated biomass of lingcod shown in the figure opposite shows a decline from approximately 40,000 mt of fish, age 2 years and older, in the mid-1970s to a low of approximately 12,000 mt during the late 1990s. More information about lingcod and its status is presented in Appendix A.



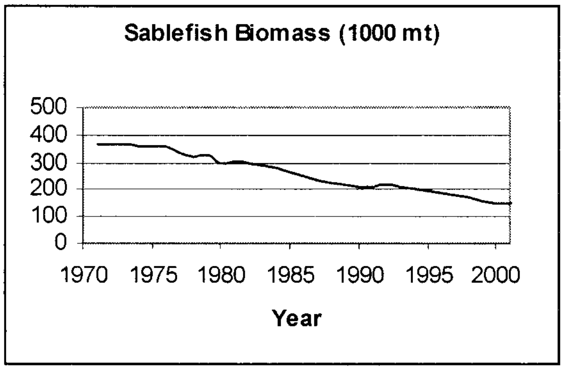
The abundance of Pacific whiting has been surveyed and assessed more frequently than for other groundfish species on the West Coast. Estimated biomass has declined fairly steadily from its historical peak of 5.7 million mt in 1987 to a low of about 1.7 million mt in recent years. Again, more information is provided about Pacific whiting and its status in Appendix A.

This section discusses the status of other highlighted groundfish species.

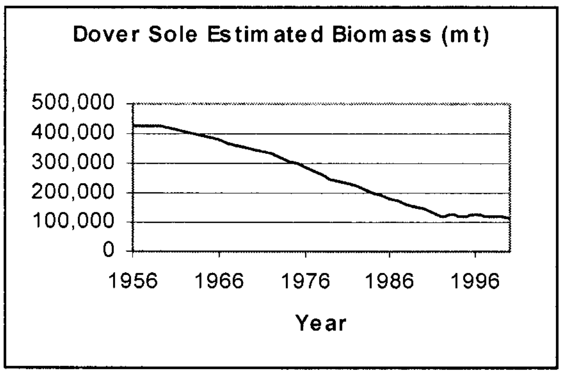
Status of Emphasis Groundfish Species

In addition to overfished species, eleven groundfish species are identified as "emphasis"species, those stocks that are particularly relevant to bycatch issues and specifically addressed in analysis of alternatives in this EIS. These species include sablefish, Dover sole, English sole, Petrale sole, arrowtooth flounder, chilipepper rockfish, yellowtail rockfish, shortspine thornyhead, longspine thornyhead, black rockfish and cabezon. Information about their population status is summarized below except for cabezon whose abundance has not been assessed.

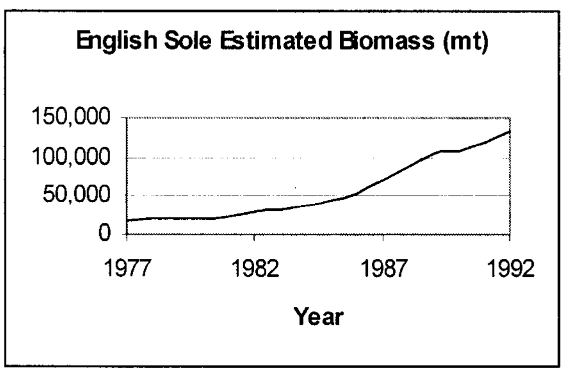
More detailed information about their life histories and population status is provided in Appendix A.



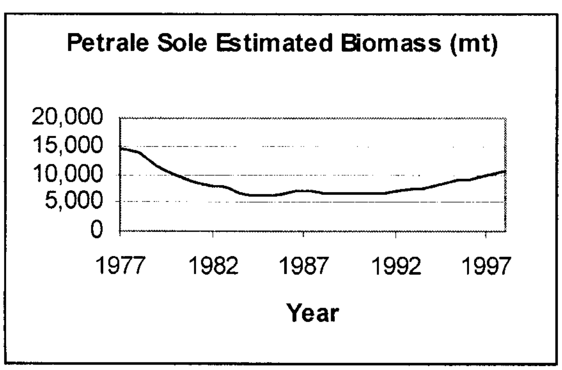
The estimated biomass of sablefish shows a slow, steady decline since the early 1970s. The stock is currently estimated to be between 27% and 38% of its unfished biomass and consequently, falls under "precautionary management" principles.



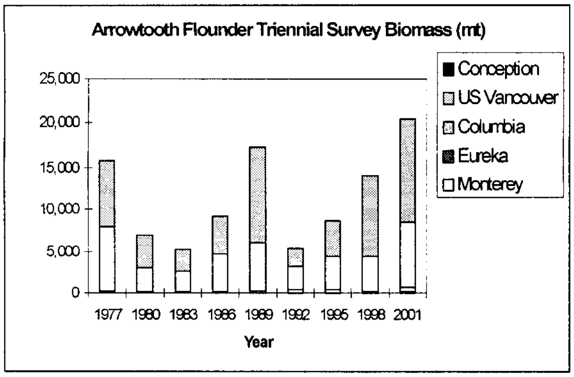
The most recent stock assessment for Dover sole completed in 2001 indicates that the current spawning stock size is about 29% of its unexploited biomass.
Recent abundances appear to be without trend, but they were preceded by a steady decline since the late 1950s.



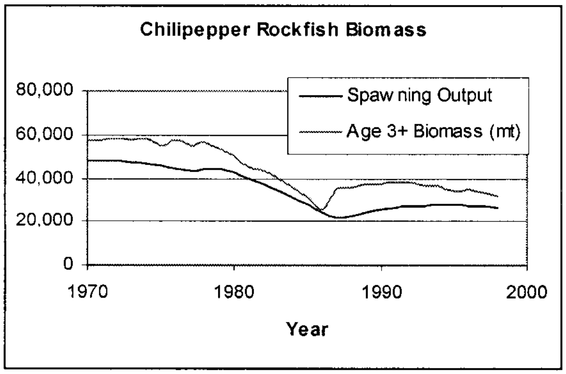
English sole has not been assessed since 1993. This assessment addressed English sole in northern areas (US Vancouver and Columbia) and indicated a nearly 7-fold increase in biomass since the 1970s to about 133,000 mt.



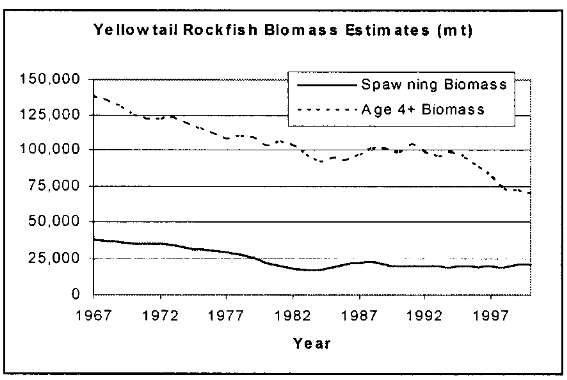
Current spawning biomass of Petrale sole is estimated to be in excess of 39% of its unfished spawning biomass. The most recent assessment addressed the northern stock (US Vancouver and Columbia areas). Biomass appears to be stable or increasing after an initial fishing down process.



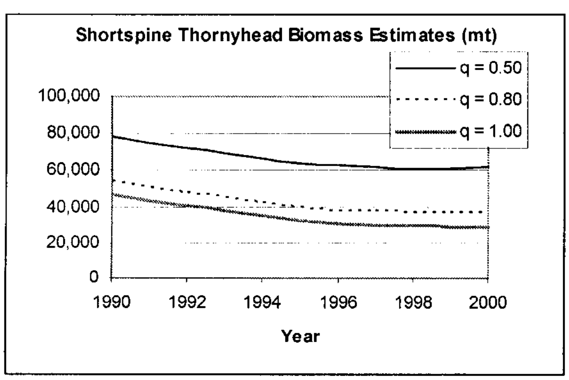
Arrowtooth flounder is at the southern end of its range in the Pacific region, and biomass off the West Coast appears to be highly variable, based on triennial trawl survey results. Most of the biomass occurs in the US Vancouver and Columbia areas, and a joint US/Canada assessment is recommended.



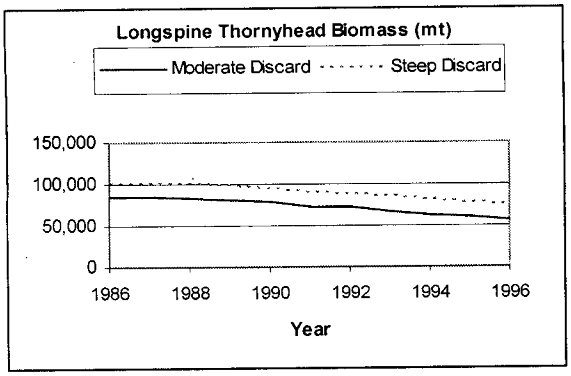
The most recent assessment of chilipepper rockfish (1998) indicated a decline in biomass, but the stock remains above the target level. Chilipepper is managed as part of a complex, and regulations to protect bocaccio rockfish have probably reduced catches of chilipepper rockfish.



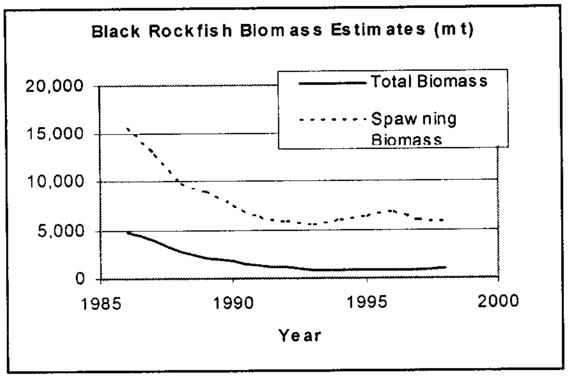
The most recent assessment for yellowtail rockfish in 2000 indicated that there has been a long-term decline in biomass, but the stock remains above the target level. Considerable uncertainty remains in the assessment, particularly over the relationship of yellowtail rockfish off the West Coast to those off Canada.



The most recent assessment for shortspine thornyhead in 2001 shows that the stock remains above the overfished level, between 24% and 48% of its unfished biomass. Considerable uncertainties remain in the assessments, particularly on the estimates of "q", the survey catchability coefficient.



Longspine thornyhead is estimated to be above 40% of its unfished biomass, according to the most recent assessment completed in 1997. One of the uncertainties in the assessment is the level of discard. The biomass trend is similar for both levels of discard, although estimated biomass is lower when a moderate level of discarding is assumed.



The black rockfish stock off Washington and Oregon are above the target biomass level. Estimated spawning biomass and total biomass declined during the 1980s , but appear to remain relatively stable during the 1990s. However, major uncertainties remain in the assessment.

3.2.4 Other Relevant Fish, Shellfish and Squid

3.2.4 Other Relevant Fish, Shellfish and Squid

These 12 non-groundfish have been selected to represent other fish species in order to illustrate the impacts of the alternatives.

Pacific halibut are large flatfish that mostly live north of the West Coast. Most are born off Alaska or Canada and migrate to this area. Most found off the West Coast are adults.

We have selected twelve non-groundfish species (excluding protected species described in Section **XXX**), identified as "emphasis species," to capture the impacts of the alternatives. These twelve species are Pacific halibut, California halibut, ocean shrimp, spot prawn, ridgeback prawn, Dungeness crab, jack mackerel, Pacific mackerel, walleye pollock, common thresher shark, and eulachon. These species represent the range of impacts likely experienced by a broader range of species, but with similar life histories, distributions, and vulnerabilities to bycatch impacts. Life histories of emphasis species are summarized below and more detailed descriptions, including available information on stock status, are given in Appendix A. Similar descriptions are also provided in Appendix A for seven additional species that likely experience similar impacts of the Alternatives. These seven are blue shark, shortfin Mako shark, Pacific angel shark, Pacific herring, longfin smelt, night smelt, and surf smelt.

Pacific Halibut (*Hippoglossus stenolepis*) ranges from California to the Bering Sea and extends into waters off Russia and Japan. The International Pacific Halibut Commission (IPHC) is responsible for Pacific halibut in the Northeast Pacific ocean. Pacific halibut are demersal and inhabit sand and gravel bottoms, especially banks, on the continental shelf. Halibut from California through the Bering Sea are considered to form one homogeneous population. Halibut off the west coast are at the extreme southern end of their range and those that inhabit west coast waters result from the southerly migration of juveniles. Halibut spawn during the winter in deep water (1,000 feet or 300 m). Their eggs and larvae rise and drift great distances with the ocean currents in a counter-clockwise direction around the northeast Pacific Ocean. Young fish settle to the bottom in shallow feeding areas. After two or three years, young halibut tend to counter-migrate to more southerly and easterly waters. Adult fish tend to remain on the same grounds year after year, making only a seasonal migration from the more shallow feeding grounds in summer to deeper spawning grounds in the winter. Pacific halibut are large, up to about 500 pounds (227 kg). Females typically grow faster and live longer than males; nearly all halibut over 100 pounds (45 kg) are females. Age of maturity for females is approximately 12 years. Most halibut are less than 25 years old. Halibut are carnivorous. Adults prey upon cod, sablefish, pollock, rockfishes, sculpins, turbot, and other flatfish. They also leave the bottom to feed on sand lance and herring in the water column. Octopus, crabs, clams, and occasionally small halibut are also eaten. Large juvenile and adult halibut are occasionally eaten by marine mammals but are rarely prey for other fish.

California halibut is another large flatfish that live mostly off central to southern California in relatively shallow water.

California Halibut (*Paralichthys californicus*) range from the Quillayute River, Washington to Almejas, Baja California, but their abundance and commercial fishery in U.S. waters are concentrated from Bodega Bay to San Diego, California. California Dept. of Fish and Game (CDFG) manages fisheries for California halibut off its coast; little fishing and catch occurs off Oregon and Washington. Adults live on soft bottom habitats in coastal water generally less than 300 feet (91 m) deep, with greatest abundance at depths less than 100 feet (30 m). California halibut live up to 30 years and reach 60 inches (153 cm). Male halibut mature at one to three years of age and eight to twelve inches (20 - 30 cm), whereas females mature at four to five years and 15 to 17 inches (38 - 43 cm). Adults spawn throughout the year with peak spawning in winter and spring. Pelagic eggs and larvae drift over the shelf but are in greatest densities within four miles of shore. Newly settled and larger juvenile halibut are usually found in unvegetated shallow-water embayments. Juveniles emigrate from the bays to the coast at about one year of age and 6.9 to 8.7 inches (17.5 - 22 cm). Adult California halibut primarily prey upon Pacific sardine, northern anchovies, squid, and white croaker. Small juvenile halibut eat primarily crustaceans.

Shrimp and prawns eaten by groundfish and other species. Fisheries for shrimp and prawns often catch groundfish.

Ocean Shrimp (*Pandalus jordani*), also called pink shrimp, occur from the Aleutian Islands to San Diego, California. State agencies plus the Washington treaty tribes manage the ocean shrimp resource and fisheries off their respective coasts. Ocean shrimp occur at depths from 150 to 1,200 feet (46 - 366 m) but are generally found at depths from 240 to 750 feet (73 - 229 m). Concentrations of shrimp remain in well-defined areas or beds from year to year. These areas are associated with green mud and muddy-sand bottoms. Most ocean shrimp spend the first year and a half of life as males, then pass through a transitional phase to become females. Ocean shrimp adjust their sex ratio to fluctuating age distributions. Mating takes place during September and October. Fertilization takes place when the females begin extruding eggs in October. Females usually carry between 1,000 and 2,000 eggs until the larvae hatch in March and April. The larval period lasts 2½ to three months. Developing juvenile shrimp occupy successively deeper depths, and often begin to show in commercial catches by late summer. Ocean shrimp grow in steps by molting or shedding their shells and growth rates vary by region, season, sex and year class. Ocean shrimp feed mainly at night on planktonic animals, such as euphausiids and copepods. Many species of fish prey on ocean shrimp, including Pacific whiting, arrowtooth flounder, sablefish, petrale sole and several species of rockfish. Predation by whiting may affect the abundance of ocean shrimp.

Spot Prawn (*Pandalus platyceros*) ranges from the Aleutian Islands to San Diego, California, and extends to the Sea of Japan and the Korea Strait. Spot prawns are typically found at depths between 653 and 772 feet (198-234 m). Juvenile shrimp concentrate in shallower, inshore areas (<297 feet or 90m) and migrate offshore as they mature. Spot prawn distribution is very patchy and related to water temperature, salinity and physical habitat. Spot prawns typically inhabit rocky or hard bottoms, including reefs, coral or glass-sponge beds, and the edges of marine canyons. Spot prawns can live up to six years off California but longevity decreases in more northerly areas; the average age off Canada is only four years. Spot prawns change sex in midlife. They mature first as males, mate, and then change to females after a transition phase. Sexual maturity is reached during the third year (about 1.5 inches or 38 mm carapace length). By the fourth year (about 1.75 inches or 44 mm carapace length), many males begin to change sex to the transitional stage. By the end of the fourth year, the transitionals become females. Each individual mates once as a male and once or twice as a female. Spawning occurs once each year, typically in late summer or early autumn. Spawning takes place at depths of 500 to 700 feet (151-212 m). Females carry eggs for a period of four to five months before they hatch. Spot prawns produce a few thousand eggs. Eggs hatch over a 10-day period and is completed by April. The larvae spend up to three months in the water column and then begin to settle out at shallow depths. Spot prawns typically feed on other shrimp, plankton, small mollusks, worms, sponges and fish carcasses. They usually forage on the bottom throughout the day and night.

Ridgeback prawn is primarily a southern California species that lives at depths of about 30 - 90 fm.

Ridgeback Prawn (*Sicyonia ingentis*) occurs from Monterey, California, to Cedros Island, Baja California. They inhabit depths ranging from less than 145 feet to 525 feet (44 - 160 m). Major concentrations occur in the Ventura-Santa Barbara Channel area, Santa Monica Bay, and off Oceanside. Other pockets of abundance occur off Baja California. Ridgeback prawns inhabit substrates of sand, shell and green mud. Because they are relatively sessile, little or no intermixing occurs. Their maximum life span is five years and sexes are separate. Females reach a maximum carapace length of 1.8 inches (46 mm) and males 1.5 inches (38 mm). Ridgeback prawns are free spawners, in contrast to other shrimps which carry eggs. Both sexes spawn as early as the first year, but most spawn during the second year at a size of 1.2 inches (30 mm). On average, females produce 86,000 eggs. Following spawning, both sexes undergo molting. The food habits of the ridgeback prawn are unknown, but it may feed on detritus like closely related species. Likely predators include rockfish, lingcod, octopus, sharks, halibut, and bat rays.

Dungeness Crab occur from Alaska to Mexico, typically on sandy bottom in relatively shallow water.

Dungeness Crab (*Cancer magister*) and their respective fisheries are managed by the West Coast states and Washington treaty tribes. Dungeness occur in coastal waters along North America from Unalaska Island to Magdalena Bay, Mexico. They are widely distributed over sandy or muddy bottom, generally in waters shallower than 90 feet (27.4 m), but they have been found as deep as 600 feet (183 m). Crabs grow each time they molt. Juveniles molt 11 or 12 times prior to sexual maturity, which may be reached at three years. At four to five years, a Dungeness crab can be over 6.5 inches (16.5 cm) in carapace width and weigh between 2 and 3 pounds (0.9 - 1.4 kg). The estimated maximum life span is between 8 and 13 years. Males mate only with female crabs that have just molted, from spring through fall. A large female crab can carry 2.5 million eggs under her abdomen until hatching. Young planktonic crabs go through six developmental stages before they molt into their first juvenile stage. After molting, the juveniles inhabit shallow coastal waters and estuaries with large numbers living among eelgrass or other habitats with aquatic vegetation. Shell hash is also important habitat for young Dungeness crabs. Dungeness crabs scavenge along the sea floor and their diet includes shrimp, mussels, small crabs, clams, and worms. Cannibalism is common. Young planktonic crabs are important prey for salmon and other fishes. Juveniles are eaten by a variety of fishes in the nearshore area, especially starry flounder, English sole, rock sole, lingcod, cabezon, skates and wolf eels. Octopus may also be an important predator.

> Market squid are small, short-lived molluscs that grow to about 12 inches (30 cm) total length, including arms. Most mature and spawn when about one year old, then die. Spawning squid concentrate in dense schools.

Market Squid (*Loligo opalescens*) is a coastal pelagic species (CPS) managed by the Council. They occur throughout the California and Alaska current systems from the southern tip of Baja California, Mexico, to southeastern Alaska. Market squid are most abundant from Punta Eugenio, Baja California and Monterey Bay, California. Although generally considered pelagic, they are found over the continental shelf from the surface to depths of at least 2,625 feet (800 m). Adults and juveniles are most abundant between temperatures of 10 °C and 16° C. Market squid are small, short-lived molluscs reaching a maximum size of 12 inches (30 cm) total length, including arms. Most mature and spawn when about one year old, then die. Spawning along the west coast occurs year-round. Spawning squid concentrate in dense schools. Known major spawning areas are shallow semi-protected nearshore areas with sandy or mud bottoms adjacent to submarine canyons. In these locations, egg deposition occurs between 1.5 and 17 feet (5-55 m). Females produce 20 to 30 capsules and each capsule contains 200 to 300 eggs. Females attach each egg capsule individually to the substrate. As spawning continues, mounds of egg capsules covering more than 100 square meters (1076 sq. ft.) may be formed. Hatchlings are dispersed by currents, and their distribution after leaving the spawning areas is largely unknown. Market squid are important forage to a long list of fish, birds, and mammals. Some of the more important squid predators are chinook salmon, coho salmon, lingcod, rockfish, harbor seals, California sea lions, sea otters, elephant seals, Dall's porpoise, sooty shearwater, Brandt's cormorant, rhinoceros auklet and common murre.

Jack mackerel was previously managed as a groundfish, but now is in the CPS FMP. Older fish sometimes are found north of California.

Jack Mackerel (*Trachurus symmetricus*) is a coastal pelagic species (CPS) managed by the Council. It is a widely distributed, schooling fish throughout the northeastern Pacific Ocean and much of their range lies outside the EEZ. Young fish, up to six years old, are most abundant in the Southern California Bight and school over shallow rocky banks. Older fish, 16 to 30 years old are generally found offshore in deep water and along the coastline to the north of Point Conception. They are more available on offshore banks in late spring, summer, and early fall than during the remainder of the year. They remain near the bottom or under kelp canopies during daylight and move into deeper nearby areas at night. Young juveniles sometimes are found in small schools beneath floating kelp and debris in the open ocean. Jack mackerel live 35 years or more. Half or more of all females reach sexual maturity during their first year of life. The spawning season for jack mackerel off California extends from February to October, with peak activity from March to July. Larval jack mackerel feed almost entirely on copepods. Small jack mackerel off southern California eat large zooplankton, juvenile squid, and anchovy. Large mackerel offshore primarily prey upon euphausiids, but also on small fishes. Large predators, such as tuna and billfish, and some marine mammals, like seals and sea lions, prey upon jack mackerel.

Pacific mackerel is primarily a southern species but may range north to the central Oregon coast, especially in warm water years.

Pacific (Chub) Mackerel (*Scomber japonicus*) is a coastal pelagic species (CPS) and one of three spawning stocks along the Pacific coasts of the US and Mexico. Only the northeastern Pacific stock extending northward from Punta Abreojos, Baja California is harvested by US fishers and managed by the Council. This stock is common from Monterey Bay to Cabo San Lucas. Pacific mackerel usually occur within 20 miles of shore, but have been taken as far offshore as 250 miles. Adults inhabit water ranging from 10°C to 22.2°C and they may move north in summer and south in winter between Tillamook, Oregon and Magdalena Bay, Baja California. They are found from the surface to depths of 300 meters and commonly occur near shallow banks. Juveniles are found off sandy beaches, around kelp beds, and in open bays. Larvae are found in water around 14°C. Pacific mackerel often school with other pelagic species, particularly jack mackerel and Pacific sardine. Pacific mackerel may reach 63 cm in length and 11 years in age. Age of maturity is two to four years. Spawning peaks from late April to

July. Juvenile and adult Pacific mackerel prey upon small fish, fish larvae, squid and pelagic crustaceans. Juveniles and adults are eaten by larger fish, marine mammals, and seabirds. Pacific mackerel larvae are preyed upon by a number of invertebrate and vertebrate planktivores.

Pollock are not common off the West Coast of the U.S., but sometimes the population expands into this region. They live near the bottom on the shelf and slope.

Walleye Pollock (*Theragra chalcogramma*) are found in the waters of the Northeastern Pacific Ocean from the Sea of Japan, north to the Sea of Okhotsk, east in the Bering Sea and Gulf of Alaska, and south along the Canadian and U.S. West Coast to Carmel, California. Adult walleye pollock are generally semi-demersal species on continental shelf and slope. A variety of environmental factors, including hydrographic fronts, temperature, light intensity, prey availability, and depth determine the distribution of juveniles and adults. They are not common off the west coast, but occasionally sufficiently large enough numbers move south from Canadian waters to be targeted by west coast commercial fishers. Adults most commonly occur between 100 and 300m. Most pollock are mature by age three. Spawning takes place at depths of 50 to 300m. Walleye pollock are oviparous and females spawn several batches of eggs, usually in deep water over a short period of time. Eggs are pelagic and are found throughout the water column. Larvae and juveniles are pelagic, and are generally found in the upper water column to depths of 60m. Adults are carnivorous and feed primarily on euphausiids, small fishes, copepods, and amphipods. In some areas, cannibalism can be an important food source for adults.

Thresher shark is a large pelagic species that migrates seasonally from southern California to Oregon and Washington.

Common Thresher Shark (*Alopias vulpinus*) is a highly migratory species (HMS). It is a large pelagic shark with a circumglobal distribution. In the northeastern Pacific, it occurs from Goose Bay, British Columbia south to Baja California. Abundance is thought to decrease rapidly beyond 40 miles from the coast, although catches off California and Oregon do occur as far as 100 miles offshore. This species is often associated with areas of high biological productivity, strong frontal zones separating regions of upwelling and adjacent waters, and strong horizontal and vertical mixing of surface and subsurface waters. They may migrate north-south seasonally between San Diego/Baja Mexico and Oregon and Washington. Large adults may pass through southern California waters in early spring of the year, remaining in offshore waters from one to two months for pupping. Pups are then thought to move into shallow coastal waters. Adults then continue to follow warming water and perhaps prey northward, and by late summer, arrive off Oregon and Washington. Subadults appear to arrive in southern California waters during the early summer, and as summer progresses move up the coast as far north as San Francisco, with some moving as far as the Columbia River. In the fall, these subadults are thought to move south again. Little is known about the presumed southward migration of the large adults, which do not appear along the coast until the following spring. The common thresher shark bears live young, usually 2-4 pups. Birth is believed to occur in the spring months off California. Size and age of first maturity for females is likely between 8.5-9 feet (260-270 cm) and about 4 or 5 years old. For males, size and age of first maturity is between 8-11 feet (246-333 cm) and 3 to 6 years. This species has been variously reported to reach a maximum age of from 19 to 50 years old. Primary prey items in the diet of the common thresher shark taken in the California-Oregon drift gillnet fishery included anchovy, sardine, Pacific whiting, mackerels, shortbelly rockfish, and market squid.

Eulachon is a type of smelt that migrates from the ocean into fresh water to spawn.

Eulachon (*Thaleichthys pacificus)* range from central California to Alaska. Off the West Coast, eulachon are managed by the respective states. Eulachon are anadromous, spending most of their life in the open ocean, schooling at depths of 150 to 750 feet (46 - 229 m). They migrate to lower reaches of coastal rivers and streams to spawn in fresh water; the largest run occurs in the Columbia River, where occasionally they travel over 100 miles upriver. Eulachon may live up to five years and reach 12 inches (30.5 cm) in length. Most eulachon reach maturity in two to three years and die after spawning. Each female lays about 25,000 eggs which stick to the gravel and hatch in two to three weeks. Upon hatching, larvae begin migrating to the sea. Eulachon feed mainly on euphasiids, copepods and other crustaceans, and they are a very important food for predatory marine animals, including salmon, halibut, cod and sturgeon.

3.2.5 Protected Species

3.2.5 Protected Species

Several species of marine mammals, seabirds, sea turtles and salmon on the West Coast have been listed as threatened or endangered under the **ESA**. A species is listed as "**endangered**" if it is in danger of extinction throughout a significant portion of its range and "**threatened**" if it is likely to become an endangered species within the foreseeable future throughout all, or a significant portion, of its range. The following species are subject to the conservation and management requirements of the ESA:

Table 3.2.5. West Coast Endangered Species	
Marine Mammals	
Threatened:	
•	**Steller sea lion (*Eumetopias jubatus*) Eastern Stock,**
•	**Guadalupe fur seal (*Arctocephalus townsendi*), and**
•	**Southern sea otter (*Enhydra lutris*) California Stock.**
Seabirds	
Endangered:	
•	**Short-tail albatross (*Phoebastria (=Diomedea) albatrus*),**
•	**California brown pelican (*Pelecanus occidentalis*), and**
•	**California least tern (*Sterna antillarum browni*).**
Threatened:	
•	**Marbled murrelet (*Brachyramphs marmoratus*).**
Sea Turtles	
Endangered:	
•	**Green turtle (*Chelonia mydas*)**
•	**Leatherback turtle (*Dermochelys coriacea*)**
•	**Olive ridly turtle (*Lepidochelys olivacea*)**
Threatened:	
•	**Loggerhead turtle (*Caretta caretta*)**
Salmon	
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

Some of these species and other marine mammals and seabirds are taken incidentally in west coast groundfish fisheries and are therefore, especially relevant to bycatch issues. They are termed "emphasis species" (or species groups) for purposes of discussion of the Alternatives in Chapter 4 and include 6 marine mammals, 4 seabirds and 2 salmon species. The marine mammals are Stellar sea lion, California sea lion, northern elephant seal, harbor seal, Dall's porpoise and Pacific white-sided Dolphin. Although more than 100 species of seabirds occur along the West Coast, little information is available about the incidental take of seabirds by West Coast groundfish fisheries. Observers aboard groundfish vessels off the West Coast during August 2001-October 2002 reported four cormorants and one gull were taken by the limited entry trawl fleet. To approximate the impact of Alternatives in Chapter 4, it is assumed that any species taken by West Coast longline fisheries will be similar to the incidental takes by Alaskan longliners, for which some information is available. Seabirds taken by Alaska longliners, and considered "emphasis species" are northern fulmars, gulls, Laysan albatross, and black-footed albatross. No sea turtles are included as "emphasis species" because there is minimal take by West Coast fisheries for groundfish. Chinook (king) and coho (silver) salmon are included as emphasis species.

Life histories are described below for each of these emphasis species. More detailed information is provided in Appendix A, as well as descriptions for other marine mammals, sea birds, and sea turtles that occur on the west coast.

Sea lions and seals occur off the West Coast.

Steller (Northern) Sea Lion *(Eumetopias jubatus)* range along the North Pacific Ocean from Japan to California. Two stocks are designated in U.S. waters with the eastern stock extending from Cape Suckling, Alaska to southern California with a total of 6,555 animals off Washington, Oregon and California. They do not make large migrations, but disperse after the breeding season (late May-early July), feeding on rockfish, sculpin, capelin, flatfish, squid, octopus, shrimp, crabs, and northern fur seals.

California Sea Lion *(Zalophus californianus)* range from British Columbia south to Tres Marias Islands off Mexico. Breeding grounds are mainly on offshore islands from the Channel Islands south into Mexico. Breeding takes place in June and early July within a few days after the females give birth. The population is estimated at 214,000 sea lions. During the summer breeding season, most adults are present near rookeries principally located on the southern California Channel Islands and Año Nuevo Island near Monterey Bay. Males migrate northward in the fall, going as far north as Alaska and returning to their rookeries in the spring. Adult females generally do not migrate far away from rookery areas. Juveniles remain near rookery areas or move into waters off central California. Diet studies indicate that California sea lions feed on squid, octopus, and a variety of fishes: anchovies, sardine, mackerel, herring, rockfish, Pacific whiting, and salmon.

Harbor Seal *(Phoca vitulina richardsi)* inhabit nearshore and estuarine areas ranging from Baja California, Mexico, to the Pribilof Islands, Alaska. MMPA stock assessment reports recognize six stocks along the U.S. west coast: California, Oregon/ Washington outer coastal waters, Washington inland waters, and three stocks in Alaska coastal and inland waters. The California stock is estimated at 30,293 seals; the Oregon/ Washington Coast stock at 26,180 seals; and the Washington inland-water stock at 16,056 seals. Harbor seals do not migrate extensively, but have been documented to move along the coast between feeding and breeding locations. The harbor seal diet includes herring, flounder, sculpin, cephalopods, whelks, shrimp, and amphipods.

Several species of porpoises occur off the West Coast.

Dall's Porpoise *(Phocoenoides dalli)* are common in shelf, slope and offshore waters in the north eastern Pacific Ocean down to southern California. As a deep water oceanic porpoise, they are often sighted nearshore over deepwater canyons. These porpoise are abundant and widely distributed with at least 50,000 off California, Oregon, and Washington; however because of their behavior of approaching vessels at sea, it may be difficult to obtain an unbiased estimate of abundance. Dall's porpoise calf between spring and fall after a 10-11 month gestation period. North-south movement between California, Oregon and Washington occurs as oceanographic conditions change, both on seasonal and inter-annual time scales. Dall's porpoise feed on squid, crustaceans, and many kinds of fish including jack mackerel.

Harbor Porpoise *(Phocoena phocoena)* are small and inconspicuous. They range in nearshore waters from Point Conception, California into Alaska and do not make large scale migrations. Harbor porpoise in California are split into two separate stocks based on fisheries interactions: the central California stock, Point Conception to the Russian River, and the northern California stock in the remainder of northen California. Oregon and Washington harbor porpoise are combined into a coastal stock and there is designated an inland Washington stock for inland waterways. The most recent abundance estimates, based on aerial surveys are: central California 7,579; northern California 15,198; Oregon/ Washington coastal 44, 644; and inland Washington 3,509 harbor porpoise. There are no clear trends in abundance for these stocks. Harbor porpoise are not listed as threatened or endangered under the ESA nor as depleted under the MMPA. The average annual mortality for 1996-99 (80 harbor porpoise) is greater than the calculated PBR (56) for central California harbor porpoise; therefore, the central California harbor porpoise population is strategic under the MMPA. Although usually found in nearshore waters, distinct seasonal changes in abundance along the west coast have been noted, and attributed to possible shifts in distribution to deeper offshore waters during late winter. The harbor porpoise diet is comprised mainly of cephalopods and fishes and they prefer schooling non-spiny fishes, such as herrings, mackerels, and sardines. Harbor porpoise are very susceptible to incidental capture and mortalities in setnet fisheries. Off Oregon and Washington, fishery mortalities of harbor porpoise have been recorded in the northern Washington marine set and drift gillnet fisheries.

Pacific White-Sided Dolphin *(Lagenorhynchus obliquidens)* are abundant, gregarious and found in the cold temperate waters of the North Pacific Ocean. Along the west coast of north America they are rarely observed south of Baja California, Mexico. Aerial surveys have exceeded 100,000 white-sided dolphins over the California continental shelf and slope waters. Little is known of their reproductive biology. Longevity is not known although a 29 year old pregnant female has been reported. White-sided dolphins inhabit California waters during winter months moving northward into Oregon and Washington during spring and summer. Shifts in abundance likely represent changes in prey abundance or migration of prey species. They are opportunistic feeders and often work collectively to concentrate and feed small schooling fish including anchovies, Pacific whiting, herrings, sardines, and octopus.

Short-Beaked Common Dolphin *(Delphinus delphis)* commonly inhabit tropical and warm temperate oceans. Their distribution along the U.S. west coast extends from southern California to Chile and westward to 135° West longitude. The 1991-96 weighted average abundance estimate for California, Oregon and Washington waters based on three ship surveys is 373,573 short-beaked common dolphins. They are not endangered or threatened under the ESA nor depleted under the MMPA. The stock is not listed as strategic under the MMPA and total human-caused mortality (79) is less than the 3,188 dolphins allowed under the Potential Biological Removal formula. Reproductive activity is non-seasonal in tropical waters with peaked calving in spring and summer in more temperate waters. Short-beaked common dolphins feed nearshore on squid, octopus and schooling fish like anchovies, hake, lantern fish, deep-sea smelt or herring. These dolphins are often seen in very large schools of hundreds or thousands and are active bow riders. Common dolphin mortality has been estimated for set gillnets in California; however, the two species (short-beaked and long-beaked) were not reported separately. Short-beaked common dolphins have been reported as a bycatch in some trawl fisheries.

Long-Beaked Common Dolphin *(Delphinus capensis)* were recognized as a distinct species in 1994. Their distribution overlaps with the short-beaked common dolphin, although they are more typically observed in nearshore waters. The 1991-96 weighted average abundance estimate for California, Oregon and Washington waters based on three ship surveys is 32,239 long-beaked common dolphins. They are not endangered or threatened under the ESA nor depleted under the MMPA. The stock is not listed as strategic under the MMPA and total human-caused mortality (14) is less than the 250 dolphins allowed under the Potential Biological Removal formula. Reproductive activity is similar to short-beaked: non-seasonal in tropical waters with peaked calving in spring and summer in more temperate waters. Long-beaked common dolphins feed nearshore on squid, octopus and schooling fish like anchovies or herring. They are also active bow riders and break the water surface frequently when swimming in groups averaging 200 animals. Common dolphin mortality has been estimated for set gillnets in California; however, the two species (short-beaked and long-beaked) were not reported separately. Long-beaked common dolphins have been reported as a bycatch in some trawl fisheries.

Northern Elephant Seal *(Mirounga angustirostris)* range from Mexico to the Gulf of Alaska. Breeding and whelping occurs in California and Baja California, during winter and early spring on islands and recently at some mainland sites. The population was estimated at 127,000 elephant seals in the U.S. and Mexico during 1991. The population is growing and fishery mortality may be declining, and the number of pups born may be leveling off in California during the last five years.

Northern elephant seals are polygynous breeders with males forming harems and defending them against other mature males in spectacular battles on the beach. Female give birth in December and January, mate about three weeks later, after which the pups are weaned. They feed mainly at night in very deep water to consume whiting, skates, rays, sharks, cephalopods, shrimp, euphasiids, and pelagic red crab. Males feed in waters off Alaska, and females off Oregon and California.

Many species of seabirds occur off the West Coast. Some are resident and some migrate through the region. Some are listed under the Endangered Species Act.

Black-Footed Albatross (*Phoebastria nigripes*) ranges throughout the North Pacific. Breeding occurs on northwestern Hawaiian Islands and Torishima Island and the species disperses from the Bering Sea south along the Pacific Coast to California. Black-footed albatross is the most numerous albatross species along the Pacific Coast and is present throughout the year. The global black-footed albatross population is estimated at about 56,500 breeding pairs and thought to be decreasing. Black-footed albatross fed on fish, sea urchins, amphipods, and squid; foraging is done at night and prey is caught at the ocean's surface. This species will also follow fishing vessels and feed on discard.

Laysan Albatross (*Phoebastria immutabilis*) is the most abundant North Pacific albatross species. The vast majority of the Laysan albatross population breeds on the northwestern Hawaiian Islands, fewer numbers breed on the Japanese Ogasawara Islands, and still fewer pairs breed on islands off Baja California, Mexico (Guadalupe Island, Alijos Rocks, and in the Revillagigedo Islands). When at sea, the Laysan albatross ranges from the Bering Sea, to California, to Japan. Surveys at three sites indicate breeding populations total about 400,000 breeding pairs, but this represents an average decline of 3.2% per year since 1992. Laysan albatross feed on schooling fish and squid at the ocean's surface.

Cormorants that occur along the Pacific Coast include Brandt's cormorant (*Phalacrocorax penicillatus*), double-crested cormorant (*Phalacrocorax auritus*), and pelagic cormorant (*Phalacrocorax pelagius*).Brandt's cormorants are by far the most abundant cormorant species nesting along the coast of Oregon and California. Brant's cormorants are typically found in inshore, coastal areas, especially in areas having kelp beds, brackish bays, sheltered inlets, and quiet bays. Brandt's cormorant usually nests on offshore islands or, less frequently, on inaccessible mainland bluffs and wide cliff ledges near the water. Resident throughout the year near nesting areas, birds range more widely during non-breeding periods. Double-crested cormorants are widespread and breeding populations along the Pacific Coast seem to be increasing in number. They can be found along seacoasts, marine islands, coastal bays, swamps, lagoons, rivers, and lakes. Along the coast, they nest on offshore rocks and islands, exposed dunes, abandoned wharf timbers, and power poles. Birds are usually found within a few hours of their roosting or breeding sites. Breeding populations of pelagic cormorants are relatively evenly distributed from Washington to California and in recent years, populations have been increasing in number. Pelagic cormorants occur in outer coastal habitats, bays, and inlets, especially in rock-bottom habitats and often in water less than 100 m and within 1 - 2 km of shore. These birds will often nest with other pelagic cormorants or near other species of seabirds. Nesting occurs on island cliff ledges, crevices, and in sea caves by building nests out of seaweed. Cormorants are classified as diving birds; their strong swimming ability enables them to pursue and capture their prey underwater. Their diet includes small fishes, squid, crabs, marine worms, and amphipods.

Northern fulmar *(Fulmarus glacialis)* ranges along the Pacific Coast from Alaska to Oregon and they are primarily pelagic. The estimated total population of northern fulmars in the North Pacific is between 3 and 3.5 million individuals. This species primarily breeds in Alaska at colonies on sea cliffs and, less frequently, on low, flat rocky islands. Northern fulmars show strong mate and nest site fidelity. Nests are often raided by weasels and gulls. Northern fulmars are surface feeders, they swim or float upon the ocean's surface while feeding on organisms found just below the surface. The diet of this species includes fishes, mollusks, crustaceans, and cephalopods. Northern fulmars have also been observed following fishing vessels, presumably to feed on offal.

Gulls (*Larus* spp.) that occur along the Pacific Coast include the glaucous gull (*Larus hyperboreus*), glaucous-winged gull (*Larus glaucescens*), western gull (*Larus accidentalis*), herring gull (*Larus argentatus*), California gull (*Larus californicus*), Thayer's gull (*Larus thayeri*), ring-billed gull (*Larus delawarensis*), mew gull (*Larus canus*), Heermann's gull (*Larus heermanni*), Bonaparte's gull (*Larus philadelphia*), and Sabine's gull (*Larus sabini*). For most marine-nesting species in the North Pacific, only rough estimates of nesting populations exist and reproductive success has only been investigated for one to two years. However, it is thought that most gull populations along the Pacific Coast are stable and not considered to be at risk. Most gulls along the Pacific Coast occur during the non-breeding season or are non-breeding individuals. Birds can be found at sea, along the coast, on rocky shores or cliffs, bays, estuaries, beaches, and garbage dumps. Only two species of gulls breed along the Pacific Coast. The glaucous-winged gull has breeding colonies in British Columbia and Washington and the western gull has breeding colonies in California (most are located on the Farallon Islands), Oregon, and Washington. Breeding habitat for these gulls includes coastal cliffs, rocks, grassy slopes or offshore rock or sandbar islands. Pacific Coast gulls feed at the ocean's surface and their diet typically includes fishes, mollusks, crustaceans, carrion, and garbage.

Chinook and coho salmon are important species in the West Coast ecosystem. Ocean conditions are critical to their abundance and distribution.

Chinook (King) Salmon (*Oncorhynchus tshawytscha*) range widely throughout the north Pacific Ocean and the Bering Sea, and as far south as the U.S./Mexico border. After leaving the freshwater and estuarine environment, juvenile chinook disperse to marine feeding areas. Some tend to be coastal-oriented, preferring protected waters and waters along the continental shelf. In contrast, others pass quickly through estuaries, are highly migratory, and may migrate great distances into the open ocean. Chinook salmon typically remain at sea for one to six years. They have been found in ocean waters. They are most abundant at depths of 30-70m and often associated with bottom topography. However, during their first several months at sea, juveniles are predominantly found at depths less than 37 m and are distributed in the water column. Juvenile chinook are generally found within 55 km of the U.S. west coast, with the vast majority of fish found less than 28 km offshore. Concentrations may be found in areas of intense upwelling. The historic southern edge of their marine distribution appears to be near Point Conception, California. Throughout their range, adult chinook salmon enter freshwater during almost any month of the year. For example, chinook enter the Columbia River between March and November and the Sacramento River between December and July. Chinook salmon mature at a wide range of ages, from two to eight years. Most adult females are 65-85 cm in length and males are 50-85 cm, although fish larger than 100cm are not uncommon. Chinook salmon are the most piscivorous of the Pacific salmon. Fish make up the largest part of their diet, but squids, pelagic amphipods, copepods, and euphausiids are also important.

Coho (Silver) Salmon (*Oncorhynchus kisutch*), also called silver salmon, are a commercially and recreationally important species. They are found in small rivers and streams throughout much of the Pacific Rim, from central California to Korea and northern Hokkaido, Japan. Coho salmon spawn in freshwater streams, juveniles rear for at least one year in fresh water and spend about 18 months at sea before reaching maturity as adults. North American populations are widely distributed along the Pacific coast and spawn in tributaries to most major river basins from the San Lorenzo River in Monterey Bay, California, to Point Hope, Alaska. Two primary dispersal patterns have been observed in coho salmon after emigrating from freshwater. Some juveniles spend several weeks in coastal waters before migrating northwards into offshore waters of the Pacific Ocean while others remain in coastal water near their natal stream for at least the first summer before migrating north. The latter dispersal pattern is commonly seen in coho salmon from California, Oregon, and Washington. Coho salmon rarely use areas where sea surface temperature exceeds 15° C and are generally found within the uppermost 10 m of the water column. While juvenile and maturing coho are found in the open north Pacific, the highest concentrations appear to be found in more productive waters of the continental shelf within 60 km of the coast. Adults enter fresh water during October and November in Washington and Oregon and during December and January in California. Marine invertebrates, such as copepods, euphausiids, amphipods, and crab larvae, are the primary food when coho first enter salt water. Fish represent an increasing proportion of the diet as coho grow and mature.

3.2.6 Miscellaneous Species

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Commercial and recreational fisheries for groundfish take various fish, including finfish, shellfish, corals and other invertebrates. There is little information about the amounts or distribution of such bycatch. Although gear size and configuration and fishing operations are not the same as for commercial fisheries, information available from groundfish assessment surveys with bottom trawl gear can give an indication of the potential types of bycatch of benthic animals. In these surveys, a variety of benthos are taken, including sea urchins, starfish, snails, octopuses, various crustaceans and small fishes. At times, coral, sponges, and other animals may be taken or damaged during fishing (and survey) operations, but the distributions of these benthic animals are poorly known on the West Coast. Pot and longline fisheries may also take some of these animals, but little is known about this bycatch.

3.2.7 Biological Associations

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Most bottom-dwelling groundfish are currently managed based on distinction between nearshore, continental shelf, and continental slope species. For example, rockfishes are managed as assemblages of species grouped into nearshore, shelf, and slope categories [SAFE, 2002]. These categories reflect differences in fisheries catch compositions and are based primarily on depth which, in combination with distance from shore, roughly characterizes ecological zones. In addition, groundfish that live higher in the water column are managed differently than those living on the bottom. Some groundfish, such as Pacific whiting and shortbelly rockfish inhabit midwater along the coast. For many species, the biogeographic zone varies by life history stage; many groundfish produce pelagic larvae, and juveniles of many species are more commonly found in nearshore areas than as adults. These biogeographic zones also have a north south component, with Cape Mendocino representing an important break in the distribution of many groundfish species (particularly rockfish), hence the use of the 40°10' N line of latitude to separate northern and southern management regions. Finally, particular species may exhibit seasonal migrations, producing some annual variation in the characteristics of these different ecological zones. The nearshore, shelf, slope and pelagic environments can be characterized by combinations of the habitats described below, the species associations (and life stages) particular to these environments, and the trophic relationships between these species. Biological associations are dynamic, changing with time of day, season, life history stage, prey availability, mating opportunities, and environmental variables. Within each of the five regional environments, species associations also vary with depth and latitude. Of necessity, characterization of biological associations in the following sections provides only broad generalizations based on the available information. Most of the information also only pertains to adults; references to other life stages are noted as such.

Non-groundfish species, including other finfish, shellfish, marine mammals, marine birds, and sea turtles, also occupy specific biogeographic zones, often similar to those occupied by various groundfish species. For example, ocean shrimp and Pacific halibut co-occur with several flatfish species on the northern shelf. Marine mammal communities are pelagic, but some are found primarily in nearshore waters, whereas others are more common over the shelf or slope. Sea turtles occur in midwater and sea birds are found primarily in or near surface waters all along the west coast.

Information collected to understand biological associations of West Coast groundfish comes primarily from three sources: fishing activities, research surveys, and research studies. All of the means to collect information have limitations for the purpose of characterizing biological associations. Fishing, survey activities and research studies are often quite limited by gear selectivities, and temporal and spatial scales. Consequently, our understanding of biological associations and ecological relationships for West Coast groundfish is very incomplete.

3.2.7.1 Northern Shelf Environment

The boundaries of the northern shelf environment are 40° 10' N. Lat. (Cape Mendocino) on the south and the US/Canada border to the north, and between 20 and 109 fm, up to 5.5 fm off the sea floor.

Emphasis species that commonly occur on the northern shelf include four overfished groundfish species, as well as arrowtooth flounder, English sole, yellowtail rockfish, Pacific halibut and ocean shrimp. The overfished groundfish species are lingcod, canary rockfish, yelloweye rockfish, and bocaccio. Associations among these and other species, as well as habitat on the northern shelf, are more fully described below.

Marine mammals, marine birds, and sea turtles may only occasionally occur near the bottom on the northern shelf and are not considered in the northern shelf environment. These species are considered as part of the pelagic environment (Section 3.2.7.4).

Habitat Off the West Coast, the continental shelf generally broadens from south to north. It widens from a few miles at Cape Mendocino to about 50 miles off northern Washington and generally slopes gently westward. Bordering the nearshore zone, the shelf extends seaward to about 100 fm.

The shoreward edge of the shelf off Oregon is usually composed of soft substrates, primarily sand or green mud. This expanse of soft substrate is interrupted by prominent rocky banks, especially at the seaward edge of the shelf. These banks, such as Heceta Bank, Coquille Bank, Daisy Bank and Stonewall Bank, contain unique habitats formed by varied combinations of rock ridges, boulders, cobbles and pebbles. For example, submersible operations at Heceta Bank showed that diagonally stacked ridges are separated by sand, pebble, and cobble-filled depressions. A narrow band of precipitous pinnacles is located on the edge of the bank and large, round boulders are found on the eastward slope, which gradually fades to cobble and finally mud. In comparison, Coquille Bank is comprised largely of siltstone and mudstone and characterized by eroded, flat, slab-like boulders which were mostly covered by a layer of silt. No rocky ridges were observed on the bank (ODFW, 1994).

Off Washington, broad fans of gravel created by retreating glaciers from the northern Cascade and Olympic mountains, produce structural habitat on the seafloor. Similarly, empty shells from mussels and gastropods, and deposits of other biogenic debris, such as coral skeletons, sponge spicules, urchin tests, and worm tubes, provide some shelter for fish and attachment substrate for invertebrates.

Submarine canyons, such as Astoria Canyon off the Columbia River, are also prominent features of the northern shelf. Canyon habitat is structurally complex and diverse. It is characterized by vertical walls (textured with joints, fractures and overhangs), ledges, talus slopes, and the canyon floor covered with cobble, boulder and mud substrates.

Climatic conditions influence productivity; the duration and strength of winds favorable for upwelling along the west coast diminish northward. Wind velocities and upwelling are variable but tend to be at a maximum in the spring to early summer in the region between Point Conception (34.5° N) and the Oregon border (42° N). Off Washington upwelling is relatively minor and is largely restricted to the late spring to early fall; winter storms there result in intense downwelling events (CDFG, 2001).

Bottom water temperatures on the northern shelf make good habitat for sub-arctic and cold-temperate species. Summertime bottom temperatures observed during the 1986-1998 west coast triennial bottom trawl surveys ranged between about 7° C and 8.5° C (Shaw, 2000).

Biological Associations Plant life on the shelf is small and sparse. Light does not usually penetrate below 60 fm, so algae are not found below that depth (ODFW, 1994).

Non-rocky substrates are commonly utilized by ocean shrimp, sea pens, and weathervane scallops. In addition, English sole, petrale sole, arrowtooth flounder, Pacific halibut, big skate and longnose skate frequently co-occur on or very near the bottom in these areas. Hagfish also occur over soft substrates. All flatfish species inhabit the non-rocky substrates on the northern shelf (EFH appendix), but their distributions differ by depth and substrate type (e.g., mud versus sand). Although their distributions overlap, adult arrowtooth flounder, rex sole, curlfin sole, Dover sole, rock sole and petrale sole also occupy deeper waters than sand sole and starry flounder (EFH appendix). Sablefish (particularly juveniles), spiny dogfish, ratfish and soupfin shark also cruise over these soft bottom habitats, in search of prey. Some nearshore species, such as blue rockfish, and deeper dwelling species like yellowtail rockfish, Pacific Ocean perch and Pacific whiting move into these areas to feed.

Banks create locally shallow areas in the otherwise deeper water of the shelf and are highly productive. Rocky substrates are often covered with a distinct and diverse suite of invertebrate species including sponges, corals, anemones, crinoids, hydroids, tunicates, bryozoans, tube worms, mussels, and other animals. These creatures form a structurally complex environment for other animals, such as brittle stars, shrimp, clams, mussels, barnacles, worms, crabs and fishes.

Common fish species in rocky habitats on the northern shelf include yellowtail, canary, sharpchin, greenstriped, pygmy and rosethorn rockfishes, kelp greenling, and lingcod. Many juvenile rockfishes inhabit these areas, and at Heceta Bank, dense schools above the shallower rocky ridges have been observed. These isolated rocky areas may serve as nursery grounds especially in areas where other suitable nursery habitat is unavailable.

Common fish and invertebrates seen in submersible operations at various habitat types on Heceta Bank and Coquille Bank are summarized in the following table (ODFW, 1994).

Table 3.2.7.1-1 Species observed in submersible operations at Heceta and Coquille Bank.

NEARSHORE-SAND & GREEN MUD	ROCK RIDGE & PINNACLES	BOULDER-COBBLE	MUD
English sole petrale sole rex sole slender sole hagfish ocean shrimp sea pens scallops	juvenile rockfishes yellowtail rockfish widow rockfish basketstars anemones coral sponges crinoids	pygmy rockfish sharpchin rockfish juvenile rockfishes yellowtail rockfish canary rockfish widow rockfish rosethorn rockfish lingcod greenling yelloweye rockfish bocaccio crinoids sponges anemones shrimp sea cucumbers sea stars octopus	Dover sole rex sole slender sole sablefish thornyheads splitnose rockfish ratfish poachers eelpouts hagfish fragile urchins sea cucumbers snails sun stars brittle stars euphausiids box crabs hermit crabs

Species associations vary during the year, generally related to feeding, growth, and reproduction. Many species make seasonal spawning migrations; for example, female lingcod move to shallow water during the winter to lay their eggs in nests. Dover sole and sablefish are common on the continental slope but make seasonal migrations onto the shelf. Juveniles of many groundfish species also move to deeper areas as they grow and take advantage of new prey sizes and species.

As on rocky banks, invertebrates, such as crinoids, sea anemones, and sponges create additional structural habitat and diversity in submarine canyons. Information about species that commonly inhabit canyons on the northern shelf is very limited, although soupfin sharks and sablefish reportedly are associated with canyons, along with other habitats (See EFH appendix).

Emphasis Species Canary, yellowtail, widow and silvergray rockfish, lingcod and sablefish are frequently associated. Although widow rockfish often occur near bottom, they more commonly inhabit midwaters and are considered a component of the pelagic complex (Section 3.2.7.4).

Yelloweye rockfish are generally a solitary, rocky reef fish. Researchers have observed adult yelloweye rockfish associated with bocaccio, cowcod, greeenspotted, and tiger rockfish (Appendix A).

Adult bocaccio have two primary habitat preferences: some are semipelagic, forming loose schools above rocky areas; and some are non-schooling, solitary individuals (EFH appendix). Solitary bocaccio have been found in association with large sea anemones. Bocaccio are often caught with chilipepper rockfish and have been observed schooling with speckled, vermilion, widow and yellowtail rockfish (Appendix A).

English sole, petrale sole, arrowtooth flounder, Pacific halibut, big skate and longnose skate frequently co-occur. Although distributions of English sole and arrowtooth flounder overlap, arrowtooth flounder are much more abundant at deeper depths in the northernmost areas, especially off Cape Flattery, Washington. English sole are most common in the shallower waters all along the shelf. Although fishing and survey reports indicate Pacific halibut frequently occur at Heceta and other banks on the northern shelf, they probably occupy areas of low-relief and soft substrates on these banks.

Ocean shrimp are associated with green mud and muddy-sand bottoms and are important prey for many species. Arrowtooth flounder, petrale sole, sablefish, and Pacific whiting are some of the groundfish that prey heavily on ocean shrimp. Predation by whiting may affect the abundance of ocean shrimp (Appendix A).

The list of common groundfish species inhabiting rocky and non-rocky substrates in the Northern Shelf Environment is presented in Table 3.2.7.5-1 below. Other relevant fish and shellfish species to groundfish bycatch on the northern shelf are also included in the list.

Table 3.2.7.1-2 Species associations in the **Northern Shelf Environment**. Emphasis species are shown in bold; minor species are not included.

ROCKY SUBSTRATES	NON-ROCKY SUBSTRATES
Lingcod	**Arrowtooth Flounder**
Canary Rockfish	**English Sole**
Yelloweye Rockfish	**Pacific Halibut**
Yellowtail Rockfish	**Ocean Shrimp**
Bocaccio	Sablefish
Chilipepper Rockfish	Dover Sole
Greenstriped Rockfish	Pacific Sanddab
Redstripe Rockfish	Petrale Sole
Rosethorn Rockfish	Rex Sole
Silvergray Rockfish	Sand Sole
Tiger Rockfish	Soupfin Shark
Vermilion Rockfish	Spiny Dogfish
Spiny Dogfish	Big Skate
Ratfish	Dungeness Crab
Spot Prawn	

3.2.7.2 Southern Shelf Environment

The boundaries of the southern shelf environment are 40°10' N. Lat. (Cape Mendocino) on the north and the US/Mexico border to the south, and between 20 and 109 fm, up to 5.5 fm off the sea floor.

Emphasis species that commonly occur on the southern shelf include two overfished species, as well as chilipepper rockfish and ridgeback prawn. The overfished groundfish species are bocaccio and cowcod. Associations among these and other species, as well as habitat on the southern shelf, are more fully described below.

Marine mammals, marine birds, and sea turtles may only occasionally occur near the bottom on the southern shelf and are not considered in the southern shelf environment. These species are considered as part of the pelagic environment (Section 3.2.7.4).

Habitat The continental shelf diminishes southward along the California coast, from its widest (about 50 nm) at Cape Mendocino to its narrowest, only a few miles wide along the Southern California Bight. The shelf also forms very narrow rings around several islands in the Southern California Bight which rise sharply from the deep sea floor.

The southern shelf is comprised of similar substrate types as the northern shelf, although species assemblages are often different, largely due to the warmer waters south of Cape Mendocino. In addition to banks, reefs, and sandy or muddy bottoms like those described for the north, canyons are a prominent feature of the shelf. Submersible observations at depths from 40 to 150 fm in Soquel Canyon, Monterey Bay revealed a structurally diverse habitat, comprised of vertical walls (with joints, fractures, and overhangs), ledges, talus slopes, and a canyon floor with cobble, boulder and mud substrates. Invertebrates such as crinoids, sea anemones, and sponges create additional structural diversity.

Biological Associations Many of the species that co-occur on rocky and non-rocky substrates on the northern shelf similarly co-occur on the southern shelf, particularly between Cape Mendocino and the Southern California Bight. Redstripe, rosethorn, and silvergray rockfish are minor species associated with rocky substrates on the southern shelf but are considered more important on the northern shelf. In contrast, greenblotched, greenspotted, and Mexican rockfish and California scorpionfish are important species associated with rocky substrates on the southern shelf, but not in the north. Non-rocky substrates are more abundant on the northern shelf and consequently, flatfishes and ocean shrimp are typically more important in the north.

Submersible observations of benthic rockfishes in Soquel Canyon revealed six distinct habitat guilds. In general, small species were associated with mud and cobble substrates of low relief and larger species were associated with high-relief habitat (Table 3.2.7.2-1). Some of these guilds observed at Soquel Canyon were remarkably similar to observations at several other sites along the Pacific Coast from Central California to Alaska. Sedentary fishes, such as bocaccio, lingcod, cowcod, greenblotched, greenspotted and yelloweye rockfish, were primarily sheltered under ledges, in crevices, and among large sea anemones on an isolated rock outcrop (Yoklavich, *et al.* 2000).

Table 3.2.7.2-1 Main habitat guilds observed in Soquel Canyon (from Yoklavich, *et al.* 2000.

Mud	Cobble-Mud Mud-Pebble	Mud-Cobble Mud-Rock	Boulder-Mud	Mud-Boulder Rock-Mud Rock Ridge	Rock-Boulder
Stripetail R Dover sole Agonidae Shortspine Th	Halfbanded R Greenstriped R Greenspotted R Pygmy R	Stripetail R Rosethorn R Agonidae Greenspotted R Greenstriped R	Rosethorn R Greenspotted R Bocaccio	Bocaccio Rosethorn R Greenspotted R	Pygmy R Bocaccio

Emphasis Species Bocaccio occur in a wide variety of habitats: often on or near bottom features but sometimes over muddy bottoms. Adult bocaccio are often caught with chilipepper rockfish and have been observed schooling with speckled, vermilion, widow and yellowtail rockfish. Chilipepper rockfish occur over the lower shelf and upper slope at depths between 41 and 168 fm. They are semi-pelagic and are found on deep rocky reefs as well as sand and mud bottoms. At times, they form large schools. Adult cowcod inhabit the lower shelf and upper slope, primarily at depths between 82 and 164 fm in the Southern California Bight. They are often found on bottoms with high relief such as rocky reefs. A cowcod conservation area encompassing most of their known habitat was established to provide protection to this overfished species. Ridgeback prawns occur only south of Monterey, California, at depths ranging from 24 to 87 fm. They inhabit substrates of sand, shell and green mud. Species associations for common groundfish and other species in the Southern Shelf Environment are listed in Table 3.2.7.2-2.

Table 3.2.7.2-1 Species associations in the **Southern Shelf Environment**. Emphasis species are shown in bold; minor species are not included.

ROCKY SUBSTRATES	NON-ROCKY SUBSTRATES
Bocaccio	**Ridgeback Prawn**
Cowcod	Sablefish
Chilipepper	California Scorpionfish
Lingcod	Dover Sole
Canary Rockfish	English Sole
Yelloweye Rockfish	Pacific Sanddab
California Scorpionfish	Petrale Sole
Greenblotched Rockfish	Rex Sole
Greenspotted Rockfish	Spiny Dogfish
Greenstriped Rockfish	Big Skate
Mexican Rockfish	Pacific Halibut
Tiger Rockfish	Dungeness Crab
Vermilion Rockfish	
Yellowtail Rockfish	
Spiny Dogfish	
Ratfish	
Spot Prawn	

3.2.7.3 Slope Environment

The slope environment is bounded by the US/Canada and US/Mexico borders to the north and south, respectively, and depths greater than 109 fm, up to 11 fm off the sea floor. The slope extends westward onto the deep continental basin (>1000 fm), which covers most of the EEZ.

Emphasis species that commonly occur on the slope include two overfished species, as well as Dover sole, sablefish, shortspine thornyhead, longspine thornyhead, and spot prawn. The overfished groundfish species are darkblotched rockfish and Pacific ocean perch. Associations among these and other species, as well as habitat on the slope, are more fully described below.

Marine mammals, marine birds, and sea turtles may only occasionally occur near the bottom on the slope and are not considered in the slope environment. These species are considered as part of the pelagic environment (Section 3.2.7.4).

Habitat The continental slope forms a narrow, steep strip at the seaward edge of the continental shelf. Except for the Southern California Bight, the slope drops rapidly from approximately 100 fm to 1,000 fm, less than 50 miles from shore. The islands of the Southern California Bight rise sharply from depths of about 1,000 fm. Beyond 1,000 fm, the bottom gradually slopes downward, to depths of 2,000 fm to form the continental basin which comprises most of the EEZ.

Relatively little is known about bottom types and their distributions on the continental slope. Descriptions of bottom type have been generally identified as "hard" or "soft," often based on experiences with bottom gear during fishing operations. An oxygen minimum zone occurs on the deep slope; thornyheads spawn in this zone at about 300-500 fm.

Biological Associations Little is known about biological associations on the deep, steep slope. Most information comes from co-occurrence of species in fisheries catches. Aurora, bank, blackgill, rougheye, sharpchin, shortraker and yellowmouth rockfish are considered important slope groundfish species on hard bottom. Bank, redbanded, rougheye, and splitnose are also important groundfish species on soft bottom. Bronze-spotted, chilipepper, greenblotched, redstripe, rosethorn, and stripetail rockfish occur on the slope, but are not a major component of fisheries catches. Other groundfish including petrale sole, rex sole, finescale codling and Pacific rattail are also considered minor species on the slope. Little is known about other fish and shellfish species on the slope, except spot prawns. Spot prawns typically inhabit rocky or hard bottoms, including reefs, coral or glass-sponge beds and the edges of marine canyons.

Emphasis Species Dover sole, shortspine thornyhead, longspine thornyhead, and sablefish comprise a deepwater assemblage (DTS) managed as a complex under the FMP. These species occur primarily over soft bottom on the slope. Shortspine thornyhead also co-occur with Pacific ocean perch, darkblotched, splitnose, redbanded and rougheye rockfishes.

Pacific ocean perch occur on the upper slope (109-150 fm) during the summer and somewhat deeper (164-246 fm) during the winter. Adults sometimes aggregate up to 16 fm above hard-bottom features and my then disperse and rise into the water column at night. Most adult darkblotched rockfish are associated with hard substrates on the lower shelf and upper slope at depths between 77 and 200 fm. As mentioned above, spot prawns are also associated with hard bottoms.

The list of common groundfish species inhabiting hard and soft substrates in the Slope Environment is given in Table 3.2.7.3 below. Other fish and shellfish species relevant to groundfish bycatch are also included.

Table 3.2.7.3-1 Species associations in the **Slope Environment**. Emphasis species are shown in bold; minor species are not included.

HARD SUBSTRATES	SOFT SUBSTRATES
Pacific Ocean Perch	**Sablefish**
Darkblotched Rockfish	**Longspine Thornyhead**
Spot Prawn	**Shortspine Thornyhead**
Aurora Rockfish	**Dover Sole**
Bank Rockfish	Bank Rockfish
Blackgill Rockfish	Redbanded Rockfish
Rougheye Rockfish	Rougheye Rockfish
Sharpchin Rockfish	Splitnose Rockfish
Shortraker Rockfish	
Yellowmouth Rockfish	

3.2.7.4 Pelagic Environment

The pelagic environment includes waters overlying the slope, shelf, and nearshore environments, all along the West Coast EEZ. Emphasis species that commonly occur in the pelagic environment include two overfished species, as well as market squid, mackerels, sharks, Eulachon, and 16 protected species/species groups. The overfished groundfish species are widow rockfish and Pacific whiting. The protected species include Stellar sea lion, California sea lion, harbor seal, harbor porpoise, Dall's porpoise, Pacific white-sided dolphin, short-beaked common dolphin, long-beaked common dolphin, northern elephant seal, black-footed albatross, Laysan albatross, cormorants, northern fulmar, gulls, chinook salmon and coho salmon.

Habitat The California Current System and climate are the most influential factors in determining the diversity and distribution of marine life in the pelagic environment. Currents and climate off the West Coast are briefly described earlier in Section 3.1. The California current generally moves from north to south along the West Coast, transporting cooler water toward the equator. It flows near the coast north of Point Conception during most of the year, except in winter when southeast winds force it farther offshore, producing the Davidson Current that flows north near the coast. In some years, this counter current is stronger than normal and is forced as far north as British Columbia, Canada. South of Point Conception, in the Southern California Bight, the coast bends sharply to the east. There the California Current breaks away from the coast and flows offshore along the continental edge until it swings back toward the mainland south of San Diego. In the Southern California Bight, the usual surface flow, called the California Countercurrent, moves north along the coast resulting in a counterclockwise gyre that mixes offshore and nearshore surface waters off southern California (CDFG 2001).

Temperature is the most commonly correlated climatic variable used to determine associations with biological processes. The colder, northern waters are good habitat for sub-arctic and cold-temperate species, such as Dungeness crab, Pacific salmon, and petrale sole. The warmer, southern waters are suited to warm-temperate and sub-tropical species, such as California halibut and spiny lobster. The offshore environment is often more stable than nearshore and estuarine environments, where the distribution of warm and cold waters can be highly variable. For example, average monthly sea surface temperatures offshore of San Francisco indicate a distinct summer upwelling pattern with cold sea surface temperatures nearshore, as well as large yearly variations. Within this strong upwelling cell, sea surface temperatures can be colder during the summer in cold years than they are during the winter in warm years (CDFG 2001). Local physical processes including intense winds, extended periods of calm, infusions of freshwater runoff, and currents also greatly affect the growth, survival and distribution of many marine species. In addition, seasonal-scale influences are so important to many species that their life cycle is often largely adapted to these seasonal cycles.

Biological Associations Many marine species in the pelagic environment are sub-arctic and cold-temperate species, others are warm-temperate or sub-tropical and still others prefer nearshore areas, perhaps living on land at times. In addition, some pelagic species commonly occur all along the West Coast.

Consequently, these species are grouped into northern offshore, southern offshore, and/or nearshore categories to approximate species associations.

Few groundfish species are considered pelagic: Pacific whiting, Pacific cod, widow rockfish, shortbelly rockfish, soupfin shark, leopard shark and spiny dogfish. Some marine mammals are residents (e.g., seals, California sea lions) and others are migrants (gray and humpback whales). Groundfish species provide an important prey source for most marine mammals. Seabirds can search large expanses of the ocean for prey and generally take the most abundant and high energy prey available, especially sardines, herring, smelt, anchovies, squid, some crustaceans and juveniles of many larger fish species. Some seabirds feed near the surface, especially on large fish schools, and others may dive for their prey. More detailed information about the life histories and distributions of the numerous seabirds and marine mammals found on the West Coast is provided in Appendix A. Although protected species are wide-ranging, their distributions have been categorized as primarily northern offshore, southern offshore and/or nearshore and included in the species associations listed in Table 3.2.7.4 for the Pelagic Environment.

Emphasis Species Pacific whiting forms very large aggregations and migrates long distances between feeding grounds off the northern coast and winter spawning grounds off southern California. Pacific whiting and widow rockfish can co-occur; midwater trawl fisheries for Pacific whiting also catch widow rockfish and sometimes small quantities of canary, darkblotched, and yelloweye rockfish, Pacific ocean perch, and lingcod. Widow rockfish sometimes form large schools, sometimes associated with bottom features. At other times, they may be dispersed in mid waters or on the bottom. Adults are often caught with yellowtail rockfish off Washington.

Relevant species of other fish, shellfish, and squid include jack mackerel, Pacific mackerel, market squid, and walleye pollock. Fisheries for these species may take groundfish species, especially some overfished species, vice versa. In addition, the coastal pelagic species provide an important prey source for Pacific whiting and other marine species. At times, fisheries for Pacific whiting have taken chinook and coho salmon as bycatch and pelagic sharks, such as the common thresher shark, may be vulnerable to capture in groundfish fisheries.

The list of common groundfish species inhabiting offshore and nearshore waters in the Pelagic Environment is given in Table 3.2.7.4 below. Other fish and shellfish species relevant to groundfish bycatch are also included. All of the protected species of salmon, marine mammals, sea turtles, and sea birds that have been identified as potentially vulnerable as bycatch (takes) in groundfish fisheries off the West Coast are included in this list.

Table 3.2.7.4-1 Species associations in the **Pelagic Environment**. Emphasis species are shown in bold; minor species are not included.

NORTHERN OFFSHORE	SOUTHERN OFFSHORE	NEARSHORE
Widow Rockfish	**Widow Rockfish**	**Jack Mackerel**
Pacific Whiting	**Pacific Whiting**	**Pacific Mackerel**
Jack Mackerel	**Market Squid**	**Chinook Salmon**
Walleye Pollock	**Jack Mackerel**	**Coho Salmon**
Thresher Shark	**Pacific Mackerel**	**California Sea Lion**
Chinook Salmon	**Thresher Shark**	**Harbor Seal**
Coho Salmon	**Stellar Sea Lion**	**Dall's Porpoise**
Stellar Sea Lion	**California Sea Lion**	**Harbor Porpoise**
California Sea Lion	**Dall's Porpoise**	**Long-Beaked Common Dolphin**
Dall's Porpoise	**Harbor Porpoise**	**Black-Footed Albatross**
Harbor Porpoise	**Pacific White-Sided Dolphin**	**Brandt's Cormorant**
Pacific White-Sided Dolphin	**Short-Beaked Common Dolphin**	**Double-Crested Cormorant**
Northern Elephant Seal	**Northern Elephant Seal**	**Pelagic Cormorant**
Black-Footed Albatross	**Black-Footed Albatross**	**Glaucous Gull**
Laysan Albatross	**Laysan Albatross**	**Glaucous-Winged Gull**
Northern Fulmar	**California Gull**	**Western Gull**
California Gull	**Bonaparte's Gull**	**Herring Gull**
Bonaparte's Gull	Shortbelly Rockfish	**California Gull**
Shortbelly Rockfish	Soupfin, Blue, and Shortfin Mako Sharks	**Thayer's Gull**
Soupfin and Blue Sharks	Spiny Dogfish	**Ring-Billed Gull**
Spiny Dogfish	Chinook and Coho Salmon	**Mew Gull**
Eulachon	Guadalupe and Northern Fur Seals	**Heerman's Gull**
Northern Fur Seal	Risso's Dolphin	**Bonaparte's Gull**
Risso's Dolphin	Short-Finned Pilot, Gray, Minke,	**Sabine's Gull**
Short-Finned Pilot, Gray,	Humpback, Blue, Fin, Killer, and	Soupfin Shark
Minke, Sperm, Humpback,	Sei Whales	Spiny Dogfish
Fin, and Killer Whales	Loggerhead, Green, Leatherback, and Olive	Pacific Angel Shark
Leatherback Sea Turtle	Ridley Sea Turtles	Pacific Herring
Short-Tailed Albatross	Short-Tailed Albatross	Eulachon
Arctic, Common, and	Arctic, Common, and Black Terns	Southern Sea Otter, Sea Otter
Black Terns	Marbled, Craveri's, Xantu's and	Risso's Dolphin
Marbled, Xantu's, and	Ancient Murrelets	Fin and Killer Whales
Ancient Murrelets	Black, Fork-Tailed, Ashy, Least,	California Brown Pelican
Fork-Tailed, Leach's, Sooty,	Galapagos, Wilson's and Leach's	Black, California Least, Caspian,
Short-Tailed, Pink-Footed,	Storm-Petrels	Forster's, Gull-Billed,
Flesh-Footed, and Buller's Shearwaters	Townsend, Black-Vented, Wedge-Tailed,	Royal and Elegant Terns
Pomarine, Parasitic and	Sooty, Short-Tailed, Pink-Footed, and	Marbled Murrelets
Long-Tailed Jaegers	Bugler's	Wedge-Tailed Shearwater
Black-Legged Kittiwake	Shearwaters	Parasitic Jaeger
Common Murre	Polarize, Parasitic and Long-Tailed Gaugers	Black-Legged Kittiwake
Pigeon Guillemot	Black-Legged Kittiwake	Common Murre
Parakeet, Rhinoceros, and Cassin's Auklets	Common Murre	Pigeon Guillemot
Horned and Tufted Puffins	Pigeon Guillemot	Rhinoceros Auklet
South Polar Skua	Rhinoceros and Casein's Auklets	Black Skimmer
	Horned and Tufted Puffins	
	South Polar Skua	

3.2.7.5 Nearshore Environment

The nearshore environment extends from the high tide line seaward to 20 fm, from the US/Canada border on the north to the US/Mexico border on the south. It also includes estuarine habitats along the West Coast.

Emphasis species that commonly occur nearshore include cabezon, Dungeness crab, and California halibut. Associations among these and other species, as well as habitat in the nearshore environment, are more fully described below.

Many protected species occur in the nearshore environment, but most are highly mobile and are frequently found in offshore areas, as well. To capture their wide distribution, they are considered as part of the pelagic environment (Section 3.2.7.4).

Habitat The nearshore environment is comprised of a variety of habitats ranging from high-relief rocky reefs to broad expanses of sand and mud. The diversity of physical habitat in the nearshore environment is similar to that of the continental shelf, but being shallower, sunlight, tides, and waves are also important features. Intertidal and subtidal plant communities are highly productive and provide food and shelter for a wide variety of fish, shellfish, and invertebrates. The dominance and diversity of species varies latitudinally with temperature, as well as levels of solar radiation, wave exposure, rainfall and tidal range.

San Francisco Bay, Willapa Bay, and Grays Harbor are large estuaries and important nursery areas for many species of fish and shellfish. Flows from the Columbia River and Strait of Juan de Fuca influence the variety of marine life and are seasonally affected by the direction of the current system off the West Coast.

Biological Associations Nearshore areas north of Cape Mendocino are often dominated by black rockfish, cabezon, redtail perch, and night and surf smelt. Quillback and china rockfish, kelp greenling, and monkeyface prickleback are common in northern nearshore areas, but rarely seen in southern areas. South of Cape Mendocino, where rocky-reef habitat dominates, kelp beds are home to a variety of nearshore rockfish, abalone and sea urchins. California scorpionfish, calico rockfish, and treefish are common in southern nearshore areas, but uncommon in northern areas.

Estuaries provide nursery areas for California halibut, surfperches, Dungeness crab, leopard sharks, starry flounder, and other marine species.

Emphasis Species Cabezon commonly inhabit rocky bottoms and kelp beds, although they may also be found on sandy and mud bottoms. To spawn, they deposit eggs in shallow waters on bedrock or in crevices. Adult black rockfish are semi-pelagic and commonly associated with kelp forests and rocky pinnacles. They frequently form midwater schools, but at other times they may be on the bottom. Adults are often caught with other fish, such as yellowtail and widow rockfish. Lingcod is an overfished groundfish species that is common in nearshore areas, and has been considered as an emphasis species in the Northern Shelf Environment (Section 3.2.7.1).

California halibut and Dungeness crab are abundant on sandy bottoms in the southern and northern nearshore environment, respectively. Both species co-occur with a variety of flatfishes may be taken as bycatch in some fisheries for groundfish. Dungeness crab, through all its life history stages, is an important prey species for many groundfish.

The list of common groundfish species inhabiting rocky and non-rocky substrates in the Nearshore Environment is presented in Table 3.2.7.5 below. Other fish and shellfish species relevant to groundfish bycatch are also included in the list among the emphasis species.

Table 3.2.7.5-1 Species association in the **Nearshore Environment**. Emphasis species are shown in bold; minor species are not included.

ROCKY SUBSTRATES	NON-ROCKY SUBSTRATES
Cabezon	**California Halibut**
Black Rockfish	**Dungeness Crab**
Lingcod	California Scorpionfish
Kelp Greenling	Pacific Sanddab
Black-and-Yellow Rockfish	Rock Sole
Blue Rockfish	Sand Sole
Brown Rockfish	Starry Flounder
Calico Rockfish	
California Scorpionfish	
China Rockfish	
Copper Rockfish	
Gopher Rockfish	
Grass Rockfish	
Kelp Rockfish	
Olive Rockfish	
Quillback Rockfish	
Treefish	
Vermilion Rockfish	

3.3 Fishing Activities, Gears and Patterns

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3.3.1 Characteristics of the Groundfish Industry and Fishery

3.3.1 Characteristics of the Groundfish Industry and Fishery

The Pacific Coast groundfish fishery is a year-round, multi-species fishery that takes place off the coasts of Washington, Oregon, and California. Pacific Coast groundfish support or contribute to a wide range of commercial, recreational, and tribal fisheries.

Non-tribal commercial fisheries include those that target groundfish, which for the most part are regulated under a license limitation program ("limited entry") implemented in 1994, and other fisheries that, while targeting other species, may catch groundfish. This latter category is termed "open access" because it does not require a federal license and participation is not limited by the federal license program. Most of the Pacific coast non-tribal, commercial groundfish harvest is taken by the limited entry fleet. The groundfish limited entry program applies to midwater and bottom trawl, longline, and trap (or pot) gears. Gears used by participants in open access commercial fisheries include longline, vertical hook-and-line, troll, pot, setnet, trammel net, shrimp and prawn trawl, California halibut trawl, and sea cucumber trawl gears. The Council allocates harvest specifications (OYs) between these limited entry and open access categories.

Of 4,579 West Coast commercial fishing vessels active during November 2000 through October 2001, 1,341 vessels (37% of the fleet) landed some groundfish. This segment of the fleet was responsible for 47% of the value of all West Coast landings (groundfish and non-groundfish species).

Members of the Makah, Quileute, Hoh, and Quinault tribes participate in commercial, ceremonial and subsistence fisheries for groundfish off the Washington coast. Participants in the tribal commercial fishery use similar gear to non-tribal commercial fishers who operate off Washington, and groundfish caught in the tribal commercial fishery is typically sold through the same markets as non-tribal commercial groundfish catch.

Participants in marine recreational fisheries fish from CPFV/charter and private vessels, as well as from shore. CPFV/charter vessels are larger vessels for hire that can typically fish farther offshore than most vessels in the private recreational fleet. Both nearshore and shelf opportunities are important for West Coast recreational groundfish fisheries.

Limited Entry Fisheries

Limited Entry Fisheries There are about 500 vessels with Pacific coast groundfish limited entry permits, of which approximately 55% are trawl vessels, 40% are longline vessels, and 5% are pot/trap vessels. Each permit is endorsed for a particular gear type and that gear endorsement cannot be changed, so the distribution of permits among gear types is fairly stable. The number of total permits can only change if multiple permits are combined to create a new permit with a longer length endorsement, or if a permit is not renewed. Limited entry permits can be sold and leased out by their owners, so the distribution of permits among the three states often shifts. At the beginning of 2000, roughly 39% of the limited entry permits were assigned to vessels making landings in California, 37% to vessels making landings in Oregon, and 23% to vessels making landings in Washington.

West Coast limited-entry trawl vessels use midwater gear to target Pacific whiting, and sometimes yellowtail and widow rockfish, and use bottom trawl gear for benthic species on the shelf and the slope, such as flatfish and DTS complex (Dover sole, thornyheads, and sablefish). Some of the other slope and shelf rockfish species also have been important targets in the limited-entry trawl fishery.

Limited-entry, fixed-gear vessels use longline or trap (pot) gear, whichever is endorsed on their permit. Sablefish has long been an important target species in this sector; however, some shelf and slope rockfish species have also been important and valuable targets. In recent years, nearshore rockfish and other species have been harvested by the live-fish fishery. Bottom longlines and pots are classified as "fixed gear" in the limited entry program. The size selectivity and species selectivities of the gears vary, with longline gear having somewhat more bycatch of non-sablefish species during the sablefish fishery and being capable of targeting groundfish other than sablefish. Although about 230 permits are issued, only about 180 limited-entry, fixed-gear vessels are active in a given year.

Harvest rates in the limited entry fishery are constrained by annual harvest guidelines, two-month or one-month cumulative period landings limits, individual trip limits, size limits, species-to-species ratio restrictions, and other measures, all designed to control effort so that the allowable catch is taken at a slow rate that will stretch the season out to a full year. Cumulative period catch limits are set by comparing current or previous landings rates with the year's total available catch. Landing limits have been used to slow the pace of the fishery and stretch the fishing season out over as many months as possible, so that the overall harvest targets are not reached until the end of the year.

Limited entry fishers target on many different species, with the largest landings by volume (other than Pacific whiting) from these species: Dover sole, sablefish, thornyheads, widow rockfish, and yellowtail rockfish. There are 55 rockfish species managed by the Pacific coast groundfish FMP and, taken as a whole, rockfish landings represent the highest volume of non-whiting landings in the Pacific coast commercial groundfish fishery. Trawlers take the vast majority of the groundfish harvest by weight but somewhat less by value. In 2001, groundfish trawlers landed 97% of total groundfish harvest by weight (including whiting) but only 75% by value. Trawling is much more dominant north of Cape Mendocino

(U.S./Vancouver, Columbia, and Eureka INPFC areas) than south of Cape Mendocino (Monterey and Conception INPFC areas). While non-trawl vessels took only 2% of the coastwide groundfish harvest by weight, their harvest accounted for about 25% of the exvessel value due to the prevalence of relatively high value sablefish and live fish landed in this fishery. When high-volume, but low-value whiting is excluded from the totals, non-trawl landings are in the 10% to 12% range by weight and in the 25% to 27% range by value (percent of coastwide total groundfish excluding whiting).

In addition to these mixed-species fisheries, there is a distinct mid-water trawl fishery that targets Pacific whiting. Pacific whiting landings are significantly higher in volume than any other Pacific coast groundfish species. In 1998, whiting accounted for approximately 66% of all Pacific coast commercial groundfish shoreside landings by weight. The Pacific whiting fleet includes catcher boats that deliver to shore-based processing plants and to at-sea processor ships, as well as catcher-processor ships. Whiting is a high volume species, but it commands a relatively low price per pound, so it accounts for only about 9% of all Pacific coast commercial groundfish shoreside landings by value.

Catcher vessel owners and captains employ a variety of strategies to fill out a year of fishing. Fishers from the northern ports may fish in waters off of Alaska, as well as in the West Coast groundfish fishery. Others may change their operations throughout the year, targeting on salmon, shrimp, crab, or albacore, in addition to various high-value groundfish species, so as to spend more time in waters close to their communities.

With the exception of the portion of Pacific whiting catch that is processed at sea, all other Pacific coast groundfish catch is processed in shore-based processing plants along the Pacific coast. By weight, 1998 commercial groundfish landings were distributed among the three states as follows: Washington, 13%; Oregon, 69%; California, 18%. By value, commercial groundfish landings are distributed among the three states as follows: Washington, 15%; Oregon, 43%; California, 41% (PFMC, October 1999.) The discrepancies between the Oregon and California portions of the landings are expected because Oregon processors handle a relatively high percent of the shore-based whiting landings, a high volume, low value fishery. Conversely, California fishers land more of the low volume, high value species as a proportion of the total state-wide catch than Oregon fishers.

Directed Open Access – Groundfish Fishery

Open Access – Directed Groundfish In the open access fishery that targets groundfish, certain gears are used to target specific species. Hook-and-line gear, the most common gear type, is generally used to target sablefish, rockfish, and lingcod, whereas pot gear generally targets sablefish and some thornyheads and rockfish. In southern and central California, setnet gear has been used to target rockfish, including chilipepper, widow rockfish, bocaccio, yellowtail rockfish, and olive rockfish, and to a lesser extent vermilion rockfish.

Fishing intentions or strategies are not explicitly reported and so it is difficult to determine if the fisher is targeting groundfish. A given trip or vessel is classified as part of the directed fishery based on the species composition detailed in logbook records and landing receipts. A vessel is considered to target groundfish in the open access fishery during a fishing trip if it is fishing with any gear other than groundfish trawl and if over 50% of the revenue from landings in that trip were from groundfish species. In recent years, there have been approximately 1,500 vessels per year that have been making small groundfish landings against open access allocations. Of these vessels, about 1,000 land their catch in California, about 400 land their catch in Oregon, and about 100 land their catch in Washington.

In the directed open access fishery, fishers target groundfish in the "dead" and/or "live" fish fishery using a variety of gears. The terms dead and live fish fisheries refer to how the fish are landed and sold. The dead fish fishery has historically been the most common way to land fish and made up 80% of the directed open access landings by weight coastwide in 2001. More recently, the greater market value for live fish has led to increased landings of live groundfish.

Live fish harvests are a recent but growing component of the directed fishery. Fish are caught using pots, stick gear, and rod-and-reel, and kept aboard the vessel in a seawater tank, to be delivered to foodfish markets—such as the large immigrant Asian communities in California—that pay a premium for live fish. Determining landings from this fishery is difficult because fishing intentions or strategies are not known. In practice, only those sales of species other than sablefish that garner a landed price above $2.50 per pound are classified in the live fish sector. Using this criterion 20% of coastwide directed open access landings by weight in 2001 are considered live fish, compared to only 6% in 1996. This growth in landings may be attributed to the price premium awarded live fish.

Recreational Fisheries

Recreational Fisheries Groundfish are both targeted and taken incidentally when other species, such as salmon, are targeted. Recreational fishing is conducted from shore, such as beaches, banks, piers, docks, and jetties and from boats, including private, rental, party and charter boats. Historically, most recreational fishing along the northern coast targeted salmon although groundfish, especially rockfish, were often taken incidentally. Some effort shift from salmon to groundfish likely occurred prior to 1996 when salmon seasons were shortened.

Fishing effort, both private and charter, is related to weather, with relatively more effort occurring in the milder months of summer and less in winter. This seasonal trend is more pronounced in higher latitudes, although the reasons include opportunity as well as climate. Salmon seasons are longer in California than in Oregon, which in turn are longer than in Washington. Groundfish seasons, until recently were also more restrictive in Washington; the lingcod season is closed from November through March.

Recreational fishing in the open ocean has been on an increasing trend since 1996; however, charter effort has decreased while private effort increased during this period. Coastwide, about twice as many angler trips for groundfish were taken by private anglers (1.33 million) as charter anglers (0.63 million) in 2001. Of these trips, 33,000 private angler trips for groundfish were taken off Washington and Oregon combined, with the remaining 1.3 million trips taken off California. Similarly, a total 59,000 angler trips aboard charter vessels were taken off Washington and Oregon in 2001 and 569,000 private angler trips for groundfish were taken off California. Angler trips for groundfish comprise 43% of all charter trips but only 16% of all private trips.

In 2001, the total catch of all groundfish species coastwide was very similar for charter (1,445 mt) and private recreational anglers (1,632 mt). About half of these catches were comprised of nearshore rockfish species, followed by lesser amounts of shelf rockfish, other nearshore groundfish and lingcod.

Tribal Fisheries

Tribal Fisheries The bulk of tribal groundfish landings, other than Pacific whiting, occur during the March-April halibut and sablefish fisheries. A small number of tribal fishers use bottom trawl gear. Most continental shelf species taken in the tribal groundfish fisheries are taken during the halibut fisheries, and most slope species are similarly taken during the tribal sablefish fisheries. About one-third of the tribal sablefish allocation is taken during an open competition fishery, in which member vessels from the sablefish tribes all have access to this portion of the overall tribal sablefish allocation. The open competition portion of the allocation tends to be taken during the same period as the major tribal commercial halibut fisheries in March and April. The remaining two-thirds of the tribal sablefish allocation is split between the tribes according to a mutually agreed-upon allocation scheme. Tribe-specific sablefish allocations are managed by the individual tribes, beginning in March and lasting into the autumn, depending on vessel participation management measures used. Participants in the halibut and sablefish fisheries tend to use hook-and-line gear, as required by the International Pacific Halibut Commission (IPHC) for halibut.

In 2002, tribal sablefish longline fisheries were allocated 10% of the total catch OY (436.7 mt) and then were discounted 3% of that allocation for discard mortality, for a landed catch allocation of 424 mt. For the commercial harvest of black rockfish off Washington State, the treaty tribes have a harvest guideline of: 20,000 lb (9,072 kg) north of Cape Alava (48°09'30" N. lat.) and 10,000 lb (4,536 kg) between Destruction Island (47°40'00" N. lat.) and Leadbetter Point (46°38'10" N. lat.).

In addition to these hook-and-line fisheries, the Makah tribe annually harvests a whiting allocation using midwater trawl gear. Since 1996, a portion of the U.S. whiting OY has been allocated to the Pacific Coast treaty tribes. To date, only the Makah tribe has fished on the tribal whiting allocation.

In 1999 and 2000, 32,500 mt of whiting was set aside for treaty Indian tribes on the coast of Washington state, resulting in a commercial OY of 199,500 mt for 2000. In 2001 and 2002, the landed catch OY declined to 190,400 mt and 129,600 mt, respectively, and the tribal allocations for those years were also reduced to 27,500 mt and 22,680 mt, respectively. Makah vessels fit with midwater trawl gear have also been targeting widow rockfish and yellowtail rockfish in recent years.

Twelve western Washington tribes possess and exercise treaty fishing rights to halibut, including the four tribes that possess treaty fishing rights to groundfish. Specific halibut allocations for the treaty Indian tribes began in 1986. The tribes did not harvest their full allocation until 1989, when the tribal fleet had developed to the point that it could harvest the entire Total Allowable Catch (TAC) off Washington, Oregon and California. In 1993, judicial confirmation of treaty halibut rights occurred and treaty entitlement was established at 50% of the harvestable surplus of halibut in the tribes' combined Usual and Accustomed fishing grounds. In 2000, the courts ordered an adjustment to the halibut allocation for 2000-2007, to account for reductions in the tribal halibut allocation from 1989-1993. For 2000 through 2007, the non-tribal fisheries will transfer at least 25,000 lb per year to the tribal halibut fisheries, for a total of 200,000 lb to be transferred to the tribal fisheries over the period. Tribal allocations are divided into a tribal commercial component and the year-round ceremonial and subsistence component.

Tribal commercial halibut fisheries have historically started at the same time as Alaskan and Canadian commercial halibut fisheries, generally in mid-March. The tribal halibut allocation is divided so that approximately 80–85% of their allocation is taken in brief open competition derbies, in which vessels from all halibut tribes compete against each other for landings. In 2002, three of these "unrestricted" openings were held in the spring: a 48-hour opening on March 18, a 24-hour opening on April 2, and a 36-hour opening on April 30. In addition to these unrestricted openings, 15-20% of the tribal halibut allocation is reserved for "restricted" fisheries, in which participating vessels are restricted to a per trip and per day poundage limit for halibut. Two restricted opening opportunities were available in 2002, from March 20 through April 19 and from May 5 through 9. Similar to the unrestricted openings, these restricted openings are available for vessels from all halibut tribes.

3.3.2 Characteristics of Other Fisheries that Affect Groundfish

3.3.2 Characteristics of Other Fisheries that Affect Groundfish

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. To distinguish landings and vessels from fisheries targeting species other than groundfish but take groundfish incidentally from the directed open access fishery for groundfish, the following criterion is used. If revenues from groundfish represent less than half of total revenue for a vessel landing some amount of groundfish, those landings are considered incidental, and the corresponding vessel can be classified in the incidental open access sector.

These incidental open access fisheries may also account for substantive amounts of bycatch, especially for overfished groundfish species. A range of fisheries, identified by the target species, comprise this sector. These include ocean (pink) shrimp, spot prawn, ridgeback prawn, California and Pacific halibut, Dungeness crab, salmon, sea cucumber, coastal pelagic species, highly migratory species, and the gillnet complex. A summary description of these fisheries follows.

California Halibut Fishery

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. Fishing with 4.5-inch minimum mesh size trawl nets is permitted in federal waters, but prohibited within state waters, except in the designated "California halibut trawl grounds," where a 7.5-inch minimum mesh size must be used. These areas are also closed seasonally. Historically, commercial halibut fishers have preferred setnets because of these restrictions. Setnets with 8.5-inch mesh and maximum length of 9,000 feet are the main gear type used in Southern California. 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 1 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).

Dungeness Crab Fishery

Dungeness Crab The Dungeness crab fishery is divided between treaty sectors, covering catches by Indian Tribes, and a non-treaty sector. The crab fishery is managed by the states of Washington, Oregon, and California with inter-state coordination through the Pacific States Marine Fisheries Commission. This fishery is managed by season, sex and size of crab. Only male crabs may be retained in the commercial fishery (thus protecting the reproductive potential of the populations), the fishery has open and closed seasons, and a minimum size limit is imposed on commercial landings of male crabs (Hankin and Warner 2001). In Washington, the Dungeness crab fishery is managed under a limited entry system with two tiers of pot limits and a December 1 through September 15 season. In Oregon, 306 vessels made landings in 1999 during a season that 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 limited entry program in 1995 and as of March 2000, about 600 California residents and 70 non-residents had limited entry permits. Nonetheless, effort has increased with the entry of larger multipurpose vessels from other fisheries. Landings have not declined, but this effort increase has resulted in a "race for fish" with more than 80% of total landings made during the month of December (Hankin and Warner 2001).

California Gillnet Complex Fishery

Gillnet Complex The gillnet complex is managed by the State of California and comprises two gear types. Fishers use setnets to target California halibut (discussed above), white seabass, white croaker, swordfish, and sharks. Driftnets are used for California halibut, white croaker, and angel shark. Most of the commercial catch is sold in the fresh fish market, although a small amount is used for live bait (Moore and Wild 2001). Currently, the only restriction on catches of white croaker off California is a small no-take zone off Palos Verdes peninsula. In the early 1990s, California's set gillnet fishery was subject to increasingly restrictive state regulations addressing high marine bird and mammal bycatch mortality. This forced the fleet into deeper water where shelf rockfish became their primary target. However, as open access rockfish limits became smaller, there was a shift from targeting shelf rockfish with setnets to the use of line gear in the more lucrative nearshore live-fish fishery. Thus, many fishers that were historically setnet fishers have changed their target strategy in response to increasing restrictions and changing market value.

Pink Shrimp Fishery

Ocean Shrimp The ocean (pink) shrimp fishery is managed with uniform coastwide regulations by the states of Washington, Oregon, and California. The Council has no direct management authority. The season runs from April 1 through October 31. Ocean shrimp may be taken for commercial purposes only by trawl nets or pots. Most of the ocean shrimp catch is taken with trawl gear with minimum mesh size of 3/8 inch to one inch between knots. In some years the ocean shrimp trawl fishery has accounted for a significant share of canary rockfish incidental catch. Since canary rockfish was designated as overfished, all canary rockfish harvests have been greatly restricted. To reduce bycatch of canary rockfish in the shrimp trawl fishery, the states have mandated the use of finfish excluders.

Pacific Halibut Fishery

Pacific Halibut Pacific halibut harvest levels and gear restrictions are set by the International Pacific Halibut Commission (IPHC), with implementing regulations set by Canada and the U.S. in their own waters. A license from the IPHC is required to participate in the commercial Pacific halibut fishery. Commercial halibut fishers use bottom setline gear; any halibut caught in trawls or traps must be released. The commercial sector off the West Coast, IPHC Area 2A, has both a treaty and non-treaty sector. The directed commercial fishery in Area 2A is confined to south of Point Chehalis, Washington, Oregon, and California. In the non-treaty commercial sector, 85% of the harvest is allocated to the directed halibut fishery and 15% to the salmon troll fishery to cover incidental catch. When the Area 2A total allowable catch (TAC) is above 900,000 pounds, halibut may be retained in the limited entry primary sablefish fishery north of Point Chehalis, Washington (46°53'18" N latitude). In 2001, the TAC was above this level for the first time, and 56% (47,946 pounds) of the allocation was harvested. Area 2A licenses, issued for the directed commercial fishery, have decreased from 428 in 1997 to 320 in 2001.

Salmon Troll Fishery

Salmon Troll The ocean commercial salmon fishery, both non-treaty and treaty, is under federal management with a suite of seasons and total allowable harvest. The Council manages fisheries in the EEZ while the states manage fisheries in their waters (within three nm). All ocean commercial salmon fisheries off the West Coast states use troll gear. Chinook and coho are the principal target species with limited pink salmon landings in odd-years. However, commercial coho landings fell precipitously in the early 1990s and remain very low. Reductions in landings are mainly due to diminished opportunity as salmon populations declined. Many natural salmon runs on the West Coast have been listed under the ESA. Ocean fisheries are managed based on zones which reflect the distribution of salmon stocks and are structured to allow and encourage capture of hatchery-produced stocks while depressed natural stocks are avoided. 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.

Spot Prawn Fishery

Spot Prawn Spot prawn, which are targeted with both trawl and pot gear, are state-managed. The prawn trawl fishery is categorized in the groundfish open access (exempted trawl) sector. California has the largest trawl prawn fishery with about 54 vessels operating from Bodega Bay south to the U.S./Mexico border. Standard gear is a single-rig shrimp trawl with roller gear, varying in size from eight-inch disks to 28-inch tires. Washington state is phasing out its trawl fishery by converting its trawl permits to pot/trap permits. Washington also prohibits spot prawn trawlers from landing groundfish to discourage incidental catch. In California, area and season closures for the trawl fleet are implemented to protect spot prawns in the Southern California Bight during their peak egg-bearing months of November through January. These closures, along with the development of ridgeback prawn, sea cucumber, and other fisheries, and also greater demand for fresh fish, have kept spot prawn trawl landings low and facilitated growth of the trap fishery with a live prawn segment. The fleet operates from Monterey Bay - where 6 boats are based - to Southern California, where a 30 to 40 boat fleet results in higher production. In both fishing areas traps are set 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 limited entry 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 Ridgeback Prawn Fishery

Ridgeback Prawn The ridgeback prawn fishery is managed by the State of California and, similar to spot prawn and ocean shrimp, is considered an "exempted" trawl gear in the federal open access groundfish fishery, entitling the fishery to groundfish trip limits. Ridgeback prawns are also managed by state regulation and thus considered an open access (exempted trawl) fishery. Ridgeback prawns occur from Monterey, California to Cedros Island, Baja, California, at depths ranging from less than 145 feet to 525 feet. According to Sunada *et al.* (2001) this 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.

The fishery is closed during June through September to protect spawning female and juvenile ridgeback prawns. An incidental take of 50 pounds of prawns or 15% by weight is allowed during the closed period. During the season, a maximum of 1,000 pounds of other finfish may be landed with ridgeback prawns, of which no more than 300 pounds per trip can be groundfish, per federal regulation. 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 codends or 3 inches for double-walled codends and a logbook requirement.

Sea Cucumber Fishery

Sea Cucumber Along the West Coast, sea cucumbers are harvested by diving or trawling. Only the trawl fishery for sea cucumbers, which is also classified as an open access (exempted trawl) fishery, is allowed an incidental catch of groundfish. Sea cucumbers are managed by the states. 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.

Two species of sea cucumbers are fished in California: the California sea cucumber, also known as the giant red sea cucumber, and the warty sea cucumber. 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. In 1997 the state established separate, limited entry permits for the dive and trawl sectors. Permit rules encourage transfer to the dive sector, which now accounts for 80% of landings. There are currently 113 sea cucumber dive permittees and 36 sea cucumber trawl permittees. 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.

Coastal Pelagic Fishery

Coastal Pelagic Species (CPS) CPS include northern anchovy, Pacific sardine, Pacific (chub) mackerel, jack mackerel and market squid. They are largely landed with round haul gear (purse seines and lampara nets). Vessels using round haul gear are responsible for 99% of total CPS landings and revenues per year. The southern California round haul fleet is the most important sector of the CPS fishery in terms of landings. This fleet is primarily based in Los Angeles Harbor, along with fewer vessels in the Monterey and Ventura areas. The fishery harvests Pacific bonito and tunas as well as CPS. The fleet consists of about 40 active purse seiners averaging 20 m in length. Although these fisheries are concentrated in California, CPS fishing also occurs in Washington and Oregon. In Washington, the sardine fishery is managed under the Emerging Commercial Fishery provisions as a trial commercial fishery. The target of the trial fishery is sardines; however, anchovy, mackerel, and squid are also landed. The fishery is limited to vessels using purse seine gear. It is also prohibited inside of three miles and logbooks are required. 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. In Oregon, the sardine fishery is managed under the Developmental Fishery Program with 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 number of vessels increased from three to 18 during this period (McCrae 2001; McCrae 2002).

The Council manages these fisheries under its CPS FMP. 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 35°40' N latitude) and two-thirds is allocated to southern California (south of 35°40' N latitude). An open access CPS fishery is in place north of 39° N latitude and a limited entry 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).

Highly Migratory Species Fisheries

Highly Migratory Species (HMS) HMS include tunas, billfishes, dorado and sharks. Management of HMS is complex due to the multiple management jurisdictions, users, and gear types targeting these species. Adding to this complexity are 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. The states currently regulate the harvest of HMS but the Council is in the process of implementing an FMP for fisheries prosecuted in the West Coast EEZ or by vessels originating from West Coast ports fishing beyond the EEZ. There are five distinctive gear types used to harvest HMS commercially, with hook-and-line gear being most common. Other gear types used to target HMS are driftnet, pelagic longline, purse seine, and harpoon. While hook-and-line can be used to take any HMS species, traditionally it has been used to harvest tunas. Drift gillnet for swordfish, tunas and sharks off California and Oregon is most likely to intercept groundfish, including spiny dogfish and yellowtail rockfish.

Albacore is the most important CPS species, in terms of landings, and is commonly caught with troll gear. The majority of albacore are taken by troll and jig-and-bait gear (92% in 1999), with a small portion of fish landed by gillnet, drift longline, and other gear. These gears vary in the incidence of groundfish interception depending on the area fished, time of year, as well as gear type. Overall, nearly half of the total landings of albacore in millions of pounds coastwide were landed in California. Other gear includes pelagic longline, used to target swordfish, shark and tunas; and harpoon for swordfish off California and Oregon. Some vessels, especially longliners and purse seiners, fish outside of the U.S. EEZ, but may deliver to West Coast ports.

SPECIES	ENVIRONMENTS: Northern Shelf						Southern Shelf						Slope						Pelagic									Nearshore					
	Emphasis		Important		Minor		Emphasis		Important		Minor		Emphasis		Important		Minor		Emphasis			Important			Minor			Emphasis		Important		Minor	
	Rocky	Non-Rocky	Rocky	Non-Rocky	Rocky	Non-rocky	Rocky	Non-Rocky	Rocky	Non-Rocky	Rocky	Non-Rocky	Hard Substrate	Soft Substrate	Hard Substrate	Soft Substrate	Hard Substrate	Soft Substrate	Northern Offshore	Southern Offshore	Nearshore	Northern Offshore	Southern Offshore	Nearshore	Northern Offshore	Southern Offshore	Nearshore	Rocky	Non-Rocky	Rocky	Non-Rocky	Rocky	Non-Rocky
Overfished Groundfish																																	
Lingcod	X								X																					X			
Bocaccio			X				X																										
Pacific Ocean Perch													X																				
Widow Rockfish																			X	X													
Canary Rockfish	X								X																								
Darkblotched Rockfish													X																				
Yelloweye Rockfish	X								X																								
Cowcod							X																										
Pacific Whiting																			X	X													
Other Groundfish																																	
Cabezon																												X					
Kelp Greenling					X						X																			X			
Pacific Cod																									X								
Sablefish				X						X				X																			
Aurora Rockfish															X																		
Bank Rockfish															X	X																	
Black Rockfish																												X					
Black and Yellow Rockfish																														X			
Blackgill Rockfish															X																		
Blue Rockfish																														X			
Bronze Spotted Rockfish											X						X																
Brown Rockfish																														X			
Calico Rockfish											X																			X			
California Scorpionfish									X	X																				X	X		
Chilipepper			X				X										X																
China Rockfish																														X			
Copper Rockfish																														X			

SPECIES	ENVIRONMENTS																																
	Northern Shelf						Southern Shelf						Slope						Pelagic									Nearshore					
	Emphasis		Important		Minor		Emphasis		Important		Minor		Emphasis		Important		Minor		Emphasis			Important			Minor			Emphasis		Important		Minor	
	Rocky	Non-Rocky	Rocky	Non-Rocky	Rocky	Non-rocky	Rocky	Non-Rocky	Rocky	Non-Rocky	Rocky	Non-Rocky	Hard Substrate	Soft Substrate	Hard Substrate	Soft Substrate	Hard Substrate	Soft Substrate	Northern Offshore	Southern Offshore	Nearshore	Northern Offshore	Southern Offshore	Nearshore	Northern Offshore	Southern Offshore	Nearshore	Rocky	Non-Rocky	Rocky	Non-Rocky	Rocky	Non-Rocky
Other Groundfish (cont)																																	
Flag Rockfish											X																						
Gopher Rockfish																														X			
Grass Rockfish																														X			
Greenblotched Rockfish									X								X																
Greenspotted Rockfish									X																								
Greenstriped Rockfish			X						X																								
Honeycomb Rockfish											X																					X	
Kelp Rockfish																														X			
Longspine Thornyhead														X																			
Mexican Rockfish									X																								
Olive Rockfish																														X			
Pink Rockfish											X																						
Quillback Rockfish																														X			
Redbanded Rockfish																X																	
Redstripe Rockfish			X														X																
Rosethorn Rockfish			X														X																
Rosy Rockfish											X																						
Rougheye Rockfish															X	?																	
Sharpchin Rockfish															X																		
Shortbelly Rockfish																						X	X										
Shortraker Rockfish															X																		
Shortspine Thornyhead														X																			
Silverygray Rockfish			X								X																						
Speckled Rockfish											X																					X	
Splitnose Rockfish																X																	
Squarespot Rockfish											X																					X	
Starry Rockfish											X																						

SPECIES	ENVIRONMENTS																																
	Northern Shelf						Southern Shelf						Slope						Pelagic									Nearshore					
	Emphasis		Important		Minor		Emphasis		Important		Minor		Emphasis		Important		Minor		Emphasis			Important			Minor			Emphasis		Important		Minor	
	Rocky	Non-Rocky	Rocky	Non-Rocky	Rocky	Non-rocky	Rocky	Non-Rocky	Rocky	Non-Rocky	Rocky	Non-Rocky	Hard Substrate	Soft Substrate	Hard Substrate	Soft Substrate	Hard Substrate	Soft Substrate	Northern Offshore	Southern Offshore	Nearshore	Northern Offshore	Southern Offshore	Nearshore	Northern Offshore	Southern Offshore	Nearshore	Rocky	Non-Rocky	Rocky	Non-Rocky	Rocky	Non-Rocky
Other Groundfish (cont)																																	
Stripetail Rockfish						X						X						X															
Tiger Rockfish			X						X																								
Treefish																														X			
Vermilion Rockfish			X						X																					X			
Yellowmouth Rockfish															X																		
Yellowtail Rockfish	X								X																								
Arrowtooth Flounder		X																															
Butter Sole						X																											
Curlfin Sole						X						X																					X
Dover Sole				X						X				X																			
English Sole		X								X																							
Flathead Sole						X																											
Pacific Sanddab				X						X																					X		
Petrale Sole				X						X								X															
Rex Sole				X						X								X															
Rock Sole						X						X																			X		
Sand Sole				X																											X		
Starry Flounder						X																									X		
Leopard Shark																											X						
Soupfin Shark				X																		X	X	X									
Spiny Dogfish			X	X					X	X												X	X	X									
Big Skate				X						X																							
California Skate												X																					X
Longnose Skate						X						X																					
Ratfish			X						X																							X	
Finescale Codling																	?	?															
Pacific Rattail																		X															

SPECIES	ENVIRONMENTS																																
	Northern Shelf						Southern Shelf						Slope						Pelagic									Nearshore					
	Emphasis		Important		Minor		Emphasis		Important		Minor		Emphasis		Important		Minor		Emphasis			Important			Minor			Emphasis		Important		Minor	
	Rocky	Non-Rocky	Rocky	Non-Rocky	Rocky	Non-rocky	Rocky	Non-Rocky	Rocky	Non-Rocky	Rocky	Non-Rocky	Hard Substrate	Soft Substrate	Hard Substrate	Soft Substrate	Hard Substrate	Soft Substrate	Northern Offshore	Southern Offshore	Nearshore	Northern Offshore	Southern Offshore	Nearshore	Northern Offshore	Southern Offshore	Nearshore	Rocky	Non-Rocky	Rocky	Non-Rocky	Rocky	Non-Rocky
Other Relevant Fish																																	
Pacific Halibut		X								X																							
California Halibut																													X				
Ocean Shrimp		X										X																					
Spot Prawn			X						X				X																				
Ridgeback Prawn								X																									
Dungeness Crab				X						X																			X				
Market Squid																				X					X								
Jack Mackerel																			X	X	X												
Pacific Mackerel																				X	X												
Walleye Pollock																			X														
Thresher Shark																			X	X													
Blue Shark																						X	X										
Shortfin Mako Shark																							X										
Pacific Angel Shark																								X									
Pacific Herring																								X	X	X							
Eulachon																						X		X									
Longfin Smelt																									X	X	X						
Night Smelt																											X						
Surf Smelt																											X						
Protected Species																																	
Chinook Salmon																			X		X		X										
Coho Salmon																			X		X		X										
Stellar Sea Lion																			X	X													
California Sea Lion																			X	X	X												
Harbor Seal																					X												
Dall's Porpoise																			X	X	X												
Pacific White-Sided Dolphin																			X	X													
Northern Elephant Seal																			X	X													
Black-Footed Albatross																			X	X	X												
Laysan Albatross																			X	X													

SPECIES	ENVIRONMENTS																																
	Northern Shelf						Southern Shelf						Slope						Pelagic									Nearshore					
	Emphasis		Important		Minor		Emphasis		Important		Minor		Emphasis		Important		Minor		Emphasis			Important			Minor			Emphasis		Important		Minor	
	Rocky	Non-Rocky	Rocky	Non-Rocky	Rocky	Non-rocky	Rocky	Non-Rocky	Rocky	Non-Rocky	Rocky	Non-Rocky	Hard Substrate	Soft Substrate	Hard Substrate	Soft Substrate	Hard Substrate	Soft Substrate	Northern Offshore	Southern Offshore	Nearshore	Northern Offshore	Southern Offshore	Nearshore	Northern Offshore	Southern Offshore	Nearshore	Rocky	Non-Rocky	Rocky	Non-Rocky	Rocky	Non-Rocky
Protected Species (cont)																																	
Brandt's Cormorant																					X												
Double-crested Cormorant																					X												
Pelagic Cormorant																					X												
Northern Fulmar																			X														
Glaucous Gull																					X												
Glaucous-Winged Gull																					X												
Western Gull																					X												
Herring Gull																					X												
California Gull																			X	X	X												
Thayer's Gull																					X												
Ring-billed Gull																					X												
Mew Gull																					X												
Heerman's Gull																					X												
Bonaparte's Gull																			X	X	X												
Sabine's Gull																					X												
Guadalupe Fur Seal																							X										
Northern Fur Seal																						X	X										
Southern Sea Otter																								X									
Sea Otter																								X									
Harbor Porpoise																						X	X	X									
Risso's Dolphin																						X	X	X									
Short-Beaked Common Dolphin																							X										
Long-Beaked Common Dolphin																								X									
Short-Finned Pilot Whale																						X	X										
Gray Whale																						X	X										
Minke Whale																						X	X										
Sperm Whale																						X											
Humpback Whale																						X	X										
Blue Whale																							X										

SPECIES	ENVIRONMENTS																																
	Northern Shelf						Southern Shelf						Slope						Pelagic									Nearshore					
	Emphasis		Important		Minor		Emphasis		Important		Minor		Emphasis		Important		Minor		Emphasis			Important			Minor			Emphasis		Important		Minor	
Protected Species (cont)	Rocky	Non-Rocky	Rocky	Non-Rocky	Rocky	Non-rocky	Rocky	Non-Rocky	Rocky	Non-Rocky	Rocky	Non-Rocky	Hard Substrate	Soft Substrate	Hard Substrate	Soft Substrate	Hard Substrate	Soft Substrate	Northern Offshore	Southern Offshore	Nearshore	Northern Offshore	Southern Offshore	Nearshore	Northern Offshore	Southern Offshore	Nearshore	Rocky	Non-Rocky	Rocky	Non-Rocky	Rocky	Non-Rocky
Fin Whale																						X	X	X									
Killer Whale																						X	X	X									
Sei Whale																							X										
Loggerhead Sea Turtle																							X										
Green Sea Turtle																							X										
Leatherback Sea Turtle																						X	X										
Olive Ridley Sea Turtle																							X										
Short-tailed Albatross																						X	X										
California Brown Pelican																								X									
Arctic Tern																						X	X										
Common Tern																						X	X										
Black Tern																						X	X	X									
California Least Tern																								X									
Caspian Tern																								X									
Forster's Tern																								X									
Gull-billed Tern																								X									
Royal Tern																								X									
Elegant Tern																						X	X	X									
Marbled Murrelet																							X										
Craveri's Murrelet																						X	X										
Xantu's Murrelet																						X	X										
Ancient Murrelet																							X										
Black Storm-Petrel																						X	X										
Fork-Tailed Storm-Petrel																							X										
Ashy Storm-Petrel																							X										
Least Storm-Petrel																							X										
Galapagos Storm-Petrel																							X										
Wilson's Storm-Petrel																							X										

	ENVIRONMENTS																															
	Northern Shelf						Southern Shelf						Slope						Pelagic									Nearshore					
	Emphasis		Important		Minor		Emphasis		Important		Minor		Emphasis		Important		Minor		Emphasis			Important			Minor			Emphasis		Important		Minor	
SPECIES	Rocky	Non-Rocky	Rocky	Non-Rocky	Rocky	Non-rocky	Rocky	Non-Rocky	Rocky	Non-Rocky	Rocky	Non-Rocky	Hard Substrate	Soft Substrate	Hard Substrate	Soft Substrate	Hard Substrate	Soft Substrate	Northern Offshore	Southern Offshore	Nearshore	Northern Offshore	Southern Offshore	Nearshore	Northern Offshore	Southern Offshore	Nearshore	Rocky	Non-Rocky	Rocky	Non-Rocky	Rocky	Non-Rocky
Protected Species (cont)																																	
Leach's Storm-Petrel																						X	X										
Townsend's Shearwater																							X										
Black-Vented Shearwater																							X										
Wedge-Tailed Shearwater																							X	X									
Sooty Shearwater																						X	X										
Short-Tailed Shearwater																						X	X										
Pink-Footed Shearwater																						X	X										
Flesh-Footed Shearwater																						X											
Buller's Shearwater																						X	X										
Pomarine Jaeger																						X	X										
Parasitic Jaeger																						X	X	X									
Long-Tailed Jaeger																						X	X										
Black-Legged Kittiwake																						X	X	X									
Common Murre																						X	X	X									
Pigeon Guillemot																						X	X	X									
Parakeet Auklet																						X											
Rhinoceros Auklet																						X	X	X									
Cassin's Auklet																						X	X										
Horned Puffin																						X	X										
Tufted Puffin																						X	X										
South Polar Skua																						X	X										
Black Skimmer																								X									

Chapter 4. Impacts of the Alternatives

4.0 Impacts of the Alternatives

In this chapter, the potential impacts of the six alternatives are analyzed by evaluating seven types of effects required by NEPA: direct and indirect, cumulative, short and long term, and irreversible and irretrievable effects.

The Magnuson-Stevens Act requires that each fishery management plan include provisions to measure and minimize bycatch and bycatch mortality. Specifically, National Standard 9 of the Act specifies

> "Conservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch."

To achieve this National Standard, section 303(a)(11) requires each FMP

> "establish a standardized reporting methodology to assess the amount and type of bycatch occurring in the fishery, and include conservation and management measures that, to the extent practicable and in the following priority –
>
> > (A) minimize bycatch; and
> > (B) minimize the mortality of bycatch which cannot be avoided."

In simple terms, this means specify how bycatch and bycatch mortality information will be reported (and collected) and to establish measures that reduce bycatch and bycatch mortality as much as practicable. The information collected should be adequate to demonstrate if harvest policies are being achieved. Along with this goes improved accountability.

How this Chapter is Organized

In this analysis, we first describe the affected environment as it pertains to incidental catch, bycatch, bycatch mortality, and catch reporting/monitoring. We identify the factors that are related to bycatch: co-occurrence in time and space; species behavior; fish body size and shape; type of fishing gear used. We describe the capture methods of the various fishing gears, including selectivity features and placement factors (that is, where and in what conditions can they be used?). We identify non-gear related regulations that can be used, such as harvest specifications, allocation, retention limits, catch/mortality limits, time/are management, and limiting access (reducing fleet size). Collectively, we refer to these management measures as the "mitigation toolbox." Next we rank the effects and effectiveness of each tool, and then apply those ranks to each alternative. In this stepwise process, we provide the basis for modifying any alternative to better achieve the intended goals, taking into account the costs associated with any changes.

Co-occurrence: In Chapter 3, we describe co-occurrence of groundfish, other fish, marine mammals, and seabirds in general terms. We describe the latitudinal distributions and preferences (i.e., north-south ranges) and depth distributions and preferences. Depth distribution is only generally related to distance from shore, but sometimes distance may be a factor. We describe distribution in the water column: near surface, near bottom, midwater, etc. We describe prey species preferences that may tend to bring various predatory species near each other.

Species Behavior: And we describe physical characteristics and behavior of various species, such as their escape or avoidance response and swimming speed.

Fishing Gears and Methods: We describe fishing gear and gear dynamics, and the general method of capture. For example, are the fish attracted to the gear, chased by the gear, or is the gear passive. We discuss some of the attributes of fishing gear that can be modified to change its selectivity. For example, larger mesh allows smaller fish to escape through the webbing. We note that any injuries from escape are likely undetected and may or may not be significant.

Other Mitigation Tools: We describe the attributes and general effects of other (non-gear) management measures, such as area restrictions and seasons. We describe how adjustments to these measures can affect encounter rates between fishing gears and various species.

We describe in some detail the effects of each tool, focusing on effectiveness, cost, collateral/side effects, etc.

Recognizing that each alternative is a combination of objectives, emphasis, and mitigation tools, we then describe the combined effects of each alternative. Synergistic and antagonistic effects are identified and described to the extent possible.

Next, we rank the alternatives as to how well they achieve the desired results, noting the administrative and user costs associated with each.

The emphasis, levels of effects, and degree of impacts on biological and fishing communities vary among the different alternatives. One objective of this analysis is to illustrate this tension and evaluate pros and cons, benefits and costs of each alternative. Impacts of alternatives to groundfish, non-groundfish, ecosystem and habitat, and social/economic environment will be evaluated. As this EIS is programmatic in nature, critical comparative methods will be used. Possible analytical methods that might be used to quantify impacts of more specific plans to reduce bycatch, bycatch mortality, and to improve accountability are described. Cost estimates of alternative monitoring programs, where available, are provided.

This chapter outlines the tools available and general impacts of their application. The methods used to evaluate alternatives are described next. Each alternative is presented with corresponding tools used to mitigate for bycatch, bycatch mortality, and to address bycatch accountability. The previous chapter provides baseline conditions on the affected environment needed to evaluate impacts of the programmatic alternatives presented in this chapter. Impact analysis is organized by resource following an outline similar to Chapter 3 with sections on ecosystem, affected groundfish and non-groundfish species and stocks, socioeconomic impacts, and effects on the management system. Direct and indirect effects are described in Sections 4.1 through 4.7. In section 4.2, groundfish receives special treatment with a more detailed look at how tools apply to overfished and emphasis species for each alternative. Section 4.3 summarizes impacts of each alternatives proposed monitoring program. Section 4.4 summarizes impacts to the biological environment. Section 4.5 describes socioeconomic impacts. Cumulative effects are summarized in Section 4.8 and irreversible and irretrievable effects are discussed in Section 4.9.

FISHERY MANAGEMENT TOOLS

FISHERY MANAGEMENT TOOLS

Management measures, referred to here as management "tools," are the rules and requirements to control the fishing activities and to mitigate the effects of fishing on the fishery resources and other components of the natural environment. Management measures are the tools used to achieve the goals and objectives of a management program. In the context of this EIS, they are the means for reporting, monitoring, and reducing bycatch and bycatch mortality. Their purpose is to contribute to achievement of the bycatch management strategy. Together all of the tools make up a management "toolbox," or suite of management measures that can be applied alone or in groups with the intent of achieving a particular result. Few tools have only one effect, and thus it is often a case of choosing tools that effectively address a variety of goals. Likewise, it is important that the chosen tools work in harmony to achieve the objectives, rather than work in opposition to each other. In theory, an optimum management program would use a few tools that work together synergistically to achieve the desired effects. Many types of tools have not been used in managing the west coast groundfish fisheries. In many more cases, specific applications have not been used.

Establishing Definitions to Characterize Management Strategies

In analyzing the utility, effects and effectiveness of various management measures, it is necessary to understand the cause and effect relationships as well as the linkages between tools, toolboxes, objectives, policies and goals. Tools and toolboxes are most easily described by their function, along with a specific vocabulary for function-related characteristics. For example, we can describe a wrench as a tool used to tighten or loosen nuts. Although it could also be used to pound, pry, and dig, it does not do those activities as effectively as other tools would. Similarly, we can describe a hammer as a tool used to pound nails, flatten metal, align parts, and separate attached components. Combined with a chisel, it can be used to shape objects. Incorrect or careless use of a hammer or management tool can result in unintended results; thoughtful or imaginative use can result in several desired effects simultaneously.

Description of Fishery Management Tools

Description of Fishery Management Tools

The primary components of a fishery that can be "managed" are gear, vessels, harvest levels, times and areas fished, and capacity (number of vessels and potential effectiveness of those vessels). Other management tools include monitoring/ reporting requirements. Management tools, or measures, are the means used to manage these components. The following is a description of different management tools.

Harvest Specifications: ABCs, OYs and Allocations

Harvest Specifications: ABCs, OYs and Allocations

FISHERY MANAGEMENT TOOLS
The Mitigation Toolbox

Harvest Levels
- ABC/OY
- sector allocations
- trip (landing) limits
- catch limits
- individual quotas

Gear Restrictions
- **Trawl**
  - mesh size
  - footrope diameter/length
  - net height
  - codend mesh and dimensions
  - design: on-bottom or pelagic
  - bycatch reduction devices (BRDs)
- **Line**
  - number of hooks
  - hook size
  - line length
  - retrieval requirements
- **Pot/trap**
  - number of pots
  - pot size
  - escape panel in net/pot
  - retrieval requirements
- **Other**
  - setnets (gill and trammel nets)

Time/Area Restrictions
- seasons
- area closures
- depth closures
- marine reserves

Capacity (number of participants)
- permits/licenses/endorsements
- limited entry

Capacity (Vessel Restrictions)
- vessel size
- engine power
- vessel type

Monitoring/Reporting Requirements
- permits/licenses
- registrations
- Fish tickets (commercial landings/ sales receipts)
- Vessel logbooks
- Surveys
- Punch cards/tags (recreational)
- Port sampling/on-shore observers
- On-board observers
- Vessel monitoring systems (VMS)
- Onboard video recording devices
- Enforcement

Groundfish harvest specifications are the first level of conservation and management to ensure that harvest stays within sustainable levels. Harvest specifications are typically set annually[1/] and are based on stock assessments whenever possible.[2/] Rigorous scientific procedures are followed throughout the stock assessment and harvest specification process, including adjustments to mitigate for uncertainty in available data, models and other factors. Briefly, where enough information is available to prepare a quantitative biomass assessment, a harvest rate is applied to the best estimate of current stock abundance, taking into account age structure of the population, anticipated reproduction in future years, and other information on stock condition. The baseline harvest rates differ among species and species groups to compensate for differences in productivity, growth and mortality rates, longevity and other critical demographic factors. The baseline harvest rate for each species is the best scientific estimate of the harvest rate if the stock were at the population size that would create its **maximum sustainable yield** (**MSY**). The best estimate of the MSY harvest rate is called "$\mathbf{F_{msy}}$" and is usually expressed as a percentage (for example, $F_{45\%}$). Harvest rates for rockfish are lower than harvest rates for more productive species such as Dover sole and other flounders. The F_{msy} is multiplied times the current **biomass** estimate ("**B**") to calculate the **acceptable biological catch** (**ABC**).

Next, the harvest control rule requires calculation of the **optimum yield** (**OY**) for the stock. OY, as defined in federal regulations at 50 CFR 660.302, means "the amount of fish that will provide the greatest overall benefit to the Nation, particularly with respect to food production and recreational opportunities, and, taking into account the protection of marine ecosystems, is prescribed as such on the basis of the maximum sustainable yield (MSY) from the fishery, as reduced by any relevant economic, social, or ecological factor; and,

---

[1/] The Council is considering (in 2003) an FMP amendment to create two-year harvest specifications.

[2/] The stock assessment process is described in detail in the groundfish FMP and SAFE documents. Comprehensive stock assessments have been prepared for only about 20 species due to data limitations. In some cases, harvest specifications are based on historical harvest levels.

in the case of an overfished fishery, provides for rebuilding to a level consistent with producing the MSY in such fishery." An OY may be numerical or non-numerical. The default formula for calculating OY is described in detail in the FMP and SAFE document, and is commonly referred to as the "**40-10**" OY adjustment. It reduces the harvest of any stock that is currently smaller than 40% of its estimated pristine (unfished) size. Any stock smaller than 20% of its estimated unfished size is classified as **overfished**, which requires that OY be set to quickly rebuild the stock to its MSY biomass.

OY can apply to total catch of a single species or species group; it can apply throughout the entire region or to smaller management areas. Estimated bycatch (discard) levels are also taken into account so the best estimates of total catch do not exceed the intended levels.

In some cases, the calculated OYs of species in an assemblage are out of proportion with the typical catch ratios in the fishery. This is especially true in assemblages that include overfished stocks. In those cases, harvest rates for abundant stocks may need to be restricted in order to protect the weak stock(s). In such cases, the OY for an abundant stock may be specified lower to reflect the expected smaller harvest.

OY can be subdivided and allocated to sectors of the fishery. Numerical OYs are typically allocated among Tribal, recreational and commercial fisheries. The commercial allocation is typically further subdivided between the limited entry and open access sectors. In a few cases, most notably sablefish and whiting, a limited entry allocation may be further subdivided.

Trip limits, Bag limits, and Catch Limits

Trip Limits, Bag Limits, and Catch Limits

Trip limits are retention and landing limits (by species or species complex) that apply to individual commercial fishers, vessels, permits, gear groups, or other defined groups in a given area for a given period of time. Bag limits are the equivalent for recreational fishers. Any groundfish captured beyond a specified trip or bag limit are classified as bycatch (if discarded) or a violation (if retained) . Trip and bag limits, as they have traditionally been applied, do not require fishers to stop fishing when the specified limit has been reached. As long as the fisher/vessel does not retain more fish than the limit, additional fishing is allowed. The intention and trip and bag limits is to remove the incentives to catch more fish. Any fish beyond the limit must be released or discarded, even if it is dead. This creates an incentive to avoid catching the fish; or, conversely, a level of disincentive based largely on the cost of sorting and extra handling or a feeling of being wasteful. The incentive/ disincentive is not a specified monetary amount, and is not equal in all individuals. On the other hand, failure to release or discard excess groundfish (or other species) is a fishing violation. Each fisher has (potentially) the same monetary incentive to discard, which may be stronger than the incentive to avoid catching.

> Trip limits and bag limits refer to the amount of fish that may be kept; they are intended to discourage further fishing, but do not prohibit continued fishing. Any additional fish caught must be released/discarded. All those fish are bycatch.

Over the years, the Council and NOAA Fisheries have revised the definition and use of trip limits, partly in response to fishermen's concerns about discard and waste of useable fish. Fishers and managers realized that wastage would occur and, as a policy decision, the FMP acknowledged a level of discard was inevitable and acceptable. This was reflected in the definition of OY, which included only those fish that could be captured and retained under the gear and retention limits adopted each year. The public ethic has changed over the years, as reflected in the 1996 Sustainable Fisheries Act mandate to minimize bycatch to the extent practicable.

Initially, trip limits were designated as per-trip limits, and sometimes the number of trips was also restricted (for example, not more than one trip per week might be allowed).

> Catch limits or fishing mortality limits are very different from trip limits!

Catch limits, on the other hand, restrict the amount of fish that may be *caught*, whether landed or discarded. Catch limits require fishers to stop fishing when a limit is reached. Catch limits have not been used in the federal groundfish management program.

Individual retention quotas (IQs), sometimes referred to as **Individual Fishing Quotas** or **IFQs**, are a tool that can be set up to be driven by market/economic incentives. IQs can be allocated to an individual, group, corporation, or vessel. IQs can be transferable ("ITQs") or non-transferable. They can be based on a share of the total OY, or a specified amount of fish. They can grant ownership, or grant an opportunity to catch.

IQs typically are landing limits but can be also be defined as catch limits. If they are applied as catch limits, fishermen would still have the option to discard unwanted fish, but those fish would count against their allotment. This would increase the incentive to keep the fish rather than use them as bycatch. It would also mean the quota holder would have to stop fishing immediately or acquire additional quota share. Individual quotas can be applied to restricted species ("RSQs") such as overfished species. They can be applied to prohibited species (PSCs) and even to limit the amount of a species that may be discarded.

Gear Definitions and Restrictions

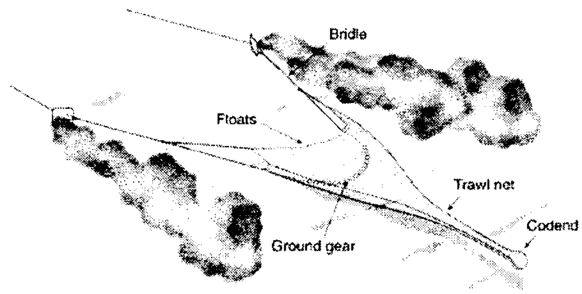
Gear Definitions and Restrictions

West coast groundfish fishermen are allowed to use 4 basic gear types to catch groundfish: trawls, hook-and-line, traps ("pots"), and, in part of California, set nets. (Recreational fishers may also use spears.) These gears are described in detail in **Appendix B**, which includes detailed diagrams. These gears capture fish in different ways, and fishermen know how their gear catches fish, what types of fish the gear catches better, and how to best operate the gear to maximum advantage. Every commercial fisherman's intent is to catch fish to make money, and each has an idea of how to make more money at less cost. Catching unwanted species creates costs of sorting the wanted from the unwanted. Fishing in an area with many seafloor hazards can increase costs through damaged or lost gear; refining the gear by adding protective components or "tuning" it can reduce the risks. Gear definitions, requirements and restrictions can be effective in achieving some management objectives, often at the expense of harvest efficiency. Much of the history of fishing and fishery management is the result of fishermen's efforts to improve their catching efficiency and management trying to reduce their efficiency.

Trawl

West Coast commercial fishers use a variety of otter trawl types. This diversity of gear types is a result of the diversity of fisheries (fishing strategies) and bottom types in the region. The specific gear design used is typically a result of the target species complex (whether they are on the seafloor or higher in the water column) and whether the seafloor is smooth or rough, soft or hard.

Otter trawls are not just simple sieves used to collect everything in their path; they are actually very complex systems designed to target specific types of fish in specific conditions. Trawl gear has several components, including the doors (otter boards), bridles, footrope ("ground gear"), and the net body, including the codend. Trawl doors can be of various sizes and designs to match the target strategy and net. Their purpose is to help sink the net to the desired depth, hold the "mouth" open, and help move fish towards the net. Bridles connect the doors to the net and can be chain, bare wire, or covered wire. The footrope is attached to the bottom front of the net and can include chain-



wrapped wire, rubber cookies, rollers, bobbins, and tickler chains.

Bottom trawls are designed to capture fish that are on or near the seafloor, such as flatfish (flounders). Fish herding is an important aspect of trawl design and depends upon the hydrodynamic forces of the doors and the sediment clouds generated by the ground rigging and footrope. In bottom trawls, the footrope is designed to get the fish up off the bottom. The net body can vary based on the head rope height, the amount of overhang, and the mesh sizes of the various net panels. The top of the net typically has floats attached to help hold it open. The doors, ground rigging behind the doors, and the footrope can come into contact with the seafloor. With the exception of the doors, trawl gear must be relatively light on the bottom to maintain its shape and effectiveness. The net itself typically does not drag along the bottom but may sometimes contact the seafloor, especially when there are obstructions. Chafing gear, a protective covering fastened to the underside to prevent abrasion, tearing, and other damage, may be attached to protect the underside of the net from snagging and tearing.

In a "cutback" trawl, the floats are behind the footrope (ground gear) or the top of the net above the footrope is constructed of wide meshes (or open) so that any fish can escape by swimming upward. This type of net is being tested for its ability to avoid rockfish, which typically are slightly off-bottom or swim up when startled. Flatfish tend not to swim as far upward, and therefore may not escape as readily.

Midwater (pelagic) nets are used to target Pacific whiting. Smaller mesh (3 inch minimum) is used, compared to 4½ inch mesh used for bottom trawls. Prior to about 1987, midwater nets used for whiting were smaller than those typically used since then. (New processing methods require larger amounts of fish.) Midwater nets use the doors, bridles, and large mesh to herd fish towards the codend, rather than sediment clouds, and typically do not come into contact with the seafloor.

Bycatch reduction devices are typically not used in West Coast groundfish trawls but are used by groundfish trawlers in Alaska (to reduce bycatch of Pacific halibut) and by West Coast shrimp and prawn trawlers (to reduce groundfish bycatch).

Potential tools for managing trawl gears

Potential tools for managing trawl gears address several components of a typical trawl that address selectivity and/or placement: mesh size, type of footrope, net size and shape, chafing gear, type or design (on-bottom or off- bottom/pelagic), and use of bycatch reduction devices (BRDs).

Mesh size - The size and shape of a net's mesh are related to the size and shape of fish it will capture, and these can be adjusted to select for fish of different sizes and shapes. Larger mesh increases the chances for small fish to escape. Smaller trawl mesh catches more small fish along with the larger fish. Mesh selectivity can never be perfect, but much research over the years has been conducted to improve the catching efficiency of trawl gear. For the past several years, regulations have specified 4½ inches as the minimum mesh size in West Coast groundfish bottom trawls and 3 inches minimum in midwater trawls. The minimum mesh size in bottom trawls was increased in the early 1990s from 4 inches to 4½ inches to increase escapement of small fish, especially those below marketable size.

Footrope diameter- The footrope of a bottom trawl is line along the bottom front edge of the net that contacts the ocean floor. The footrope is important in making sure the trawl stays in contact with the seafloor but does not dig into the mud or snag on rocks or other structures. The diameter of the footrope can be increased by attaching rollers or bobbins; larger diameter footropes tend to move over the seafloor more smoothly and easily. Larger diameter footropes allow trawls to be used in areas where the seafloor is rough, such as rock piles. Without the protection of large rollers, trawls cannot be fished effectively in those areas. This relationship between footrope diameter and fishing location has been used since 2000 to reduce trawl fishing in rocky areas where overfished rockfish tend to be concentrated. Based on an industry proposal, the Council and NOAA Fisheries reduced trip limits for most species for vessels

Potential tools for managing trawl gears

that used footropes over 8 inches in diameter. This would reduce trawl encounters with fish species in rocky ("high relief") areas, especially on the continental shelf.

Trawl size/configuration - Trawls range in size from relatively flat, small, bottom trawls to very wide, tall midwater trawls. The catching capacity of a trawl is related to the dimensions (width and height) of the net; a small net cannot catch as much as a large net. One way to reduce catching capacity would be to limit net size. This could be accomplished by restricting the maximum length of the footrope, which must match the width of the net.

Taller nets cover more of the water column; in bottom trawls, they tend to catch species (such as some rockfish) that hover above the bottom or try to escape upwards. Trials with flatter nets are being conducted to see if rockfish can be avoided.

The size of the codend is related to the amount of fish that can be captured and held at any one time. In the early years of the whiting joint venture fishery (e.g., with the USSR and Poland), the processing ships produced fillets and headed/gutted products. Both the size of deliveries and the rate of delivery were controlled to match the processing rates. Production rates were limited by the equipment to prepare these products, and bruised, crushed whiting were too difficult to cut. American catcher vessels were required to make small deliveries using relatively small codends (compared to those used later by vessels delivering to processing ships that produced surimi). In an attempt to keep the high-volume surimi operations out (in order to maintain a longer season), some U.S. fishers proposed setting a limit on the size (volume) of codends that could be used. The suggested regulation was not approved for several reasons including the allocative effects and impact on economic efficiency. Effects of small trip limits, need for reduced harvest of overfished stocks, and bycatch reduction requirements may provide justification to consider adoption of size restrictions for bottom trawls.

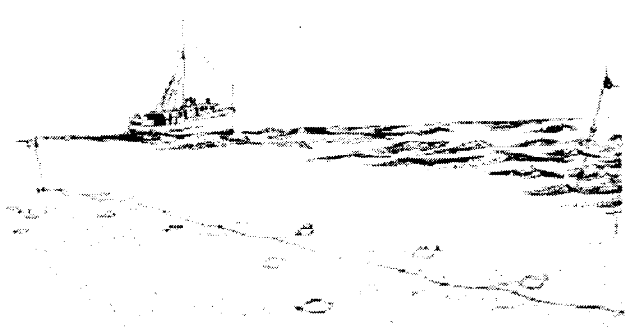
Chafing gear - Chafing gear is used to protect the underside ("belly") of the net, including the codend. They types of material are restricted by regulation to prevent chafing gear from reducing the effectiveness of minimum mesh regulations (i.e., reducing selectivity). Currently (2003), further restrictions are placed on chafing gear in conjunction with the small footrope requirement to reduce the use of trawls in rocky, rough-bottom seafloor areas.

Bottom versus pelagic - Bottom trawls and pelagic/midwater trawls have different uses and selectivities that can be used to achieve certain bycatch reduction objectives. For example, a requirement to use pelagic trawls (which must have unprotected footropes and no chafing gear) would greatly reduce the encounter with animals that live on or in the seafloor. However, the use of large midwater nets could increase the encounter rate with pelagic species that should be avoided.

Bycatch reduction devices (BRDs)- Bycatch reduction devices, as they apply to trawls, are mechanisms that guide or force unwanted species or sizes out of the net and reduce the likelihood they will be captured. They are gear selectivity devices. BRDs have been effective in reducing catches of halibut in certain groundfish trawl fisheries in Alaska. BRDs are also used in other regional trawl fisheries to reduce bycatch of turtles, finfish and other animals. In particular, they are used in West Coast trawl fisheries for pink shrimp and prawns to reduce bycatch of canary and other rockfish. Often BRDs reduce catch rates of the target species, but in some cases fishers can improve the gears performance with experience and practice. BRDs have not been required in the West Coast groundfish trawl fishery. However, development of effective rockfish excluder devices could result in increased catches of other species.

Hook-and-Line

West Coast commercial and recreational fishers use a variety of hook-and-line gears. This diversity of gear types is a result of the diversity of fisheries (fishing strategies) and species in the region. The specific hook-and-line gear design used is typically a result of whether the target species or species complex lives on the seafloor or higher in the water column and whether it is sedentary or mobile. Many commercial groundfish vessels are included in the federal groundfish limited licence program for stationary (fixed) longline gear. Another name for this is setline gear. Vessels typically fish this gear along the ocean floor for sablefish (blackcod) and/or Pacific halibut, but may take other groundfish and non-groundfish species also.



Other hook-and-line gears are considered "open access" which means any commercial fisher (including limited entry vessels) may use them in accordance with state or federal regulations.

(Fixed longline gear may also be used by any commercial groundfish vessel, but harvest levels are restricted). Some hook-and-line gear is pulled (trolled) through the water; other longline gear extends from the surface towards the bottom and may drift with the current. Rod and reel is included in the hook-and-line category; this is the typical recreational gear type.

Tools for managing hook-and-line gears include the number of hooks, whether the gear is stationary ("fixed"), pulled (trolled) or free-drifting, the type and size of hooks, how the fixed gear is marked/labeled, maximum length of the line, and how long it may be left unattended. In addition, bycatch reduction devices (BRDs) may be required to reduce bycatch of seabirds.

Potential tools for managing hook-and-line gears

Number of hooks - For the recreational fishery, limits on the number of hooks been used to reduce the potential catch of overfished rockfish that must be avoided. However, it is recognized this is not a selective method to protect any particular species, but rather it reduces the potential catch of all species that might be taken. It may be used in combination with other restrictions, such as the amount of weight that may be attached to the line, and the number of fishing rods an individual may use.

Stationary (setline) versus mobile gear - Mobile gear is being defined here as all hook-and-line gear that is not anchored at both ends, and it includes a variety of configurations. The distinction is used primarily for setting separate trip limits for limited entry and open access sectors. However, these gears often have substantially different selectivity and applicability. For example, setline gear cannot be effectively used to catch many pelagic (off-bottom) species. It can be fished throughout the water column and need not contact the seafloor, although some mobile line gear does contact the bottom (for example, "dingle bar" gear typically is bounced along the seafloor). Vertical longlines (sometimes called "Portuguese" longlines) are multi-hook lines, weighted at the bottom, that hang vertically from a vessel or a float, drifting with the current. "Fly" gear is trolled nearer the surface. Also, a variety of hook-and-line gear is used to catch nearshore (shallow water) groundfish and other species for the "live fish" market.

Type and size of hooks - Hook size and type can affect selectivity. For example, commercial sablefish fishers now use "circle hooks" because they tend to retain more fish and to hook the fish more in the "lip" rather than deeper in the mouth. In

Potential tools for managing hook-and-line gears

earlier years, the "J hook" was the primary gear. The use of small hooks can increase selectivity for small-mouth fish (such as sand-dabs, a type of flatfish) and avoid larger-mouth rockfish. Also, barbless hooks are required in some (non-groundfish fisheries) to improve survival of fish that must be released. Where the species suffer from **barotrauma** (pressure change), barbless hooks have little utility.

Gear marking (identification) requirements - Federal regulations require fixed-longline gear be clearly and visibly marked at both ends with the vessel or fisher's identification and with a flag, radar reflector, etc. (Other line gears do not have this requirement because they are not left unattended.) Marking requirements serve both a safety and enforcement function. The safety requirement is that the gear be marked so it does not present a navigation hazard (collision or entanglement). The identification is so the owner of any lost or illegal gear can be identified. These requirements have little if any affect on bycatch other than to aid in recovery of lost gear.

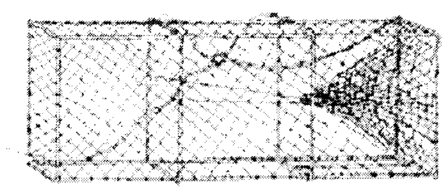
<u>Gear retrieval requirements</u> - Baited setlines continue to fish as long as any hooks remain baited. At the end of the fixed-gear sablefish season, vessels may be required to "stop fishing" at a specific time. Retrieving gear is a fishing activity, so a "stop fishing" order means any gear must be left in place. Typically, after a specified period of time, the gear may be retrieved, although it may be necessary to release any fish. Any fish that must be released are considered bycatch. To prevent excessive bycatch of this type, gear must be retrieved within a specified period of time, unless the vessel is incapable of retrieving it (for breakdown, weather or safety reasons).

<u>Bycatch reduction devices (BRDs)</u> - Bycatch reduction devices, as they apply to longlines, are devices that discourage seabirds from chasing baited hooks as the gear is set . Thus, the BRDs reduce the likelihood seabirds, and in particular listed species such as short-tailed albatross, will be killed. BRDs have been effective in reducing seabird bycatch in Alaska groundfish longline fisheries and Pacific Ocean pelagic longline fisheries. BRDs have not been required in the West Coast groundfish longline fishery. While seabirds are technically not fish, and therefore cannot be bycatch as defined in the Magnuson-Stevens Act, there are legal and moral reasons groundfish fishers should avoid catching them.

Potential tools for managing pot gear

Pot/Trap
The words "pot" and "trap" are used interchangeably to mean baited cages set on the ocean floor to catch various fish and shellfish. They can be circular, rectangular or conical and may be set out individually or fished in strings. All pots contain entry ports that allow fish to enter. Current regulations require that all pots used for groundfish must have biodegradable escape panels or fasteners that are intended to disable the trap if it becomes lost or abandoned. This requirement is intended to prevent "ghost fishing." Individual groundfish pots must be marked at the surface; strings of pots must be marked at each terminal end with a pole and flag and a light or radar reflector. Traditionally, groundfish pots have been used on the West Coast primarily to target sablefish. Commercial groundfish pot gear is included in the federal groundfish limited licence program for stationary (fixed) gear. Vessels typically fish this gear along the ocean floor for sablefish (blackcod). Pots are also considered an "open access" gear, which means any commercial fisher (including limited entry vessels) may use them in accordance with state or federal regulations. (Groundfish pot gear may be used by any commercial groundfish vessel, but harvest levels are restricted). Trap gear may be used to target live fish.

Tools for managing pots include size and shape, mesh size, number of pots, how the gear is marked/labeled, requirements to prevent "ghost fishing" if the trap is lost, and how long gear may be left unattended (retrieval time requirements).



Size and shape - Larger pots potentially can capture and hold larger numbers of fish, but typically would not affect the species mix. Setting a maximum pot size would thus not affect selectivity but would affect harvest capacity. There are no pot size restrictions at this time.

Mesh size - The mesh size of a trap's is related to the size of fish the trap will retain. Mesh size can be adjusted to select for fish of different sizes. Larger mesh increases the chances for small fish to escape. Smaller trawl mesh catches more small

Potential tools for managing pot gear

fish along with the larger fish. There are no mesh size restrictions at this time.

Number of pots - A maximum number of pots an individual fisher or vessel may use can be specified. The effect of "pot limits" is to reduce individual and/or fleet capacity. This can be useful in highly overcapitalized fisheries to slow the pace of the "race for fish" and to reduce bycatch during closed seasons (for example, after the season closes). There are no pot restrictions at this time.

"Escape panels" - Escape panels create an opening in the pot to allow fish to escape. This is important because a pot can continue to "ghost fish" as long as it remains in the water. The size of the opening can be regulated, as can be the material that creates the opening. For West Coast groundfish, the federal regulation specifies the use of biodegradable twine that should disintegrate if the pot remains in the water too long.

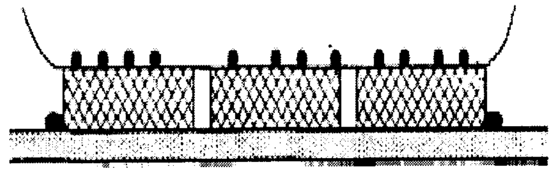
Gear marking (identification) requirements - Federal regulations require that groundfish pots must be clearly and visibly marked at both ends with the vessel or fisher's identification and with a flag, radar reflector, etc. (Other line gears do not have this requirement because they are not left unattended.) Marking requirements serve both a safety and enforcement function. The safety requirement is that the gear be marked so it does not present a navigation hazard (collision or entanglement). The gear identification is so the owner of any lost or illegal gear can be identified. These requirements have little if any affect on bycatch other than to aid in recovery of lost gear.

Gear retrieval requirements - Baited pots continue to attract and catch fish as long as they maintain their structural integrity. At the end of the fixed-gear sablefish season, vessels may be required to "stop fishing" at a specific time. Retrieving gear is a fishing activity, so a "stop fishing" order means any gear must be left in place. Typically, after a specified period of time, the gear may be retrieved, although it may be necessary to release any fish. Any fish that must be released are considered bycatch. To prevent excessive bycatch of this type, gear must be retrieved within a specified period of time, unless the vessel is incapable of retrieving it (for breakdown, weather or safety reasons).

Unbaited pots may also attract fish because they may provide "structure." Pots left on the grounds after the end of the season will continue to ghost fish unless they are de-activated by leaving an open escape route such as an open door or escape panel. Any fish left in a closed trap eventually die and become bait for other fish. By requiring that pots be removed soon after the end the season, this can be minimized.

Setnets are not legal groundfish gear north of 38° N latitude (near San Francisco, California)

Setnet (Gill and Trammel Nets) [The Groundfish FMP recognizes setnets as legal groundfish gear only in California south of Point Reyes (near San Francisco). Most regulations controlling their configuration and use are implemented by the State of California. Drift nets are not legal gear for taking groundfish. Potential management tools are listed below but are not described.]



Setnets are flat, rectangular nets that hang vertically in the water from a buoyed cork line and weighted along the bottom with a lead line. Setnets must be anchored, and they hang fairly vertically in the water column. They tend to bulge under the effect of currents. The nets are intended to be slack rather than taught, because fish swimming into a taut section of webbing tend to bounce away rather than become entangled. Nets are made of a lightweight multifilament nylon or monofilament strands with certain specific mesh sizes to select the catch. Mesh size of gillnets is selected so the heads of the desired fish go through the mesh, but their bodies do not. When a fish tries to escape it tends to become entangled in the net.

A **trammel net** is a net made with two or more walls joined to a common float line. The inner net is made of smaller mesh and hangs deeper than the outer webbing. Fish pass through the outer webbing, strike the inner webbing and carry through to the larger webbing on the opposite side. Fish thus become trapped in the pocket formed by the intertwined webbing.

Tools for managing setnets include mesh size, size (height and length), number of panels, how the gear is marked/labeled, how long gear may be left unattended, and where it may be used.

Time/Area Restrictions (Closures)

Time/Area Restrictions (Closures)

Closures, as a management tool, have both a spatial (area) and temporal (time) dimension. Some area closures are long term to address a long term problem or condition. Examples of this would be to protect areas with special habitat, historical significance, or scientific or other value. Marine reserves are an example of a long-term area closure where all or certain activities may be restricted, depending on the objective and designation. Short term closures may be for an entire region (such as a season) or for a more localized area (such as a spawning area to protect eggs and/or young when they are present).

In recent years, area closures based on depth contours have been used to reduce the likelihood certain overfished groundfish species might be caught. This approach may be especially effective for species (cowcod, for example) that are relatively sedentary, that move only short distances. Often, however, juveniles concentrate at different depths or habitats than adults, and in some cases may be caught in different fisheries or by different gear types. Some species migrate seasonally; a permanent area closure would have to consider the entire migratory range, while a seasonally-adjusted or moving closure might provide a similar degree of protection while allowing greater fishing opportunities for other species. Also, where multiple species are in need of protection, the individual distributions must be taken into account.

NMFS regulatory guidance on EFH suggests time/area closures as possible habitat protection measures. These measures might include, but would not be limited to: closing areas to all fishing or specific equipment types during spawning, migration, foraging, and nursery activities; and designating zones for use as marine protected areas to limit adverse effects of fishing practices on certain vulnerable or rare areas/species/life history stages. To the extent that such an identified species or assemblage is taken as bycatch in the groundfish fishery, area closures may be an effective bycatch reduction approach.

Capacity Limits

Capacity Limits

Capacity limits are used to restrict access to the fish resource. Tools to limit capacity include permits and licenses and are intended to restrict the number of participants in a fishery. (They also serve as a mechanism to monitor participation in the fishery.) “Fishing power” is also a measure of capacity that is managed with the use of gear restrictions and other tools. Permits and licenses can be used in a number of ways to limit capacity. A permit can specify the type of vessel or gear that may be used, the amount of fish that may be caught or retained, or who may do the fishing. That is, permits can apply to vessels, gear or fishers, and the number of permits can be limited. Once the number of permits has been limited, it may be necessary to further reduce the number of participants in the fishery. This can be accomplished through a "buyback" program, by the government cancelling or revoking permits, or by requiring participants to obtain multiple permits (for example, buying them from other fishers/vessels or joining into cooperatives).

A trawl buyback program is under consideration and development at this time. See the 7/18/03 *Federal Register* "Final Notice on Fishing Capacity Reduction Program for Pacific Coast Groundfish Fishery" for further information.

Vessel Restrictions

Vessel Restrictions

Restrictions on the type, size and/or power of a fishing vessel can be used as a management tool, typically to address fishing capacity. In the West Coast groundfish fishery, only vessel length is restricted. Vessel restrictions in themselves often have limited effect on capacity or "fishing power," and many potential vessel restrictions are rarely used because they are easy to circumvent. Combined with other tools, they may be an effective means of achieving a particular management goal, although the effectiveness may be difficult to predict.

Monitoring/Reporting Requirements

Monitoring/Reporting Requirements

Monitoring and reporting requirements are essential fishery management tools. Without monitoring and reporting, there is no effective measure to either ensure compliance with the tools used or to determine if the tools have been effective. Monitoring and reporting tools include permits/licenses, registration, fish tickets, logbooks, port sampling/onshore observers, on-board observers, vessel monitoring systems (VMS), onboard video recording devices, surveys, punch cards/tags, and enforcement activities. The current federal reporting requirements include permits/endorsements for the limited entry sector of the commercial fleet, reporting requirements for the at-sea whiting fleet (catcher/processor and mothership/processor vessels), an onboard observer (scientific data collection) program, and a VMS program expected to begin in 2003. Federal licenses are not required for the commercial open access sector or for the recreational sector. The current fish ticket and commercial logbook reporting requirements are conducted by the states.

Permits/licenses/endorsements - Permits and licenses confer permission to conduct specified activities. For fisheries, they may be a registration of vessel or gear, species, amounts, etc. There may or may not be a limited number of licences/permits available, and there may or may not be a cost to obtain them. In the groundfish fishery, trip limits apply to vessels rather than to permits. Endorsements are added to permits to provide specific conditions or permissions. For example, each limited entry permit includes a vessel length and gear endorsement. Also, a sablefish endorsement was created to identify those longline and pot vessels eligible to participate in the "open season" and the amount of sablefish they may harvest during the season.

Registration - Vessels may be required to report in advance their intention to fish in a certain area, fishery, time period, etc. This provides a record of intention and may confer permission. NOAA Fisheries has published (in 2003) a proposed rule to require that operators of any vessel registered to a limited entry permit and any other commercial or tribal vessel using trawl gear, including exempted gear used to take pink shrimp, spot and ridgeback prawns, California halibut and sea cucumber, to declare their intent to fish within a conservation area specific to their gear type, in a manner that is consistent with the conservation area requirements. That is, the vessel must notify a state or federal agency before it enters an area closed to fishing.

Fish tickets (commercial landings/sales receipts) - Fish tickets are a record of the amount and species of fish landed by a commercial fishing vessel. They are required by each state, and the information required may differ among states. Typically, fish tickets may also indicate gear used, area fished and other specified information. This information is keypunched into an electronic data system and transmitted to a centralized database (PacFIN, maintained by PSMFC).

Vessel logbooks - Logbooks are a vessel's record of activities and estimated amounts of fish caught and retained. The trawl logbook program is conducted by the states (with the help of PSMFC). Vessels are required to complete and submit these records as specified by state regulation. Fishing location is required, as well as amounts of fish retained in each set/haul/tow. Currently, only retained catch is recorded. Selected logbook information is keypunched into an electronic database and compared to fish ticket records. Although states require some non-trawl vessels to fill out logbooks, only trawl logbook information is entered into the data system. Electronic logbooks are used in some fisheries.

Surveys - Surveys are a series of questions, verbal or in writing, designed to collect useful information. Surveys may be conducted in person (as in a port sampling survey), by phone (as in the survey of recreational fishing), or by mail. Typically, participation in a survey is voluntary.

Punch cards/tags (recreational) - Punch cards and tags may serve as a license/permission and as a catch record. There are no federal requirements at this time for West Coast groundfish.

Port sampling/on-shore observers - When a vessel or fisher returns to port, he/she may be met by an official surveyor who collects specified fishing-related information. This may be biological information about the fish, fishing locations and methods, ocean conditions, marine animals observed, etc. Species information may be incorporated into the data system to provide more specific information than recorded by other methods. For example, a fish ticket may not record the weight of each species or even a complete list of species, but a port sampler/observer may provide that information. Port sampling is typically conducted by the states, in conjunction with PSMFC.

On-board observers - Commercial vessels fishing for groundfish are required to allow an agency-certified fishery observer aboard to collect scientific information. The current federal observer program for the West Coast groundfish fishery has resources to observe about 10% of the commercial (limited entry) groundfish fishing trips. Currently, the West Coast observer program focuses on discarded fish, recording amounts, species, and some biological information about the fish. Other information, such as time, location, and gear may also be recorded. Observers can also record observations or measurements of seabirds and marine mammals and other useful scientific information. The federal observer program is not intended or designed to be a compliance or enforcement program.

A compliance monitoring program could be established, as in conjunction with an individual fishing quota program, to help ensure vessels maintain appropriate records and comply with the fishery management program requirements. For example, a compliance monitor could record discarding activities and fishing location.

Vessel monitoring systems (VMS) – Mobile vessel monitoring system (VMS) is a tool that allows vessel activity to be monitored in relation to geographically defined management areas. VMS transceivers automatically determine the vessels position using Global Positioning System (GPS) satellites. Generally, the vessels position is determined once per hour, but the position determinations may be more or less frequent depending on the fishery. VMS transceivers are designed to be tamper resistant. In most cases, the vessel owner is not aware of exactly when the unit is transmitting and is unable to alter the signal or the time of transmission. VMS is a technological tool that can be used to improve bycatch management by providing location data that can be used in conjunction with observer data collections. (See the 5/22/03 *Federal Register* "Proposed Rule for a Vessel Monitor System" for additional information.)

Onboard video recording devices are used in some areas to monitor vessels' fishing activities. Cameras mounted on vessels can record fishing times and provide a general view of catch, as well as certain fishing-related activities. Limited bycatch (discard) and species composition information can be obtained by this method.

Enforcement activities include a variety of data collection methods and information. Traditional techniques used to monitor marine fisheries include monitoring from air and surface craft. Monitoring from aircraft provides fishing location, vessel counts, and other general information. It could provide only limited bycatch information, such as whether discarding has occurred (such as visible, floating fish).

GENERAL EFFECTS OF FISHERY MANAGEMENT TOOLS

GENERAL EFFECTS OF FISHERY MANAGEMENT TOOLS

Management measures or tools vary in their application and effect at reducing bycatch, bycatch mortality and in improving catch accountability. Few tools have only one effect, and thus it is often a case of choosing tools that effectively address a variety of goals. Likewise, it is important that the chosen tools work in harmony to achieve the objectives, rather than work in opposition to each other. In theory, an optimum management program would use a few tools that work together synergistically to achieve the desired effects. In this EIS, traditional tools and some new tools never before used in managing West Coast groundfish fisheries are evaluated.

Tools and Their Linkage to Species Associations

Tools and Their Linkage to Species Associations

The utility, effects, and effectiveness of various management measures are linked to key attributes of species we seek to manage. Some tools are more effective at reducing bycatch of rockfish than flatfish for example. Other tools designed to reduce the bycatch of one species may have different impacts on another species. In this EIS, example groundfish species have been highlighted for the analysis. These are all of the overfished groundfish species and selected emphasis groundfish species representing a sample of the 83 groundfish species managed under the Groundfish FMP. These species represent a cross section of groundfish, and have differences in stock status, behaviors, life history, and habitat associations.

Several other important non-groundfish emphasis species have also been chosen for the analysis.

Knowledge of species attributes is key to understanding if a tool can be used to reduce bycatch and how effective it will be. For example, several of the over-fished groundfish species are rockfishes that have a high degree of association with rocky-bottom shelf habitat. Some of these habitats are well defined areas on the continental shelf. Area management tools (such as MPAs or the current RCAs) may be very effective at controlling vessel encounters with concentrations of canary rockfish and cowcod. However, canary rockfish also occur outside of present RCA boundaries in lower concentrations, and thus area management alone may not minimize incidental encounter with them. A combination of area management and other tools may

SPECIES ASSOCIATIONS AND ATTRIBUTES IMPORTANT TO APPLICATION OF BYCATCH REDUCTION TOOLS

Overfished
- **Canary rockfish**
- **Lingcod**
- **Yelloweye rockfish**
- **Boccacio**
- **Cowcod**
- **Widow rockfish**
- **Pacific Ocean perch**

Rocky-bottom shelf habitat
- **Canary rockfish**
- **Lingcod**
- **Yelloweye rockfish**
- **Boccacio**
- *Yellowtail rockfish*
- *Chilipepper*

Non-rocky shelf habitat
- *Dover sole*
- *English sole*
- *Petrale sole*
- *Arrowtooth flounder*

Slope
- **Darkblotched rockfish**
- **Pacific Ocean Perch**
- *Dover sole*
- *Sablefish*
- *Shortspine thornyhead*
- *Longspine thornyhead*

Pelagic or Semi-pelagic
- **Widow rockfish**
- **Pacific whiting**
- *Yellowtail rockfish*

Nearshore
- *Black rockfish*
- *cabezon*

Migratory
- **Pacific whiting**

Longevity
- Rockfishes - longest
- Flatfishes - intermediate
- **Lingcod** and *cabezon* - intermediate
- **Pacific whiting** - shortest

Productivity
- Rockfishes - lowest
- Flatfishes - intermediate
- **Lingcod** and *cabezon* - intermediate
- **Pacific whiting** - highest

Handling survivability
- Rockfishes, Pacific whiting - none
- Flatfishes - intermediate from mesh
- **Lingcod**, *cabezon*, fair

Overfished species - **Bold**, Emphasis species-*italic*

be more effective in minimizing incidental canary rockfish catch.

Lingcod is another overfished species which is associated with rocky-bottom shelf habitats and partially overlap canary rockfish distribution. However, lingcod are also found in non-rocky bottom and nearshore habitats. Area management tools designed to protect canary rockfish will reduce encounters with lingcod within the canary management area, but to minimize lingcod bycatch, additional measures (or area) would be necessary.

Many species have a much broader distribution across shelf and slope habitats. Generally, younger fish settle in shallow water areas and gradually move offshore as they mature. Others make small scale seasonal migrations to feed on the shelf during the summer or spawn offshore in the winter. Lingcod move inshore to spawn during the winter.

Flatfishes as a group are broadly distributed, while Pacific whiting make extensive migrations between southern and northern limits of their range. Because they are so broadly distributed, area management tools would have to be extremely broad and greatly reduce areas for fishing for other species. Gear restrictions, on the other hand, could be used to for flatfish, and seasonal restrictions on Pacific whiting to do so.

Another important attribute to be considered in designing and applying bycatch reduction tools is a species' sensitivity to handling. Rockfishes have swim bladders that expand to the point of bursting when they are brought to the surface from seafloor depths greater than a few fathoms. Few rockfish survive this kind of trauma. Thus, regulations that require release of rockfish will likely result in near 100% bycatch mortality. Species that lack swim bladders, such as lingcod and cabezon, appear to be more durable and may be less traumatized by capture and release. Size, bag and trip limits may not contribute to high bycatch mortality rates for these species.

Effects of Fishery Management Tools

Effects of Fishery Management Tools

The primary components of a fishery that can be "managed" are harvest levels, gear, who, when and how many (that is, which vessels, times and areas, and capacity (number of vessels and characteristics of those vessels). Other management tools include monitoring/ reporting requirements. Management tools, or measures, have different effects on mitigating for incidental catch, bycatch, bycatch mortality, and effectiveness . The following is a description of the range of effects for different management tools.

Harvest Specifications: ABCs, OYs and Allocations

Harvest Specifications: ABCs, OYs and Allocations

Harvest specifications (such as ABC, TAC, MSY and OY) are the first level of conservation and management to maintain sustainable fisheries. For West Coast groundfish, harvest specifications are set to either maintain or rebuild various stocks. When stocks are not equally available (or available in the same proportions), specified harvest levels may not match the relative abundance (ratios) of all the species. OYs are the annual harvest targets for groundfish. Other management measures are designed to achieve but not exceed those targets. OYs provide the basic framework for management, but the fishery management measures to achieve them have greater direct relationship to incidental catch and bycatch.

A relatively small OY in conjunction with larger OYs may generally result in an increased probability and level of regulatory induced discard. Exceptions to this have to do with the distributional characteristics of the species and other management measures that might be applied. A widely dispersed species with a small OY is likely to have a higher encounter rate when fishers target other co-occurring species. Most of an OY would likely be used as incidental catch allowance for fisheries directed at co-occurring species.

Allocations of OY at the highest level (to major limited entry gears, open access, and recreational fishers) will also have potential impacts on bycatch due to differing selectivity of gears involved. Other tools, discussed below, may be used to mitigate for fishing impacts of small OYs.

The balance of OY and fleet size/capacity is critical to bycatch. If a stock is very abundant, and few vessels or anglers fish for it, there is unlikely to be any regulatory discard. However, any abundant stock that is underutilized is likely unmarketable. A large stock biomass in conjunction with a large (but not overcapacity) fleet can result in very low regulatory discard also. Even a small stock in conjunction with a small fleet may not have much regulatory discard. However, if that stock is mixed with abundant but unwanted species, the level of economic (non-regulatory) discard may be excessive.

And finally, a species may have a large OY but also have harvest constraints to reduce impacts on a small OY species. The result would likely be a large regulatory discard. This is a result not of the OY directly, but rather the management measures to achieve two or more OYs that are "out of balance." This is the case with species like yellowtail rockfish that have high OY levels but are constrained by catch co-occurring species with a lower OYs such as canary and widow rockfish.

For other species with relatively large OYs, bycatch may not necessarily decrease as there are many non-regulatory sources of bycatch that are proportional to the size of catch. Some non-regulatory sources of bycatch are related to market limits on fish size, quality, and quantity. Another different set of tools may therefore be needed to reduce non-regulatory forms of bycatch that are associated with species having high OYs.

Trip Limits, Bag Limits, and Catch Limits

Trip Limits, Bag Limits, and Catch Limits

Trip limits are retention and landing limits (by species or species complex) that apply to individual commercial fishers, vessels, permits, gear groups, or other defined groups in a given area for a given period of time. Bag limits are the equivalent for recreational fishers.

In a study of West Coast groundfish, discard rates were found to vary inversely with the size of the trawl trip limits imposed (Pikitch *et al.* 1988). Restrictive limits may therefore result in a higher catch and bycatch mortality of overfished species compared to alternatives that allow larger trip limits, or alternatives that utilize a different set of management tools. Vessel trip limits for overfished species are designed to provide for non-target incidental catch, although target fishing is allowed with some gear types part of the fishing year for Pacific whiting, widow rockfish, and lingcod. Cumulative 1 or 2 month limits are used to help minimize regulatory discard.

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Trip limits are often structured to preserve a ratio of catches reflective of a fishing strategy that results in a particular mixture of species. Often times the mixture contains one or more species that is either overfished or under precautionary management. Catches are constrained so that the ratio is preserved and the overfished or precautionary species OY is not exceeded. Fishers may attempt to develop strategies to maximize value of joint catches of the mixture. If actual fishing experience on the grounds and optimal values for a species mixture matched the average ratios applied when trip limits are set, regulatory bycatch should be minimized. Unfortunately catches of individual species tend to be highly variable, leading to a significant tow by tow and trip by trip variation in ratios. This high degree of variability is related to the aggregating nature of some of the species in the mixture (see above discussion on species associations). This problem can be significant with a species like canary rockfish with a trip limit set at a very low level. Although rare, there are times when encounter with an isolated school of canary rockfish can lead to bycatch that is several times larger than the incidental catch limit.

In addition, market forces stemming from price, quantity, and size may result in fishers seeking an alternative mixture of species. Discarding of undersized or lower valued species can, therefore, be coupled with regulatory limits leading to bycatch. This problem generally increases with smaller limits.

Some fishing strategies do not take significant amounts of overfished species. Trip limits on some species of groundfish may not result in significant regulatory discarding, as most of the trips fall short of attainment and are limited by market factors. By themselves, market factors such as size, quantity, and price limitations may also lead to discard if fishers continue to fish for other more valued species.

Bag limits contribute to bycatch, but provide an opportunity to reduce bycatch mortality of rockfishes, particularly in the nearshore areas where the effects of barotrauma are lessened. Some species subject to bag limits and size limits, such like lingcod and cabezon, can tolerate effects of hooking, handling, and release better than rockfish.

Catch limits are substantially different than trip or retention limits!

Catch limits (or fishing mortality limits) restrict the amount of fish that may be caught or killed, whether landed or discarded. These limits require fishers to stop fishing when a limit is

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reached. Catch limits have not been used in the federal groundfish management program. One form of catch limit is the Individual fishing quota or (IQ). As used within this EIS, the IQ takes the form of an individual vessel quota for overfished species called a restricted species quota (RSQ), or an individual vessel quota for other groundfish called an individual fishing quota (IFQ). Generally, individual quotas allow managers to do away with or minimize the use of trip limits as a management tool and to restrict fishing when quotas are reached. This has the potential to reduce regulatory induced discard, especially for overfished species. IQ programs work generally work best in conjunction with extensive monitoring to ensure accountability in catch accounting system. This may mean 100% observer coverage or some other reliable catch verification system. If 100% retention is not a requirement, discarding could still occur. However, with an improved monitoring system, it would be accounted for. If 100% retention were a requirement, for either RSQ or IFQ managed groundfish, some method of ensuring compliance would be necessary.

A clear distinction must be made between retention quotas and mortality or catch quotas. Retention quotas are much less effective at reducing incidental catch, bycatch and discard. This is especially apparent where the value of different sized fish is substantial; in that case, high-grading would be likely as a fisherman (as a business man) would seek to maximize his profit. Retention limits can be effectively monitored on shore through landings receipts and sampling deliveries. Catch limits, on the other hand, must be monitored at sea. The exception to this is if discarding is prohibited; in that case, an onboard video system would be relatively effective in monitoring discard activities, but would not be effective in distinguishing species.

If IQs were transferable, some consolidation of fishing strategies and perhaps fleet could be anticipated. One consequence might be a reduction in the number of vessels participating in the groundfish fishery, if fishers elected to sell their IQ shares and switch to some other fishery. Fewer vessels with more IQ shares would have access to more resource. The impacts of this scenario is less easily resolved. Acquiring more IQ shares of overfished species should allow fishers more access to other groundfish. Unless there is a 100% retention requirement for IFQ species, bycatch of a non-regulatory nature may increase due to increased harvest levels.

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Gear Restrictions

Gear Restrictions
Gear regulations are often intended to reduce the efficiency of the various gear types. Gear regulations can also be used to change the gear's selectivity. Gear selectivity is related to catch and bycatch, and thus selectivity can be adjusted to mitigate for the effects of fishing and reduce bycatch. Unobserved bycatch mortality may still occur even though bycatch as measured through observer programs is reduced. Gears can be modified to reduce the take of undersized fish, change the species composition, reduce the take of prohibited species, decrease overall efficiency, or force the gear to be used in particular habitats. Through the EFP process, fishers, agencies, and gear manufacturers are actively experimenting with modified gears designed reduce the take of overfished species.

Trawl
West Coast commercial fishers use a variety of otter trawl types. Bottom trawls are used to fish for rockfish, flatfish, and sablefish. Gear restrictions on bottom trawl gear have had a significant impact on bycatch rates and amounts of overfished and other groundfish species. The minimum mesh size for trawl gear was increased from 4 inches to 4 ½ inches in 1995, based in large part on a mesh size study conducted in the late 1980s. The study demonstrated reduced retention of small, unmarketable groundfish. Larger mesh size reduces the catch of undersized fish that would otherwise be sorted and discarded at sea. Changes in the type and use of chafing gear is also believed to have increased escapement of juvenile rockfish, flatfish and sablefish. Bycatch mortality of fish escaping through the meshes may be occurring, however (Davis and Ryer 2003).
Large diameter roller gear permitted bottom trawls to be used in hard bottom areas preferred by shelf rockfish species. Restricting the use of rollers larger than 8 inches effectively reduced directed rockfish fishing on these rocky-bottom shelf areas. A study by Hannah(2003) showed that trawlers avoided rocky reef areas on the shelf as a result of the regulation, and that encounter rates of overfished species were reduced.

EFPs are currently be used to test the selectivity of special flatfish trawls designed to reduce rockfish catches. These nets have large, cut-back sections of net in the upper panel of the trawl and reduced trawl height compared to conventional trawls. Preliminary results from an ODFW study using this experimental trawl in 50-180 fms indicated a 61% reduction in

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canary rockfish catch while increasing catches of flatfish by a similar degree (Parker 2003).

Other regulations could be used to change selectivity and efficiency of the gear. Size of trawl gear has not been restricted in the West Coast groundfish fishery. Smaller trawls could reduce bycatch by reducing area swept by the trawl, which in turn would reduce bottom disturbance and catch. If navigation methods were sufficiently accurate, smaller trawls may be able to be fished without risking contact with habitat types that may need to be avoided. Reduced trawl height would reduce the take of species like rockfish often times are found distributed in the water column above the bottom.

Most rockfish species do not survive after being brought to the surface after capture with trawl gears. Sablefish, cabezon, lingcod, and flatfishes (including halibut) lack swim bladders and have a better chance at survival. Thornyheads also do not have a swim bladder but are usually descaled badly due to contact with other fish and trawl webbing.

In addition to catching other non-groundfish marine finfish, all bottom trawls have some contact with the sea floor that result in the bycatch of benthic epifauna and shellfish. Examples of incidental catch include marine plants, coral, sponges, sea urchins, and sea stars. Bottom trawl doors, bridles and also disturb rocks and sediments. Indirect impacts of this type of disturbance are poorly understood but are thought to reduce or modify fish habitats.

Midwater (pelagic) nets are used to target Pacific whiting and can be used to target semi-pelagic species of rockfish like widow and yellowtail rockfish. Smaller mesh (3 inch minimum) is used, compared to 4½ inch mesh used for bottom trawls. Pelagic trawls can be used to access species with higher OYs, like yellowtail rockfish while minimizing the bycatch problems associated with bottom trawl gear.

Bycatch reduction devices (BRDs) are typically not used in West Coast groundfish trawls but are used by groundfish trawlers in Alaska (to reduce bycatch of Pacific halibut) and by West Coast shrimp and prawn trawlers (to reduce groundfish bycatch). Studies by the ODFW show a significant reduction in the bycatch of finfish species when fish excluders are used in shrimp trawls (Hannah *et al.* 1996). States currently manage the shrimp fishery and require the use of excluder devices to help reduce the take of canary rockfish

Hook-and-Line
West Coast commercial and recreational fishers use a variety of hook-and-line gears. Most West Coast groundfish longline gear is used to target sablefish and bycatch rates of sablefish and other groundfish are thought to be low in this fishery. While sablefish is a relatively hardy species, an unknown amount of hooking mortality occurs. Small fish or fish damaged by sand fleas or bites from predators typically make up the discard. A study of the Alaskan sablefish fishery indicated that sablefish bycatch as discard including bycatch mortality was less than 12 % of the total allowable catch (TAC) (Richardson and O'Connell 2002). Halibut can be retained in the longline fishery which lessens bycatch mortality of this species. In a comparison of sablefish pot and longline gear survey methods, bycatch of Pacific rattail was more than half of the total catch of all species in gear tended in deep water (600 fm) (Matteson *et al.* 2001). Most longline gear is fished shallower than this and bycatch rates in the same study were quite low. This EIS considers the use of hook and line gear as an alternate to trawl gear for limited entry permit holders to access unattained OY. The selectivity characteristics may allow fishers to minimize incidental catch and bycatch of overfished species while targeting healthier stocks of groundfish.

Open access and recreational hook and line gears are diverse. Bycatch is can be managed by limiting the use and amounts of certain gear types. Each gear type has different selectivity characteristics and these are used to harvest different species mixtures. Restricting fisheries to certain gear types or depths can significantly change the species composition of the catch. Gear restrictions on the shelf reduce bycatch of canary and yelloweye rockfish. Small fish or those with limits are discarded. Hook and line gear bycatch, when released, has some chance of survival depending on the species and depths fished. Due to barotrauma, mortality rates for rockfish released from hook and line gear are likely to be high especially if they are taken in deeper water. A study of different handling methods showed no significant difference in survival rates between quillback rockfish vented with a hyper-dermic needle or brought more slowly to the surface compared to un-vented fish or those brought more rapidly to the surface. Survival was significantly improved in fish rapidly returned to depth (Berry 2001). Similar findings for black rockfish were noted by Oregon Dept. of Fish

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and Wildlife researchers (Rankin 2003). Impacts to lingcod, cabezon, and sablefish should be less as they do not have swim bladders. Ultimate survival of all of these species handled in such a manner is poorly understood, however.

BRDs have not been required in the West Coast groundfish longline fishery and little information is available on encounter rates with marine bird species. Observer programs may provide better information on encounter rates. BRDs have been successfully used in Alaskan longline fisheries.

Pot/Trap
Pot or trap gear is principally used to target sablefish in the West Coast limited entry fixed gear groundfish fishery. It is highly selective for sablefish. Bycatch in the commercial fishery is made up of undersized fish. A pilot survey study conducted by the Oregon Department of Fish and Wildlife comparing pot and longline gears indicated that nearly all of the catch by pot gear was comprised of sablefish (more than 99%) over a broad range of depths (Matteson *et al.* 2001). West Coast traps are typically equipped with 3 ½ inch mesh allowing escapement of some small fish. Fish caught in the pilot survey study ranged from about 54 cm to more than 90 cm.

Little is known about the mortality of released sablefish. Some studies indicate that bringing sablefish through an abrupt temperature change, such as the thermocline present offshore during the summer, can lead to stress and mortality (Davis and Ryer 2003).

Pot gear is also used by open access and limited entry participants in nearshore live fish fisheries. These small pots facilitate handling of fish and reduce injury so that fish will have a higher rate of survival when transported and held in the market place.

There is no maximum on pots used in the limited entry fixed gear fishery. No race for fish occurs as the vessel based tiered catch limit system allocates a portion of the sablefish OY to each fisher. Other means of making pot gear less effective are not used for the same reason. Oregon does limit the number of pots used by one nearshore fisher holding the only developmental fisheries pot endorsed permit for nearshore species.

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Some ghost fishing can occur with lost pots and traps. To minimize losses gear is marked so it can be found and biodegradable lacing is used to in the event that it is lost so that a large hole will eventually open up and release fish. Mortality due to lost gear is not well understood or documented.

Setnet (Gill and Trammel Nets)
Tools for managing setnets are not discussed here because this gear is managed by the State of California.

Time/Area Restrictions (Closures)

Time/Area Restrictions (Closures)
Large scale, depth-based closures, designed to protect several overfished species, are now in effect (Rockfish Conservation Areas or RCAs. A very small percentage of the available habitat is set aside in long-term (permanent) marine protected areas or research reserves. Fishing activities in the RCAs, in particular on-bottom fishing, are restricted; fishing with certain gear types is still allowed. Protected areas are best used when the migratory range of species is limited and species have strong site affinity for specific habitat types that can be identified and isolated through regulatory means. Protected areas have significantly reduced the bycatch of overfished canary rockfish, boccaccio, and cowcod. Seasonal restrictions can afford similar protection to species that aggregate during spawning migrations. Winter closures have been effective at reducing the catch of lingcod in nearshore spawning areas for example.

Use of RCAs and MPAs will have some impacts on other species both inside and outside of the boundaries. Catch and bycatch of co-occurring species within the area should be reduced if the area is closed to most fishing activities. As was pointed out above, catch and bycatch can increase due to effort shifting affecting other groundfish. Similar effects may occur to non-groundfish species inside and outside of protected areas.

Capacity Limits

Capacity Limits
Capacity limits are used to restrict access to the fish resource. Reducing capacity is a goal of the Council's *Strategic Plan for Groundfish*. Generally, capacity reduction in most forms reduces the need for other controls that may lead to regulatory induced bycatch in particular. Non-regulatory bycatch may also be reduced if there are fewer boats to supply market demands.

IQ programs typically have a direct effect of reducing capacity as fishers sell their shares and leave the fishery. Impacts would

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be similar to other capacity reduction methods that consolidated vessel permits into a smaller fleet.

Vessel Restrictions

Monitoring/Reporting Requirements

Monitoring/Reporting Requirements
Monitoring and reporting requirements are essential fishery management tools. Accountability and accuracy of these programs is proportional to the amount of observer coverage and catch verification that can be accomplished. Higher levels of monitoring will yield more complete, accurate, and timely estimates of total catch including bycatch. Direct benefits would include in-season adjustments based on current season data and higher compliance rates. Indirect benefits would include improved stock assessments and tracking of rebuilding plans.

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draft

Contents

draft

Glossary and Acronyms

A

ABC	Acceptable biological catch – see below
Abyss	The deepest part of the ocean.
Acceptable biological catch	(**ABC**) Refers to the allowable catch for a species or species group, based on its estimated abundance. The ABC is used to set the upper limit of the annual total allowable catch and is calculated by applying the estimated or proxy harvest rate that produces maximum sustainable yield to the estimated exploitable stock biomass.
Allocation	Distribution of the opportunity to fish among user groups or individuals. The share a user group gets in sometimes based on historic harvest amounts.
Alternatives	Different combinations of management objectives and measures to reduce bycatch to the extent practicable, reduce bycatch mortality, and to assess the amount and type of bycatch in the fishery. This EIS analyzes the environmental impacts of each alternative.
Angler	A person catching fish or shellfish with no intent to sell. This includes people releasing the catch.
Annuli	Annual variations in the pattern of growth rings on fish scales or otoliths.
Anthropogenic	Refers to the effects of human activities.

B

B_0	Unfished biomass; the estimated size of a fish stock at equilibrium in the absence of fishing.
$B_{25\%}$	25% of unfished biomass. This is the Council's threshold for declaring a stock overfished or the Minimum Stock Size Threshold.
$B_{40\%}$	40% of unfished biomass. This is the Council's threshold for declaring a stock rebuilt or the size of the stock estimated to produce MSY. This is also referred to as B_{MSY}.
Bag limit	The number and/or size of a species that a person can legally take in a day or trip. This may or may not be the same as a possession limit.
Baleen	A specialized plate of horny material used by some species of whales (Mysticetes) to filter-feed.
Barotrauma	Physical trauma or injury to a fish due to pressure change. When a fish is rapidly brought from deep water to the surface, the drop in pressure can cause a variety of physical problems, such as severe expansion of the swim bladder and gas bubbles in the blood.
Bathymetry	The measurement of ocean depth.
Bathypelagic Zone	The zone of the ocean that extends from 1,000m to 4,000m below the surface of the ocean.
Benthic	Refers to organisms that live on or in the ocean floor.

Benthic Invertebrate	An animal, such as a mollusk, with no spinal column that lives on the ocean floor.
Best available science	The term "best available science" comes from the second National Standard listed in the Magnuson-Stevens Act and is the informational standard mandated for decision-making.
Bight	A name for the water body found abutting a large indentation in the coast. A bight is less enclosed than a bay.
Bimodal distribution	Indicating two length groups within which individuals are most abundant, possibly with other less abundant length groups around them.
Bioaccumulation	The build-up over time of substances (like metals) that cannot be excreted by an organism.
Biodiversity	The variation in life on Earth reflected at all levels, from various ecosystems and species, to the genetic variation within a species. See also ecosystem diversity, species diversity, genetic diversity.
Biological Opinion	A scientific assessment issued by the National Marine Fisheries Service, as required by the Endangered Species Act for listed species.
Biomass	The total weight of a group (or stock) of fish in a given area. The term biomass means total biomass (age one and above) unless stated otherwise.
BiOp	Biological opinion (see above)
Biota	Refers to any and all living organisms and the ecosystems in which they exist.
Biotic Factor	A living component of the environment which arises from and affects living organisms (distinct from physical factors). For example, the interaction between predators and prey is a biotic interaction.
Bioturbation	Disturbance of soft sediments by the movements and feeding activities of infauna (animals that live just beneath the surface of the sea bed).
B_{MSY}	The biomass that produces the maximum sustainable yield.
BO	Biological opinion (see above)
BRD	Bycatch reduction device (finfish excluders, etc.). These are devices incorporated in fishing gears designed to reduce the take of non-target species.
Bycatch	Fish which are harvested in a fishery, but which are returned to the sea (or discarded) rather than being sold or kept for personal use. Bycatch includes economic discards and regulatory discards, including fish donated to a charitable organization. Bycatch + landed catch = total catch or total estimated fishing-related mortality.
Bycatch model	A model used to calculate amounts of overfished species and other groundfish expected to be caught under various trip limits or certain combinations of measures. Strictly speaking, it calculates expected catch rather than bycatch.

C

CA	California
CalCOFI	California Cooperative Fishery Investigation

California Rockfish Conservation Area	The **CRCA** is defined as, (1) Ocean waters 20 fm to 250 fm between Cape Mendocino and Point Reyes and 20fm to 150 fm between Point Reyes and the U.S.-Mexico Border, and (2) the Cowcod Conservation Areas. The purpose of the CRCA is to regulate all gear types that have a potentially significant affect on rebuilding of overfished rockfish species south of Cape Mendocino.
California Bight	The region of concave coastline off Southern California between the headland at Point Conception and the U.S./Mexican border, and encompassing various islands, shallow banks, basins and troughs extending from the coast roughly 200 km offshore.
Catch	The total number or poundage of fish captured from an area over some period of time. This includes fish that are caught but released or discarded instead of being landed. The catch may take place in an area different from where the fish are landed. Note that catch, harvest, and landings are different terms with different definitions.
Catcher/processor	A factory-trawl vessel that participates in the Pacific whiting fishery. This type of vessel catches fish and processes fish. Also, a sector of the whiting fishery.
Catch per unit of effort	(CPUE) The quantity of fish caught (in number or in weight) with one standard Unit of fishing effort; (e.g., number of fish taken per 1,000 hooks per day or weight of fish, in tons, taken per hour of trawling). CPUE is often considered an index of fish biomass (or abundance). Sometimes referred to as catch rate. CPUE may be used as a measure of economic efficiency of fishing as well as an index of fish abundance.
CCA	Cowcod Conservation Area(s) - see below
CDFG	California Department of Fish and Game
CEQ	Council on Environmental Quality
Cetaceans	Marine mammals of the order *Cetacea*. Includes whales, dolphins and porpoises.
CFR	Code of Federal Regulations – see below
cm	centimeter
Coastal pelagic species	(**CPS**) Coastal pelagic species are schooling fish, not associated with the ocean bottom, that migrate in coastal waters. They are usually planktivorous (plankton-eating) and the main forage of higher level predators such as tuna, salmon, most groundfish, and man. Examples are herring, squid, anchovy, sardine, and mackerel.
Coastal Zone Management Act	(**CZMA**) An act of federal law with the main objective to encourage and assist states in developing coastal zone management programs, to coordinate state activities, and to safeguard regional and national interests in the coastal zone.
Code of Federal Regulations	(**CFR**) A codification of the regulations published in the *Federal Register* by the executive departments and agencies of the federal government. The CFR is divided into 50 titles that represent broad areas subject to federal regulation. Title 50 contains wildlife and fisheries regulations.
Codend	The end of a trawl net. Fish are eventually swept into the codend as the net is dragged along.

Cohort	In a stock, a group of fish generated during the same spawning season and born during the same time period. Also, in cold and temperate areas, where fish are long-lived, a cohort corresponds usually to fish born during the same year (a year class).
Commercial fishing	Fishing in which the fish harvested, either whole or in part, are intended to enter commerce through sale, barter, or trade.
Commercial Fishery	A term related to the whole process of catching and marketing fish and shellfish for sale. It refers to and includes fisheries resources, fishermen, and related businesses directly or indirectly involved in harvesting, processing, or sales.
Community	An ecological unit composed of the various populations of micro-organisms, plants, and animals that inhabit a particular area.
Continental Shelf	The submerged continental land mass, not usually deeper than about 100 fathoms (200 m). The shelf may extend from a few miles off the coastline to several hundred miles.
Continental Slope	The steeply sloping seabed that connects the continental shelf and continental rise.
Convergence	The contact at the sea surface between two water masses converging, one plunging below the other.
Co-occurring stocks	Stocks of different fish that swim or school near one another, and may be caught together.
Coriolis effect	The deflection of air or water bodies, relative to the solid earth beneath, as a result of the earth's eastward rotation.
Council	Pacific Fishery Management Council
Cowcod Conservation Area(s)	(**CCA**) Two areas located in the Southern California Bight southwest of Santa Monica to the California-Mexico border that encompass roughly 4,300 nm^2 of habitat where the highest densities of cowcod occur. These areas are closed to bottom fishing in order to rebuild the cowcod stock to B_{MSY}.
CPFV	Commercial passenger fishing vessel or charterboat operating in waters off California
CPS	Coastal pelagic species - see above
CPUE	Catch per unit of effort - see above
CRCA	California Rockfish Conservation Area - see above
Cumulative limit	The total allowable amount of a species or species group, by weight, that a vessel may take and retain, possess, or land during a period of time. Fishers may take as many landings of a species or species complex as they like as long as they do not exceed the cumulative limit that applies to the vessel or permit during the designated period.
CZMA	Coastal Zone Management Act - see above

D

Decomposer	An organism which gains energy by breaking down the final remains of living things. Predominantly bacteria and fungi, decomposers are important in freeing the last of minerals and nutrients from organic matter and recycling them back into the food web. See also decomposition; compare detrivore.
Decomposition	The biochemical process where biological materials are broken down into smaller particles and eventually into basic chemical compounds and elements. See also decomposer.
DEIS	Draft environmental impact statement
Demersal	Fish and animals living in close relation with the sea floor.
Density dependence	The degree to which recruitment changes as spawning biomass changes. Typically we assume that a Beverton-Holt form is appropriate and that the level of density-dependence is such that the recruitment only declines by 10% when the spawning biomass declines by 50%.
Derby fishery	A fishery of a few days' or weeks' duration during which fishers compete to take as much catch as they can before the fishery closes.
Detritus	Dead organic matter of plant or animal. See also detrivore.
Detrivore	An organism that feeds on large bits of dead and decaying organic matter (detritus). What detrivores leave behind is used by decomposers. Crabs and seabirds are examples of detrivores. Compare decomposer; see also detritus.
Diatom	One-celled phytoplankton with an external skeleton of silica.
Dispersal	The spreading of individuals throughout suitable habitat within or outside the population range. In a more restricted sense, the movement of young animals away from their point of origin to locations where they will live at maturity
Distribution	(1) A species distribution is the spatial pattern of its population or populations over its geographic range. (2) A population age distribution is the proportions of individuals in various age classes. (3) Within a population, individuals may be distributed evenly, randomly, or in groups throughout suitable habitat.
Diversity	Genetic variations that allow a population to use a wider array of environments, protect against short-term spatial or temporal changes in the environment and survive long-term environmental changes.
Downwelling	The process whereby prevailing seasonal winds create surface currents that cause surface water to sink, bringing nutrient-poor ocean surface water into the area.
DTS complex	Dover sole/thornyhead/trawl-caught sablefish complex

E

EA	Environmental assessment – see below
EC	Enforcement Consultants – see below
Ecological Niche	The role a plant or animal plays in its community. The niche of an organism is defined by what it eats, its predators, salt tolerances, light requirements etc. Two species are not stabile if they both live in the same habitat if they occupy identical niches.

Ecology	The study of the physical and biological interactions between an organism and its natural environment.
Economic bycatch	Or **economic discard**. The portion of bycatch that is not caused by regulations but is related to other factors. Fish discarded because they are too small to be sold, or the wrong species, are considered to be economic discards. Broadly defined it can mean all discard that is not related to regulations.
Ecosystem	A community of plants, animals and other organisms that are linked by energy and nutrient flows and that interact with each other and with the physical environment.
Ecosystem Diversity	The diversity of biological communities and their physical environment. Diversity is determined by the species composition, physical structure and processes within an ecosystem. This is the highest level of biodiversity. See also biodiversity; compare species diversity, genetic diversity.
EEZ	Exclusive Economic Zone – see below
Effects	Impacts; anticipated results of an action. Effects include ecological, aesthetic, historic, cultural, economic, social, or health. They may be beneficial or detrimental. An EIS describes and analyzes anticipated effects of the alternatives. (Also, see impacts below)
Effort	The amount of time and fishing power used to harvest fish. Fishing power includes gear size, boat size, and horsepower.
EFH	Essential fish habitat – see below
EFP	Exempted fishing permit – see below
EIS	Environmental impact statement – see below
Ekman circulation	Movement of surface water at an angle from the wind, as a result of the Coriolis effect.
El Niño Southern Oscillation	(**ENSO** or **El Niño**) Abnormally warm ocean climate conditions, which in some years affect the Eastern coast of Latin America (centered on Peru) often around Christmas time. The anomaly is accompanied by dramatic changes in species abundance and distribution, higher local rainfall and flooding, massive deaths of fish and their predators. Many other climatic anomalies around the world are attributed to consequences of El Niño. See also La Niña, below.
Endangered Species Act	(**ESA**) An act of federal law that provides for the conservation of endangered and threatened species of fish, wildlife, and plants. When preparing fishery management plans, councils are required to consult with the National Marine Fisheries Service and the U.S. Fish and Wildlife Service to determine whether the fishing under a fishery management plan is likely to jeopardize the continued existence of an ESA-listed species, or to result in harm to its critical habitat.
Endemic	An animal or plant species that naturally occurs in an area.
Energetics	The study of the flow and transformation of energy, as between trophic levels.
Enforcement Consultants	A Council committee that provides advice on enforcement of fishery regulations.
ENSO	El Niño Southern Oscillation – see above

Environment	All of the physical, chemical, and biological factors in the area where a plant or animal lives.
Environmental assessment	**(EA)** As part of the National Environmental Policy Act (NEPA) process, an EA is a concise public document that provides evidence and analysis for determining whether to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact.
Environmental impact statement	**(EIS)** As part of the National Environmental Policy Act (NEPA) process, an EIS is an analysis of the expected impacts resulting from the implementation of a fisheries management or development plan (or some other proposed action) on the environment. EISs are required for all fishery management plans as well as significant amendments to existing plans. The purpose of an EIS is to ensure that the fishery management plan gives appropriate consideration to environmental values in order to prevent harm to the environment.
EO	Executive Order
EO 12866	A Federal executive order that, among other things, requires agencies to assess the economic costs and benefits of all regulatory proposals and complete a Regulatory Impact Analysis (RIA) that describes the costs and benefits of the proposed rule and alternative approaches, and justifies the chosen approach. See RIR.
Epibenthic	A term for organisms that live attached to the bottom.
Epipelagic zone	The upper region of the sea from the surface to about 200-300 meters depth. see Photic Zone
Epiphyte	A plant that grows on another plant.
ESA	Endangered Species Act
Essential fish habitat	**(EFH)** Those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity.
Estuary	A semi-enclosed body of water with an open connection to the sea. Typically there is a mixing of sea and fresh water, and the influx of nutrients from both sources results in high productivity.
Evolutionarily Significant Unit	**(ESU)** a population segment equivalent to the "Distinct Population" referred to in the Endangered Species Act
Exclusive Economic Zone	**(EEZ)** All waters from the seaward boundary of coastal states out to 200 nautical miles. This was formally called the Fishery Conservation Zone (FCZ).
Exempted fishing permit	**(EFP)** A permit issued by National Marine Fisheries Service that allows exemptions from some federal fishing regulations in order to study the effectiveness, bycatch rate, or other aspects of an experimental fishing gear or technique.
Exploitable biomass	The biomass that is available to a unit of fishing effort. Defined as the sum of the population biomass at age (calculated as the mean within the fishing year) multiplied by the age-specific availability to the fishery. Exploitable biomass is equivalent to the catch biomass divided by the instantaneous fishing mortality rate.
Extirpation	Situation when something is no longer present.

Exvessel Refers to activities that occur when a commercial fishing boat lands or unloads a catch. For example, the price received by a captain for the catch is an exvessel price.

F

F The rate of fishing mortality. – see below

F_{MSY} is the fishing mortality rate that maximizes catch biomass in the long term.

F_{OF} is the rate of fishing mortality defined as overfishing.

$F_{x\%}$ is the rate of fishing mortality that will reduce female spawning biomass per recruit to x% of its unfished level. $F_{100\%}$ is zero, and $F_{40\%}$ is believed to be a reasonable proxy for F_{MSY} for some species.

Factory-trawl A type of vessel that catches fish with trawl gear and processes the fish onboard. Sometimes called catcher/processor. In the West Coast groundfish fishery, the only target species for this type of vessel is Pacific whiting.

Fathom Six feet.

FEAM Fishery economic assessment model – see below

Fecundity The potential of an organism to produce offspring, measured in the number of gametes produced.

Federal Register The *Federal Register* is the official daily publication for Rules, Proposed Rules, and Notices of Federal agencies and organizations, as well as Executive Orders and other Presidential documents. Fisheries regulations are not considered final until they are published in the *Federal Register*.

Finfish A common term to define fish as separate from shellfish.

Fish Fish means finfish, mollusks, crustaceans, and all other forms of marine animal and plant life other than marine mammals and birds.

Fish stock A population of a species of fish from which catches are taken in a fishery. Use of the term "fish stock" usually implies that the particular population is more or less isolated from other stocks of the same species, and hence self-sustaining.

Fisheries observers Trained professionals who monitor and record catch data from commercial fishing vessels and processing facilities. Observers collect data on species composition of the catch, weights, and disposition of fish caught, seabird sightings and marine mammal interactions. Observers also collect biological data such as sexed fish lengths, weights and aging structures.

Fishery All the activities involved in catching a species of fish or group of species.

Fishery-dependent Describes data about fish resources collected by sampling commercial and recreational catches.

Fishery-independent Describes data about fish resources collected by methods other than sampling commercial and recreational catches. An example of such a method is a NMFS trawl survey.

Fishery economic assessment model (**FEAM**) uses historical landings data, information on industry cost and margin structure (vessels and processors), and income multipliers generated by IMPLAN to produce estimates of "regionalized" local income impact after deducting for leakage of payments to non-residents and to non-local suppliers, wholesalers, and manufacturers.

Fishery management plan (**FMP**) A plan, and its amendments, that contains measures for conserving and managing specific fisheries and fish stocks.

Fishing The catching, taking, or harvesting of fish; the attempted catching, taking, or harvesting of fish; any other activity that can reasonably be expected to result in the catching, taking, or harvesting of fish; any operations at sea in support of, or in preparation for, any of these activities. This term does not include any activity by a vessel conducting authorized scientific research.

Fishing community A community which is substantially dependent on or substantially engaged in the harvest or processing of fishery resources to meet social and economic needs. Includes fishing vessel owners, fishing families, operators, crew, recreational fishers, fish processors, gear suppliers, and others in the community who depend on fishing.

Fishing mortality (**F**) - A measurement of the rate of removal of fish from a population by fishing. Fishing mortality can be reported as either annual or instantaneous. Annual mortality is the percentage of fish dying in one year; instantaneous is that percentage of fish dying at any one time. The acceptable rates of fishing mortality may vary from species to species.

Fishing year January 1 through December 31.

Fixed gear Fishing gear that is stationary after it is deployed (unlike trawl or troll gear which is moving when it is actively fishing). Within the context of the limited entry fleet, "fixed gear" means longline and fishpot (trap) gear. Within the context of the entire groundfish fishery, fixed gear includes longline, fishpot, and any other gear that is anchored at least at one end.

fm fathom (6 feet)

FMP fishery management plan – see above

Food Chain A linear sequence of organisms that exist on successive trophic levels within a natural community, through which energy is transferred by feeding. Primary producers capture energy from the environment (through photo- or chemo-synthesis) and form the base of the food chain. Energy is then passed to primary consumers (herbivores) and on to secondary and tertiary consumers (carnivores and top carnivores) (e.g. phytoplankton -> zooplankton -> herring -> salmon -> killer whales). Once they die, these organisms are in turn consumed and their energy transferred to detrivores and decomposers.

Food Web A non-linear network of feeding between organisms that includes many food chains, and hence multiple organisms on each trophic level. A network describing the feeding interactions of the species in an area.

Forage Fish such as herring, smelt and krill that are eaten by seabirds, mammals, and larger fish.

FWS U.S. Fish and Wildlife Service

G

Gamete A reproductive cell.

GAP Groundfish Advisory Subpanel – see below

GF Groundfish

Ghost fishing Situation when abandoned fishing gear continues to catch organisms

Gillnet	A curtain-like net suspended in the water with mesh openings large enough to permit only the heads of the fish to pass through, ensnaring them around the gills when they attempt to escape
GMT	Groundfish Management Team – see below
Green mud	Greenish sand deposits in which glauconite is abundant.
Groundfish	A species or group of fish that lives most of its life on or near the sea bottom.
Groundfish Advisory Subpanel	(**GAP**) The Council established the GAP to obtain the input of the people most affected by, or interested in, the management of the groundfish fishery. This advisory body is made up of representatives with recreational, trawl, fixed gear, open access, tribal, environmental, and processor interests. Their advice is solicited when preparing fishery management plans, reviewing plans before sending them to the Secretary, and reviewing the effectiveness of plans once they are in operation.
Groundfish Management Team	(**GMT**) Groundfish management plans are prepared by the Council's GMT, which consists of scientists and managers with specific technical knowledge of the groundfish fishery.

H

Habitat	The immediate space where an animal or plant lives and has food, water and protection. Habitat loss, which includes the destruction, degradation, or fragmentation of habitats, is the primary cause of decreasing biodiversity.
Harvest	The total number or poundage of fish caught and kept from an area over a period of time. Note that landings, catch and harvest are different.
Harvest specifications	The detailed regulations that make up management measures – for example, trawl footrope size, depth limits, net mesh size, etc.
Harvest guideline(s)	A numerical harvest level that is a general objective, but not a quota. Attainment of a harvest guideline does not require a management response, but it does prompt review of the fishery.
HG	Harvest guideline(s) – see above
High seas	All waters beyond the EEZ of the United States and beyond any foreign nation's EEZ, to the extent that such sea is recognized by the United States.
Highly migratory species	(**HMS**) In the Council context, highly migratory species in the Pacific Ocean include species managed under the HMS Fishery Management Plan: tunas, sharks, billfish/swordfish, and dorado or dolphinfish.
HMS	Highly migratory species – see above
Hydrography	The arrangement and movement of bodies of water, such as currents and water masses.

I

IFQ	Individual fishing quota. See below.
Impact	Effect; a change from current conditions, or a change that would result from an action. Impacts may be direct, indirect and cumulative, and may be significant or not significant. An EIS provides an analysis of expected impacts that would result from the alternatives being considered and identifies those considered to be significant.

IMPLAN	(IMpact Analysis for PLANning) a regional economic impact model
Incidental catch or incidental species	Groundfish species caught when fishing for the primary purpose of catching a different species or species group. Incidental catch that is released, returned to the sea, discarded at sea, or retained and donated to a charitable food organization is considered a type of bycatch.
Individual fishing quota	(IFQ) A Federal permit under a limited access system to harvest a quantity of fish, expressed by a unit or units representing a percentage of the total allowable catch of a fishery that may be received or held for exclusive use by a person (individual fisherman or vessel owner).
Individual transferable (or tradeable) quota	(ITQ) A type of IFQ allocated to individual fishermen or vessel owners and which can be sold, leased, exchanged, etc, to others.
Initial Regulatory Flexibility Analysis	(IRFA) An analysis required by the Regulatory Flexibility Act (see RFA).
INPFC	International North Pacific Fishery Commission – see below
International Pacific Halibut Commission	(IPHC) A Commission responsible for studying halibut stocks and the halibut fishery. The IPHC makes proposals to the U.S. and Canada concerning the regulation of the halibut fishery.
International North Pacific Fishery Commission	(INPFC) was a tri-lateral commission of Canada, Japan and the U.S. established in 1952, to coordinate marine fisheries research and address scientific and management issues of mutual concern. Although the Commission was dissolved in 1993, the statistical areas defined by the are still commonly used in marine fisheries management.
Intertidal	Between the high and low tide marks and periodically exposed to air.
IPHC	International Pacific Halibut Commission – see above
IRFA	Initial regulatory flexibility analysis – see above
Isotherm	An imaginary line passing through points on the earth's surface having the same mean temperature.
ITQ	Individual transferable (or tradeable) quota – see above

JKL

Jetty	A rocky structure constructed from land into the sea to protect shore-based property.
Jig	An artificial lure made to simulate live bait. It is usually made with a lead head cast on a single hook and is heavier than most other lures.
Juvenile	A young fish or animal that has not reached sexual maturity.
Keystone species	A species that maintains community structure through its feeding activities, and without which large changes would occur in the community.
Keystone predator	The dominant predator or the top predator that has a major influence on community structure. For example, sea otters are a keystone predator in kelp beds. Sea otters eat urchins that feed on kelp which house a huge diversity of other organisms. If sea otter populations are lowered in an area the kelp beds are generally reduced and urchin barrens appear.

Knot	A unit of speed equal to one nautical mile per hour (approximately 51 centimeters per second).
La Niña	An episode of strong trade winds and unusually low sea surface temperature in the central and eastern tropical Pacific. The opposite of El Niño (see above).
Landing	The number or poundage of fish unloaded at a dock by commercial fishermen or brought to shore by recreational fishermen for personal use. Landings are reported at the points at which fish are brought to shore. Note that landings, catch, and harvest define different things.
LE	Limited entry – see below
Limited entry fishery	A fishery for which a fixed number of permits have been issued in order to limit participation.
Limiting factor	A factor primarily responsible for determining the growth and/or reproduction of an organism or a population. The limiting factor may be a physical factor (such as temperature or light), a chemical factor (such as a particular nutrient), or a biological factor (such as a competing species). The limiting factor may differ at different times and places.
Littoral zone	The intertidal zone.
Local depletion	Local depletion occurs when localized catches take more fish than can be replaced either locally or through fish migrating into the catch area. Natural causes can also result in local depletion. Local depletion can occur apart from the status of the overall stock, and can be greater than decreases in the entire stock.
Logbook	A document or form for recording specified information about commercial fishing activities. Logbooks must be maintained by groundfish trawl vessels in accordance with state fishing regulations. Some logbook information is used in stock assessments, inseason monitoring, and predicting landings.
Long-term potential yield	The maximum long-term average yield that can be achieved through conscientious stewardship, by controlling the proportion of the population removed by harvesting by regulating fishing effort or total catch levels.

M

m	meters
M	Instantaneous natural mortality rate (as opposed to F, fishing mortality rate) or the rate of mortality not related to fishing.
Magnuson-Stevens Fishery Conservation and Management Act	The **MFCMA**, sometimes called the "**Magnuson-Stevens Act**," established the 200 nm fishery conservation zone (EEZ), the regional fishery management council system, and the process and mandates for regulating marine fisheries in the EEZ.
Marine Mammal Protection Act	The **MMPA** prohibits the harvest or harassment of marine mammals, although permits for incidental take of marine mammals while commercial fishing may be issued subject to regulation.
Marine Recreational Fisheries Statistical Survey	(**MRFSS**) A national survey conducted by National Marine Fisheries Service to estimate the impact of recreational fishing on marine resources.

Maturity	The age at which an animal is physically capable of reproduction
Maximum sustainable yield	**(MSY)** 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.
Maximum fishing mortality threshold	**(MFMT)** A threshold fishing mortality rate identified in the National Standard Guidelines above which constitutes overfishing.
MBTA	Migratory Bird Treaty Act
Mean	The sum of the data divided by the number of pieces of data; the average.
Median	Within a data set, the median is the number that divides the bottom 50% of the data from the top 50%.
Mesopelagic Zone	A somewhat arbitrary depth zone in offshore or oceanic waters, usually below 600 feet and above 3,000 (200-1,000 meters or 100-500 fathoms). It is bordered by the photic zone above and darkness below.
MFMT	Maximum fishing mortality threshold – see above
MHHW	Mean higher high water level or the average of the highest of two daily high tides in the Pacific Ocean (i.e., high tide line)
Minimum stock size threshold	**(MSST)** A threshold biomass used to determine if a stock is overfished. The proxy for groundfish MSST is $B_{25\%}$.
Mitigation	includes avoiding the impact altogether, minimizing impacts, rectifying the impact by repairing the environment, reducing or eliminating the impact over time, or compensating for the impact in other ways.
MLMA	California Marine Life Management Act.
MLPA	California Marine Life Protection Act.
mm	Millimeter
MMPA	Marine Mammal Protection Act – see above
Morphology	The physical characteristics of an individual.
Mothership	A vessel that does not catch groundfish but processes fish (whiting) delivered by other vessels. A sector of the whiting fishery.
MOU	Memorandum of Understanding
MPA	Marine protected area; an area in which some human activities are restricted.
MRFSS	Marine Recreational Fisheries Statistics Survey – see above
MRPZ	Marine resources protection zone
MSA	Magnuson-Stevens Fishery Conservation and Management Act (also known as Magnuson-Stevens Act) – see above
MSST	Minimum stock size threshold; sometimes called the overfishing threshold – see above

MSY Maximum sustainable yield (see above).

mt Metric ton = 2,204.62 pounds.

N

NAO NOAA Administrative Order

National Standards Guidelines (**NSG**) Guidelines issued by National Marine Fisheries Service to provide comprehensive guidance for the development of fishery management plans and amendments that comply with the national standards of the Magnuson-Stevens Act. These guidelines are found in Title 50, Code of Federal Regulations, part 600.

National Environmental Policy Act (**NEPA**) Passed by Congress in 1969, NEPA requires Federal agencies to consider the environment when making decisions regarding their programs. Section 102(2)(C) requires Federal agencies to prepare an Environmental Impact Statement (EIS) before taking major Federal actions that may significantly affect the quality of the human environment. The EIS includes: the environmental impact of the proposed action, any adverse environmental effects which cannot be avoided should the proposed action be implemented, alternatives to the proposed action, the relationship between local short-term uses of the environment and long-term productivity, and any irreversible commitments of resources which would be involved in the proposed action should it be implemented.

National Marine Fisheries Service (**NMFS** or **NOAA Fisheries**) A division of the U.S. Department of Commerce, National Ocean and Atmospheric Administration (NOAA). NMFS is responsible for conservation and management of offshore fisheries (and inland salmon). The NMFS Regional Director is a voting member of the Council.

NE Northeast

Nearshore "Nearshore" is defined (by the California Nearshore Fishery Management Plan) as the area from the high-tide line offshore to a depth of 120 ft (20 fm).

Nekton Pelagic organisms that are free-swimming and so whose movements are independent of the tides, currents and waves. Such animals include fish, whales, squid, crabs and shrimps.

NEPA National Environmental Policy Act – see above

Neritic Inhabiting coastal waters primarily over the continental shelf, generally over bottom depths equal to or less than 183 meters (100 fm) deep.

Neuston The distribution of nekton is limited by temperature and nutrient supply and decreases with decreasing depth. Compare benthic, plankton surface water.

NMFS National Marine Fisheries Service – see above

NOAA National Oceanic and Atmospheric Administration

NOI Notice of Intent

North Pacific Fishery Management Council (**NPFMC**) The regional fishery management council established by the Magnuson-Stevens Act to develop management plans and recommendations for managing marine fish stocks in the EEZ off Alaska.

NPDES	National Pollutant Discharge Elimination System
NS	Nearshore – see above
NSG	National Standards Guidelines – see above

O

OA	Open access. See below.
Oceanic	Inhabiting the open sea, ranging beyond the continental and insular shelves, beyond the neritic zone.
ODFW	Oregon Department of Fish and Wildlife
OMB	Office of Management and Budget
Open-access fishery	The segment of the groundfish fishery or any other fishery for which entry is not controlled by a limited entry permitting program.
Optimum yield	(**OY**) The amount of fish that will provide the greatest overall benefit to the Nation, particularly with respect to food production and recreational opportunities, and taking into account the protection of marine ecosystems. The groundfish FMP specifies a default harvest control rule (the **"40-10" rule**) that reduces the OY of any stock found to be less than its estimated MSY stock size. If a stock is overfished, the OY provides for rebuilding to its MSY stock size, consistent with the analysis prepared for its rebuilding plan.
OSP	Oregon State Police
OSP	Optimum sustainable population (in reference to marine mammals)
Otolith	"Ear bone" of a fish; calcareous concretions in the inner ear of a fish, functioning as organs of hearing and balance. They often show seasonal or annual "rings" that can be counted to determine age.
Otter trawl	A cone-shaped net that is dragged along the sea bottom. Its mouth is kept open by floats, weights and by two otter boards which shear outward as the net is towed.
Over-capitalization	In a fishing fleet, this means more money has been invested in boats than the fishery can support. It can also refer to the ability of fishermen to increase effort without increasing the number of boats. If no new boats are added to a fishery, but each boat doubles its fishing power by carrying twice as much gear or using new technology (sonar, GPS, etc.), the new effort can have the same effect as doubling the number of boats. Other commercial fishery sectors can also become overcapitalized.
Overfished	Any stock or stock complex whose size is sufficiently small that a change in management practices is required to achieve an appropriate level and rate of rebuilding. The term generally describes any stock or stock complex determined to be below its overfished/rebuilding threshold. The default proxy is generally 25% of its estimated unfished biomass; however, other scientifically valid values are also authorized.

Overfishing	Fishing at a rate or level that jeopardizes the capacity of a stock or stock complex to produce MSY on a continuing basis. More specifically, overfishing is defined as exceeding a maximum allowable fishing mortality rate (or the MFMT). For any groundfish stock or stock complex, the maximum allowable mortality rate will be set at a level not to exceed the corresponding MSY rate (F_{MSY}) or its proxy (e.g., $F_{35\%}$).
Oviparous	Producing eggs that hatch outside the female's body.
Ovoviviparous	Pertaining to an animal that incubates eggs inside the mother until they hatch.
OY	Optimum yield – see above

P

PacFIN	Pacific Coast Fisheries Information Network. A database managed by the Pacific States Marine Fisheries Commission that provides commercial fishery information for Washington, Oregon, and California.
Pacific decadal oscillation	(PDO) A long-term, El Niño-like pattern of Pacific climate variability. Two main characteristics distinguish PDO from El Niño/Southern Oscillation (ENSO): first, 20th century PDO "events" persisted for 20-to-30 years, while typical ENSO events persisted for 6 to 18 months; second, the climatic "fingerprints" of the PDO are most visible in the North Pacific/North American sector, while secondary signatures exist in the tropics - the opposite is true for ENSO.
Pacific Fishery Management Council	(PFMC) The regional fishery management council established by the Magnuson-Stevens Act to develop management plans and recommendations for managing marine fish stocks (including salmon) in the EEZ off the coasts of Washington, Oregon and California.
Pacific States Marine Fisheries Commission	(PSMFC) Authorized by Congress in 1947, the PSMFC is one of three interstate commissions dedicated to resolving fishery issues. Representing California, Oregon, Washington, Idaho, and Alaska, the PSMFC does not have regulatory or management authority; rather it serves as a forum for discussion, and works for coastwide consensus to state and federal authorities. PSMFC addresses issues that fall outside state or regional management council jurisdiction.
Parturition	Birth
Patchy distribution	A condition in which organisms occur in aggregations.
PBR	Potential biological removal – see below
PDO	Pacific decadal oscillation – see above
Pelagic	Inhabiting the water column as opposed to being associated with the sea floor; generally occurring anywhere from the surface to 1000 meters (547 fm). See also epipelagic and mesopelagic.
Pelagic	Refers to the plants and animals that live in the water column or in the open waters of the ocean rather than the ocean floor (see benthic). Life is found throughout the pelagic zone, however is more concentrated at shallower depths. Pelagic organisms can be further divided into the plankton and nekton. Compare benthic. (epipelagic: living in the upper or photic layer between 0 and 200 meters; mesopelagic: living between 200 and 1000 meters).
Permit stacking	The registration of more than one limited entry permit for a single vessel, where a vessel is allowed additional catch for each additional permit registered for use with the vessel.

PFMC	Pacific Fishery Management Council – see above
Photic zone	The surface layer of the ocean that is penetrated by sunlight. The photic zone is the layer of the ocean that has been explored the most as it is relatively easy to access with conventional diving equipment. Light can penetrate down to approximately 200m which marks the end of the photic zone. Also referred to as the Sunlight Zone or the Epipelagic Zone.
Phytoplankton	Microscopic planktonic plants. Examples include diatoms and dinoflagellates
Pinniped	A member of the order of marine mammals that includes the seals, sea lions, and walruses, all having four swimming flippers.
Piscivorous	An organism that eats fish.
Planktivorous	An organism that feeds on planktonic organisms.
Plankton	Pelagic organisms that float through the water column, not attached to any substrate and unable to move against the currents and tides. Plankton can be further divided into phytoplankton and zooplankton, meroplankton and holoplankton. Compare nekton.
POP	Pacific ocean perch
Population	All individuals of the same species living in a certain area during a given time. Environmental barriers may divide the population into local breeding units with restricted interbreeding between the localized units.
Potential biological removal	(PBR) The maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population.
PRA	Paperwork Reduction Act
Preferred alternative	The alternative that is identified as preferred by the authors of an environmental impact statement or environmental assessment. It is identified to indicate which alternative is likely to be selected, thereby helping the public focus its comments.
Processing	The preparation or packaging of fish to render it suitable for human consumption, retail sale, industrial uses, or long-term storage, including but not limited to cooking, canning, smoking, salting, drying, filleting, freezing, or rendering into meal or oil, but not heading and gutting unless additional preparation is done.
Production	Gross primary production is the amount of light energy converted to chemical energy in the form of organic compounds by autotrophs like algae. The amount left after respiration is net primary production and is usually expressed as biomass or calories/unit area/unit time. Net production for carnivores and herbivores is based on the same concept, except that chemical energy from food, not light, is used and partially stored for life processes. Efficiency of energy transfers between trophic levels ranges from 10-65% (depending on the organism and trophic level). Organisms at high trophic levels have only a fraction of the energy available to them that was stored in plant biomass. After respiration loss, net production goes into growth and reproduction, and some is passed to the next trophic level.
Productivity	The rate at which a given quantity of organic material is produced by organisms.
Prohibited species	Species that may not be retained, and that should not be captured or harmed. Prohibited species identified in the groundfish FMP include Pacific halibut, salmonids, and Dungeness crab.

Prohibited species catch or cap	(PSC) A PSC limit is a specified limit on the amount of the species that may be caught or killed.
PSMFC	Pacific States Marine Fisheries Commission – see above.

Q-R

Q	The selectivity of fishing gear or the ratio of fish caught by the gear to those actually present.
QSM	Quota species monitoring is a PacFIN database that monitors the cumulative landings of species managed either with individual OYs or OYs prescribed for a species complex (grouping of species in a single management unit). The GMT uses quota species monitoring to develop inseason groundfish fishery management recommendations to attempt to attain, but not exceed, prescribed OYs.
Quota	A specified numerical harvest objective, the attainment (or expected attainment) of which causes closure of the fishery for that species or species group.
R/S	Recruits per spawner
R	Recruits or recruitment. This is the estimated production of new members to a population as measured at a specific life stage.
R_0	Level of unfished recruitment
Rebuilding	Implementing management measures that increase a fish stock to its target size.
Rebuilding Plan	When abundance of a groundfish stock is found to have declined to 25% or less of the size it was before any fishing (or to some other early stock size), it must be rebuilt to its MSY stock size, which is typically about 40% of the unfished size. A rebuilding plan calculates how long it will take to rebuild the stock and the methods and management measures that will be used.
RecFin	Recreational Fishery Information Network. A database managed by the Pacific States Marine Fisheries Commission that provides recreational fishery information for Washington, Oregon, and California.
Recreational Fishing	Recreational fishing means fishing for sport or pleasure, but not for sale.
Recruit	An individual fish that has moved into a certain class, such as the spawning class or fishing-size class.
Recruitment	(1) Entry of new fish into a population, whether by reproduction or immigration; (2) Addition of new individuals to the fished component of a stock (because they have acquired the size, age, or location that makes them part of it.)
Regime shift	A long-term change in marine ecosystems and/or in biological production resulting from a change in the physical environment. – see also PDO above
Regulatory bycatch	Or **regulatory discard**. The portion of bycatch that results from fishers complying with the regulations.

Regulatory Flexibility Analysis (or Act)	(**RFA**) Anytime an agency publishes a notice of proposed rule making, an RFA is required. It describes the action, why it is necessary, the objectives and legal basis for the action, a description of who will be impacted by the action, and a description of the projected reporting, record-keeping, and other compliance requirements of the proposed rule. The types of entities subject to the rule, and the professional skills required to prepare the report or record, must also be described.
Reproductive potential	The number of offspring possible for a female of a given species to produce if she lives to the average age.
Restricted species catch quota	(**RSQ**) A specified catch limit of an overfished stock that applies to an individual vessel or limited entry permit holder. A type of individual quota or cap.
RFA	Regulatory Flexibility Analysis, or Regulatory Flexibility Act – see below
RIR	Regulatory Impact Review – See Regulatory Flexibility Analysis.
Roller trawl	A trawl net equipped with rollers that enable the net to go over rocky areas without snagging.
Rulemaking	The process of developing Federal regulations which occurs in several steps, including publishing proposed rules in the *Federal Register*, accepting comments on the proposed rule, and publishing the final rule. An "advanced notice of proposed rulemaking" is published when dealing with especially important or controversial rules.

S

SAFE	Stock assessment and fishery evaluation. See below.
Salmonid	A member of the Salmonidae family of fishes.
Scientific and Statistical Committee	(**SSC**) An advisory committee of the PFMC made up of scientists and economists. The Magnuson-Stevens Act requires that each council maintain an SSC to assist in gathering and analyzing statistical, biological, ecological, economic, social, and other scientific information that is relevant to the development of fishery management plans.
Scoping	An early and open process for determining the scope (range) of issues to be addressed and for identifying the significant issues related to a proposed action.
***Sebastes* complex**	Rockfish assemblage, including most species of the genus *Sebastes*.
Secondary Consumer	A heterotrophic, carnivorous organism that feeds on a primary consumer. Herring feeding on zooplankton are an example of a secondary consumer. See also food chain, heterotroph, primary consumer.
Secretary	The U.S. Secretary of Commerce.
Sessile	Referring to animals that are permanently attached to a substrate.
Set gillnet	A gillnet that is anchored on both ends.
Setline	Fishing gear made up of a long main line attached to which are a large number of short branch lines. At the end of each branch line is a baited hook. When catching groundfish and Pacific halibut, setlines are typically laid on the sea-floor. When catching swordfish, shark or tuna they are buoyed near the surface. Setlines can be twenty or more miles long. They are also called longlines.
Shelf	see continental shelf, above.

Shelf survey	NMFS bottom trawl surveys of the continental shelf, designed to provide information on distribution and abundance of demersal species, and other biological resource information.
Shore-based	Refers to catcher vessels that deliver Pacific whiting to processing facilities on land. This sector of the whiting fishery, as the other sectors, has a whiting allocation.
SFA	Sustainable Fisheries Act of 1996 that amended the Magnuson-Stevens Act with stricter stock conservation standards including the prescribed rules for rebuilding overfished marine fish populations.
Simple random sampling	A sampling procedure for which each possible sample is equally likely to be the one selected. A sample obtained by simple random sampling is called a simple random sample.
Slope	see continental slope, above.
Slope survey	NMFS bottom trawl surveys of the continental slope, designed to provide information on distribution and abundance of demersal species, and other biological resource information.
Southern California bight	See California Bight
Spawning biomass	The biomass of mature female fish at the beginning of the year. If the production of eggs is not proportional to body weight, then this definition is construed to be proportional to expected egg production.
Species	(1) A fundamental taxonomic group ranking after a genus. (2) A group of organisms recognized as distinct from other groups, whose members can interbreed and produce fertile offspring
Species Richness	The number of different species that exist within a given area or community. Compare species abundance.
Species diversity	A measure of both species abundance and species richness. An area that has a large number of species and many representative individuals from each species is more diverse than an area that has only a single species. See also biodiversity; compare ecosystem diversity.
Spawning Potential Ratio	**(SPR)** the number of eggs that could be produced by an average recruit in a fished stock, divided by the number of eggs that could be produced by an average recruit in an unfished stock. SPR can also be expressed as the spawning stock biomass per recruit (SSBR)
Spawning Stock Biomass	**(SSB)** the total weight of the fish in a stock that are old enough to spawn
SSBR	Spawning Stock Biomass Per Recruit - the spawning stock biomass divided by the number of recruits to the stock, or how much spawning biomass an average recruit would be expected to produce.
SSC	Scientific and Statistical Committee – see above
STAR	Stock assessment review
STAR Panel	Stock Assessment Review Panel
STAT	Stock Assessment Team

Status quo	"No action," or the current conditions and expected conditions if no action is taken.
Stock	A grouping of fish usually based on genetic relationship, geographic distribution, and movement patterns. Stock is the practical unit of a population that is selected for management or harvesting purposes. In some casts a managed stock may include more than one species.
Stock Assessment and Fishery Evaluation (SAFE)	A SAFE document is a document prepared by the Council that provides a summary of the most recent biological condition of species in the fishery management unit, and the social and economic condition of the recreational and commercial fishing industries, including the fish processing sector. It summarizes, on a periodic basis, the best scientific information available concerning the past, present, and possible future condition of the stocks and fisheries managed in the FMP.
Stratified random sampling	A sampling method in which one (1) divides the population into subpopulations (called strata), (2) obtains from each stratum a simple random sample of size proportional to the size of the stratum, and (3) uses all of the members obtained in step 2 as the sample.
Substrate	A solid surface on which an organism lives or to which it is attached (also called substratum); or, a chemical that forms the basis of a biochemical reaction or acts as a nutrient for microorganisms.
Subtidal zone	The benthic zone extending from the low tide mark to the outer edge of the continental shelf.
Sustainable	A sustainable way of life is one in which human needs are met without diminishing the ability of other people, wild species, or future generations to survive.
SWFSC	Southwest Fisheries Science Center (NMFS)
Swim bladder	A sac inside the fish's body by which the fish can control buoyancy
Sympatry	The common occurrence of two taxa (closely related forms) in the same geographic area.

T

TAC	Total allowable catch (this term is used for Pacific halibut and for Alaska groundfish but typically not for West Coast groundfish)
Target fishing	Fishing for the primary purpose of catching a particular species or species group (the target species).
Territorial sea	A zone extending seaward from the shore or internal waters of a nation for a distance of twelve miles (19.3 km) as defined by the United Nations Conference on the Law of the Sea (UNCLOS). The coastal state has full authority over this zone but must allow rights of innocent passage.
Thermocline	The often sharply defined boundary between surface water and deeper, cooler water. The water layer in which temperature changes most rapidly with increasing depth.
T_{MAX}	The maximum time period to rebuild an overfished stock according to National Standard Guidelines

T_{MIN} The minimum time period to rebuild an overfished stock according to National Standard Guidelines

Total catch OY Total catch optimum yield. The landed catch plus discard mortality.

Trammel net An entangling net that hangs down in several curtains.

Transect A straight line placed on the ground along which ecological measurements are taken. If an ecologist wanted to sample the diversity of intertidal organisms in the intertidal, he/she would place a number of transects perpendicular to the shore and take samples at predetermined interval lengths.

Trawl A sturdy bag or net that can be dragged along the ocean bottom, or at various depths above the bottom, to catch fish.

Tribal Refers to vessels owned and operated by members of the four coastal Indian Tribes in Washington that harvest groundfish. Amounts of various groundfish, including sablefish and whiting, are set aside for harvest by Tribal fishers.

Troll To trail artificial or natural baits behind a moving boat. The bait can be made to skip along the surface or trailed below at any depth to just above the bottom.

Trophic Concerning feeding habits, food chains, or nutrition

Trophic level The nutritional position occupied by an organism in a food chain or food web; e.g. primary producers (plants); primary consumers (herbivores); secondary consumers (carnivores), etc.

U

U and A Usual and accustomed

Upwelling The process whereby prevailing seasonal winds create surface currents that allow nutrient rich cold water from the ocean depths to move into the euphotic or epipelagic zone.

USCG U.S. Coast Guard

USFWS U.S. Fish and Wildlife Service

Viviparous Bringing forth living young, rather than being an egg-layer. Rockfish are viviparous.

VMS Vessel monitoring system

VWXYZ

WA Washington

Water column The water from the surface to the bottom at a given point.

WDFW Washington Department of Fish and Wildlife

WOC Washington, Oregon and California

Year-class Refers to animals of a species population hatched or born in the same year at about the same time; also known as a cohort. Strong year classes result when there is high larval and juvenile survival: the reverse is true for weak year-classes. The effects of strong and weak year-classes on population size and structure persist for years in species with long lives. Variation in year-class strength often affects fisheries.

YOY	Young-of-the-year.
Zooplankton	Animal members of the plankton.

GROUNDFISH BYCATCH PROGRAM ENVIRONMENTAL IMPACT STATEMENT

Situation: In 2001 NMFS announced its intention to prepare a Programmatic Environmental Impact Statement (PEIS) for the Pacific Coast Groundfish Fishery Management Plan (FMP). The scope of this EIS has undergone two important changes and the initial draft EIS currently before the Council focuses on bycatch reduction. At the June meeting, Mr. Jim Glock briefed the Council on this narrowing of the scope and presented a revised set of alternatives. The Council approved the narrowed scope and revised alternatives during that agendum.

An initial draft EIS is presented for Council consideration. The economic analysis of the alternatives has not been completed but is expected before the November Council meeting. If the Council is satisfied with the scope and content of the analysis, they should approve this initial draft for public review. This review is part of the Council process. NMFS plans to publish a draft EIS (DEIS) in early 2004, which will be subject to an additional public comment period required by the National Environmental Policy Act. The Council also may make recommendations for revisions to the initial draft.

The Council is not required to identify a preferred alternative at this meeting, although doing so would facilitate public review of the initial draft. If the Council defers at this meeting, it would be important to choose a preferred alternative at the November meeting, in advance of DEIS publication.

Council Action:

1. **Approve Groundfish Bycatch Program initial draft EIS document for public review.**
2. **Consider identifying the Council-preferred alternative.**

Reference Materials:

1. Exhibit C.9, Attachment 1: West Coast Groundfish Bycatch Program Environmental Impact Statement - Initial Public Review Draft.
2. Exhibit C.9, Attachment 2: Appendix A. Biological Environment: Distribution, Life History, and Status of Relevant Species *(Electronic copy on CD-ROM, enclosed separately)*.

Agenda Order:

a. Agendum Overview	Kit Dahl
b. NMFS Report	Jim Glock
c. Reports and Comments of Advisory Bodies	
d. Public Comment	
e. **Council Action:** Approve initial draft EIS for Public Review	

PFMC
08/25/03

3.0 The Affected Environment

3.0 The Affected Environment

Introduction Groundfish **bycatch** and its characteristics (e.g., species, extent of harm, quantity, distribution in time and space) result from the dynamic and complex interaction of attributes of the species, the fisheries, and the affected environment, both physical and biological. Life history strategies can influence vulnerability to bycatch at the level of an individual, a population, or group of species. For example, fish morphology (e.g., size, shape, presence of spines, large gill cover), distribution (e.g., preferred temperature, in deepwater, along cliffs) and behavior (e.g., schooling, inhabiting crevices, fast-swimming) affect how vulnerable a fish or species is to capture or harm by a particular gear. Fishers continuously adjust their gears, fishing practices and areas, to the extent allowed by regulation, to take advantage of these attributes in order to efficiently maximize the harvest of targeted species, as well as to reduce the harvest of unwanted species. The physical and biological environment also influences the distribution and abundance of species, largely through the availability and abundance of suitable habitat, prey, predators, competitors, and reproductive opportunities.

Chapter 3 describes various components of the coastal marine ecosystem and how people and communities use and rely on the groundfish resources of this region. The groundfish **FMP** and management regime covers groundfish stocks off Cape Flattery, Washington to the California border with Mexico. Hundreds of plant and animal species occur along the west coast and groundfish-related bycatch related may affect many of them. To make this chapter easier to read and understand, much of the detail on the biology of species has been placed in an appendix (See Appendix A).

This chapter describes the affected environment, which is the baseline environmental condition. The baseline represents the status of environmental attributes at a time before the proposed action is implemented, and in Chapter 4 serves as a point of comparison to evaluate possible significant impacts.

How The Chapter Is Organized

How The Chapter Is Organized The chapter begins with a brief description of the physical environment, including marine geology, climate and currents. This is followed by descriptions of the biology of selected species, including important groundfish species, protected species, and other relevant fish and shellfish species. Several species or species groups are given special emphasis in this chapter because of concerns regarding their population status and relevancy to bycatch issues. These include nine **overfished** groundfish species and protected marine species including Pacific salmon, marine birds, marine mammals and sea turtles. Other important species include those with substantive bycatch of groundfish in a non-groundfish fishery such as for ocean shrimp; with substantive bycatch of the species in a groundfish fishery, such as Pacific halibut; especially vulnerable species such as Dungeness crab in softshell condition and long-lived and slowly reproducing species such as sharks and rays.

Chapter 3 also describes important non-groundfish species, particularly those potentially affected by groundfish fishing operations. It includes species targeted by other fisheries that may affect various groundfish stocks. Known **trophic** relationships are identified, as are species that may be directly affected by groundfish fishing operations (for example, accidentally captured and/or killed by groundfish operations).

In Chapter 3, fishing activities, gears and patterns are described. Important interactions among species, gears and fisheries are also described, as well as types of management tools and their application to bycatch issues.

Chapter 3 also describes the human uses of West Coast groundfish stocks, and how these activities relate to other fishing activities in the region. The commercial and recreational fisheries, commercial fish buyers and processors, and coastal communities where groundfish-related activities occur are described.

3.1 The Physical Environment

3.1 The Physical Environment

Essential Fish Habitat (**EFH**) for 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**. This approach focuses on ecological relationships among groundfish species and between the species and their habitat. These habitat types are described primarily by physical features with the caveat that EFH also includes the associated biological communities. EFH for groundfish is identified by seven major habitat types: rocky shelf, non-rocky shelf, continental slope/basin, canyon, **neritic** zone, oceanic zone and **estuarine**. EFH descriptions have been incorporated in the FMP in both section 11.10 and in a detailed appendix (available online at http://www.nwr.noaa.gov/1sustfsh/efhappendix/page1.html. Groundfish EFH is currently being re-evaluated in a separate EIS.

The geological structure and ocean environment affect the distribution of fish, which affects catch, incidental catch, and bycatch.

Geology Bathymetry and physical topography help determine habitat by influencing its physical structure and also the **co-occurrence** of other species. Groundfish species are harvested in the **pelagic** zone, close to the bottom, or on the bottom, mostly within 50 miles of the shoreline where maturing and adult stages are found. Mud, sand, gravel, and exposed rocky areas, along with associated biological **communities**, make up the varied benthic habitats for groundfish on the continental margin.

The continental shelf off the West Coast is relatively narrow. It is generally widest from Oregon north and narrow off California.

The continental margin and waters out to 200 miles, the seaward boundary of the **EEZ**, are important habitat for groundfish and other marine species affected by groundfish fishing. The continental margin is composed of the **continental shelf** and **continental slope** - the steeper, deeper part of the continental margin. The U.S. West Coast is characterized by a relatively narrow continental shelf. The 100 fathom (200 m) depth contour shows a shelf break closest to the shoreline off Cape Mendocino, Point Sur, and in the Southern California Bight; and widest from central Oregon north to the Canadian border, as well as off Monterey Bay. Deep submarine canyons pocket the EEZ, with depths greater than 4,000 m south of Cape Mendocino. Major estuaries along the coast include San Francisco Bay, Columbia River, Willapa Bay, Grays Harbor, and the Strait of Juan de Fuca. A number of small estuaries occur all along the west coast.

California Current System Biological characteristics of species, combined with physiographic features, are important determinants of changes in distribution. More mobile and schooling species, such as Pacific whiting, may vary in location *en masse* as they move in response to environmental conditions and prey availability. Current regimes may also control the distribution of larvae, helping to determine the location of adult populations. As mentioned earlier, fish distribution is an influential factor in determining bycatch, and thus, currents and changes to them can affect bycatch.

The West Coast marine environment is part of the California Current ecosystem. The current is a major influence on the all marine plants and animals in the region.

The West Coast marine environment is part of the California Current ecosystem. Large scale ocean currents, the North Pacific and Alaska gyres in particular, create a dynamic coastal environment (Hickey, 1989). The North Pacific Current crosses the Pacific Ocean from Japan to Canada where it encounters the continental margin near Vancouver Island. The current splits into a northward flowing current carrying water into the Gulf of Alaska and a southward flowing current carrying water along the coast from Washington to California. This broad, shallow surface current which flows southward is called the California Current. It is strongest during the summer and is opposed by a weaker northward flowing and deeper California Undercurrent.

The California Current system changes significantly during the winter. The California Current moves farther offshore and the continental shelf is dominated by a strong northward flowing Davidson Current associated with winter storms.

Coastal winds help create major nutrient upwelling as deep, nutrient-rich water rises against the coastline. This increases ocean production, especially in upwelling areas.

Influenced by the California Current system and coastal winds, waters off the U.S. West Coast are subject to major nutrient upwelling as deep, nutrient-rich water is upwelled against the coastline. During periods of strong upwelling, primary ocean productivity is enhanced, increasing overall ocean production throughout many different trophic levels including those occupied by groundfish species.

Shoreline topographic features such as Cape Blanco and Point Conception, and bathymetric features such as banks, canyons, and other submerged features, often create large-scale current patterns such as eddies, jets, and squirts. For example, a current jet off Cape Blanco drives surface water offshore, which is replaced by upwelling sub-surface water (Barth *et al.* 2000). One of the better known current eddies off the West Coast occurs in the Southern California Bight between Point Conception and Baja, California (Longhurst 1998), wherein the current circles back on itself by moving in a northward and counterclockwise motion just within the Bight.

Long and short term climate conditions affect the size and distribution of fish populations as well as other marine animals.

Climate Climate can influence the distribution and abundance of marine species, which in turn, can be reflected in bycatch type and amount. Population data on some groundfish species seem to show a linkage between climate and recruitment. The effect of El Niño-Southern Oscillation (**ENSO**) events on climate and ocean productivity in the northeast Pacific is relatively well-known. For example, Pacific whiting tends to have stronger year classes following an El Niño event than in other years. Also, some localized larval rockfish populations have shown lower survival rates in years when coastal upwelling and plankton production was reduced by El Niño events.

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

Some species thrive in colder water, while others do better in warmer water. Both short term and long term climate events influence survival and reproduction.

El Niño and **La Niña** events are examples of short-scale climate change, six-month to two-year disruptions in oceanic and atmospheric conditions in the Pacific region. An El Niño is a climate event with trends such as a slowing in Pacific Ocean equatorial circulation, resulting in warmer sea surface conditions and decreased coastal upwelling. Conversely, a La Niña is a short-scale climate events characterized by cooler ocean temperatures (NOAA, 2002). In years of poor upwelling or when El Niño warms the waters off the West Coast, ocean productivity is reduced. Under severe El Niño conditions, species distributions can change radically (Wooster and Fluharty, 1985)

Recently, scientists have concluded that large scale regime shifts overlay shorter term El Niño and La Niña events, creating longer term changes in productivity associated with decades-long warm or cold periods. In the past decade a still longer period cycle, termed the **Pacific Decadal Oscillation** or **PDO**, has been identified. Although similar in effect, instead of the 1 year to 2 year periodicity of ENSO, PDO events affect ocean conditions for 15 years to 25 years (Mantua in press). The PDO shifts between warm and cool phases. The warm phase is characterized by warmer temperatures in the northeast Pacific (including the West Coast) and cooler-than-average sea surface temperatures and lower-than-average sea level air pressure in the central North Pacific; opposite conditions prevail during cool phases. Because the effects are similar, "in-phase" ENSO events (that is, an El Niño during a PDO warm phase) can be intensified.

3.2 The Biological Environment

3.2 The Biological Environment

3.2.1 Primary and Secondary Productivity

Primary production (phytoplankton abundance) and secondary production (zooplankton abundance) influence the abundance of higher trophic level organisms, including fish populations targeted by fishers. Changes in production in terms of increasing or decreasing abundance of the zooplankton biomass as a whole or of particular zooplankton species ripple through the food web (Francis *et al.*, 1998.)

Upwelling zones are generally considered the most productive in the ocean. Upwelling occurs in the spring and early summer off central California (GFNMS website). Submarine canyons along the Washington coast are sites of increased upwelling (OCNMS website).

3.2.2 Vegetation

3.2.2 Vegetation

Brown, red, and green algaes and coralline algaes are abundant in the intertidal areas of rocky shorelines. These algae provide rich food supplies and provide cover for diverse communities of animal species. Eel grasses are also important spawning and nursery areas in estuaries.

The vegetation zone extends to from shore to depths where light penetration becomes insufficient for substantial plant growth. Kelp forests provide cover for many groundfish species, especially rockfishes, and they attract other species that may be prey, predators, or competitors with groundfish. Kelp forests of the Washington, Oregon and northern California coasts are dominated by bull kelp (*Nereocystis*), which is an annual species, dying each winter. Kelp forests off central and southern California are comprised of giant kelp (*Macrocystis*), which is a perennial species. It can live for several years in deeper water, but can be removed by storms on exposed coasts.

3.2.3 Groundfish

3.2.3 Groundfish

The Pacific Coast groundfish FMP manages more than 80 species. These species occur throughout the EEZ and occupy diverse habitats at all stages in their life history. While a few species have been intensively studied, there is relatively little information on the life history, habitat, and stock status of most groundfish species.

More detailed information about groundfish and other species can be found in Appendix A.

The life history, distribution, and stock status of each important groundfish species are summarized in Appendix A. More detailed information on the status of each of the groundfish species or species groups is available in the stock assessments associated with the annual SAFE report, as well as in the Environmental Assessment/Regulatory Impact Review/Initial Regulatory Flexibility Analysis for Proposed Groundfish ABC and OY Specifications and Management Measures for the 2002 Pacific Coast Groundfish Fishery.

This EIS highlights nine overfished groundfish stocks and 11 other groundfish stocks.

In addition to the individual species descriptions in Appendix A, generalized descriptions are provided below for the following groundfish species groups: rockfishes, thornyheads, gadids, flatfishes, sharks, and skates. These generalized descriptions are followed by information on the stock status for each overfished species and "emphasis species." The term "overfished" describes a groundfish stock whose abundance is below its overfished/rebuilding threshold. Nine groundfish species are below the overfished threshold in 2003: bocaccio, canary rockfish, cowcod (south of Point Conception), darkblotched rockfish, lingcod, Pacific whiting, Pacific ocean perch, widow rockfish, and yelloweye rockfish. We are using the term "emphasis species" to describe a groundfish stock (other than an overfished stock) that is particularly relevant to bycatch issues and specifically incorporated in analyses of the alternatives in this EIS. Our groundfish emphasis species are black, yellowtail and chilipepper rockfish, shortspine and longspine thornyhead, sablefish, cabezon, English, Dover, and Petrale sole and arrowtooth flounder. The impacts of the alternatives described in Chapter 4 on these species should be representative of the impacts on species with similar life histories and distributions.

This section presents some basic groundfish biology facts, starting with rockfish.

Generalized Rockfish (*Sebastes* spp.) Biology

Rockfishes are a very diverse group of over 55 species that occur along the west coast. Adults of many species are most common in nearshore areas, whereas others (e.g., yellowtail

Rockfish typically grow slowly, reproduce sporadically, and some live 100 years or longer. They have swim bladders that expand when the are caught and brought up from deep water. Nearly all die if that happens.

rockfish) inhabit deeper waters on the shelf. Most rockfishes are demersal, often solitary, and associated with rocky areas or other structure. Adults of these species tend to remain in localized areas and do not undertake significant migrations or movements. A few others (e.g, widow rockfish) are considered pelagic, schooling species. All bear live young. Most species mate in the fall and larvae are released in spring, often in rocky or reef habitats. Larvae are carried inshore to rear during the summer and fall. Typically young-of-the-year are associated with vegetated and/or rocky areas and may occur in groups or larger schools. As they grow older, they adapt the adult lifestyle. Most rockfishes are slow-growing, long-lived and produce relatively few young each year. For most species, average age of maturity is reached between five and ten years. Some species are estimated to have a life span well over 50 years, perhaps 100 years, and the longevity of many species is 20 years or more. More detailed life histories for many rockfish species are provided in Appendix A.

Thornyheads are also in the rockfish family. They live on the bottom in deep water. The two species overlap, but longspine occur mostly deeper than shortspine.

Sometimes depths are given in meters (m) and sometimes in fathoms (fm). A fathom is 6 feet. A meter is slightly more than 3 feet. So, 1 fm is slightly less than 2 m.

Generalized Thornyhead Biology Two species of thornyheads occur off the West Coast, shortspine thornyhead (*Sebastolobus alascanus*) and longspine thornyhead (*S. altivelis*). They are found from Baja California to the Bering Sea and occasionally to Japan. They are common from southern California northward. Thornyheads are demersal and occupy soft bottoms in deep water. Their distributions overlap considerably although longspines also inhabit somewhat deeper waters. Off Oregon and California, shortspine thornyhead mainly occur between about 50 to 700 fm (100 and 1,400 m), most commonly from 50-500 fm (100-1,000 m), and longspine thornyhead mainly occur at depths of 200-700+ fm (400 - 1,400+m), most often between about 300-500 fm (600 -1,000 m) in the oxygen minimum zone. Off California, spawning occurs in February and March in deep water. Eggs rise to the surface to develop and hatch. Floating egg masses can be seen at the surface in March, April, and May. Larvae are pelagic for about 12-15 months. During January to June, juveniles settle onto the continental shelf and then move into deeper water as they become adults. Off California, shortspines begin to mature at 5 years; 50% are mature by 12-13 years; and all are mature by 28 years. Although it is difficult to determine the age of older individuals, they may live to over 100 years of age. Thornyheads eat a variety of invertebrates such as shrimps, crabs, and amphipods, as well as fishes and worms. Longspine thornyhead are a common item found in the stomachs of shortspine thornyhead and cannibalism of newly settled juveniles is important in the life history of thornyheads. Sablefish commonly prey on longspine thornyhead.

"Flatfish" includes 12 species of flounders and soles. They are typically found on sandy bottom areas. Some species are shallower than others, and some make seasonal migrations from deep to shallow water.

Generalized Flatfish Biology Twelve species of flatfishes are classified as West Coast groundfish: arrowtooth flounder, butter sole, curlfin sole, Dover sole, English sole, flathead sole, Pacific sanddab, Petrale sole, rex sole, rock sole, sand sole, and starry flounder. (Pacific halibut and California halibut are not classified as West Coast groundfish, and are considered in Section **XXX** below.) Flatfish are demersal, inhabiting sandy, muddy, or gravelly bottoms from estuarine areas seaward over the shelf and onto the continental shelf. Starry flounder is common in estuarine areas and shallow nearshore areas and Dover sole and arrowtooth flounder are common on the outer shelf and slope. Others are most common nearshore and on the shelf. Individuals of the same species often occur together in large, non-random associations. Some may make extensive migrations, especially between feeding and spawning grounds. Spawning is most common during late winter and early spring. Except for rock sole, flatfish spawn many pelagic eggs, from hundreds of thousands to a few million, depending on species and size of the fish. Rock sole reportedly spawn over a variety of substrates, from rocky banks to sand and mud; their eggs are demersal and adhesive. For many species, eggs rise in the water column and are carried shoreward with the currents as they develop, although rex sole settle mainly on the outer continental shelf. As they age and grow, most flatfish move from shallow nursery areas into deeper waters. Age of maturity varies from 2 to 10 years, depending on species and sex. Longevity varies from 10 to 20 years with Dover sole living potentially twice as long. Juveniles and adults are carnivorous.

"Gadid" means members of the cod family. Pacific whiting is the most abundant groundfish in the West Coast region.

Generalized Gadid Biology Two species of gadids are classified as groundfish off the West Coast: Pacific whiting (*Merluccius productus*) and Pacific cod (*Gadus macrocephalus*). (Another gadid, walleye pollock, is not classified as a West Coast groundfish under the FMP, but its biology is described in Section **XXX** below.) Pacific Whiting, also known as Pacific hake, range from Sanak Island in the western Gulf of Alaska to Magdalena Bay, Baja California Sur. Off the west coast, Pacific cod are at the southern end of their range, which extends from northern China along the Pacific rim to the Bering Sea and southward to Santa Monica, California. Smaller populations of cod and whiting occur in several of the larger semi-enclosed inlets, such as the Strait of Georgia and Puget Sound. Whiting are semi-pelagic. The highest densities of Pacific whiting are usually between 50 and 500 m, but adults occur as deep as 920 m and as far offshore as 400 km. Whiting school at depth during the day, then move to the surface and disband at night for feeding. Coastal stocks spawn off Baja California in the winter, then the mature adults begin moving northward and inshore, as far north as southern British Columbia by fall. They then begin the southern migration to spawning grounds and further offshore. Spawning occurs from December through March, peaking in late January. Their eggs are neritic and float to neutral buoyancy. Age of maturity for makes and females is three years and longevity is about 25 years. All life stages feed near the surface late at night and early in the morning. Juveniles and small adults feed chiefly on euphausiids. Large adults also eat amphipods, squid, herring, smelt, crabs, and sometimes juvenile whiting. Eggs and larvae of Pacific whiting are eaten by pollock, herring, invertebrates, and sometimes whiting. Juveniles are eaten by lingcod, Pacific cod and rockfish species. Adults are preyed on by sablefish, albacore, pollock, Pacific cod, marine mammals, soupfin sharks and spiny dogfish. The life history of Pacific cod off the West Coast differs in some aspects from the life history of Pacific whiting. Adult Pacific cod occur as deep as 875 m, but the vast majority occurs between 50 and 300 m. They are not considered to be highly migratory, but individuals can move long distances. Eggs are demersal, and eggs and larvae can be found over the continental shelf between Washington and central California from winter through summer. Most mature by 3 years of age, and longevity is about 15 years. Juveniles and adults are carnivorous and feed at night.

Three species of sharks are classified as groundfish. These sharks bear live young and may live 30-70 years.

Generalized Shark Biology On the West Coast, three species of sharks are classified as groundfish: spiny dogfish, soupfin shark and leopard shark. (Other sharks off the west coast are more oceanic and considered in Section **XXX** below.) Leopard shark inhabit nearshore waters, including shallow bays and estuaries in California; soupfin shark occur near bottom in nearshore areas and over the shelf; and spiny dogfish occur near bottom and at times, higher in the water column from inshore areas to the outer shelf. They are schooling species and may make long migrations. They bear live young, primarily during the spring. Leopard sharks can produce up to 36 pups; soupfin sharks average 35 pups and spiny dogfish produce up to 20 pups, although litters of 4-7 are common. The gestation period lasts for 10-12 months for leopard shark, but two years for spiny dogfish. Age at maturity also varies by species and sex, but is

Exhibit C.10
Situation Summary
September 2003

CONSIDERATION OF INDIVIDUAL QUOTA PROGRAMS

Situation: Recently, there have been industry initiatives to begin independent work on individual quotas (IQs). Reports on these efforts will be presented to the Council under this agenda item and related background materials are provided as attachments, including background information in Attachment 1.

Consideration of IQs has been constrained by a Congressional moratorium on new IQ programs which first expired October 1, 2000, but was subsequently extended two additional years. The moratorium was not renewed after its last expiration, October 1, 2002. However, Congressional Representative Wayne Gilchrest has requested the Council postpone any final decisions on IQ programs and first assist in the development of national framework guidelines for the design of IQ programs (Attachment C.10.a).

IQs for trawlers have been on the Council's workload list since just after the October 2000 adoption of the strategic plan. However, the Council has not had the resources available to advance development of a program. In June 2001, the Council created an Ad Hoc Trawl Permit Stacking Work Group. That group met February 26, 2002, but then activity was suspended while the permit buyback program was developed and other Council workload priorities were addressed.

After receiving the IQ reports, the Council should consider whether it may want to raise the priority for IQs on the workload list so that some progress can be made on this issue. Given other tasks that the Council has previously identified as high priority, the amount of effort that can be made between the September and November Council meetings will probably be limited. An example of an achievable task would be to authorize the Council chair to work with staff to draft a list of seats for an ad hoc IQ committee, identify individuals to fill those seats, and present the list in November for Council concurrence. Such a procedure would be consistent with that followed for the appointment of other Council ad hoc committees. Final determination of Council workload priorities is scheduled for Friday under agenda item B.7.

Council Action: Plan future Council action regarding groundfish IQ development.

Reference Materials:

1. Exhibit C.10.a, Attachment 1 (Background Information on Council Consideration of Individual Quota Programs).
2. Exhibit C.10.a, Attachment 2 (Letter from Congressional Representative Wayne T. Gilchrest, July 8, 2003).
3. Exhibit C.10.b, Canadian Symposium Report (Memo and Report on Meeting with British Columbia Individual Vessel Quota [IVQ] Participants, August 19, 2003).
4. Exhibit C.10.c, MTC Letter (Letter from Midwater Trawlers Cooperative, August 13, 2003).

Agenda Order:

a.	Agendum Overview	Jim Seger
b.	Report on the Canadian Symposium	Dorothy Lowman
c.	Whiting Catcher Vessel Industry Report	David Jincks
d.	Newport, Oregon Inclusive Rationalization Meeting Report	Tim Hogan
e.	Trawl Sector Initiatives	Pete Leipzig
f.	Reports and Comments of Advisory Bodies	
g.	Public Comment	
h.	**Council Action:** Plan Future Council Action Regarding Groundfish IQ Development.	

PFMC
08/25/03

Exhibit C.10.a
Attachment 1
September 2003

BACKGROUND BRIEFING ON COUNCIL CONSIDERATION OF INDIVIDUAL QUOTA PROGRAMS

Individual quota (IQ) programs have been under Council discussion since before the 1987 inception of the limited entry committee that designed the West Coast groundfish license limitation program. Individual quota programs allocate a share, or amount of fish, to individual fishing operations and thereby control "output"(amount of fish harvested).

The groundfish license limitation program is an "input" control, controlling the number of vessels, but still requiring government managers to impose numerous regulatory restrictions in order to ensure that allowable harvests are not exceeded. Under the individual quota "output" control, fishers are provided considerable latitude as to when and where they harvest their quota, allowing them to increase the efficiency of their operations. Common property resource problems faced by harvesters and fishery managers are largely resolved by IQs and, if IQs are transferable, market mechanisms will cause individual quota to be transferred into the hands of the most efficient producers. Properly designed IQ programs can substantially resolve overcapacity problems.

Council consideration of limited entry programs, such as license limitation and IQs, has been in response to significant over capacity problems in the harvesting sector of the groundfish fishery. When the Council adopted the groundfish license limitation program in 1991, it acknowledged that additional capacity control measures would be required. It was anticipated that the license limitation program would limit the growth of harvesting capacity but would not resolve the overcapacity problem.

The groundfish strategic plan, adopted in October 2000, listed reduction of harvesting capacity as one of its main goals and included a trawl vessel buyback program as a short to intermediate term objective, and a trawl IQ or mandatory stacking program as an intermediate to long-term objective. Since the adoption of the groundfish strategic plan, a significant portion of the fixed gear sablefish fishery as been placed under a tiered, stackable permit system that is generally regarded as a kind of IQ program. Currently, there is also a bidding and referendum process under way which may result in a buyback program that will substantially reduce the number of groundfish trawl permits.

PFMC
08/25/03

WAYNE T. GILCHREST
1st District, Maryland

COMMITTEE ON TRANSPORTATION
AND INFRASTRUCTURE

COAST GUARD AND
MARITIME TRANSPORTATION

WATER RESOURCES

COMMITTEE ON SCIENCE

Congress of the United States
House of Representatives

COMMITTEE ON RESOURCES

CHAIRMAN, FISHERIES CONSERVATION, WILDLIFE AND OCEANS

NATIONAL PARKS, RECREATION AND PUBLIC LANDS

CHAIRMAN, CHESAPEAKE BAY WATERSHED TASK FORCE

July 8, 2003

Dr. Hans Radtke
Chairman, Pacific Fishery Management Council
7700 NE Ambassador Pl, Suite 200
Portland, OR 97220

Dear Dr. Radtke:

As you know, one of the most difficult and divisive debates during last year's consideration of Magnuson-Stevens Fisheries Conservation and Management Act (the Act) reauthorization was over the creation of workable guidelines for the councils to use when developing and implementing Individual Fishing Quota (IFQ) systems. I think we came very close to a comprehensive and workable, yet flexible, set of guidelines last Congress. Unfortunately, the bill was not enacted before the moratorium on IFQ programs expired. However, one of my top priorities in this Congress is to reauthorize the Act and, once again, we will work on a fair statutory framework for IFQ and other quota systems. In light of this, I respectfully request that the Council postpone any final decisions on such programs and assist in the development of this framework first.

The reauthorization of the Act is a difficult task and one we must all share. I believe the Sustainable Fisheries Act (SFA) took fisheries management in a direction it needed to go and I understand that the implementation of the SFA's provisions has not been easy. In crafting the new reauthorization, I have been aware of the need to move forward toward ecosystem-based management and to incorporate our current level of scientific awareness, as well as the economic implications of fisheries management. I have tried to strike the appropriate balance and worked hard with you to get H.R. 4749 through the House Committee on Resources during the 107th Congress. Once again, we need to shoulder this burden together.

I appreciate all of the hard work that the Councils - both the staffs and the members - put into making the difficult decisions that determine the management of our nation's fishery resources. I have been impressed with the dedication of both time and effort that is made to create the delicate balance between the environmental needs of the resource and the economic needs of the fishermen and the fishing communities and look forward to working with you on reauthorization of the Act. It is my intention to develop and distribute a discussion draft by the end of this summer, looking toward introduction of a reauthorization bill in the fall.

Let's stay the course! We will be able to effectively address conservation, economic, and administrative issues for the full term of the reauthorized Act if we work together on the statutory framework first. Please let me know if I can answer any questions or concerns you may have about this effort.

Sincerely,

Wayne T. Gilchrest

Wayne T. Gilchrest
Member of Congress

WTG/et

Memorandum August 19, 2003

To: Don Hansen, Chairman of the Pacific Fishery Management Council

From: Dorothy Lowman, consultant for Environmental Defense
Johanna Thomas, Deputy Oceans Program Manager, Environmental Defense
Marion Larkin, Washington trawl vessel owner
Brad Pettinger, Oregon trawl vessel owner-operator
Richard Young, California trawl vessel owner-operator

Re: Report on Meeting with British Columbia Individual Vessel Quota (IVQ) Participants

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In 2000, the Pacific Council's SSC went on record identifying overcapitalization as the single most serious problem facing the West Coast groundfish fishery. That same year, the Secretary of Commerce declared the west coast groundfish fishery a disaster. The continuing problems facing the fishery are well known and include bycatch concerns, regulatory discards, economic instability and uncertainty, data collection and monitoring concerns and difficulty in competing in global markets.

By now, it is apparent that traditional fishery management tools used alone will not resolve these problems. Indeed, existing management tools such as trip limits exacerbate some of these problems (e.g., regulatory discards).

Individual Fishing Quotas (IFQs) have become the focus of increasing interest to managers, fishermen and environmentalists. Environmental Defense and leaders of the west coast trawl fishery joined forces in 2001-2002 to actively lobby for lifting the moratorium on IFQs in the Magnuson-Stevens Act. Over 150 industry and coastal community members sent letters to Congress asking that IFQs be made available as a management tool. The Council itself identified development of an IFQ program for groundfish as an intermediate/long-term goal in their 2000 Strategic Plan.

The multi-species trawl groundfish fishery in British Columbia offers a unique opportunity to learn more about how an IFQ system works successfully in a multi-species fishery. This fishery sells similar species caught with similar gear to the same markets as the west coast trawl fishery. Prior to the implementation of their IVQ program in 1997, the BC fishery operated under similar management to our current system and faced many of the same problems listed above.

On June 24, 2003, representatives of Environmental Defense and the trawl fishing industry, along with Council staff economist Jim Seger, met with a diverse group of Canadians involved in the development and operation of the IVQ system. Included in the group were government managers, fishermen, processors, union and association leaders, and consultants directly involved in the development and the ongoing review and improvement of the IVQ program.

During the six-hour meeting, we discussed at length (1) the situation prior to IVQ implementation, (2) the broad-based process through which their program was developed, (3) the key elements of the IVQ system and (4) how the fishery and management have changed as a result of the IVQ system. This information is described in detail in the attached report.

It is very clear that the British Columbia trawl groundfish fishery is far better off than before IVQs. Developed through an open process with strong leadership, the IVQ program has produced real conservation and economic benefits. TACs are no longer being exceeded, bycatch is reduced, data collection is greatly improved, and management is less contentious. The fleet has consolidated, so remaining vessels are profitable. Ex-vessel prices have increased, crew incomes have risen, and long-range planning is possible. BC is now a consistent supplier of good quality fresh groundfish. Processors can work with fishermen to plan landings to take advantage of market opportunities.

More information on the conservation and economic benefits that have been achieved are provided in the attached report. We also point out some lessons from the BC experience that may be useful for west coast IFQ discussions.

Bruce Turris, the lead DFO manager during the development of the IVQ program, will also be attending the Council meeting. Now a private consultant, Bruce continues to be actively involved in the evolution of the IVQ program and heads up the industry co-management organization. Bruce will also be happy to answer any questions you and others may have about the BC experience and its implications for west coast groundfish management.

We look forward to presenting our findings to the Council in September.

The British Columbia Individual Vessel Quota Experience: Lessons for the West Coast Trawl Groundfish Fishery Report on June 24, 2003 Meeting

Submitted by:
Marion Larkin, Washington Trawl Vessel Owner
Dorothy Lowman, Fisheries Consultant for Environmental Defense
Brad Pettinger, Oregon Trawl Vessel Owner-Operator
Johanna Thomas, Deputy Oceans Program Manager, Environmental Defense
Richard Young, California Trawl Vessel Owner-Operator

1. What prompted the meeting with BC IVQ Participants?

Problems Facing the West Coast Groundfish Fishery

- Management is contentious and difficult. Regulations are complex and enforcement is difficult.
- Significant overcapacity in the fleet
  - In 2000, the SSC estimated that 27-41% of the limited entry trawl fleet could harvest the allowable quota. Since then, quotas have declined while the fleet remained the same.
  - Buyback may reduce fleet capacity in 2004, but no mechanism exists to adjust future harvesting capacity for technical progress in fishing technology or for changes in the available resource.
- Excess fishing capacity causes a number of other problems:
  - Decreased trip limits resulting in increased regulatory discards.
  - Fleet is unprofitable
    - Inability to research/invest in new gear that would allow more selective fishing
    - Vessels are not adequately maintained
    - Declining crew wages have caused many qualified crew to leave the fishery
    - No demand for vessels, so current fishermen cannot retire.
- Fishery related data is degraded and it is difficult to accurately account for fishery-related mortalities
- Market concerns
  - Trip limits often result in timing of landings that do not match either market demand or processing capacity
  - Difficult to produce product forms desired by market.
  - Unable to plan for the future.

Management Policy Considerations

- Moratorium on IFQs in Magnuson-Stevens Act expired in 2002; making IFQ plan development possible
  - Environmental Defense and West Coast trawl fishermen joined forces in 2001-2002 to lobby Congress to lift the moratorium
  - Over 150 fishermen and coastal community members signed letters asking Congress to make IFQs available as a management tool
- The Pacific Council identified development of a comprehensive IFQ program for the limited entry trawl fishery as an intermediate to long-term goal in its 2000 Strategic Plan

2. The Who, What, When and Where of the Meeting

- Who: A coalition of west coast vessel owners and Environmental Defense staff/consultants, accompanied by Council staff met with a diverse group of IVQ participants including two vessel owners, a processor, labor union representative, industry organization leaders, executive director of the Groundfish Development Authority, an IVQ broker, and DFO groundfish manager. A list of participants is attached.

- What: The purpose of the meeting was to learn about the development and operation of the IVQ program; what were the costs and benefits associated with the program; and what lessons could be learned from the BC situation
- When: June 24, 2003
- Where: New Westminster, British Columbia

3. The BC Individual Vessel Quota System

3.1 The BC Groundfish Trawl Industry prior to IVQs

General:

- 142 limited entry licensed vessel ranging from 30 feet to 150 feet
- About 135 active annually (most all of which fished bottom trawl and about 75 that fished midwater trawl for hake and pollock)
- 12 month season
- Catches consisted of more than 50 commercially valuable groundfish stocks, including rockfish, flatfish, cods, elasmobranches, lingcod and sablefish
- Fishing occurred throughout the west coast from San Juan to Dixon Entrance with most fishing occurring in Hecate Strait, Queen Charlotte Sound, and off the west coast of Vancouver Island
- Most fish processed in Vancouver, Prince Rupert, and Ucluelet
- About 12 processors buying and processing groundfish from trawl fleet, including several plants in Washington State
- Less than half of the plants and virtually none of the vessel crews are unionized
- Most of the bottom fish sold to the U.S. (California) market with hake going to Surimi markets in U.S. and overseas (Asia)
- About one third of the vessels tied to processing companies through complete or partial vessel ownership and/or through marketing agreements

Management Regime (pre 1996):

- Individual groundfish species TACs managed on a coastwide basis (even though there were numerous area specific stocks of many different species) by simply adding the stock specific TACs together
- 12 month season (January 1 – December 31) broken into 4 quarters (pre-determined portions of TAC assigned to each quarter based on industry consultation)
- Monthly fishing periods
- Vessels could choose different fishing options (2, 4 or 15 trips per month)

- Vessel trip limits for each species (calculated by estimating fishing effort for the season – trip limits reduced as total landed catch approached TAC)
- Trip limit amounts based on fishing option chosen – more trips per month option had smaller trip limits
- At-sea daily fishing logs of total catch to be completed by skipper (including discards)
- 100% monitoring of all landed catch by independent dockside monitors
- Various vessel and gear restrictions (i.e. limits on vessel length, license stacking, and mesh size restrictions)

3.2 What was wrong?

From a management perspective:

- Managers could not manage on a stock specific basis because information from fishery regarding catch and releases was not complete or credible
- The entire coastwide TAC could be taken entirely, or largely out of a single area (stock)
- Coastwide and stock specific TACs were being exceeded by more and more each year
- Harvesting capacity and effort continued to increase, resulting in increasingly smaller trip limits and higher levels of unreported discarding and misreported catch by area
- Stock assessment capabilities had been greatly eroded by poor information, reduced numbers of fishery independent surveys, and shrinking government resources

From an industry perspective:

- Costs of fishing were increasing
- Landed value of catch was decreasing due to poor quality and not properly servicing the market
- Fishing time was declining
- TACs were declining due to overharvesting, environmental conditions, and increased use of precautionary management
- Increasingly restrictive harvesting requirements
- Losing markets because of volatile landings patterns and closures
- Unable to make long-term plans
- Instability and high risk
- Poor earnings for vessel and crew

3.3 What brought about change?

- By September of 1995, three quarters of all coastwide TACs had been exceeded with still more than one quarter of the season to go (and this was based solely on landed catch)
- There were concerns for various stocks for which the TAC had likely been exceeded by even more than the coastwide TAC (on a percentage basis)

- Government had recently suffered through the Atlantic cod closure and did not want similar problems on the Pacific coast
- Strong leadership from both the federal and provincial governments
- Industry were going broke and under the status quo could not afford the additional costs associated with proper management of the resource (dockside monitoring, at-sea observers, stock assessment research)

3.4 What was the process?

- DFO initially held a number of meetings with the Groundfish Trawl Advisory Committee (GTAC) – an industry advisory board consisting of representatives from the harvesting and processing sectors, the United Fishermen and Allied Workers Union, and the provincial and federal governments
- Public meetings were also held in Vancouver and Prince Rupert
- The majority view from industry and GTAC was to pursue the development of an IVQ plan
- GTAC recommended, and the government accepted, the appointment of a mediator to consult with the groundfish industry and make recommendations on the allocation of groundfish TACs between trawl and hook and line sectors and amongst groundfish trawl license holders
- A retired judge is hired as a mediator – receives written submissions and holds public meetings throughout the coast to hear individual and sector positions
- Mediator submits recommendations to DFO
- A subcommittee of GTAC (consisting of several GTAC members and a non-GTAC member representing coastal communities) called the Groundfish Special Industry Committee (GSIC) was established to work through the details of an IVQ plan and present the results to GTAC and the federal and provincial governments
- GSIC consists of representatives from license holders, processors, Union, coastal communities, and the provincial and federal government
- GSIC develops consensus plan following months of meetings and negotiations and presents recommended IVQ plan to GTAC and government
- DFO consults with GTAC regarding GSIC plan and then submits recommendations regarding TAC and IVQ allocations and IVQ plan to Minister of Fisheries for approval
- Entire process takes about 16 months

3.5 What was implemented (IVQ program details)?

New season

- April 1 – March 31

Trawl specific TACs

- Following industry consultations and recommendations from a mediator, DFO approved an allocation formula that divided the rockfish, lingcod and dogfish TACs among trawl and hook and line gear

Breakdown of Trawl TAC allocations

- 80% of each TAC is allocated directly to individual trawl licensed vessels as area and species specific Individual Vessel Quota (IVQ) based on the IVQ allocation formula
- 10% of each TAC is automatically allocated to individual trawl licensed vessels as Code of Conduct (CCQ) IVQ (based on the IVQ allocation formula) assuming no advice has been received by the Minister of Fisheries from the Groundfish Development Authority recommending that a specific vessel receive less than their full CCQ allocation
- 10% of each groundfish TAC is allocated as Groundfish Development Quota (GDQ) to GDQ proposals jointly prepared by processors and trawl licensed vessel owners

Groundfish Development Authority (GDA)

- The GDA was created as a means of addressing various concerns about IVQs held primarily by processor, union and coastal community representatives (i.e. this was the compromise negotiated to address the processor's, union's and coastal communities' requests for direct IVQ allocations)
  - Processors originally asked for 50% of the TACs allocated to processors
  - The United Fishermen and Allied Workers Union (UFAWU) wanted 25% of the TACs allocated to crewmen
  - Coastal communities wanted Community Development Quotas (CDQs)
- Processors, the union and coastal communities were concerned that allocating the entire TAC to license holders would result in a significant change in the industry that would seriously undermine substantial existing investments in capital and labour
- The GDA's purpose is to ensure fair crew treatment, aid in regional development, promote the attainment of stable market and employment conditions, and encourage sustainable fishing practices
- The GDA consists of a seven member Board of Directors and a Steering Committee of nine advisors whose role it is to provide background information and expertise to the Board of Directors
  - Board of Directors (seven members):
    - 3 Community Directors (North Coast, South Coast, and Vancouver Island) selected by the Coastal Community Network
    - 2 UFAWU Directors (1 shore worker and 1 vessel crew representative) selected by the UFAWU
    - 1 United Food and Commercial Workers Union (UFCWU – north coast union representing shore workers) selected by the UFCWU

    - 1 independent fishermen's Director (must have no vessel ownership or vessel license holdings) selected by GSIC
  - Steering Committee (nine members):
    - 3 processing company representatives selected by GSIC
    - 3 groundfish trawl license holder representatives selected by GTAC
    - 1 First Nations representative
    - 1 Provincial Ministry of Agriculture, Food and Fisheries representative selected by the provincial government
    - 1 Federal government representative from the Department of Fisheries and Oceans
- The 20% of the groundfish TACs influenced by the GDA is divided into two parts:
  - 10% Code of Conduct Quota (CCQ) to protect the interests of crews under the IVQ management plan
  - 10% Groundfish Development Quota (GDQ) to aid in regional development in coastal communities, attain market and employment objectives, and encourage sustainable fishing practices

Code of Conduct Quota (CCQ)

- The CCQ is designed to ensure "fair treatment of crew" and "safe vessel operation"
  - "Fair treatment of crew" means that crew sharing arrangements will not be adversely affected by the introduction of an IVQ system
  - "Safe vessel operation" means that changes in crew size or vessel maintenance practices that could affect the safety of the crew or the vessel will not occur as a result of the introduction of an IVQ system
  - Any crewmember, his legal representative or any other third party who believes that a crewmember has been unfairly treated or that his safety has been in any way compromised according to the guidelines may file a complaint with the GDA

Groundfish Development Quota (GDQ)

- GDQ is allocated to trawl licensed vessels involved with proposals submitted to the GDA jointly by processors and T licensed vessel owners
- The amount of GDQ allocated to a proposal is based on the amount of fish in the proposal, processor production history, and the proposal rating by the GDA
- Proposals are rated on how well they achieve the following objectives:
  - Market stabilization
  - Maintenance of existing processing capability
  - Employment stabilization in the groundfish industry
  - Economic development and benefits in coastal communities
  - Increasing the value of groundfish production
  - Industry training opportunities
  - Sustainable fishing practices

IVQ Allocation Formula

- For groundfish (excluding Pacific hake) the initial allocation was based:
  - 30% on vessel length – length of vessel used in the calculation is the length recorded in the DFO Pacific Licensing System on January 31, 1997
  - 70% on average catch of groundfish (excluding hake) during the five year term 1988-1992 – the groundfish species included in the catch history calculations are all rockfish, soles, Pacific cod, lingcod, dogfish, sablefish and pollock
- For Pacific hake the initial allocation was based:
  - 30% on vessel length – based on the total length of the hake vessels only
  - 70% on average hake catch history for the five year term 1987-1991
- There are 55 different IVQ allocations and they are expressed as a percentage of the respective stock TAC
- Vessels exceeding their IVQ allocation of a species will not be permitted to continue fishing in the area for which the species is allocated until additional IVQ for that species is transferred onto the vessel to cover the overage – if the IVQ is a coastwide allocation the vessel cannot fish bottom trawl anywhere until enough IVQ for that species is transferred on to cover the overage

IVQ Transferability

- IVQ can only be transferred among trawl licensed vessels
- Currently, IVQ is freely transferable subject to quota caps. In 2004, some restrictions on transferability will be implemented for the period 2004-2007.
- Because IVQ transferability has a significant impact on the operational effectiveness of the IVQ program as well as many other issues of importance to the industry (i.e. fleet rationalization, leasing, impacts on crew, distribution of benefits, stabilization, etc.), the transferability rules are reviewed every 3 years
- Industry aims for transferability rules that provide for the necessary operational flexibility that enables the fleet to catch the TAC but also limits or avoids the pitfalls that wide open transferability have created in other fisheries
- The objective is to limit fleet rationalization to the levels envisioned (60-80 vessels) and to keep most of the IVQ on working boats

Individual Species Caps

- Individual coastwide species caps are set for each species at a level which will allow vessel owners to adjust their quota holdings to a viable level, but which ensures they cannot accumulate an unreasonably large amount of a species IVQ – species caps range from 4% - 10%

Total Holdings Caps

- Each trawl license is subject to a total holdings cap set at a level which allows vessel owners to adjust their IVQ holdings to a viable level but also ensures operators cannot accumulate an unreasonably large amount of IVQ
- For the purpose of calculating the total holdings cap for each license, and for measuring holdings of a license against its cap, Groundfish Equivalents (GFEs) have been established based on relative prices of groundfish – Pacific Ocean Perch is used as the base (POP = 1.00)

Individual Vessel Halibut Bycatch Quota

- The groundfish trawl fishery halibut bycatch mortality cap (1,000,000 lbs dressed weight) is allocated as an IVQ bycatch cap to each licensed vessel in proportion to its initial groundfish IVQ holdings
- Vessels catching halibut by trawl gear are not permitted to retain the catch and must return the halibut to the water
- Halibut bycatch IVQ is freely transferable and no license can hold more than 4% of the total halibut bycatch mortality cap
- Vessels exceeding their bycatch IVQ are restricted to midwater fishing until the following season or until additional bycatch IVQ is transferred on to the vessel to cover the overage

Fish Released at Sea

- Weights of fish released at sea which are considered marketable (determined by size) will be deducted from the vessel's IVQ
- Non-marketable fish discards will be recorded (total weights by species and area) but will not be deducted from the vessel's IVQ
- There are set mortality rates for marketable fish released at sea – rates are based on species (rockfish rate is 100%), towing time (i.e. 10% - 25% per hour), or condition factors (halibut)

At-sea Monitoring (2/3 industry funded)

- Trawl vessels are required to carry DFO certified observers on every trip – the only exemption from this requirement are vessels fishing midwater trawl for hake

Port Monitoring and Validation (industry funded)

- All trawl vessels must have all their groundfish catch validated, whether landed in Canada or the U.S., to ensure proper enumeration by species
- Monitoring requirements include hail-out and hail-in requirements and designated offloading locations

Quota Overage/Underage and Quota Carryover

- For all species of groundfish subject to IVQs, other than hake and halibut, the carryover/underage limit is 30% of the vessels IVQ holdings for that species and species area group (for hake and halibut the limit is 15%)
- Vessels exceeding their IVQs up to the allowable limit can keep the proceeds from the overage but will have the equivalent poundage deducted from their IVQ in the following year
- Vessels exceeding their IVQ by more than the allowable limit can keep the proceeds for the fish up to the allowable limit but must relinquish the balance and will have the entire amount of the overage deducted from the vessels IVQ in the following year
- Vessels fishing under their IVQ up to the allowable limit will have the equivalent poundage added to their IVQ in the following year

Other measures

- A number of traditional management measures remained in place, such as:
  - Size limits
  - Gear restrictions
  - Logbooks and sales slips
  - Area closures
  - 15,000 pound trip limit of combined non-TAC rockfish

3.6 What were the Objectives?

Ensure Conservation

- Ensure that catch stays within TACs and bycatch targets
- Encourage sustainable fishing practices

Increase benefits derived from the groundfish trawl fishery

- Greater economic benefits
- Increase the value of groundfish production
- Improve or maintain market stabilization
- Allow for fleet regionalization and specialization
- Encourage safe vessel operation
- Provide for industry training opportunities

Fair distribution of benefits arising from the IVQ Plan

- Avoid pitfalls associated with leasing and quota concentration
- Maintain existing processing capability

- Groundfish employment stabilization
- Economic development in coastal communities
- Fair treatment of crews (crew shares and working conditions)

3.7 Have the Objectives been achieved?

Conservation

- Catches are within allowable TACs and bycatch targets
  - No species TAC has been exceeded since the implementation of IVQs
- Catch utilization is improving
- Sustainable fishing practices are more evident and continue to be developed
  - Vessels using shorter tows, avoiding high bycatch areas, using net mensuration, larger mesh in nets
- Increased individual accountability
- Greatly improved data collection and information for determining resource status
  - Now have reliable information on stock specific catch and mortality – including discards
- Improved cooperation amongst fishermen to share information on bycatch hotspots
- Bycatch rates and mortality have declined – i.e. halibut bycatch mortality of nearly 2 million lbs prior to IVQs now down to 300,000 lbs

Increase benefits derived from the groundfish trawl fishery

- The IVQ program eliminated the "race for fish"
- The focus changed from "maximizing catch" to "maximizing value of catch"
- The environment in the IVQ fishery is conducive to focusing on quality, servicing markets, planning and executing plans
- While some operating costs have increased, benefits to remaining industry participants have increased by more than the additional costs
- Provision of a product mix that better serves the market and reduces processing and handling costs
- Total value of landed groundfish has risen even though less fish is being landed
  - In 2000 a total of 26,000 mt of groundfish worth Can $34 million was landed by bottom trawl gear compared to 29,000 mt worth Can $21 million in 1996
- Using current fish prices and lease rates, earnings to both vessel owners and crew have improved under the IVQ program despite increased incremental costs associated with at-sea observers and acquiring quota (via purchase or lease)
- Groundfish markets have improved under the IVQ plan:
  - Some of the improvement is related to restricted supply from the U.S.
  - Some improvement is attributable to strong fresh fish market fundamentals
  - Some of the increase stems from quality/consistency/value improvements in British Columbia

- BC is now a consistent supplier of good quality fresh groundfish
  - Fresh fillets are available 48 weeks per year
  - Better quality – shorter trips, improved handling
  - Supply gluts less severe and better handled
- Groundfish prices are dramatically higher now than prior to IVQs (i.e. POP average landed price has increased from Can $0.29/lb in 1994 to Can $0.61/lb in 2001 and lingcod has gone from Can $0.39/lb to Can $0.76/lb in the same period)
- Although overall price levels have improved, severe price fluctuations over the short term do still occur on occasion
- The IVQ plan has enabled the BC groundfish trawl industry to exploit market opportunities
- Fleet rationalization has allowed for greater efficiency
  - About half of the 142 trawl licenses hold quota
  - The "truly" active fleet is 40-45 groundfish bottom trawl vessels, and 30-40 hake vessels (some overlap)

Fair distribution of benefits

- The GDA has provided incentives for vessel owners and processors to conduct their business so as to generate broad industry benefits
- Holdings caps and transferability rules have been safeguards against excessive rationalization and IVQ concentration
- The working fleet size is within the 60-80 boat range envisioned at the outset of the IVQ plan
- Active fleet size is now similar to historical patterns of the 1970s and early to mid 1980s
- Boat-by-boat analysis suggests that approximately 90% of quota is now held within the "active" fleet.
- The number of processing plants has increased slightly since the inception of the IVQ program
- All of the processors in existence prior to IVQs are still in operation
- The percentage of bottom trawl groundfish purchased by the top 5 processors has increased slightly (from 53% between 1994-1996 to 58% between 1997-1998)
- The percentage of hake purchased by the top 5 processors has increased (from 83% between 1994-1996 by the top 5 processors 96% between 1997-1998)
- Some crew members own IVQ – although not many
- Based on financial analysis for a typical working vessel, crew are better off now than before IVQ (note that model overstates pre-IVQ earnings since TACs were over harvested)
- Based on various program reviews the groundfish trawl fishery is providing a good living for current participants through
  - Improved earnings for both vessel owners and crew
  - Flexible crewing arrangements (crew rotation)
  - A safer work environment

- More groundfish is also being "handled" (i.e. offloaded and/or processed) in coastal communities (comparing the 1994-1996 and 1997-1999 periods, the percentage of total groundfish landed annually in Vancouver has declined from 36% to 30% while the percentage landed has increased in coastal communities such as Prince Rupert (15% to 23%) and North Island (10% to 16%)
- The percentage of groundfish landed annually in the U.S. has declined from 17% to 12%

3.8 Other Impacts

- Vessel size composition has changed – before IVQs vessel size ranged from 30 – 150 feet, now vessel sizes are between 50 and 120 feet
- Considerable amount of fleet specialization (i.e. midwater vs bottom trawl; deepwater vs. shallow; fresh vs. frozen) and regionalization (north coast vs south coast)
- Industry participants, especially license and IVQ holders, are more concerned about the long-term health of the resource
- Co-management initiatives have increased substantially
    - Industry currently conducting and funding 3 surveys
    - Contract with stock assessment scientists
    - Provide cost recovery funding for various DFO science projects

4. Key Lessons Learned from BC Experience

- Leadership was important in achieving success
- All interest groups were involved in designing program
- System is designed specifically for the needs of the BC industry
- The system is not perfect but is a significant improvement over the prior system
- Improvements to the system are constantly being considered and, where agreeable, adopted
- System is expensive (about $0.04/GFE)
    - Annual cost of at-sea and dockside monitoring is approximately $3 million
    - Annual industry funded science activities cost $800,000
    - GDA expenses of $80,000 annually
    - Annual license fees of $800,000
- Purchasing IVQ can be expensive
    - 2002 IVQ value of $2.50/lb uncut
    - 2002 lease value of $0.20/lb uncut
    - Banks do not recognize IVQ or trawl license as lienable asset
- Conservation benefits are real
- Economic benefits are real
- Operational flexibility is important to success
    - Real time transfers
    - Carryover of underages and overages
    - 30 days to correct overage
- Personal accountability is what drives the system

    - If you exceed your IVQ you suffer the consequence or you take actions to correct the situation
    - Individuals can live within caps given transferability and a system for corrective action
    - Operators who cannot adhere to the principals of personal accountability tend to leave the fishery
- Comprehensive at-sea and dockside monitoring are important to ensure compliance and level the playing field
- The GDA process appears to address the concerns of communities and processors without unduly restricting vessels
- CCQ system was designed to protect crews (and likely has to some extent) but system creates disincentives for crews to file complaints
- Overall, fishermen, processors and managers all have a positive long-range view of the fishery; a far different situation than before IVQs in British Columbia or the current view of the our west coast groundfish fishery

Attachment 1

List of Participants
British Columbia Individual Vessel Quota System Meeting

British Columbia Participants:

Barry Ackerman, Groundfish Coordinator, Department of Fisheries and Oceans, Canada
Murray Chatwin, Vice President, Fisheries Management, Oceans Fisheries Ltd.
Bob Humphreys, Executive Director, Groundfish Development Authority
Aaron Laing, A to Z Quota Registry
Doug March, President, Canadian Groundfish Research and Conservation Society
Bob Morreau, President, Deep Sea Trawlers Association of British Columbia
Stuart Nelson, Manager, Deep Sea Trawlers Association of British Columbia
John Radosevic, President, United Fishermen and Allied Workers' Union
Bruce Turris, Pacific Fisheries Management, Inc.

United States Participants:

Peter Emerson, Chief Economist, Environmental Defense
Marion Larkin, Washington trawl vessel owner
Dorothy Lowman, Fisheries Consultant for Environmental Defense
Brad Pettinger, Oregon trawl vessel owner-operator
Jim Seger, PFMC staff economist
Johanna Thomas, Deputy Program Manager, Oceans, Environmental Defense
Richard Young, California trawl vessel owner-operator

Exhibit C.10.b
Supplemental Brochure
September 2004

IVQs and Multi-Species Groundfish Fisheries:
The British Columbia Experience

Image courtesy of Canadian Groundfish Research and Conservation Society

The Pacific Fishery Management Council (PFMC) and stakeholders are exploring management options for the Pacific groundfish fishery. A look to the north may help in mapping a direction for the future. In British Columbia, the trawl groundfish fishery was once plagued with the same problems that our US fishery now faces: overcapitalization, high bycatch and discards, insufficient data collection and monitoring, declining income for fishermen, and economic instability throughout the industry. While there is still a long way to go toward creating a fully sustainable fishery, the fishery has shown significant improvement in several areas under an Individual Vessel Quota Program. The program has lessons that may lend value to PFMC and stakeholder deliberations about the future of our US groundfish fishery. This handout describes some of the fundamental elements of the IVQ program and provides a partial "before and after" comparison of the fishery.

Before & After IVQs

Industry

	Before IVQs	After IVQs
Active fleet	120–135 vessels	60-80 vessels
Vessel size	30-150 feet in length	50-120 feet in length
Efficient and effective fleet operations	Poor: Most vessels fished coastwide for all trip limits	Improved: Considerable amount of specialization and regionalization
Landed value of catch	Declining due to poor quality, supply gluts and lost markets; in 1996, 29,000 mt of groundfish worth Can $21 million landed by bottom trawl gear	Increasing due to improved quality and better servicing of market; in 2000, 26,000 mt of groundfish worth Can $34 million landed by bottom trawl gear
Fishing strategy	Maximize catch each trip	Maximize value of catch for the year
Ex-vessel prices	Poor and declining: 1994 POP average price = Can $0.29/lb, lingcod average price = Can $0.39/lb	Improved and increasing: 2001, POP average price = Can$0.61/lb, lingcod average price = Can $0.76/lb
Number of processors	12 companies buying and processing, including several plants in Washington State	In 2003, 15 companies submitted joint processor/fishermen proposals to the GDA
Servicing market needs	Poor: markets being lost due to volatile landings patterns and closures	Improved: Vessels and processors landing fish when and as the market needs it; reduced processing and handling costs; opportunities for increased market shares and new development
Costs of operation	Increasing while fishing time decreasing; excessive harvesting capacity; poor economies of scale and inefficient operations	Increased incremental costs associated with at-sea observers and acquiring quota; rationalized fleet; improved operational efficiency
Vessel and crew earnings	Declining	Increased (over and above increased incremental costs)
Overall stability	Poor: uncertain future; changing rules; poor resource and economic outlook; high risk	Improved: stable management regime; improved economics; better resource management; long-term planning; reduced risk; increased certainty

in the BC Groundfish Trawl Fishery

Image courtesy of Canadian Groundfish Research and Conservation Society

Conservation

	Before IVQs	After IVQs
Stay within TACs	Poor: Frequently and increasingly exceeded	Good: TACs not exceeded since implementation
At-sea discards and mortality	Increasing levels of unrecorded discards and mortality as trip limits declined	Improved catch utilization, increased selective fishing, and reduced discards and mortality
Individual stock management	Poor: Unable to manage on stock specific basis; many individual stocks over harvested	Good: Management of most species on a stock-specific basis; IVQs for 55 stock-specific TACs; harvest within TACs
Data collection and information for management and science	Poor; no stock specific catch data regarding catches or at-sea discards; stock assessment capabilities eroded	Improved; more reliable information of stock specific catch and mortality – including discards; fishermen share responsibility for stock assessments through co-management arrangements
Sustainable fishing practices	Poor: "Race for Fish" works against sustainable practices; regulations unable to fully address creativity of fishermen	More evident; continue to be developed; changes in gear configuration and use; avoiding/sharing information on high bycatch areas; attitude shift toward better stewardship
Government and industry relations	Poor: adversarial relationship; different objectives	Improved: cooperative relationship; shared objectives; industry involvement in management

Key Elements of the BC Groundfish Trawl IVQ Program

Allocation of Annual TACs

- 80% of each TAC is allocated directly to individual trawl licensed vessels as area and species specific Individual Vessel Quota(IVQ)
- 10% of each TAC is allocated to individual trawl licensed vessels as Code of Conduct (CCQ) IVQ (based on the IVQ allocation formula)
- 10% of each groundfish TAC is allocated as Groundfish Development Quota (GDQ) to proposals jointly prepared by processors and trawl licensed vessel owners

Groundfish Development Authority (GDA)

- The GDA's purpose is to ensure fair crew treatment, aid in regional development, promote stable market and employment conditions, and encourage sustainable fishing practices
- Groundfish Development Quota (GDQ) is allocated to trawl licensed vessels involved with proposals submitted to the GDA jointly by processors and trawl licensed vessel owners. The amount of GDQ allocated to a proposal is based on the amount of fish in the proposal, processor production history,and the proposal rating by the GDA
- Proposals are rated on how well they achieve market stabilization, maintain existing processing capability, stabilize employment, benefit coastal communities, increase the value of production, and provide training opportunities and sustainable fishing practices

IVQ Allocation Formula

- 30% on vessel length
- 70% on average catch during the five year term
- There are 55 different IVQ allocations expressed as a percentage of the respective TAC

IVQ Transferability

- IVQ can only be transferred among trawl licensed vessels
- Currently, IVQ is freely transferable
- Because IVQ transferability has a significant impact on the operational effectiveness and industry objectives, transferability rules are reviewed every 3 years. Some limitations on transferability will be implemented for the 2004-2007 period.

Individual Species Caps and Total Holdings Caps

- Individual coastwide species caps are set for each species at levels which prohibit the accumulation of a large amount of species IVQ - species caps range from 4% - 10%
- Each trawl license is subject to a total holdings cap that ensures operators cannot accumulate an unreasonable amount of IVQ
- To calculate the total holdings cap, Groundfish Equivalents (GFEs) have been established based on relative prices of groundfish to Pacific Ocean Perch (POP = 1.00)

Individual Vessel Halibut Bycatch Quota

- The groundfish trawl halibut bycatch mortality cap (1,000,00[illegible]) is allocated as an IVQ bycatch cap to each vessel in proportion to its initial groundfish IVQ holdings
- Vessels catching halibut by trawl gear are not permitted to retain the catch

Fish Released at Sea

- Weights of fish released at sea which are considered marketable (determined by size) will be deducted from the vessel's IVQ
- Non-marketable fish discards will be recorded (total weights by species and area) but will not be deducted from the vessel's IVQ

At-sea Monitoring and Port Monitoring Validation

- Trawl vessels are required to carry DFO certified observers on every trip - the only exemption from this requirement are vessels fishing midwater trawl for hake
- All trawl vessels must have all their groundfish catch validated, whether landed in Canada or the U.S., to ensure proper enumera tion by species
- Monitoring requirements include hail-out and hail-in requirements and designated offloading locations

Quota Overage/Underage and Quota Carryover

- For all groundfish IVQs the carryover/underage limit is 30%[illegible] each IVQ on the vessel (for hake and halibut the limit is 15%)
- Vessels exceeding their IVQ up to the allowable overage can keep the proceeds from the overage but will have the equivalent poundage deducted from their IVQ next year
- Vessels exceeding their IVQ by more than the allowable overage can keep the proceeds for the fish up to the allowable limit but must relinquish the balance and will have the entire overage deducted from the vessels IVQ next year
- Vessels fishing under their IVQ up to the allowable underage will have the equivalent poundage added to their IVQ next year

Other Measures

- A number of traditional management measures remain in place, including size limits, gear restrictions, logbooks and sales slips, area closures, and trip limits for non-TAC rockfish

e

ENVIRONMENTAL DEFENSE

finding the ways that work

For more information please contact
Johanna Thomas, Environmental Defense,
5655 College Avenue, Suite 304
Oakland, CA 94618, (510)658-8008
or Dorothy Lowman, fisheries consultant
(503)804-4234

BC Individual Vessel Quota Experience:

What Can We Learn?

Why Look To the North?

- BC trawl fishery similar to west coast
  - Similar species, gear, markets
- Prior to IVQs, fishery faced many of the same problems now plaguing west coast fishery
  - Overcapitalization
  - Bycatch/discard concerns
  - Unprofitable fishery
  - Poor data collection and monitoring
  - Market concerns
  - Uncertain future

Why Now?

- Moratorium on IFQs has been lifted so individual quota management now a viable option for US fisheries
- Council has identified IFQ management as intermediate to long-term strategic goal
- Recent Sacramento Bee article indicated that IVQs have improved sustainability and economic viability of BC fishery
- Industry interest in IFQs increasing

The BC Meeting
Who

West Coast Participants:

- Trawl vessel owners from 3 states
- Environmental Defense staff/consultant
- Council economist

BC Participants:

- Vessel Owners
- Processor
- Government Managers
- Union Rep
- Industry Organization Leaders
- Quota Brokers

The BC Meeting

What: Meeting to learn about IVQ program and lessons for west coast groundfish fishery

Where: New Westminster, BC

When: June 24, 2003

Pre-IVQ Management

- Monthly trip limits
- Individual groundfish species TACs managed on coastwise basis
- 12 month season, broken into 4 periods
- Vessel and gear restrictions
- Closed areas
- 100% dockside monitoring

What Was Wrong?

From a Conservation Perspective

- Stock-specific management not possible
- Entire coastwide TAC could be taken out of single area
- Declining trip limits led to higher levels of unreported or misreported catch by area
- Stock assessment capabilities reduced
- TACs being exceeded

What Was Wrong
From an Industry Perspective

- Costs increasing
- Landed value of catch decreasing
- Fishing time decreasing
- TACs declining
- Increasingly restrictive regulations
- Markets being lost
- Long-term planning impossible
- Instability and risk increasing
- Poor earnings for vessel and crew

IVQ Program Development Key Elements

- Government provided strong leadership
- All interest groups involved in designing program
- System designed specifically for needs of BC trawl groundfish fishery

Common IFQ Concerns To Be Addressed

Concern: Excessive consolidation of quota

BC solution:

Each trawl license subject to:

- total holdings cap
- individual species caps ranging from 4%-10% of coastwide TACs

Common IFQ concerns to be addressed

Concern: Quota transferred away from working fishermen

BC solution:

- Quota can only be transferred among trawl licensed vessels
- Transferability rules reviewed every 3 years
- Transferability viewed as critical for operational flexibility

Common IFQ concerns to be addressed

Concern: Duration of program

BC solution:

- No sunset, but government has the right to terminate
- Program reviewed every 3 years and modified to improve the program

Common IFQ concerns to be addressed

Concern: Bycatch

BC solution:

- Allocate IVQs for all TAC species, including bycatch species
- Monitor at-sea catch/mortality
- Individual accountability: All vessels must have IVQ to cover bycatch
- If IVQ exceeded for any species, vessel restricted to mid-water fishing until following season or until more IVQ obtained

Common IFQ concerns to be addressed

Concern: Monitoring

BC solution:

- All trawl vessels required to carry observers on every trip, except when fishing midwater trawl for whiting
- 100% dock-side monitoring
- Hail in and out requirements and designated off-loading locations
- Comprehensive data mgmt program provides quota data on a timely basis

Common IFQ concerns to be addressed

Concern: Effect of IFQs on processing sector and coastal communities

BC solution:

- Reserve 10% of IVQs to be allocated annually as Groundfish Development Quota (GDQ)
- Provide process where processors and vessel owners jointly submit proposals for GDQ
- Amount of GDQ allocated based on amount of fish committed in the proposal, processor production history and proposal rating by Groundfish Development Authority.

GDQ rating criteria

- Market stabilization
- Maintenance of existing processing capability
- Employment stabilization
- Economic development/benefits in coastal communities
- Increased value of groundfish production
- Industry training opportunities
- Sustainable fishing practices

How have things changed?

"When I first saw my quota, I almost puked. I thought I was finished….

Now, my revenues are higher than they've ever been..

But what is most interesting to me is when I'm out trawling and I see a school of fish I'm thinking, 'I know your parents..they did me well..now do me well…Be productive.."

--Brian Mose

F/V Frosti

How have things changed?
From a conservation perspective

	Before IVQs	*After IVQs*
Individual Stock Management	Poor: Unable to manage on stock specific basis; many over-harvested	Good: Management of most species on a stock-specific basis; all harvest within TACs

How have things changed?

From a conservation perspective

	Before IVQs	*After IVQs*
Data Collection and Information for Management and Science	Poor •No stock specific catch data or at-sea discard info •Stock assessment capabilities eroded	Improved •Reliable stock specific catch, discard and mortality info •Increased research through co-management

How have things changed?
From a conservation perspective

	Before IVQs	*After IVQs*
At-sea discards and mortality	Increasing levels of unrecorded discards and mortality as trip limits declined (halibut bycatch 2million lbs)	Reduced discards and mortality due to individual accountability and at-sea observation (halibut bycatch 300,000lb)

How have things changed?
From a conservation perspective

	Before IVQs	*After IVQs*
Sustainable Fishing Practices	Poor "Race for fish" works against sustainable practices	More Evident •Shorter tows •More selective gear •Avoidance of high bycatch areas

How have things changed?
From a conservation perspective

	Before IVQs	*After IVQs*
Stewardship of the Resource	Poor •Attitude: conservation someone else's problem	Improved •Attitude: Desire to improve health of stock

How have things changed?
From an industry perspective

	Before IVQs	*After IVQs*
Active Fleet	120-135 vessels	60-80 vessels
Fishing Strategy	Maximize catch each trip	Maximize value of catch for year
Efficient and effective fleet operations	Poor: Most vessel fished coastwide for all trip limits available	Improved: Increased specialization and regionalization

How have things changed?
From an industry perspective

	Before IVQs	*After IVQs*
Landed Value of Catch	Declining due to poor quality, supply gluts, lost markets In 1996, 29,000mt worth Can$21 million landed by bottom trawl gear	Increasing due to improved quality, better servicing of market In 2000, 26,000mt worth Can $34 million landed by bottom trawl gear

How have things changed?
From an industry perspective

	Before IVQs	*After IVQs*
Ex-vessel prices	Poor and declining 1994 •POP avg. price=Can$0.20/lb •Lingcod avg price=Can$0.39/lb	Improved and increasing 2001 •POP avg. price=Can$0.61/lb •Lingcod avg price=Can$0.76/lb

How have things changed?
From an industry perspective

	Before IVQs	*After IVQS*
Costs of Operation	Increasing while fishing time decreasing	Increased incremental costs associated with at-sea observers and acquiring quota Other costs related to race for fish decreased

How have things changed?
From an industry perspective

	Before IVQs	*After IVQs*
Vessel and Crew Earnings	Declining	Increased (over and above increased incremental costs)
Number of processors	12 companies buying and processing	15 companies submitted proposals to GDA this year

How have things changed?
From an industry perspective

	Before IVQs	*After IVQs*
Servicing Market Needs	Poor: Markets being lost due to volatile landing patterns and closures	Improved: Vessels and processors work together so fish is landed when market needs it; reduced processing and handling costs

How have things changed?

"…DFO managers follow precautionary principles …and substantially reduced the longspine thornyhead quota…Before the IVQ system, this action would have caused ill feelings in the industry; however, a collaborative spirit among stakeholders, managers and scientists has motivated a search for new information…"

Rowan Haigh and John T. Shute. *North American Journal of Fisheries Management* 23:120-140. 2003

Lessons Learned

- IFQs can provide real conservation and economic benefits in a multi-species fishery
- In developing an IFQ program it is important to:
  - Design it to meet needs of specific fishery
  - Include all stakeholder groups
  - Have strong leadership

Lessons Learned

- The IVQ program isn't perfect but it is a significant improvement
- Overall, fishermen, processors and managers all have a positive, long-range view of the fishery…..a far different situation than before IVQs….or our west coast fishery right now

Lessons Learned

What are we waiting for? It is time to appoint an IFQ committee to consider the potential for and design of an IFQ program for the west coast trawl groundfish fishery

MIDWATER TRAWLERS COOPERATIVE

P. O. BOX 2352 * NEWPORT, OREGON 97365
David Jincks, President
Phone: (541) 265-9317 Fax: (541) 265-4557

August 14, 2003

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

Dear Dr. McIsaac:

I am writing on behalf of MTC (Midwater Trawlers Cooperative) MTC was formed in 1982 by a handful of whiting fishermen. This organization later grew to represent over thirty vessels with the majority of them still very active in the whiting fishery. MTC has always been very active in the Council process when dealing with Pacific Whiting and other groundfish issues.

MTC has gone from foreign at-sea joint ventures to the first shore-side landings of whiting in 1990. MTC was also involved in the inshore offshore allocations stemming from the building offshore fishery by American processors thus eliminating a three way Olympic fishery (Inshore, Mothership, and Catcher Processor).

The inshore offshore allocation brought a short lived calm to the whiting fishery. In 1994 the shore-side fishery was starting to grow rapidly due to the lower trip limits in the traditional groundfish fisheries processors were beginning to turn towards whiting to continue to operate at full capacity. The at-sea whiting fleet experienced the same rapid growth as more vessels entered the fishery.

The calm we experienced the first two years of the inshore offshore allocation was short; we were once again engaged in a derby style fishery in our own sectors. The shore-side fishery grew from a handful of boats to the present day fleet of 36 trawlers. The processing sector went from two facilities to eleven, eight in Oregon, two in Washington, one in California.

The 2003 shore-side whiting fishery lasted 29 days and the mothership whiting fishery went for three weeks. The whiting fishery is once again being managed within a derby style fishery with C/Vs (Catcher Vessels) and processors rushing to harvest and process as fast as they can.

Catcher vessels represented by MTC and others believe it’s now time to move towards rationalization of the whiting fishery.

The goal is to rationalize the Pacific Whiting fishery so as to reduce continued capitalization of an overcapitalized fishery and to provide a means to facilitate Industry management of fishery issues, including bycatch.

We also understand that at this time the traditional groundfish fleet and representatives are discussing rationalization plans for the traditional Groundfish fishery (other than whiting). Representatives of the two groups have met together to discuss ways of working together to eliminate Council workload and to move forward in a manner that would facilitate both fisheries in a productive way.

The system of rationalization being discussed is a catcher vessel ITQ. At the September Council meeting, MTC will hand out their proposal for the rationalization of the whiting fishery. This document is not ready at this time; it is still being reviewed by catcher vessels owners that belong to other organizations. We are very hopeful that by September the plan we submit will be supported, in concept, by a consensus within the Catcher Vessel Whiting industry.

MTC is very aware of the Councils workload, we will keep our testimony at the September meeting short and to the point. We appreciate very much the opportunity to be part of your September agenda, if you have any questions before the Council meeting please contact the MTC office.

Sincerely,

David Jincks
Midwater Trawlers Cooperative
P.O. Box 2352
Newport, Or 97365

MTC PROPOSAL FOR RATIONALIZATION OF THE PACIFIC WHITING FISHERY

1. Purpose

The goal is to rationalize the Pacific Whiting fishery so as to reduce continued capitalization of an overcapitalized fishery and to provide a means to facilitate Industry management of fishery issues, including bycatch.

2. Proposed System of Rationalization

The proposed catcher vessel system of rationalization would include a program for individual transferable quotas (ITQs) for both the mothership fishery and inshore fishery so as to preserve the allocations between those fisheries as they now exist and, also, to recognize the history of the catcher vessels that have participated in those fisheries over a substantial number of years in an equitable fashion. The processors would be protected by virtue of the continued separation between the mothership fishery and the inshore fishery, yet because of the uncertain nature of this fishery and to assure that the catcher vessel quota can be harvested on an annual basis, all restriction with regard to location of delivery between mothership and inshore would be eliminated after August 1 of any given year.

3. Eligibility for ITQs

A. Eligibility to Receive ITQ.

Eligibility to receive ITQ is any person that holds a valid, permanent and fully transferable Pacific Coast Groundfish Fishery Permit with "A" endorsement with trawl gear. To be eligible for catcher vessel ITQ, the catch history of the vessel or permit (depending on the basis selected for distribution) must have been 1,000 tons or more of whiting (alternative 500 tons) in at least two of the applicable catch history years in the mothership and/or inshore fishery using a valid, permanent and fully transferable Pacific Coast Groundfish Fishery Permit with"A" endorsement with trawl gear.

B. The Basis for Distribution.

1) **First Alternative** (based on the catch history of the permit)

The distribution of ITQs shall be based on the catch history of the vessel or vessels fishing under authority of the trawl permit with "A" endorsement owned by the applicant. In situations where the owner of the vessel and the owner of the permit are different parties at the time of harvest, the same principle shall apply unless to the extent a contract exists between the owner of the vessel and the owner of the permit which provides for the catch history to be distributed to the vessel owner.

2) **Second Alternative** (based on catch history of the vessel)

The distribution of ITQs shall be based on the catch history of the vessel on which the license was used, and in cases where the vessel is operated with multiple licenses over time, the distribution of ITQ to the vessel shall be based on the aggregate catch histories of the licenses while on that vessel. In situations where the owner of the vessel and the owner of the permit are different parties at the time of harvest, the same principle shall apply unless to the extent a contract exists between the owner of the vessel and the owner of the permit which provides for the catch history to be distributed to the permit holder.

4. <u>Determination of Individual Transferable Quota Share</u>

A. Inshore ITQs (Possible Alternatives for Applicable Catch History Years)

1. 1994 - 2000
2. 1994 - 2002
3. 1994 - 2003
4. In all cases drop 2 years

B. Mothership ITQs (Possible Alternatives for Applicable Catch History Years)

1. 1994 - 2000
2. 1994 - 2002
3. 1994 - 2003
4. In all cases drop 2 years

C. For either the inshore ITQ or mothership ITQ the option should remain open to consider another range of years as the basis of catch history between 1994 and 2003 after initial analysis.

D. Initial Allocation of ITQ.

Calculation of initial ITQ distribution shall be based on total legal landings by sector (mothership and onshore). The calculation is to be done on a vessel by vessel basis, as a percent of the total catch within each sector (mothership and inshore), year by year during the qualifying period dropping on a vessel by vessel basis the lowest 2 percentage years. Then the sum of the yearly percentages, thus determined, on a sector basis, is to be divided by the number of qualifying years (less 2) included in the qualifying period on a sector basis to derive a vessel's ITQ within each of the mothership and inshore sectors.

5. **Transferability**

Both mothership and inshore ITQs would be freely transferable.

6. **Delivery Restrictions**

A. Inshore ITQs can only be delivered to inshore processors prior to August 1 of any year.

B. Mothership ITQs can only be delivered to mothership processors prior to August 1 of any year.

C. After August 1, any unharvested ITQs may be delivered to any inshore or mothership processor.

D. If processors desire additional individual company protection, that can be accomplished via private, long term supply contracts with CV owners.

7. **Non-Eligible CV Trawl Vessel Quota**

Whiting quota would be set aside to allow continuation of non-primary season deliveries of up to 10,000/20,000 pounds (in accordance with current regulation) of whiting by trawl permit holders that do not qualify for whiting ITQs. This quota would be capped at 200% of the highest harvest year of non-primary season deliveries between 1994 - 2003. Holders of whiting ITQ may not participate in this fishery.

8. Establish a coastwide opening date for Pacific whiting for both inshore and motherships of April 1.

9. **Whiting Set Aside**

A bycatch set aside of whiting shall be established to support the non-whiting target fisheries.

10. **Council Committee**

MTC supports formation of a Council sponsored committee charged with the responsibility of developing a comprehensive ITQ program for Pacific whiting, and also including an ITQ program for the other "traditional groundfish" if requested by that sector. If the committee is charged with developing a program for both whiting and the traditional groundfish it should consist of a fair representation of vessel owners from both sectors. In addition, the committee should be authorized to develop the programs as separate plan amendments on separate time tracks if the committee work can be completed on either sector's program more quickly than the other.

SCIENTIFIC AND STATISTICAL COMMITTEE STATEMENT ON GROUNDFISH BYCATCH PROGRAM ENVIRONMENTAL IMPACT STATEMENT

Mr. Jim Glock presented a progress report on the Bycatch Program Environmental Impact Statement (EIS) (Exhibit C.9, Attachment 1). This initial draft is fairly complete with respect to the first three chapters (Purpose and Need; Alternatives; and Affected Environment). However, the fourth chapter (Impacts of the Alternatives), which will embody all of the analysis, will not be completed until the November 2003 Council meeting. The planned timeline for the EIS then includes: Council release for public review (November 2003); NEPA review (January through April 2004); and Council selection of the preferred alternative (April 2004).

The Scientific and Statistical Committee (SSC) discussion focused primarily on the (1) definition of bycatch and (2) aspects of the analyses that should be included in Chapter 4 of the next draft.

1. Definition of Bycatch

The current draft first defines *groundfish* as those species covered by the Council's Groundfish Fishery Management Plan and *discards* as those animals that do not survive after being returned to the sea. *Bycatch* is then defined as the combination of groundfish discards and nongroundfish species caught during the course of a fishing operation. The SSC notes that this definition differs from that used in the Magnuson Act (discards only), and is more closely aligned with the definition of bycatch used in *Managing the Nation's Bycatch* (NMFS 1998) – the latter being the basis for the guidelines on implementation of National Standard 9.

While the bycatch definition in the current draft is workable, the SSC recommends that when completing the analysis of alternatives (Chapter 4), the components of bycatch under this definition be further delineated. Namely:

A. Regulation-induced discards, (e.g., catch that exceeds a trip limit, undersized fish, etc.)
B. Non-regulation-induced discards, (e.g., no or little economic value, recreational releases that do not survive, etc.).
C. The retained part of bycatch that is managed by a something other than the Groundfish FMP, (e.g., Pacific halibut, California halibut, etc.).
D. The retained part of bycatch that is not managed.
E. Take of protected species.

2. Analysis of Alternatives

For the most part, the alternatives identified in the draft EIS attempt to minimize only component A of the bycatch, as defined above. In order to meet the National Standard 9 guidelines, however, it will be necessary to minimize component B as well. In addition, the Council may also find it necessary to gauge the impact of each alternative on components C , D, and E, separately.

The various alternatives require greatly differing levels of observer coverage for proper implementation. The level of observer coverage and associated costs should be clearly identified for each alternative.

Logbook and other reporting requirements as well as levels of enforcement also differ among the alternatives. The respective costs and practicalities under each of the alternatives should be included in the next draft.

For the various alternatives, it is likely that substantial differing levels of bycatch will result as well as substantially differing implementation costs. Consequently, the selection of a preferred alternative may not be straightforward.

The SSC recognizes the analyses that will appear in Chapter 4 are likely to be qualitative, and this is customary for a programmatic EIS. However, it should be recognized that at some future time, it will become necessary to develop a fully-fledged quantitative model for such analyses. The trawl bycatch model may provide a convenient starting point for such model development.

PFMC
09/11/03

Exhibit C.9.d
Supplemental Public Comment
September 2003

Pacific Whiting Conservation Cooperative

PWC

Alaska Ocean Seafoods · American Seafoods · Glacier Fish Co. · Trident Seafoods

A Partnership to Promote Responsible Fishing

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PFMC

August 28th, 2003

Dr. Don McIsaac
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 200
Portland, OR 97220-1384

Re: comments on agenda item C.9, draft groundfish bycatch programmatic EIS alternatives

Dear Dr. McIsaac:

Please consider the following comments submitted on behalf of the Pacific Whiting Conservation Cooperative (PWCC) regarding the alternatives proposed for the groundfish bycatch EIS program.

The PWCC favors adoption of alternatives 2 or 3, which essentially modify the existing bycatch management system. Both of these alternatives make the best use of available scientific data and involve incremental steps for improving data collection, fleet monitoring, and improving bycatch avoidance without undue expense to the groundfish fishery.

For a number of years the at-sea Pacific whiting fishery, both catcher-processors and motherships, have employed several voluntary measures to minimize bycatch. These vessels all carry (and pay for) 2 NMFS observers to sample all catches for species composition, and use electronic flow scales to accurately weigh 100% of all fish harvested, even though there is still no regulation in place that requires either flowscales or any observer coverage. Companies in these sectors have also voluntarily contracted (again at their own expense) with SeaState Inc., a private catch monitoring company, to track and analyze bycatch on a real-time basis, report bycatch hotspots to each skipper, and to close areas with high bycatch rates. The at-sea fleet has demonstrated that, almost without exception, it can keep bycatch within recommended guidelines and that it can operate successfully under the existing bycatch regulatory management program by utilizing voluntary measures which give it the tools to maintain low levels of bycatch.

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However, the controls proposed in alternatives 4 and 6 such as fixed sector bycatch caps and/or permanently closed protected areas will reduce flexibility and the ability of fishermen to respond quickly to changing conditions. The bycatch of some species of fish can be minimized by avoiding certain areas and depths at certain times, but these conditions change from year to year and even within seasons such that annual sector caps or closed areas limit the ability of fishermen to respond on a real-time basis.

Further complicating the effectiveness of alternatives 4, 5 and 6 is the requirement for extensive administration and observer coverage of the groundfish fleet. All of the proposed "direct controls": the sector caps of alternative 4; individual catch and bycatch allocations of alternative 5; and the individual vessel bycatch caps, MPAs and full retention requirements of alternative 6 require monitoring and administration well beyond the current capabilities of the National Marine Fisheries Service and state agencies. These measures should only be considered when there is a realistic expectation that the funding will be available for effective implementation and enforcement. Nor do we support the establishment of permanently closed MPA's unless they are clearly defined to address biological problems that can only be resolved through the removal of fishing, and the species are shown to be closely associated with the area to be included within the MPA.

We feel that the greatest improvements in bycatch control in the short term will be obtained from reductions in fishing effort, ending the wasteful "race for fish", and in improvements in gear technology and usage. Experience has shown that a flexible management system allows fishermen to develop fishing practices that maintain viable sustainable fisheries.

Thank you for the opportunity to comment.

Jan Jacobs

Jan Jacobs
President
Pacific Whiting Conservation Cooperative

Exhibit C.10.a
Supplemental Attachment 3
September 2003

U.S. DEPARTMENT OF JUSTICE
Antitrust Division

R. HEWITT PATE
Assistant Attorney General

Main Justice Building
950 Pennsylvania Avenue, N.W.
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August 27, 2003

James R. Walpole
General Counsel
United States Department of Commerce
National Oceanic and Atmospheric Administration
Washington D.C. 20230

Dear Mr. Walpole:

You have asked for the assistance of the Department of Justice Antitrust Division ("Department") in identifying antitrust issues associated with a price arbitration system that was proposed as part of a rationalization plan to manage crab fisheries in the Bering Sea and Aleutian Islands ("BSAI").[1] The plan was developed by the North Pacific Fishery Management Council ("Council") at the request of Congress to replace the current management program.[2] The NOAA General Counsel's Office, Alaska Region, also has asked the Department to comment on the likely effects on competition of the entire rationalization plan. The Department submits these comments in response to your January 9, 2003 letter and NOAA's request.

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[1]A fishery means "(1) one or more stocks of fish that can be treated as a unit for purposes of conservation and management and that are identified on the basis of geographic, scientific, technical, recreational, or economic characteristics, or method of catch; or (2) any fishing for such stocks." 50 C.F.R. 600.10.

[2]The Council is one of eight Regional Fishery Management Councils established pursuant to 16 U.S.C. 1852. Its region covers the States of Alaska, Washington and Oregon, and it has authority over the fisheries in the Arctic Ocean, Bering Sea and Pacific Ocean seaward of Alaska. 16 U.S.C. 1852(a)(1)(G). The functions of the Council include preparing for the Secretary of Commerce a fishery management plan for each fishery, conducting public hearings on fishery management plans, and reviewing processing in each fishery. 16 U.S.C. 1852(h). The Council was directed by the Consolidated Appropriations Act of 2001 (Pub. L. No. 106-554) to determine whether rationalization is needed in its fisheries and to analyze individual fishing quotas, processor quotas, fishermen cooperatives and quotas held by communities.

EXECUTIVE SUMMARY

The Department supports implementation of a new fishery management plan that would end the "race to fish" inherent in the current derby-style management plan. Under the current derby-style program, the season ends as soon as the total allowable catch has been fished, producing an undesirable "race to fish" among harvesters. The race to fish is economically inefficient for both harvesting and processing and likely dangerous to the participants. The Department therefore recommends that NOAA support individual fishing quotas ("IFQ") for harvesters, a reform that will end the race to fish. Provided that IFQ are easily transferable, the gains in efficiency from ending the race to fish – reducing overcapitalization and improving safety – are likely to outweigh the harm of any loss of competition among harvesters.[3] The Department recommends that the plan allow easy transferability of IFQ shares; otherwise the incentive for market participants to make efficient investment decisions will be reduced.

The Department further recommends that NOAA oppose individual processor quotas ("IPQ"), because IPQ will likely reduce beneficial competition among processors with no countervailing efficiency benefit. This lost competition could deter the development of new processed crab products, reduce the incentives for processors to make efficient investment decisions and reduce welfare for consumers of processed crab products. While harvester quotas should eliminate the harmful race to fish, processor quotas are not justified by any such beneficial competitive purpose.

If the goal of using IPQ is to compensate processors for overcapitalization, we urge NOAA to consider advocating more direct solutions, such as a program to buy excess processor equipment. We also understand that there are concerns with social goals such as preserving jobs in historic fishing villages. To the extent NOAA agrees with these goals, we recommend it consider advocating more direct solutions.

The Department also urges NOAA to oppose any form of sanctioned price arbitration. Allowing an arbitrator, rather than the market, to set price may distort the incentive of processors and harvesters to make efficient investments. Further, processors and harvesters must be cautious not to use the arbitration program as a way to agree on price with their competitors, which could violate the antitrust laws.

[3] The Department of Justice has supported individual fishing quotas in the past. See, e.g. *Comments of the Department of Justice* in Proposed Rulemaking: Amendment 18 to the Fishery Management Plan for Alaska Groundfish Fisheries in the Bering Strait and Aleutian Islands, Docket No. 911215-1315 (Transferrable individual fishing rights would result in an efficient allocation of limited fishery rights.); Business Review Letter to the Pollock Conservation Cooperative, February 29, 2000 (The Department is not presently inclined to initiate an enforcement action against cooperative that allocated amongst itself the fixed quota of the BSAI pollock TAC.)

The binding arbitration proposal specifies that each processor will participate in arbitration individually and not collectively. Processors' independent participation in binding arbitration will not violate the antitrust laws. In contrast, competing processors that agree on the price they will pay harvesters would be engaged in price fixing that violates the Sherman Act. Liability cannot be avoided by having a third party arbitrator set the actual price to be paid. Similarly, competing processors that agree to use the non-binding benchmark arbitration price to set ex-vessel prices (or even as a starting point for ex-vessel price negotiations) could also be liable under the antitrust laws.

Harvesters that go beyond the contemplated arbitration program and agree among themselves to sell at the arbitrated price could violate the antitrust laws. However, harvesters would be immune under the Fishermen's Cooperative Marketing Act ("FCMA") if all participants in the arbitration are members of an eligible fishing cooperative.

Finally, the arbitration plan contemplates an exchange of competitively sensitive information which, if not handled properly, could raise antitrust concerns. Voluntary exchange of the information among competing harvesters and/or processors could violate the Sherman Act if it reduces competition. Harvesters and processors should be cautious in participating in any form of voluntary price arbitration or information exchange.

The Department's analysis here considers only the effects on competition of the proposals and whether participation in the program could result in antitrust violations. We have not considered other factors generally outside the purview of the antitrust laws, such as the social goal of protecting jobs in historic fishing villages or balancing the regulatory effects evenly among harvesters and processors. The Department is not in position to evaluate such interests. In making the ultimate recommendations, NOAA and the Council may wish to take such goals into account and balance them against the competition issues discussed here.

BACKGROUND

In developing its recommendations, the Department reviewed the rationalization plan, interviewed industry participants and examined economic research on rationalization programs. It is our understanding that the current derby-style system of fishery management works as follows: Each year, under joint management with the Council and NOAA Fisheries, the State of Alaska sets the total allowable catch ("TAC") for each fishery for the year. Once the fishing season is opened, harvesters are permitted to fish until projections determine that the TAC is reached. The fishing season is then closed. The season varies by fishery but can be very short, as little as 2 to 3 days at the fishery with the shortest season. A natural result of this system is that a "race to fish" developed, which led to over capitalization among harvesters and processors and to behavior that is dangerous to harvesters and results in less precise stock management.

In 2001, Congress directed the Council to determine whether rationalization of the fisheries under its management was needed. The Council was asked to analyze, among other things, the effects of IFQ and IPQ.

The Council detailed its proposal for rationalization of BSAI crab fisheries in its August 2002 Report to Congress and its May 6, 2003, letter to Congress.[4] Under the proposed plan, crab harvesters would be allocated IFQ "shares" for 100% of the TAC in a fishery. Ninety percent of these shares would be Class A shares that must be processed by a processor within that fishery who holds IPQ. Ten percent would be Class B shares, which could be processed by any processor.[5] The amount of IFQ issued to a particular harvester would be based on that harvester's historical catch in a fishery, computed over a qualifying period. IFQ shares would be fully transferable to anyone meeting certain requirements, subject to a limit on the number of shares that can be held by an IFQ holder.[6] The shares would be leasable by any IFQ holder for the first five years of the program and thereafter leasable only within harvester cooperatives.

Similarly, processors in each rationalized fishery would be allocated IPQ shares. IPQ shares would be issued for 90% of the allocated harvest, corresponding to harvester Class A shares. The amount of IPQ issued to a particular processor would be based on that processor's historical processing activity, computed over a qualifying period. No processor would be allowed to hold more than 30% of the IPQ in its fishery. The proposed rationalization plan includes a number of community protection provisions that limit the liquidity of processor shares.

The proposal includes a plan for binding arbitration to determine the price paid by a processor to harvesters for raw crabs, the ex-vessel price,[7] if the parties cannot reach mutually

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[4]The Council plan would apply to eight fisheries, which constitute all the large Alaskan Crab fisheries.

[5]The Council also proposes creating Class C shares to distribute 3% of the TAC to fishing vessel captains. This 3% will be allocated first, with the remaining 97% of the TAC being allocated to the remaining harvesters. For the first three years fishing vessel captains may sell their catch to anyone they wish. After three years, the captains must sell 90% of their 3% to IPQ holders, and may sell the other 10% of their 3% to any processor

[6]To be eligible to purchase IFQ a person would have to be a U.S. citizen and have at least 150 days of sea time as a harvester in a U.S. fishery. Share limits vary by fishery and are between 1% and 10% of the TAC. However, various methods exist to allow IFQ holders to combine shares. For example, subject to vessel caps, more than one IFQ holder may fish off of a single boat. In addition, there is no limit to the amount of IFQ that can be controlled by a cooperative.

[7]The "ex-vessel" price is the price paid for fish offloaded directly from the fishing vessel.

agreeable terms. The Council's preferred arbitration method is a "last best offer plan" under which the arbitrator's primary goal is to set a price that preserves the historical division of revenues between harvesters and processors.[8] The Council also proposes a pre-season, non-binding fleet-wide arbitration to develop and announce a guideline ex-vessel price for each fishery[9] that will "inform price negotiations between the parties, as well as the Last Best Offer arbitration in the event of failed price negotiations."[10]

ANALYSIS

I. INDIVIDUAL FISHING QUOTAS

The current derby-style management of the crab fisheries has led to a race to fish. With the TAC fixed, harvesters must fish quickly to maximize their share of the harvest, and thus they overinvest in crew, equipment and boats, and they engage in behavior that is dangerous to harvesters and makes product management more difficult. Similarly, because the catch is spoilable, processors overcapitalize so that they can accept and process the catch in a very short amount of time. This overcapitalization by harvesters and processors is economically inefficient.

The source of the overinvestment problem for both harvesters and processors is the incentive to race for the crabs. One way to solve these kinds of problems is to create permanent property rights in the harvest, as in the proposed IFQ program. Such programs have demonstrably lengthened the harvesting season and reduced capacity in many other fisheries, for example, in the halibut and sablefish markets.[11]

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[8]Our understanding of the Council's binding arbitration proposal is based on the February 2, 2003, Council Motion on Crab Rationalization.

[9]On April 5, 2003, in a Council Motion on C-2 Crab Rationalization, the Council added the proposal for pre-season non-binding arbitration. Our understanding of the non-binding arbitration is based on the April 5, 2003 Council Motion on C-2 Crab Rationalization, the April 2003 Council *News and Notes*, and the May 6, 2003 Council letter to Congress. It is unclear from the language in those documents whether the non-binding arbitration will produce one benchmark price for all crab fisheries or whether it will produce a separate benchmark price for each fishery.

[10]April 5, 2003 Council Motion on C-2 Crab Rationalization. In the May 6, 2003, letter to Congress the purpose of non-binding arbitration is described as follows: "The non-binding price formula is intended to provide a benchmark price that will be a starting point for negotiations and minimize the number of price disputes as negotiations progress."

[11]General Accounting Office, Individual Fishing Quotas (GAO-03-159, December 2002) at 20.

If the race to fish were ended, harvesters (and processors) would be left with an excess of capital investments. Endowing harvesters with tradeable shares would compensate them for these investments. Each harvester would receive a permanent property right to fish based loosely on his investment in capital. Those harvesters who leave the market could sell their shares and therefore receive compensation.[12]

The Council has proposed to allocate IFQ to harvesters based on a harvester's historical participation in a fishery. We have no reason to believe that such allocation will result in an unreasonably inefficient distribution of IFQ. If shares are made transferable, so that they could be sold or leased to more efficient harvesters, any inefficiencies in the initial distribution should be temporary.

IFQ programs have the potential to reduce capital investments below the optimal level. Ideally, a rationalization program would preserve the competition that incentivizes participants to make optimal investments and remove the incentive to overinvest. However, in a quota program, participants may inefficiently underinvest in capital, since they no longer can increase their profits by competing shares away from others. Efficiency can be preserved by creating a liquid market for quota shares. In other words, the ability to buy and sell IFQ freely guarantees that the most efficient market participants will harvest the catch. Rather than taking share from competitors, a firm buys (or leases) shares from less efficient firms, allowing the market to realize the efficiency gains. As the market for quota becomes less liquid, such as restrictions on leasing or absentee owner provisions, inefficiencies will arise.[13]

The proposed rationalization plan has provisions limiting liquidity, such as the prohibition on leasing IFQ outside of cooperatives after the fifth year. To the extent NOAA supports goals other than economic efficiency, it should weigh those goals against the potential for reducing economic efficiency and urge that those goals be accomplished in a manner least harmful to the market.

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[12]The Department offers no view on whether harvesters (or, as we discuss later, processors) should be compensated for overcapitalization, but urges NOAA to consider the effects on economic efficiency of the compensation plan. For example, auctioning the initial shares instead, which would not compensate harvesters, could improve efficiency. In addition, an auction would capture for the public some of the value from the scarce resource, which could be used for public purposes. The proceeds could, for example, be reinvested in the fisheries, used to fund conservation programs or used to partially compensate harvesters and/or processors for overcapitalization.

[13]The market would also not function efficiently if harvesters had strategic reasons for holding shares, for example to prevent entry.

II. INDIVIDUAL PROCESSOR QUOTAS

The second part of the proposed rationalization plan is to issue IPQ, which no fishery in the United States to date has implemented. Using IPQ likely will reduce competition among processors, which could discourage efficient investments, limit new product development, and undercut competition in selling processed crab products. With IFQ, any efficiency losses are balanced against efficiency gains – eliminating incentives for harvesters *and* processors to overcapitalize as well as improving stock management and safety. In contrast, there are no such IPQ benefits. Thus, we urge NOAA to oppose processor quotas, because of their anticompetitive effect, and to accomplish the program's other goals in ways that do not limit competition.

A. Effect on Competition of IPQ

1. Inefficient investment

In a market without IPQ, when a processor invests in technology to lower its costs, it can increase profits by offering harvesters a slightly higher ex-vessel price and thereby win a greater share of the catch. Under an IPQ program, the same investment may not be profitable because it will lower costs only on the processor's quota share of the market. The processor cannot earn further profits by taking share from other processors. Thus, some efficiency enhancing investments that would have been profitable in the absence of IPQ may not be made under this proposed program.

The current proposal also does not take full advantage of ways to mitigate these inefficiencies. First, the creation of Class B IFQ shares could preserve some of the investment incentives for processors. However, preserving competition for the small percentage of the harvest represented by Class B shares is unlikely to preserve fully the incentive to make optimal investments. Second, these inefficiencies could be mitigated by making the market for IPQ as liquid as possible. However, the current plan appears to impose significant restrictions on the liquidity of IPQ. We understand that many of the limitations are designed to protect the historic interests of fishing communities. NOAA and the Council should address these conflicting goals.

2. Fewer new products

IPQ could also stifle new product development. What new products might appear under different regulations is difficult to predict, but some markets changed to IFQ-only programs have developed in positive ways. For example, ending the race to fish in the halibut fisheries may have contributed to an expansion in the delivery of fresh halibut.

Market participants expect similar product innovations in processed crab. But issuing IPQ could curtail the creation of such new products. First, new entrants that might to develop new products may have difficulty acquiring IPQ, either because of the limitation imposed on their transferability or because existing processors want to deter entry. Only the 10 percent of the market covered by Class B shares is fully available to competition. Second, some existing processors might be better positioned to create new products, but limited by their endowed IPQ and constraints on acquiring additional shares. Third, any processor's incentives to make investments in new products is limited by its endowed share of IFQ and constraints in the market for IPQ. While increasing the liquidity of IPQ could mitigate some of these concerns, we see no countervailing efficiency benefit from IPQ to justify these potential problems.

3. Less competition

Crab processors produce multiple products for different consumers using different techniques. Market participants we interviewed stated that ending the race to fish would only increase product differentiation because processors would have more time to work with the crabs. The likely result is that more of the harvest will be devoted to higher value products and that prices of these products will fall. Endowed processor shares and transferability limits might reduce this competition by altering processors' incentives to invest in capital that would lower their costs, a benefit that could be passed to consumers, or by altering product mix.

B. Arguments by IPQ Proponents

Proponents seem to make two arguments in favor of implementing IPQ. First, they argue that, if harvesters are to be endowed with IFQ to compensate them for stranded capital, then processors should also be compensated by endowing them with IPQ. They state that overcapitalized processors will bid up the ex-vessel price, shifting economic rents from processors to harvesters. In response, it is likely that overcapitalization is a short-run problem,[14] and thus creating a permanent property right to compensate processors is an inefficient solution. If NOAA believes that processors should be compensated, a direct one-time buyback of capital from processors would be more desirable.

Second, IPQ proponents argue that any rationalization plan must make all participants no worse off than under the current regime. Undoubtedly, some participants will benefit from changes while other will not, but the experience of other fisheries suggests that long run winners and losers are hard to predict. For example, the GAO concluded that the halibut IFQ-only program had a varied effect on processors; some were better off and some worse off.[15]

[14]Without compensation, many processors will likely be worse off in the time it takes for processors to remove unprofitable capital from the crab markets. How quickly capital adjusts to its optimal level will depend on the ex-vessel price and the value of alternative uses of that capital.

[15]General Accounting Office, Individual Fishing Quotas (GAO-03-159, December 2002) at 4.

III. ARBITRATION AND INFORMATION EXCHANGE

You have specifically asked us whether the system of binding arbitration as described in the Council Motion on Crab Rationalization, dated February 2, 2003, would violate the antitrust laws if it were not legislated but instead were instituted by agreement among harvesters and processors. Below we address the legality of participating in the binding and non-binding arbitration, the economic effects of the proposed arbitration, and whether sharing the information submitted to the arbitrator among harvesters and processors could violate the antitrust laws.

Based on the documents cited in footnotes 9 and 10, we understand that the arbitration process will work as follows: Prior to the harvesting season, harvesters and processors in each crab fishery will jointly appoint a market analyst/arbitrator to review harvester and processor data and market conditions and announce a pre-season formula for setting a non-binding ex-vessel price. The stated purpose of developing a non-binding price is to guide the individual negotiations between processors and harvesters and later to guide the arbitrator in the binding arbitration process. After the non-binding price is announced, processors and harvesters may then negotiate contracts, subject to the amount of IPQ and IFQ they hold. Harvesters can make joint or individual bids. Harvesters that are unable to make a contract with a processor through negotiation may choose to use binding arbitration (or wait and later use the price that is developed in others' arbitrations). In the arbitrations that do proceed, separate and independent arbitration using a "last best offer" method is conducted for each processor.[16] All harvesters who entered arbitration with a processor will receive that processor's arbitrated price.[17] Harvesters who earlier waited and did not arbitrate can then choose a processor and will receive the price that was developed in the binding arbitration conducted with other harvesters.[18]

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[16] If several groups of IFQ holders have matched with an IPQ holder, each may make a last best offer.

[17] The Council's recommended arbitration proposal charges the arbitrator with establishing a price that "preserves the historic division of revenues in the fisheries" while considering elements including current ex vessel prices; consumer and wholesale product prices for the processing sector; innovations, developments, efficiency and productivity of the different sectors; and the interest of maintaining financial health of the different sectors.

[18] Of course, harvesters may choose a processor only until that processor's IPQ is filled. It is not clear how harvesters who did not arbitrate will be matched to processors with remaining IPQ. If the ex-vessel price developed in arbitration for one processor is high, there may be excess demand by harvesters to opt into this arbitrated price. How that excess demand will be rationed is unclear.

A. Legality of Participating in Arbitration

As we understand the proposed arbitration program, participation by harvesters and processors is voluntary. For a harvester and processor to independently choose to use arbitration to develop the price at which they will agree to trade crabs would not violate the antitrust laws. However, if processors agree among themselves to use arbitration or to adhere to a price developed in arbitration, that agreement likely would violate the antitrust laws. The same is true for harvesters, except that harvesters may have immunity under the FCMA. These liability and immunity questions are discussed below

1. Horizontal Agreements on Price

An agreement by a group of harvesters or processors to trade crabs at a price set by an arbitrator could be viewed as a naked agreement not to compete on price and thus an automatic or "per se" violation of Sherman Act §1, 15 U.S.C. §1. It is well established that an agreement for the purpose of "raising, depressing, fixing, pegging, or stabilizing" price is illegal per se. *United States v. Socony-Vacuum Oil Co.*, 310 U.S. 150, 223 (1940).[19] Even if the agreed price is set by a third party such as an arbitrator, all that matters for liability is that competitors agreed to charge that same price. In addition, liability here would extend to harvesters that agree among themselves to participate in the arbitration process and harvesters who later join that agreement by opting in once the arbitrator sets a price; they too would be fixing the ex-vessel price by agreeing with their competitors to abide by the arbitrator's decision.

Harvesters or processors may violate the antitrust law even if they agree with competitors only to use the pre-season benchmark price as a starting point for negotiations.[20] If ex-vessel prices were affected by the non-binding arbitration (as the rationalization plan intends), a court could reasonably infer that the non-binding arbitration was part of an illegal price fixing agreement.

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[19] In some limited circumstances, an agreement to set price could be examined under a "rule of reason," which requires the court to "assess and balance a restraint's harms benefits and alternatives". VII Phillip E. Areeda & Herbert Hovenkamp Antitrust Law ¶1508a (2nd ed. 2003) For a discussion of analyzing agreements among competitors, *see* Antitrust Guidelines for Collaborations Among Competitors (Federal Trade Commission & U.S. Department of Justice, April 2000).

[20] *Plymouth Dealers' Association of Northern California v. United States*, 279 F.2d 128, 132 (9th Cir. 1960) ("The competition between the Plymouth dealers and the fact that the dealers used the fixed uniform list price in most instances only as a starting point, is of no consequence. It was an agreed starting point; it had been agreed upon between competitors; it was in some instances in the record respected and followed; it had to do with, and had its effect upon, price." [footnote omitted]).

Under the proposed binding arbitration, processors will not violate the antitrust laws so long as each participates individually, as required by the Council's arbitration proposal. Harvesters will not violate the antitrust laws so long as each participates individually or as part of an FCMA cooperative.[21]

2. Antitrust immunity for fishermen's cooperatives

Harvesters can avoid antitrust liability for the conduct described above by joining a fisherman's cooperative. Under the Fishermen's Cooperative Marketing Act, 48 Stat. 1213 (1934), 15 U.S.C. §521, harvesters that join a cooperative and set prices in a manner consistent with the FCMA will be exempt from of the antitrust laws with respect to that price setting. *United States v. Maryland & Va. Milk Producers Assn.*, 362 U.S. 458, 466-467 (1960).[22] However, the cooperatives participating in arbitration must include only members who are eligible for immunity under the statute; if a cooperative includes members who are not eligible for antitrust immunity under the FCMA, the entire cooperative loses its immunity. *National Broiler Mktg. Ass'n v. United States,* 436 U.S. 816, 828-829 (1978); *Case-Swayne Co. v. Sunkist Growers, Inc.*, 339 U.S. 384 (1967); *Hinote*, 823 F. Supp. at 1354.

a. Vertically integrated harvester-processors

An important issue is whether a harvester that is vertically integrated with a processor can be a member of an FCMA fishermen's cooperative. The Supreme Court explicitly declined to decide this issue in *National Broiler,* U.S. 436 at 828, n. 21. The *Hinote* court found that vertically integrated catfish processors were not exempt from the antitrust laws for conspiring to fix the prices of catfish products. However, the activity challenged in the case was not the processors' conduct as farmers but their conduct in selling finished catfish products. *Hinote,* 823 F. Supp. at 1358 -1359. Under *Hinote* it still is possible that a vertically integrated harvester could join an FCMA cooperative and be exempt from antitrust liability with respect to its activities as a harvester, making an agreement to set the ex-vessel price of crabs. In determining whether a vertically integrated harvester can be a cooperative member without causing a cooperative to lose its immunity, a court is likely to look at a variety of factors, including the nature of its harvester and processor activities, the extent to which its activities are integrated, and the precise nature of the challenged agreement among cooperative members. *See id.*

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[21] Although processors do not have immunity under the FCMA, a processor that participates in arbitration solely as a buyer should have no antitrust liability even if a group of harvesters with whom the processor negotiates are found to have engaged in non-immune price fixing.

[22] The *Maryland* case, as well as other cases concerning cooperative exemptions was decided under the Capper-Volstead Act of 1922, 42 Stat, 388 (1922), 7 U.S.C. §291 which provides for the same kinds exemptions as the FCMA. Cases decided under Capper-Volstead are precedent for cases under the FCMA. *U.S. v. Hinote*, 823 F. Supp. 1350 (S.D. Miss. 1993).

b. Agreements between cooperatives and non-members

Under the FCMA, cooperatives may not combine with non-cooperatives or "restrain trade by combining with nonexempt parties to set either resale prices for the cooperative's products or purchase prices paid to their nonmember competitors." IA Phillip E. Areeda & Herbert Hovenkamp, Antitrust Law ¶1508a (2nd ed. 2000) Thus, it is possible that all harvesters in a cooperative could lose their Capper-Volstead immunity if the cooperative and non-member harvesters agreed to participate in binding arbitration with the same processor.

We are unaware of any direct authority on whether a cooperative can act collectively with persons who are eligible to join but have not done so. Of course, legal immunities are narrowly construed, and antitrust immunity under the FCMA in particular has been strictly interpreted.[23] One reason that the immunity might not be read to allow agreement with non-members is that non-members are not subject to regulatory oversight. Both the FCMA and Capper-Volstead allow regulators to challenge conduct otherwise immune from the antitrust laws if the regulator believes that the price of an agricultural product is "unduly enhanced" by the activities of the cooperative.[24] A harvester that is not a member of a cooperative would not be subject to this oversight. Thus, it would be inconsistent with the intent of the statute to allow harvesters to enjoy the antitrust immunity afforded cooperative members.

3. Legality of information exchanges

We understand that processors and harvesters participating in binding arbitration wish to have access to all information used by the arbitrators, including information from arbitrations between other harvesters and other processors.[25] Thus, each harvester and processor would see the data submitted to the arbitrator by every other harvester and processor. Such exchange of competitive information could violate the antitrust laws.

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[23]*See, e.g., Hinote*, 423 F. Supp. at 1354 (In order to have antitrust immunity under the FCMA defendant must establish that not only was the cooperative entitled to FCMA protection, but that all entities with which defendant allegedly conspired were entitled to protection.), *Case-Swayne*, 339 U.S. at 393 (Capper-Volstead Act is a special exception to a general legislative plan and therefore Court is not justified in expanding the Act's coverage.).

[24]The FCMA regulator is the Secretary of Commerce. 15 U.S.C. §522. The Capper-Volstead Act regulator is the Secretary of Agriculture. 7 U.S.C. §292.

[25]The February 2, 2003, Council Motion on Crab Rationalization states "Subject to limitations of antitrust laws and the need for proprietary confidentiality, all parties to an arbitration proceeding shall have access to all information provided to the arbitrator(s) in that proceeding." We have been informed by NOAA staff and Council staff that processors and harvesters would be given data from arbitrations that they did not participate in.

Information exchanges can be procompetitive, and therefore they are not automatically illegal but are examined under a rule of reason. *United States v. Citizens & Southern National Bank*, 422 U.S. 86, 113 (1975). An agreement among competitors to exchange information can be a violation of the Sherman Act if it is found to have an anticompetitive effect. *Todd v. Exxon Corp.*, 275 F.3d 191, 198-199 (2nd Cir., 2001), even without an agreement to adhere to a particular price.[26]

We cannot say that the transfer of any particular type of data would be benign. When price, capacity and cost data are shared among competitors, the ability to monitor a collusive agreement for "cheating" can improve significantly; thus, if the inability to monitor collusion is a significant factor in preventing an agreement, data transfers can make an agreement possible. Similarly, when firms interact repeatedly in a market, exchanges of price data can help them reach a collusive price even without an explicit agreement; thus, if processors are exchanging wholesale crab product price data, they may be able to use that exchange to reach an implicit agreement on prices for those products.[27]

The information that would be disseminated here includes data on historical distribution of wholesale crab product revenues between harvesters and processors,[28] the pre-season market report (the outcome of the non-binding arbitration), other data on market prices and completed arbitrations, and data voluntarily submitted by IFQ and IPQ holders. If that data were

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[26] *United States v. Container Corp. of America*, 393 U.S. 333, 1336 (1969) ("exchange of price information seemed to have the effect of keeping prices within a fairly narrow ambit."); *see also United States v. United States Gypsum Company*, 438 U.S. 422 (1978), ("exchanges of current price information, of course, have the greatest potential for generating anticompetitive effects and although not per se unlawful have consistently been held to violate the Sherman Act").

[27] In some cases, disseminating information to buyers and sellers can be pro-competitive if that information facilitates efficient trading. This procompetitive need for market information usually creates strong financial incentives for independent third parties to step in and provide that information. While we may be concerned that a market report could facilitate price fixing no matter who provides the information, when the competing market participants themselves organize to do it, those concerns are heightened. In the case of the market for raw crabs, the absence of third parties providing (or attempting to provide) this service currently makes us skeptical that informational problems are causing market failure; nor does the rationalization plan itself appear to create new informational problems. Finally, the benchmark price developed during non-binding arbitration does not appear to address any kind of market failure: With a stated purpose of reducing price disputes and guiding the decision of the arbitrator in the binding arbitration process, the benchmark price appears to be intended to facilitate an agreement to set prices.

[28] February 2, 2003, Council Motion on Crab Rationalization at 4.

disseminated to processors, it could facilitate agreements to fix prices or limit capacity for processed crab products, newly developed crab products, or crabs delivered by holders of Class B shares. The shared data could also effectively suppress price competition for processed crab products even without a direct agreement. For example, if a new product is developed and processors learn each others' capacity for that product, then that knowledge could soften price competition for that product.

We have been told that some price data is already largely public, but the quality of that information is not clear.[29] If disseminating the data provides no new, improved or more accessible information to processors, then it likely is not problematic. However, if the exchange of data increases the quality or reliability of already public data, antitrust concerns could arise.

We were told in interviews that harvesters and processors want access to all data used by the arbitrator so that they can insure that the data is accurate. This might justify only very limited information exchanges that facilitate the arbitration process.[30]

C. Economic Effects of the Proposed Arbitration

One likely outcome of implementing either an IFQ-only or an IFQ-IPQ program is that bargaining power of harvesters and processors in negotiating ex-vessel prices will change, resulting in a new division of the economic rents created by crab harvesting and processing. Some argue that an IFQ-only program will shift bargaining power towards harvesters. Others argue that an IFQ-IPQ program will shift it towards processors.[31]

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[29]If that data is largely "word of mouth," as we understand it is, the arbitration process could significantly improve the quality of information about prices.

[30]The arbitration proposal does not state whether data would be disseminated as it is received by the arbitrator or only after he has announced the price. If the data submitted in a given arbitration will be disseminated to participants in that arbitration as it is received, it could serve a purpose by enabling harvesters or processors to submit "rebuttal" data. However, we see no justification for harvesters or processors seeing data from arbitrations other than the ones in which they are participating. If the data is disseminated after the arbitrator has made his decision, the absence of a right of appeal of the decision appears to mean that there is no remedy available to a harvester or processor who believes that an arbitration decision was made on the basis of incorrect data and thus no need for the data to be disseminated.

[31]Because the Council proposes endowing IFQ and IPQ, rather than selling them, we assume these endowments are designed, at least in part, to compensate market participants for overcapitalization. If issuing both IFQ and IPQ rendered IFQ worthless because all bargaining power would accrue to processors (as some believe), then the compensation scheme would fail.

The Council has made it an explicit goal of the rationalization plan to preserve the historic division of revenues between processors and harvesters, and it has chosen the binding and non-binding arbitrations as its method for preserving that division.[32] Apart from the antitrust concerns, arbitration to preserve the historic division of rents has the potential to inefficiently affect processor and harvester investment decisions. For example, processors could be deterred from making efficient investments because the arbitrator may, in the name of maintaining the historic division of revenues, transfer too much of the benefits from that investment to harvesters by setting the ex-vessel price too high. Conversely, setting the ex-vessel price too low could similarly deter harvesters from making efficient investments. When the division of rents is set by market mechanisms, the optimal investment decisions are preserved. In addition, this arbitration scheme is complex and could have many unpredictable and undesirable consequences as market participants learn how the system can be manipulated. For example, market participants have an incentive to manipulate the data they submit to the arbitrator to affect the perceived historic division of revenues or to distort (in their favor) the price required to meet this goal. Thus, there is no guarantee that arbitration can even meet its stated goal of preserving the historic division of revenues.[33]

CONCLUSION

The Department endorses the proposed IFQ program. The current race to fish causes overcapitalization by harvesters and processors and results in market inefficiencies, danger to harvesters and difficulty in managing the crab population. The benefits from a system of readily tradeable IFQ in eliminating these externalities are likely to outweigh any negative effects of eliminating competition among harvesters.

The Department urges NOAA to oppose IPQ. Processor shares could deter product innovation, reduce the incentive for processors to make optimal investment decisions and raise prices for processed crab products, all without countervailing efficiency benefits.

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[32]Because of the difficulties of measuring the division of economic rents, the Council recommends maintaining the historic division of revenues as a proxy for rents. However, some of the criteria the arbitrator is directed to consider, such as innovations and efficiencies, make it clear that the goal is to divide economic rents. BSAI Crab Rationalization Program Trailing Amendments, Community Protection Binding Arbitration, April 2002 at 21-23.

[33]We do not advocate substituting regulatory rate-making for market forces. We do note, however, that where legislators have chosen to have rates set by regulation they have instituted procedural rules that allow the quality of data used by the regulator to be tested and provide a right to appeal the regulator's decision. In the case of the proposed arbitration system no such safeguards exist.

The Department urges NOAA to oppose the proposed non-binding and binding arbitration. The proposed arbitration could be used to facilitate price fixing agreements, and participants in the arbitration who are not immune from the antitrust laws because of membership in a FCMA cooperative could be in violation of those laws. Arbitration is not a substitute for market forces and may distort the incentives of processors and harvesters to make efficient investments. It is also unwieldy and complex, and thus subject to manipulation or significant error.

Based on the competition and antitrust law concerns that we have discussed, we urge NOAA to request that the Council develop a rationalization plan that does not include IPQ or arbitration.

Sincerely,

R. Hewitt Pate

seattletimes.com
The Seattle Times

Friday, September 05, 2003, 12:00 A.M. Pacific

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Senate bill would divvy up market for crab harvest

By Hal Bernton
Seattle Times staff reporter

An amendment tacked onto a Senate appropriations bill late yesterday sets the stage for sweeping changes in Alaska's lucrative and notoriously competitive crab industry.

The amendment, drafted by Sen. Ted Stevens, R-Alaska, authorizes harvesting shares for vessel owners and vests processors — largely based in Seattle — exclusive rights to purchase most of the Bering Sea's crustacean bounty.

Among the more than two dozen processors that would receive purchase rights, the biggest winner is likely to be Ballard-based Trident Seafoods. Estimates compiled last year suggested Trident could end up with as much as 20 percent of the crab purchase rights of a harvest that last year was worth more than $120 million.

Many of the most successful vessel owners, who would receive the biggest shares of the Bering Sea king and snow crab harvest, are based in Washington.

The amendment — added to an appropriations bill for the departments of Commerce, Justice and State, the judiciary, and related agencies — authorizes the changes to take effect in 2005. Industry officials who have backed the changes hope to improve safety and profitability in a harvest that in recent decades has ranked among the deadliest in the nation.

Under the new system, vessel owners would have individual quotas, calculated as a percentage of the harvest. Skippers can claim their quotas by setting baited traps on the bottom of the Bering Sea, or sell their quotas to the highest bidders.

The shift to the vessel quota system had widespread support among crabbers.

"We have been working on this program for 15 years," said Arni Thomson of the Alaska Crab Coalition, which represents about 50 vessel owners. Thomson said the quota program would improve safety by allowing fishermen more time to catch their allotment, and less crab would be wasted.

Thomson also supports the processor shares. But that provision has triggered intense controversy within the industry and Alaska coastal communities

"It will be a cartel," said Gordon Blue, Sitka-based crabber. "It will leave Western Alaska communities and harvesters hostages to the processors."

In an earlier interview Trident's president, Chuck Bundrant, said that if fishermen deserved rights to catch a public crab resource, then the companies that pioneered the processing deserved rights to purchase the catch. But a Justice Department review released last week opposed the processor share plan as unwieldy and liable to raise processed-crab prices "without any countervailing efficiency benefits."

The amendment also has been opposed by conservation groups, who have said that any vesting of individual harvest rights should be linked to resource conservation measures. They will seek to halt the measure on the Senate floor.

"There has been no opportunity for debate or deliberation," said Dorothy Childers of the Alaska Marine Conservation Council. "It's like Congress is acting in the dark, and that should not be possible.

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ENFORCEMENT CONSULTANTS REPORT ON CONSIDERATION OF INDIVIDUAL QUOTA PROGRAMS

The Enforcement Consultants (EC) would like to express the desire to be a part of any committee process related to discussions on, and possible development of, individual quota's (IQs). Several members of the EC are familiar with IQ programs in other areas and could offer insight into potential enforcement pitfalls associated with such a program.

PFMC
09/11/03

Exhibit C.10.f
Supplemental GAP Report
September 2003

GROUNDFISH ADVISORY SUBPANEL STATEMENT ON
CONSIDERATION OF INDIVIDUAL QUOTA PROGRAMS

The Groundfish Advisory Subpanel (GAP) listened to several presentations on individual quota programs and work being done to develop individual quota (IQ) systems. The GAP wants to express its appreciation to representatives of the Canadian fishing industry and the Canadian government for providing us with information on the Canadian quota system.

The GAP recommends the Council form a committee to develop a draft IQ system for groundfish species harvested by the limited entry trawl fleet. The committee should include those sectors affected. The Council should devote necessary resources to accomplish this.

PFMC
09/11/03

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic Atmospheric Administration
National Marine Fisheries Service
Sustainable Fisheries Division
7600 Sand Point Way N. E., Building. 1, Bin C15700
Seattle, WA 98115-0070

DATE: September 5, 2003

TO: DISTRIBUTION

FROM: F/NWR2 -Becky Renko

SUBJECT: PRELIMINARY Report #6 -- 2003 Pacific Whiting Fishery

This report consolidates preliminary state, federal, and tribal data for the 2003 Pacific whiting fishery off Washington, Oregon, and California.

	Allocation		Catch * (mt)	Thru [date]	Status	Percent of allocation taken
	Percentages	Metric Tons				
California (south of 42° N lat.)	(5% shore alloc'n; included in WOC shore allocation)	2,545	1,731	8/23	CA season started April 1; 5% alloc'n	
Oregon	--	NA	36,576	8/23		
Washington	--	NA	12,901	8/23		
WOC shoreside	42% commercial OY	**50,904**	51,208		started 0001 hrs 6/15/03 ended noon 7/14/03	100.5%
Mothership (n. of 42 ° N. lat.)	24% commercial OY	**29,088**	26,021	6/7	started 0001 hrs 5/15/03	89.4%
Catcher/processor (n. of 42 ° N. lat.)	34% commercial OY	**41,208**	27,999	9/1	started 0001 hrs 5/15/03	67.9%
Total nontribal	the commercial OY is 82% of the total catch OY	121,200	105,228		--	86.8%
Tribal (Makah)	17% of the total catch OY	**25,000**	22,274	9/1	started 6/13/03	89.0%
Total directed fishing		146,200	127,502			87.2%
Other (research & incidental catch in non-groundfish fisheries)	1% of the total catch OY	**2,000**	unknown at this time			
Total	OY=optimum yield	148,200	127,502	--	--	86.0%

* Catch includes discards from at-sea processors; weigh-backs from shore-based catcher vessels; and small amounts landed under the trip limit between the seasons. The data for at-sea processing (catcher/processors and motherships) are preliminary and are based on reports from NMFS-certified observers. Data for shoreside processors also are preliminary and are provided by each State to NMFS for the purpose of monitoring the fishery. If you have questions on shoreside landings, please contact the appropriate state fishery management agency. Preliminary data for the Makah fishery is from NMFS-trained observers and shore-based samplers. All weights are round weight (the weight of the whole fish before processing) or round-weight equivalents. One metric ton is 2,204.6 pounds.

Exhibit C.2.b
Supplemental NMFS Report
September 2003

THE EFFECT OF INCORPORATING DISCARD RATES FROM THE NMFS OBSERVER PROGRAM INTO THE INSEASON EVALUATION OF OPTIMUM YIELD (OY) ATTAINMENT IN 2003

prepared by

Dr. James Hastie, Northwest Fisheries Science Center

for the September Pacific Fishery Management Council Meeting

Since the June Council meeting, discard data from the first year of NMFS observation have been incorporated into the bycatch model, for the purpose of estimating the total catch of target species. Because the focus of the initial effort was to develop management alternatives for 2004 in time for inclusion in the NEPA decision document, the inseason implications of incorporating discard rates into analysis of the 2003 fishery could not be explored in time for inclusion in the briefing book. However, the Council's decision on whether to incorporate these new data at this time will be very important in determining trip limit recommendations for the remainder of the year. The following discussion is not intended to advocate a position on whether or not to apply the new data inseason, but to clarify implications of either choice for 2003 management.

Table 1 provides an overview of several key parameters relating to landings and catch of the DTS species. The first row for each species shows the cumulative landings reported via PacFIN's QSM system through the first four 2-month periods of the year. Projected cumulative landings from a recent model of the 2003 fishery, that includes target species discards, are shown in the second row. The percentage difference between the first and second rows is presented in the third row. It should be noted that for all four species, the current reported landings for the first 4-6 months of the year, having been updated based on fish tickets that have been submitted, are now higher than the amounts originally reported by the 'soft' data system. The italicized values for periods 4 and 5 of row 1 represent the model projections through those periods, adjusted by the percentage difference between cumulative landings and projections through period 4.

The fourth row for each species represents the estimated total catch calculated using the projected landed catch (row 2) and the observer-based discard rates. The final row adjusts the projected total catches using the same percentage by which projected and reported landings differed. Amounts in this row through periods 5 and 6 are based on the assumption that the difference observed between cumulative landings and projections through period 4 will continue through years end.

In the rows with actual and projected landings, the column after period 6 shows the percentage attainment of the <u>landed</u> catch OYs, as specified using management's existing discard assumptions. Even taking into account higher than expected landings over the first 4 periods, only shortspine would be in need of remedial action to reduce landings over the last 2-3 months.

In the rows with and unadjusted and adjusted projected total catches, the column after period 6 shows the percentage attainment of the <u>total</u> catch OYs. By applying the new discard data to the entire year, only longspine would not be expected to exceed the available total catch OY, without adjustment of trip limits. The situation is most dire in the case of shortspine, where the total catch would be expected to exceed not only the OY, but also the ABC. In fact, given the series of adjusted total catches through period 4, adding even the unadjusted projected catch for period 5 would produce a total exceeding the ABC by the end of that period. As a result, a decision to apply the new discard rates in determining 2003 inseason status would likely require closure of the fishery outside of 150 fm by or before the end of period 5.

If the Council/NMFS elect to continue managing for the existing landed catch targets for these species, reductions in the shortspine trip limit would still be required in order to keep shortspine landings from exceeding 751 mt. The degree of those reductions would depend on what assumptions are made regarding model performance during periods 5 and 6. Since the trip limits during period 5 are not specified in monthly amounts, it will therefore not be possible to effectively reduce expected landings before period 6, all of the required adjustment must occur during period 6.

If it is assumed that the model would continue to project 15% low for the remainder of the year, then only 57 mt of shortspine would remain for period 6. Further, to account for the assumed under-projection, this would represent only about 49 mt of projected landings. In order to achieve this amount, the shortspine limit would have to be reduced to **900 lb per 2-months**, from the current 2,400 lb, for period 6. With this degree of reduction, limits for the remaining DTS species would also need to be lowered to address discard concerns.

If model projections for periods 5 and 6 are close to actual landings, period 6 limits could be set so as to achieve 77 mt of projected landings. This would require that the shortspine trip limit be reduced to **1,500 lb per 2-months**, from the current 2,400 lb, for period 6. It should be noted that period 5 landings should be reasonably well known by the time of the November Council meeting. Therefore, the more conservative 900 lb limit could be adopted for period 6 in September, and then raised in November, if the current model projections for period 5 are accurate.

Inseason implementation of the new discard rates would not create an early attainment situation for other flatfish target species.

Table 1.--Comparison of reported DTS landed catch with projected landings from the bycatch model, and projected total catch, calculated using discard rates from the NMFS observer program.

	Bi-monthly period						OY attainment	OY (mt) landed total	ABC (mt)
	1	2	3	4	5	6			
Sablefish									
Reported or ***anticipated (per. 5/6)*** mts	227	508	1,042	1,370	***1,855*** [1]	***2,177*** [1]	93%	2,352	
Projected landed catch (mt) from model	206	491	912	1,284	1,739	2,040	87%		
Difference between projected and reported [2]	-10%	-3%	-14%	-7%	***[-7%]***	***[-7%]***			
Projected total catch (mt) from model [3]	293	726	1,473	2,166	2,811	3,250	107%	3,031	OY + up to 1,700
Total catch adjusted by projected/actual ratio [4]	***323***	***750***	***1,683***	***2,311***	***2,999***	***3,468***	114%		
Longspine THDS									
Reported or ***anticipated (per. 5/6)*** mts	194	465	923	1,132	***1,497*** [1]	***1,740*** [1]	86%	2,020	
Projected landed catch (mt) from model	181	435	830	1,047	1,385	1,610	80%		
Difference between projected and reported [2]	-7%	-7%	-11%	-8%	***[-8%]***	***[-8%]***			
Projected total catch (mt) from model [3]	224	537	1,025	1,292	1,708	1,986	81%	2,461	2,461
Total catch adjusted by projected/actual ratio [4]	***240***	***574***	***1,139***	***1,397***	***1,847***	***2,147***	87%		
Shortspine THDS									
Reported or ***anticipated (per. 5/6)*** mts	119	254	452	545	***694*** [1]	***822*** [1]	109%	751	
Projected landed catch (mt) from model	111	243	383	474	604	715	95%		
Difference between projected and reported [2]	-7%	-5%	-18%	-15%	***[-15%]***	***[-15%]***			
Projected total catch (mt) from model [3]	170	364	575	712	906	1,076	115%	939	988
Total catch adjusted by projected/actual ratio [4]	***183***	***381***	***679***	***818***	***1,041***	***1,237***	132%		
Dover sole									
Reported or ***anticipated (per. 5/6)*** mts	1,020	2,260	3,660	4,542	***5,738*** [1]	***6,741*** [1]	96%	7,006	
Projected landed catch (mt) from model	983	2,156	3,176	4,496	5,679	6,672	95%		
Difference between projected and reported [2]	-4%	-5%	-15%	-1%	***[-1%]***	***[-1%]***			
Projected total catch (mt) from model [3]	1,133	2,543	3,712	5,237	6,590	7,735	106%	7,318	8,388
Total catch adjusted by projected/actual ratio [4]	***1,175***	***2,666***	***4,278***	***5,292***	***6,658***	***7,815***	107%		

Notes: [1] Anticipated cumulative tonnage for periods 5 and 6 represents the cumulative projection of the model multiplied by the ratio of reported-to-projected cumulative tons as of period 4.

[2] Bracketed differences shown for periods 5 and 6 represent the assumption that the difference observed, as of period 4, will continue through the years end.

[3] Projected total catch amounts represent the projected model landings, transformed by discard rates from the NMFS Observer Program.

[3] Adjusted total catch amounts represent the projected model catches multiplied by the ratio of reported-to-projected (or anticipated) landed catch through each period.

Exhibit C.2.c
Supplemental GAP Report
September 2003

GROUNDFISH ADVISORY SUBPANEL STATEMENT ON OBSERVER DATA IMPLEMENTATION STATUS

The Groundfish Advisory Subpanel (GAP) met with representatives of the Northwest Fisheries Science Center to discuss implementation of the groundfish observer program and use of observer data.

The GAP continues to express its frustration that what was supposed to be a real-time data program still relies on data that is over a year old and doesn't reflect significant changes in management and the fishery that have occurred since the data was collected. Projections from the observer model reflect neither the reality of the fishery nor the experience of fishermen. Model projections of a 50% discard rate of shortspine thornyheads make absolutely no sense. The model does not account for changes in markets or entry into alternative fisheries that has occurred during the period over which the model is projecting increased discards. Sampling methodology is highly questionable, in that observers are now counting a certain portion of bottom mud as catch. Discard mortality of shortspine thornyheads is assumed to be 100% in spite of anecdotal data that shows a far lower mortality rate.

If this is in fact the true level of discard, then it shows such a significant increase in stock abundance that OY levels should be adjusted accordingly.

While the GAP recognizes the personnel and funding shortfalls that exist within NMFS, the GAP notes that it is the participants in the fishery who are being punished for NMFS' inability to get its own fiscal house in order.

As a way to produce more relevant real-time data, the GAP urges the Council to direct the PacFIN data committee to get together with fishermen and processors and develop a means for the industry to provide regular landing reports which could be correlated with observer data. Such reports must be provided to state agencies and could readily be adapted to NMFS data needs without compromising confidentiality.

The GAP also notes, as it has on previous occasions, that the observer data which is being used is out of synch with the rest of the fishery management schedule. Out of synch stock assessments are not used for fisheries management; the same rule should apply to out of synch observer data.

Finally, in regard to the current discard projections for shortspine thornyheads, accepting the flawed model projections as an in-season adjustment will require the closure of the entire trawl fishery - ***for all species*** - north of 40°10' for the rest of the year and impose significant changes on trawl fisheries in the south and fixed gear fisheries coast-wide.

Because of the concerns with the inaccuracy of the projections from the model, the GAP does not believe that the projections for the DTS complex should be used for inseason adjustments, but should be applied to next year's fishery, if they are used at all.

GROUNDFISH MANAGEMENT TEAM
PROPOSED INSEASON SCENARIOS

Scenario 1
The GMT has developed the following proposed inseason adjustments to be implement if the new NMFS observer program discard rates are implemented inseason:

Trawl

North of 40°10'
- Implement a total trawl fishery closure

Between 40°10' and 34°27'
- Close trawl fishery deeper than 60 fathoms (current shallow line)
- Reduce trawl trip limits in Period 6 to:
  - Other flatfish = 50,000 lbs/2 mo. with a sublimit for petrale of 20,000 lbs/2 mo.

South of 34°27'
- Close trawl fishery deeper than 100 fathoms (current shallow line)
- Reduce trawl trip limits in Period 6 to:
  - Other flatfish = 50,000 lbs/2 mo. with a sublimit for petrale of 20,000 lbs/2 mo.

Coastwide
- Remove midwater yellowtail trawl opportunity in Period 6

Fixed Gear and Open Access

Coastwide
- Keep current fixed gear RCA boundaries in place for Periods 5 and 6
- Keep current trip limits in place, except no retention of shortspine thornyheads

Scenario 2

If the new discard rates are not implemented inseason, then the GMT recommends the following inseason adjustments:

Trawl

North of 40°10'

- Keep current trawl RCA boundaries in place for Periods 5 and 6
- Reduce DTS trip limits to:

	Large Footrope	Small Footrope
Shortspine	900 lbs/2 mo.	300 lbs/2 mo.
Longspine	4500 lbs/2 mo.	2000 lbs/2 mo.
Sablefish	7000 lbs/2 mo.	2300 lbs/2 mo.
Dover	30,000 lbs/2 mo.	11,000 lbs/2 mo.

South of 40°10'

- Keep current trawl RCA boundaries in place for Periods 5 and 6
- Reduce DTS trip limits to:

Shortspine	900 lbs/2 mo.
Longspine	4500 lbs/2 mo.
Sablefish	7000 lbs/2 mo.
Dover	30,000 lbs/2 mo.

Coastwide

- Remove midwater yellowtail trawl opportunity in Period 6

Fixed Gear

North of 36°

- Change daily trip limit sablefish limits to 900 lbs/week, no more than 3600 lbs/2 mo.; no change to the daily limits

South of 36°

- Keep current limits in place for daily trip limit sablefish fishery

Exhibit C.2.c
Supplemental GMT Report
September 2003

GROUNDFISH MANAGEMENT TEAM REPORT ON OBSERVER DATA IMPLEMENTATION STATUS

The Groundfish Management Team (GMT) received an update from Dr. Jim Hastie on the status of the National Marine Fisheries Service (NMFS) observer program data and the effect of incorporating discard rates for targeted species from the observer program inseason. The new discard rates are used as a function of landed catch, rather than target strategy (unlike the treatment of overfished species in the bycatch model). The actual landed catches in Periods 1-4 for the Dover sole, thornyhead, and sablefish (DTS) complex were higher by varying degrees than the projected landed catches as modeled earlier this year. Adjusting the total catch to account for the higher landings results in attainment of a greater portion of the optimum yield (OY) at the beginning of Period 5.

While all species in the DTS complex would be affected by inclusion of the new discard rates, by far the most constraining is shortspine thornyhead. If the projections in the model are accurate for Period 5, then applying the new discard rates inseason would result in a total catch that overruns the shortspine acceptable biological catch (ABC) for 2003 by 24 mt. If the projections in the model are off in Period 5 by 15% (the same amount as in Period 4), then the shortspine total catch would exceed the ABC by 53 mt. As Period 5 has already begun, it is unlikely that action could be taken quick enough to significantly affect this outcome.

The GMT struggles in its attempt to develop a recommendation to the Council on this issue. On one hand, the new discard rates could arguably represent the “best available science” and are applied in the analyses of the 2004 management measure alternatives. Those rates, if applied inseason this year, would result in an overfishing situation. On the other hand, the timing of applying those rates to the fishery is such that drastic measures (e.g., closing the trawl fishery for the remainder of the year) may have to be taken to avoid overfishing. In April, the GMT stated that the NMFS observer data for overfished stocks should be implemented as soon as possible; however, those bycatch rates were applied early enough in the season to provide adequate time to implement mitigative measures. The GMT recognizes that revising discard rates for species in a healthier condition may not be as urgent; therefore, the Council may wish to weigh the socioeconomic impacts against the biological benefits of inseason implementation of observer discard rates for non-overfished species.

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09/09/03

SCIENTIFIC AND STATISTICAL COMMITTEE REPORT ON OBSERVER DATA IMPLEMENTATION STATUS

The Scientific and Statistical Committee (SSC) received a presentation on this agenda item by Drs. Elizabeth Clarke and James Hastie. A number of changes have been made to the bycatch modeling effort since the June 2003 Council meeting. However those changes have yet to be documented and so cannot be reviewed. Documentation will be completed prior to the November 2003 Council meeting.

The SSC had a long discussion with Dr. Hastie about issues involving incorporation of the model fueled by observer data into both multi-year and inseason management decisions. The SSC has the following recommendations:

_ The Council should manage to total catch rather than landed catch targets. Trip limits for achieving the two objectives could be quite different.

_ The trawl bycatch model in its current form is the preferred basis for inseason management.

_ When all the data for a given year have become available, the cumulative affects of inseason adjustment should be evaluated to determine how close actual harvests were to the targets.

The SSC would like to point out that, due to the current short observer time series, the calculation of 2003 total catch using the bycatch model uses observer discard rates from September 2001 to August 2002 applied to fishtickets from calendar year 2003.

PFMC
09/09/03

in the absence of fishing is 2027, while the target rebuilding year associated with a 22 mt OY for 2003 is 2052(TMID). Selecting an OY that corresponds to TMID is consistent with NMFS guidance on rebuilding plans.

NMFS believes that the Magnuson-Stevens Act requires that the Council and NMFS meet the conservation needs of the stock (National Standard 1), and also consider the needs of fishing communities (National Standard 8). A lower rebuilding OY, which would further reduce the potential income of the fishers is not required.

Comment 7: One commenter stated that the sablefish should be set higher, at 8,187 mt, which would be based on recruitment changes affected by environmental conditions, the default MSY proxy, and the Council's harvest control rule. Failing to base the sablefish OY on environmental conditions ignore the best available science, which show that environmental conditions affect stock status. Conversely, another commenter stated that the sablefish OY is 30 percent higher than that recommended by the Council's Allocation Committee, saying that the higher amount is not justified.

Response: The SSC indicated that the medium and high OYs were relatively risk-prone and advised the Council that caution should be used when setting the 2003 harvest levels. The 5,000 mt OY, as recommended by the Council's ad hoc Allocation Committee, was consistent with the Scientific and Statistical Committee (SSC) recommendation because it addressed uncertainty in the assessment relating to the different states of nature.

After deliberations, the Council recommended OY of 6,500 mt which is a 7,455 mt OY, based on a 40/10 adjustment to the ABC, with an additional 1,000 mt precautionary reduction. The Council based its recommendation on the SSC's advice to be precautionary because of assessment uncertainties, and because the sablefish biomass is within the precautionary range. While the OY is higher than that recommended by the Allocation Committee, this OY is still considered to be risk averse rather than risk neutral. NMFS agrees with the Council's recommendation.

Comment 8: One commenter stated that the whiting OY is too low and is set at a harvest rate that is more conservative than the Council's default rate, which is unjustified. Another commenter stated that the OY is contrary to the scientific advice of the U.S. Canada Review Panel. A third commenter stated that the whiting OY was higher than recommended by the Council's SSC and that setting the higher OY was unjustified.

Response: In estimating the current biomass, NMFS used a medium level recruitment assumption of a recent (1999) large year class. The medium recruitment level was considered to be risk neutral. The U.S. ABC of 188,000 mt is 80 percent of the coastwide ABC. The U.S. whiting OY is 148,200 mt which is 80 percent of the coastwide OY (185,325 mt) and is based on the application of an F45% harvest rate, reduced by the Council's default rebuilding 40–10 harvest rate policy. Under the 40–10 harvest rate policy, the OYs of stocks that are below B40% abundance are set at increasingly more conservative rates the farther they are below B40%.

The SSC advised the Council to be precautionary when setting the Pacific whiting OY and not increase it over the 2002 harvest level (U.S. OY for 2002 was 129,600 mt) until a new assessment was conducted. However, the Council indicated that the medium harvest level, 148,200 mt (13 percent increase over 2002), based on the 2003 projected biomass with an F45% harvest rate proxy was sufficiently precautionary, because the risk neutral medium recruitment assumption and a more conservative harvest rate proxy were applied. The ABC for a species or species group is generally derived by multiplying the harvest rate proxy by the biomass to forecast the amount of harvest available to the fishery. Because of expected whiting biomass growth in the coming years, this will result in a short-term increase in the OY. However, the more precautionary harvest rate proxy is expected to increase the rebuilding rate and reduce the risk of declining back into an overfished state because whiting is a highly productive species.

The Joint Canada-U.S. Review Panel on the Stock assessment of the Coastal Pacific Hake/Whiting stock met in February 2002 and prepared a report, which was used by the Council and SSC in recommending the Pacific whiting harvest levels for 2002. While both U.S. and Canadian review panel members had a common interest in conducting sound technical review, they had different responsibilities in terms of the type of advice expected by the Council and Canadian Department of Fisheries and Oceans. Specifically, the review panel recommended changing the harvest rate to an F45% harvest rate and selecting the harvest level bounded by the low and medium recruitment scenarios for the 1999 year-class. This was a risk adverse policy recommendation that was not adopted by the Council for the reasons previously stated.

Comment 9: NMFS has failed to compensate for overharvest in past years' fisheries in proposing harvest limits for 2003. In its proposed rule at 68 FR 953, NMFS discussed overfishing that had occurred in 2001, but not in 2002, claiming that landings data was not available at the time of the publication of the proposed rule. A full month has passed since the end of 2002, therefore, NMFS will violate the Magnuson-Stevens Act if it fails to consider 2002 catch data in making its final decision on the 2003 specifications.

Response: Each year since 2000, NMFS has provided a brief report within the preamble to the proposed rule on whether overfishing occurred on any groundfish species in the last year for which data was available. This report is not a required part of the preamble to the specifications and is simply provided as an update for the public. The commenter has taken a sentence from that report and revised its context so as to accuse the agency of failing to consider 2002 data in crafting specifications and management measures for 2003. The Council and its participating state and Federal agencies consider all available data, including catch data from the current fishing year when devising specifications and management measures for the upcoming fishing year.

To the extent that they were available, data from fisheries conducted during 2002 were used in evaluating 2003 management options for all fleets targeting groundfish. Inseason comparison of trawl bycatch projections with reported landings during the first four months of 2002 resulted in adjustments to the expected target species landings of vessels within the 2003 model. Additionally, because trawl landings of bocaccio during the first four months exceeded the total bycatch projected for that timespan, bocaccio bycatch rates were increased for modeling the 2003 trawl fishery. Recommendations for management of the fixed gear, daily trip limit fishery for sablefish also incorporated landings during the first four months of 2002, in conjunction with catch rates over the previous three years. Early season landings in the recreational and commercial fixed gear fisheries for nearshore rockfish were included in evaluating 2003 management, along with recent years' landings. However, in the region north of 40°10′ N. lat., participation is usually low early in the year due to bad weather. As a result, landings during this period are of

GMT STATEMENT ON FINAL HARVEST LEVELS AND OTHER SPECIFICATIONS FOR 2003

The Groundfish Management Team discussed the range of considered groundfish harvest levels for 2003 management and the implications of the varying total catch optimum yields (OYs) for each of the nine stocks with alternative specifications. The *Initial Draft Environmental Impact Statement/Regulatory Impact Review/Initial Regulatory Flexibility Analysis For Proposed Groundfish Acceptable Biological Catch and Optimum Yield Specifications and Management Measures For The 2003 Pacific Coast Groundfish Fishery* (Annual Specifications EIS; Exhibit C.3, Attachment 1) provides some of the scientific explanation for alternative harvest specifications. However, further GMT discussion of the management implications of alternative harvest levels may be fruitful for Council considerations. Additionally, the GMT discovered an error in the sablefish specifications. The attached Revised Table 2.1-1 is a revision of the table that appeared in the Annual Specifications EIS. The following summary of alternative harvest specifications and their management implications is provided for consideration.

Lingcod

The alternative lingcod OYs are based on probabilities of rebuilding within T_{MAX} that correspond to the 80%, 60%, and 50% trajectories for *Low OY*, *Medium OY*, and *High OY*, respectively. The Allocation Committee met in August and specified a preference for the *Medium OY* value of 651 mt, which is consistent with the interim Council rebuilding strategy for lingcod. The GMT notes that it is unlikely that any of the considered lingcod harvest levels, including *Low OY*, will be attained in 2003 due to the anticipated binding constraints on fisheries operating on the shelf imposed by the need to rebuild bocaccio, canary rockfish, cowcod, and yelloweye rockfish. Preliminary evidence suggests that lingcod rebuilding is on track to rebuild within ten years in accordance with the interim Council lingcod rebuilding measures, which also alleviates any concern for lingcod.

Pacific Whiting

The Pacific whiting OYs are not ranged according to a rebuilding analysis since one has not been adopted by the Council. All three harvest levels the GMT recommended for consideration assume a medium level of recruitment for the 1999 year class. The *Low OY* is the current OY, which is the default $F_{40\%}$ harvest rate with the 40-10 adjustment applied to the estimated 2002 biomass. The *Medium OY* is derived using the more conservative $F_{45\%}$ harvest rate with the 40-10 adjustment, but applied to projected 2003 biomass. The *High OY* is derived using the default $F_{40\%}$ harvest rate with the 40-10 adjustment applied to the projected 2003 biomass.

Sablefish

The alternative sablefish OYs are derived from the 2002 assessment update and reflect alternative explanations for the poor recruitment observed in the 1990s. The *Low OY* harvest level is derived using an $F_{60\%}$ harvest rate under a density-dependence hypothesis and resampling of the 1992-2001 recruits to determine future recruitment. This harvest alternative was requested by the GMT in May in an effort to identify a harvest rate that would provide greater assurance of stock increase over the next 5-10 years, assuming average recruitment after the 1999 and 2000 year classes. The *Medium OY* alternative is based on the default $F_{45\%}$ harvest rate under a density-dependence hypothesis (resampling of 1992-2001 recruits). The *High OY* alternative is based on the default $F_{45\%}$ harvest rate under an environmental regime shift hypothesis (resampling of 1975-2001 recruits). Previous versions of the alternative harvest levels table prepared by the GMT depicted slightly lower harvest levels under these alternatives. The Team discovered the conversion of the OY derived for the assessed area north of Pt. Conception (34°27' N. lat.) to the management area north of 36° N. lat. incorrectly subtracted the entire Conception area OY. This mistake is corrected in the attached Revised Table 2.1-1.

The GMT is not recommending a specific harvest level but does note the STAR-light Panel advice that "given that (1) Q is poorly determined and that (2) at this time there is no compelling scientific basis to select between the two states of nature (density-dependent vs. regime shift), the review panel concluded that a precautionary adjustment that would lower the "risk neutral" sablefish OY is warranted, in order to reduce the possibility of over-harvesting the resource." The GMT is concerned that a harvest level as high as the *Medium OY* risks driving stock spawning biomass down near the overfished threshold if we do not continue to see recruitments that are as large as 1999 or 2000. Precaution is also warranted due to the expected delays in conducting the next assessment if the Council proceeds with multi-year management.

Pacific Ocean Perch

The Pacific ocean perch OY alternatives range probabilities of 80%, 70%, and 50% of rebuilding within T_{MAX} for *Low OY*, *Medium OY*, *High OY*, respectively. The Team notes that it is unlikely that any of the OYs will be attained in 2003 due to expected measures to constrain darkblotched rockfish mortality.

Widow Rockfish

The range of widow rockfish harvest alternatives corresponds to rebuilding probabilities of 80%, 60%, and 50% under the *Low OY*, *Medium OY* (= *Alloc. Cm. OY*), and *High OY* alternatives, respectively with the *Medium OY* consistent with the Council's interim rebuilding strategy. The *Medium OY* harvest level of 832 mt conforms to the Council's adopted interim strategy for rebuilding the stock and may provide a winter opportunity for a midwater trawl fishery after anticipated bycatch in the at-sea fishery is taken into account. Therefore, the GMT recommends the 60% probability option of 832 mt, as the expected bycatch of widow in other targeted fisheries is approximately 250 mt which provides a significant buffer against unanticipated mortalities, and provides for a midwater opportunity in a portion of period 6. Using the T_{MID} option (which is equivalent to the 80% probability) produces an OY of 656 mt. This *Low OY* alternative would not provide both a midwater opportunity and an adequate buffer against unanticipated mortalities and possible increased effort. A higher harvest level would provide flexibility for scheduling a midwater trawl opportunity and an adequate buffer between expected catches and the OY. Not providing a midwater trawl opportunity in 2003 would reduce widow/yellowtail exvessel revenue by about $600,000-$750,000.

Canary Rockfish

The range of canary rockfish harvest alternatives correspond to rebuilding probabilities of 80%, 60%, and 50% under the *Low OY*, *Medium OY*, and *High OY* alternatives, respectively. The GMT is primarily concerned with the bycatch implications under the considered catch sharing options. The GMT supports Council consideration of canary rockfish catch sharing for 2003 that is higher on the commercial end than 50%. Catch sharing of canary that is 60% commercial:40% recreational would provide for an overall higher OY at the 60% probability level (44 mt vs. 41 mt). The increase in OY is due to the tendency of recreational fisheries to take smaller fish. This creates a greater "per-ton" impact over the course of rebuilding. Not only would this provide for commercial trawl fisheries which would otherwise be constrained, it would also provide for anticipated canary rockfish mortalities associated with proposed exempted fisheries (EFPs) for 2003. As an example, under a 60:40 split, the recreational portion of the OY would be reduced from 19 mt to 16 mt. The additional 3 mt from the recreational share plus the 3 mt from the increased OY under 60:40 sharing would provide most of what the Team believes would be needed to accommodate valuable experimental fisheries in 2003. However, the GMT notes that the current preferred state recreational management proposals cannot be accommodate under the 50:50 catch sharing option (as they produce mortalities in the 21 mt range); therefore, these proposals must be significantly restructured to meet the appropriate OY targets.

Bocaccio

The GMT could not recommend an OY for bocaccio given the lack of any available harvest under rebuilding in the revised rebuilding analysis.

Darkblotched Rockfish

The darkblotched OYs reviewed with their associated probabilities of rebuilding within T_{MAX} were as follows: *Low OY* (~92%), *2001 OY* (~88%), *Alloc. Cm. OY* (80%), *Medium OY* (70%), and *High OY* (50%). The consequence of managing for the lower OYs are that the trawl fishery would be constrained for a greater portion of the year outside of 250 fm. Smaller vessels would be most affected since they may not be able to effectively fish in deeper water. Opportunities to fish flatfish in shallower water could also be more constrained due to projected bycatch of young darkblotched rockfish inside 100 fm. Some of these vessels could be forced out of the fishery with no viable economic incentives. The GMT believes the T_{MID} value of 172 mt (*Alloc. Cm. OY*) provides a reasonable balance for rebuilding the stock while lessening the potential adverse economic impacts to the limited entry trawl sector.

Yelloweye Rockfish

The *Low OY* is based on the older rebuilding analysis considered in June which was called into question due

Exhibit C.4.d
Supplemental SSC Report
June 2002

SCIENTIFIC AND STATISTICAL COMMITTEE REPORT ON PRELIMINARY HARVEST LEVELS AND OTHER SPECIFICATIONS FOR 2003

Dr. Jim Hastie presented an overview of the Groundfish Management Team (GMT) preliminary acceptable biological catch (ABC) and optimum yield (OY) determinations for 2003 (Exhibit C.4, Attachment 1). The Scientific and Statistical Committee (SSC) comments on ABC and OY determinations for Pacific whiting, sablefish, and yelloweye rockfish as follows:

Pacific whiting - Pacific whiting was declared overfished because of a recently completed assessment that estimated spawning biomass to be 20% of an unfished stock in 2001. The rebuilding analysis for whiting indicates that the 40-10 rule is adequate to achieve recovery to $B_{40\%}$ within 10 years. The potential rapid recovery of whiting is due to an above-average (but still uncertain) 1999 year-class that would increase spawning stock biomass as it becomes mature and due to the relatively high growth rate of whiting. The SSC recommends that any 40-10 rule OY values be based on the results of the assessment conducted in 2002 rather than the rebuilding software, because the 2002 assessment model includes multiple fisheries and time-varying weight-at-age. The 2002 whiting Stock Assessment Review (STAR) Panel concluded that "given concerns with the current formulation of the stock reconstruction model and the dependence of yield options beyond 2002 on continued recruitment of the 1999 year-class and recruitment from year-classes not actually observed, the Panel recommends against adopting 2003 projections until another assessment is conducted." The SSC again strongly supports this recommendation.

Sablefish - An updated assessment for sablefish was completed in 2002 and reviewed under the terms of reference for an expedited stock assessment update. Sablefish was considered for an expedited review, because of 2001 shelf survey results that suggested strong sablefish recruitment (primarily the 1999 year class) that was not included in the previous assessment. Contrast in the relative abundance of young fish in the shelf and slope surveys in 2001 resulted in a relatively large decrease in the slope survey catchability (Q), which translates into a substantial increase in the sablefish OY. The SSC cautions that the estimate of Q, and the implied estimate of sablefish OY remain highly uncertain. Management decisions should be made with the expectation that future sablefish assessments will result in similarly large swings in Q and the implied sablefish OY (both upwards and downwards).

Exhibit C.4, Attachment 1 show three alternatives for 2003 OY: a density-dependent recruitment scenario (alternative 2), a regime-shift scenario (alternative 3), and an $F_{60\%}$ density-dependent scenario that was developed by the Groundfish Management Team (GMT) to stabilize the spawning stock biomass (currently estimated to be 31% of unfished). Given the potential for an OY based on an imprecise stock assessment to reduce spawning stock biomass to a level approaching the overfished threshold, the SSC considers that a precautionary adjustment to the OY is warranted. This could be accomplished by setting the sablefish OY less than Alternative 2 of Exhibit C.4, Attachment 1, while Alternative 1 might usefully be considered as a lower bound to the sablefish OY.

Yelloweye rockfish - The yelloweye rockfish OY is based on a rebuilding analysis that considers two cases: a density-dependent hypothesis (scenario 1), and regime-shift hypothesis (scenario 2).

The SSC requests that, for consistency, the rebuilding analysis define B_0 for the regime-shift hypothesis (scenario 2) on recruitments for the years 1967-1993 and project future recruitment for the density-dependence hypothesis (scenario 1) on recruits/spawning output ratios for the years 1983-1993. The assessment author provided the SSC with revised rebuilding analysis results.

The SSC has no clear basis to choose between the two scenarios for yelloweye. These scenarios bound the range of possibilities. However, the SSC notes that the Terms of Reference for Groundfish Rebuilding Analysis (April 2001) suggest that the density-dependent scenario should be the default case, because stocks that have declined into an overfished condition are more likely to be unproductive (e.g., low spawner-recruit steepness).

GROUNDFISH ADVISORY SUBPANEL STATEMENT ON FINAL 2004 HARVEST LEVELS

The Groundfish Advisory Subpanel (GAP) discussed proposed harvest levels for the 2004 groundfish fishery. The GAP's recommendations below are based on Table 2.1.1-1, found in Exhibit C.3 Attachment 1.

The GAP recommends adoption of the Council's preferred harvest levels as identified in the table, with the following exceptions:

Widow rockfish: the majority of the GAP recommends the Council adopt an **acceptable biological catch (ABC) of 3,908 mt** and an **optimum yield (OY) of 501 mt**. The widow rockfish stock assessment from which harvest levels are derived suffers from sparse data and inconsistencies between projected abundance levels and actual abundance observed in the ocean. The proposed OY, which is obtained from the rebuilding analysis, is sufficiently precautionary and has a probability of rebuilding of greater than 50%. The GAP's OY recommendation will barely sustain existing fisheries; the lower OY identified as the Council's Preferred alternative will result in harvest reductions and prevent the fishery from achieving the OY on healthy stocks.

A minority of the GAP recommends the Council Preferred alternative be adopted in order to demonstrate needed precaution.

Bocaccio rockfish: the GAP notes that the ABC figures shown on the table are incorrect. The majority of the GAP recommends an **ABC of 501 mt** and an **OY of 306 mt**, the corrected numbers for the Council's Preferred alternative.

A minority of the GAP recommends adoption of the corrected low value of a 400 mt ABC and 199 mt OY in order to exercise precaution.

Cowcod: For the north of Conception and Monterey areas, the GAP recommends an **OY of 9 mt**. The GAP notes that the assessment area covers only south of Point Conception, and the OY for the northern area was simply adopted to parallel the southern OY. Providing a small OY will have an insignificant effect on stock rebuilding, but will allow some small amount of cowcod to be landed and data obtained for future stock assessments. The cowcod assessment is extremely data-poor, and any additional scientific data will greatly improve our knowledge of overall stock status.

Darkblotched rockfish: The GAP notes that the ABC values shown on the table are lower than the OY values, a situation not allowed by law. The GAP recommends the Council Preferred alternative **ABC of 240 mt** and a corresponding **OY of 240 mt**.

For those species for which no Council Preferred alternative has been identified, the GAP makes the following recommendations:

Pacific whiting: Although a final whiting harvest level will not be determined until after the stock assessment has been completed and reviewed next year, the GAP is concerned that the upper end of the range identified is too low, based on significant evidence of increased whiting abundance in the fishery. As you recall, the range was established by using the 2003 ABC as a base and assuming a 50% range higher and lower. In order to accommodate the likelihood of the stock assessment projecting an ABC above the range in the table, the GAP recommends the high end of the ABC range be increased to **400,000 mt for the U.S. portion of the ABC**, with an OY that corresponds to necessary harvest levels which reflect whiting status in relation to B_0, the Council's harvest policy, and other relevant factors. Increasing the range will provide the Council with necessary flexibility to deal with abundance increases.

Sablefish: The majority of the GAP recommends the Council adopt an **ABC of 8,487 mt** and an **OY of 8,423 mt**, which is identified as the high option, along with the appropriate division between the Conception area and the area north of Conception. This harvest level reflects a sablefish stock which is influenced by a regime shift, rather than density dependence. The evidence for existence of a regime shift and accompanying changes in productivity is too strong to ignore. Fishery observations demonstrate several strong year classes of sablefish. The majority of the GAP believes that harvest levels should reflect this evidence.

A minority of the GAP recommends the medium ABC and OY levels in order to ensure necessary precaution.

Black rockfish: For the Oregon/California area, the GAP recommends an **ABC of 775 mt** and an **OY of 775 mt**, which correspond to the medium levels shown on the table.

PFMC
09/09/03

Exhibit C.3.d
Supplemental SSC Report
September 2003

SCIENTIFIC AND STATISTICAL COMMITTEE REPORT ON FINAL HARVEST LEVELS FOR 2004

The Scientific and Statistical Committee (SSC) provided detailed comments on 2004 harvest levels at the June Council meeting. SSC recommendations concerning the range of 2004 harvest levels are unchanged (See B.4. of SSC minutes for the June Council meeting). Council staff correctly note that for darkblotched rockfish the medium and high optimum yield (OY) alternatives are higher than the acceptable biological catch (ABC), which is based on the F_{MSY} proxy for rockfish of $F_{50\%}$. Since the Magnuson-Stevens Act does not allow harvest rates greater than F_{MSY}, the ABC constrains the harvest level for these alternatives. The medium and high OY alternatives use assessment estimates of relatively strong (but uncertain) recruitment in 2000 (medium OY alternative), or both 2000 and 2001 (high OY alternative). Strong recruitment in those years imply that harvest rates could be higher than F_{MSY}, and the stock would still rebuild by T_{MAX} with 80% probability. If subsequent assessments confirm the estimates of strong recruitment in 2000 and 2001, F_{MSY} may continue to constrain harvest levels as the stock rebuilds.

PFMC
09/09/03

Exhibit C.4.b
Supplemental GMT Report
September 2003

GROUNDFISH MANAGEMENT TEAM REPORT ON STATUS OF GROUNDFISH FISHERIES AND INSEASON ADJUSTMENTS

The Groundfish Management Team (GMT) recommends the following inseason adjustments:

Trawl

North of 40°10'

- Keep current trawl RCA boundaries in place for Periods 5 and 6
- Reduce DTS trip limits in Period 6 to:

	Large Footrope	Small Footrope
Shortspine	900 lbs/2 mo.	300 lbs/2 mo.
Longspine	4,500 lbs/2 mo.	2,000 lbs/2 mo.
Sablefish	7,000 lbs/2 mo.	2,300 lbs/2 mo.
Dover	30,000 lbs/2 mo.	11,000 lbs/2 mo.

South of 40°10'

- Keep current trawl RCA boundaries in place for Periods 5 and 6
- Reduce DTS trip limits in Period 6 to:

Shortspine	900 lbs/2 mo.
Longspine	4,500 lbs/2 mo.
Sablefish	7,000 lbs/2 mo.
Dover	30,000 lbs/2 mo.

Coastwide

- Remove midwater yellowtail trawl opportunity in Period 6

Fixed Gear and Open Access

North of 36°

- Change daily trip limit sablefish limits to 900 lbs/week, no more than 3,600 lbs/2 mo.; no change to the daily limits for Period 6

South of 36°

- Keep current limits in place for daily trip limit sablefish fishery

South of 40°10'

- Increase deeper nearshore trip limits for Periods 5 and 6 to 400 lbs/month

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09/09/03

GROUNDFISH ADVISORY SUBPANEL STATEMENT ON FINAL CRITERIA FOR EXEMPTED FISHING PERMITS AND CONSIDERATION OF PROPOSALS FOR THE 2004 SEASON

The Groundfish Advisory Subpanel (GAP) discussed the Revised Proposed Council Operating Procedure for EFPs as presented in Exhibit C.5.b, GMT Attachment 2. We recommend the following revisions.

On page 1, under "Submission," we recommend the GAP be required to review EFP proposals prior to issuance. While the Groundfish Management Team (GMT) and Scientific and Statistical Committee (SSC) have the scientific and technical credentials to comment on methodology and management data needs, the GAP has the expertise to consider whether an EFP proposal makes sense, especially in regard to gear modifications and effects on participants in the fishery.

On page 2, in the list of required information for a completed application, the following should be included:

* a description of how vessels will be chosen to participate in the EFP; and
* a description of the anticipated cost and known sources of funding.

The GAP believes that including this information will provide a better sense of the practicality of a proposed EFP.

On page 3, the GAP notes there is no discussion of who will investigate EFP applicants in terms of their enforcement history. Will this be done by the Council? The GMT? The SSC? Some members of the public and the GAP also expressed concern that a double jeopardy standard is being imposed: if a fisherman or processor has an exemplary record, but wound up paying a single fine during their entire career, they could be banned - by somebody, as it isn't clear - from participating in an EFP fishery, even though they might have innovative proposals for solving bycatch problems.

On page 4, under "Report Contents," the GAP recommends the report should contain a discussion of the value of the fishery for which the EFP was issued. Since EFPs are of short duration, this will allow the Council and advisory bodies to better judge whether benefits were maximized in the event that a scarce species is provided to an EFP fishery and not to a non-EFP fishery.

The GAP also notes the monthly updates of EFP landings of overfished species and others are not provided in any formal manner, but are often transmitted informally to the GMT for purposes of harvest attainment projections and inseason management. The GAP requests the EFP landing updates be provided to the GAP.

On the issue of how to assign scarce species to EFP and non-EFP fisheries, the majority of the GAP recommends that no formal system be put in place, but rather that the GMT, in consultation with the GAP, continue to make its best efforts to assign harvest projections to fisheries.

A minority of the GAP recommends that non-EFP fishery needs be calculated first before assigning any catches to EFPs.

In regard to the EFP proposals presented to the GAP for review, the GAP was not allowed time for appropriate review of individual EFPs and has no comments at this time.

PFMC
09/10/03

GROUNDFISH MANAGEMENT TEAM REPORT ON EXEMPTED FISHING PERMITS (EFPs)

Standards and Criteria for Approving EFPs

Following the June Council meeting, the Groundfish Management Team (GMT) revised its proposed process and timeline for Exempted Fishing Permit (EFP) application review and consideration (GMT Attachment 1) to include additional checkpoints for updates to the "bycatch scorecard" and potential release of EFP Optimum Yield set asides inseason.

The GMT also revised its proposed Council Operating Procedure that describes the standards and criteria for approving exempted fishing permits (GMT Attachment 2) in response to Council guidance we received at the June meeting (changes are in bold and underlined). In addition, the GMT supports 100% shoreside sampling coverage of the EFP trips be conducted by the sponsoring individual or agency. However, due to the tight budget constraints of state fish and wildlife agencies, the GMT recognizes that this may not be achieved.

The GMT recommends that the Council approve the revised Council Operating Procedure for the standards and criteria for approving EFPs, as well as the proposed process and timeline.

EFP Proposals for 2004

The GMT reviewed and had a lengthy discussion on the following EFP proposals for 2004:

ODFW Deepwater Complex (DTS) EFP

The GMT received a presentation from Mr. Mark Saelens on this EFP proposal. There were concerns initially expressed regarding proposed price differentials for the targeted species (i.e., DTS), potential changes in fishing behavior as a result, and the possibility of earlier OY attainment for DTS species. These concerns were adequately addressed through our discussions with ODFW staff and EFP processing participants, as well as clarification of the EFP provisions. Our understanding is that the EFP would be conducted in Periods 2 and 3 and the GMT would like to receive preliminary catch totals for targeted species at the June meeting, so we can anticipate adjustments to projected DTS catches, if needed. As the EFP would take place seaward of the RCA, it is unlikely that current rockfish limits will be exceeded with the proposed EFP; however, the GMT believes that bycatch caps need to be established, particularly for darkblotched rockfish and Pacific ocean perch. The GMT supports the approval of this EFP because the primary objective is bycatch reduction and it will not impact canary rockfish.

CDFG Selective Flatfish Trawl EFP

The GMT discussed the continuation of this proposed EFP for its final year in 2004, with the same bycatch caps as were in place for 2003. The GMT believes this EFP would provide valuable data on the use of the same selective flatfish trawl gear that has been tested in the

ODFW Selective Flatfish Trawl EFP in 2002 in a different area. Given the objectives of the EFP, and its minimal estimated impact on canary rockfish, the GMT supports this EFP going forward.

California Charter/Party Fishing Vessel (CPFV) EFP

There is a California CPFV EFP being proposed by a professor at Cal Poly University. This EFP is research-oriented in nature, collecting data to support stock assessment efforts, rather than data that would be directly used to develop management measures (e.g., bycatch data). West Coast stock assessments that have used this data set in the past include black rockfish, bocaccio, and cabezon. While the GMT believes that data collection to support stock assessment efforts is valuable, the GMT identified several questions regarding this proposed EFP. As these questions are more technical and would be better addressed by research scientists, the GMT requested that the SSC review this EFP application. It is our understanding that the SSC plans to refer the EFP to its Groundfish Subcommittee for review and has identified additional questions and requested additional analyses of the original data set. As these questions and analyses will take some time to address and develop, the GMT recommends that this EFP be deferred until 2005, pending the outcome of the SSC's review.

WDFW Longline Dogfish EFP

The GMT received a verbal presentation of the proposed WDFW-sponsored EFPs. The longline dogfish EFP was conducted in 2003, and 2004 would be its final year. While three vessels qualified for the EFP in 2003, only one vessel was able to participate. The GMT believes that the data collected in this EFP is not ready for implementation, as the amount of data (one vessel fishing for a few months) is not sufficient to draw conclusions that could be applied on a fleetwide basis. Further, while the NMFS observer program has increased its coverage of longline vessels, that coverage has primarily been on vessels targeting sablefish, not dogfish. The GMT supports this EFP be approved as the data collected would be valuable and the canary impact is estimated to be minimal.

WDFW Midwater Pollock EFP

The midwater pollock EFP was scheduled for a different time period in 2003 (April-June) than the time fishing occurred under state regulation in 2002 (August). There were three vessels that qualified, but only one participated, for a total of three trips in May. WDFW is proposing that this be the final year for this EFP and that this fishery be covered by federal regulations in 2005. The proposed EFP for 2004 would take place during the same time period as the initial year (August-October). The GMT supports this EFP be approved as the data collected would be valuable and the canary impact is estimated to be minimal.

WDFW Arrowtooth Flounder Trawl EFP

WDFW is proposing this EFP be continued in 2004 for its final year. In 2003, this EFP required participants to use selective gear (i.e., excluder devices), although a prescribed gear configuration was not set. In 2004, there would be specific gear and area requirements for the EFP; the excluder requirements would be narrowed down to three configurations, including one that would allow the selective flatfish trawl gear being tested in Oregon and California. WDFW plans to have the 2004 EFP provisions closely mimic the federal regulations that would be in place if this fishery was provided fleetwide. The GMT supports this EFP be approved and encourages it moving into regulations in 2005. The expected canary bycatch for this EFP, while reduced from the 2003 cap, is still at 2.5 mt. In the event that additional canary is needed to balance the bycatch scorecard for 2004, the GMT recommends that the amount of canary set aside for this EFP be slightly scaled back, perhaps to 2.0 mt.

WDFW Selective Flatfish Trawl EFP

This is a new EFP that is being proposed as the first year of two. This EFP would have specific gear and area requirements, including the use of the selective flatfish trawl being tested in Oregon and California. However, there are a few fishermen that would like to test gear that is slightly modified from the current selective flatfish gear being used; therefore, different selective gear configurations would be allowed to be tested in this EFP. There was some concern that this EFP could hinder the movement of the Oregon and California selective flatfish EFPs into federal regulations. The GMT recommends that, if the selective gear configuration currently being tested would be prescribed in federal regulations that would apply fleetwide, then this EFP would not go forward or be continued (depending on the timing of the regulatory action–2004 vs. 2005). The GMT believes that the data collected in this EFP would be valuable as it would provide data on the use of this gear in a different area by a different portion of the fleet and recommends it move forward. The GMT felt that it is particularly important that the gear configurations that are required under the EFP are consistent with the selective flatfish trawl gear being tested in Oregon and California.

Whiting EFP

Additionally, the GMT briefly discussed the Whiting EFP and notes that, while there is not a formal written EFP application available at this time, the proposed EFP for 2004 would not differ from the 2003 EFP. The GMT advocates putting in a placeholder for this EFP with the understanding that a final complete EFP application will be available at the November Council meeting.

Prioritization of EFPs

The GMT prioritized the EFPs that we are recommending for approval based on the criteria outlined in the proposed Council Operating Procedure and the estimated impacts to overfished species. As in the past, the GMT believes that the whiting EFP be given priority consideration (absent regulations to implement Amendment 10), and the impacts to overfished stocks for this EFP are accounted for as a separate line item in the bycatch scorecard. The GMT's priority order for the remaining EFPs is:

1. ODFW Deepwater Complex (DTS) EFP (0 mt canary)
2. CDFG Selective Flatfish Trawl EFP (0.5 mt canary)
   WDFW Longline Dogfish EFP (0.1 mt canary)
   WDFW Midwater Pollock EFP (0.1 mt canary)
3. WDFW Arrowtooth Flounder Trawl EFP (2.5 mt canary)
4. WDFW Selective Flatfish Trawl EFP (1.0 mt canary)

Total Canary: 4.2 mt

Exhibit C.5.d
Supplemental SSC Report
September 2003

SCIENTIFIC AND STATISTICAL COMMITTEE REPORT ON FINAL CRITERIA FOR EXEMPTED FISHING PERMITS AND CONSIDERATION OF PROPOSALS FOR THE 2004 SEASON

The Scientific and Statistical Committee (SSC) considers the protocol for Council consideration of exempted fishing permits (EFPs) (see Attachment 2 of Exhibit C.5.b) proposed by the Groundfish Management Team (GMT) to be appropriate. However, there is a need to clarify the time line under the multi-year management cycle.

The SSC discussed the EFP application: "Application for Issuance of an Exempted Fishing Permit for the Sport Harvest of Rockfish from Partyboats in Waters Deeper than 20 Fathoms off the Central Coast to Duplicate the Sampling Program Conducted by the CDFG from 1988-1998." This EFP proposal is based on the old bag limit regulation, which is different from the currently implemented limit. It is important for the applicant to address the implications of changing regulations on the estimation of an abundance index.

This EFP may provide useful time series of abundance indices for many species because data will be collected by observers. As seen in black rockfish and bocaccio stock assessments, inclusion of spatio-temporal interactions in the statistical modeling of commercial passenger fishing vessel (CPFV) series led to important improvements in the stock assessments of these species. There is no other data source that generates information at this level of spatial resolution. This EFP can also serve as a means to obtain catch per unit effort (CPUE) and biological data from the closed area.

The methodology to be used to analyze the future data and the analyses of the 1988-1998 data are not presented. The proposed sample size, 44 trips per year, is around 20% to 25% of annual sample size during 1988-1998. The implications of the proposed annual sample size could be evaluated by estimating all coefficients of variation (CVs) by species from the earlier data. The SSC suggests the applicant consider whether to use this EFP as a pilot study to establish a reasonable CV level that is attainable under current regulations. The extension of the study to other ports would allow evaluation of port-year-region interactions.

PFMC
09/10/03

Exhibit C.6
Supplemental Attachment 3
September 2003

Supplemental Annual Specifications Analyses

(Selected Tables and Discussion for the *Draft Proposed Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for the 2004 Pacific Coast Groundfish Fishery*)

The text and tables in this supplemental document contain additional materials considered useful for evaluating alternative management measures. This information also will be incorporated into the 2004 Groundfish Annual Specifications Draft EIS.

In addition to the materials provided in this attachment, which were prepared after the briefing book deadline, reports prepared by the Council's advisory bodies during the meeting will be presented prior to the Council's final decision and incorporated in the Draft EIS document.

Attachment 3 contains the following sections:

A - Socioeconomic conditions on the West Coast: Summary maps

B - Species managed under the Groundfish FMP

C - Bycatch information on the Pacific whiting and selected open access fisheries

D - Recreational fisheries background information

E - The historic use of the "B" platoon and implications for its use in 2004 and beyond

Part A - Socioeconomic Conditions on the West Coast: Summary Maps

Tables and figures in this section:

Travel Distances to the Trawl Groundfish Conservation Area boundary – Safety Considerations

Figures A.1 through A.3 show a series of concentric rings around selected West Coast ports, spaced at 10, 20, and 40 nautical mile intervals. These distance rings are displayed over the Trawl Groundfish Conservation Area (GCA) to show the distance from these ports to the shoreward and seaward boundaries of the GCA. (The GCA boundary displayed on these maps is based on the waypoints effective July 1, 2003, and available on the NMFS NWR website.[1] The Yelloweye Rockfish Conservation Area and Cowcod Conservation Area are not displayed. The GCA for fixed gear and open access vessels is configured differently.) Although trawlers may operate shoreward of the GCA, the current regulatory regime favors fishing seaward of the closed area. First, trawling is prohibited in state waters (within 3 nautical miles from shore) off of Washington and California. Second, vessels may only use small footrope gear when operating in shoreward areas.[2] Furthermore,

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[1]http://www.nwr.noaa.gov/1sustfsh/groundfish/gConservAreas/

[2]Footrope size determines the size of roller gear attached to the bottom of the net. Requiring small footropes discourages trawling in rocky inshore areas, considered more sensitive habitat and preferred by several overfished rockfish species. Large footropes are also preferred for fishing in

the cumulative limits for deepwater species are smaller for vessels which use small footrope gear at any time in any area during a two month cumulative fishing period.

Smaller vessels are less likely to be able to carry the amount of cable necessary to fish at greater depths and are at a disadvantage operating farther offshore in bad weather. If trawl opportunities are constrained in shoreward areas, for the reasons just discussed, small vessels will either limit operations or try fishing in seaward areas. In addition to increasing costs, this could increase safety risks as more vessels operate farther offshore. The figures indicate that the seaward boundary of the GCA is generally farther offshore off the Washington and Oregon coasts. (Table A.1 and Figure A.7 display the number of vessels in different length categories for ports and port areas. See discussion below.)

Socioeconomic Conditions in Coastal Counties

Table A.1 and Figures A.4-A.8 highlight socioeconomic conditions along the West Coast. Figure A.4 shows the 2002 unemployment rate in coastal counties and groundfish landings by port group. (For reference, Figure A.8 shows port groups and their constituent ports.) Groundfish landings are represented by pie charts dividing landings between the limited entry trawl sector and all other sectors; the pie charts are scaled according to total groundfish landings. W-O-C and national unemployment rates are also shown. Unemployment by county is displayed in quartiles; an equal number of counties are grouped in each of four quartiles according to their unemployment rate. This figure can be used to determine the unemployment rate in counties where groundfish landings are significant, and compare those rates to state and national values.

Figure A.5 and A.6 map the poverty rate and per capita personal income, respectively, in similar fashion. One would expect that the unemployment and poverty rates would be positively correlated, and that these two rates would negatively correlate with per capita personal income.

Table A.1 and Figure A.7 show vessel length information for ports and port groups. The pie charts in Figure A.7 are scaled according to the total number of vessels in each port group. Note that the table and figure enumerate all vessels, not just those targeting groundfish. It can be seen that most vessels on the West Coast are under 40 feet in length. However, some ports and port groups have a larger proportion of longer vessels. In Washington, Oregon, and Northern California port groups—such as Astoria-Tillamook, Newport, and Crescent City—groundfish trawlers likely represent an important part of the longer vessel length classes. In Southern California, where groundfish trawling is less important (refer to Figure A.4 for landings), most large vessels are likely involved in other fisheries. To the degree that groundfish vessels are represented in the smaller length classes, as discussed above, the GCA (see Figures A.1-A.3) could raise a safety issue, if these smaller vessels fish farther offshore in response to the closures.

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offshore areas; the bigger bobbins keep the net from fouling in the muddy sediments typical at greater depths.

Table A.1. Number of vessels by port by length class during 2000-01 (2 pages).

	Vessel Length Category							
	<40'	40'-50'	50'-60'	60'-70'	70'-150'	>150'	Unspecified	Total
Blaine	75	18	17	3	4	-	2	119
Bellingham	109	33	39	16	9	1	3	210
Point Roberts	6	-	-	-	-	-	-	6
Friday Harbor	3	-	-	-	-	-	-	3
Anacortes	70	1	2	-	-	-	1	74
LaConner	24	1	-	-	-	-	-	25
Everett	34	8	4	3	-	-	2	51
Seattle	48	19	15	5	6	-	-	93
Tacoma	17	4	4	1	-	-	-	26
Shelton	4	-	-	-	-	-	-	4
Centralia	13	1	-	-	-	-	-	14
Puget Sound Total	**403**	**85**	**81**	**28**	**19**	**1**	**8**	**625**
Port Townsend	18	1	2	1	1	-	-	23
Quilcene	2	-	-	-	-	-	-	2
Sequim	10	-	-	-	-	-	-	10
Port Angeles	36	17	4	-	1	-	-	58
Neah Bay	2	2	1	-	-	-	-	5
La Push	4	4	2	-	-	-	-	10
NW Olympic Peninsula Total	**72**	**24**	**9**	**1**	**2**	**0**	**0**	**108**
Copalis	-	4	6	-	-	-	-	10
Aberdeen	2	-	-	-	-	-	-	2
Westport (WA)	56	53	41	16	12	-	-	178
Central WA Coast Total	**58**	**57**	**47**	**16**	**12**	**0**	**0**	**190**
Tokeland	50	2	2	1	2	-	-	57
Ilwaco	69	36	27	16	15	-	-	163
Pacific County	45	-	1	-	-	-	1	47
Columbia River	173	-	-	-	-	-	-	173
South WA Coast Total	**337**	**38**	**30**	**17**	**17**	**0**	**1**	**440**
Astoria	37	55	20	25	24	-	3	164
Gearhart-Seaside	2	-	-	-	-	-	-	2
Cannon Beach	2	-	-	-	-	-	-	2
Nehalem Bay	2	-	-	-	-	-	-	2
Garibaldi (Tillamook)	57	11	3	-	-	-	-	71
Pacific City	21	-	-	-	-	-	-	21
Astoria Tillamook Total	**121**	**66**	**23**	**25**	**24**	**0**	**3**	**262**
Depoe Bay	9	3	-	-	-	-	-	12
Newport	103	89	36	20	19	-	-	267
Waldport	6	-	-	-	-	-	-	6
Newport Total	**118**	**92**	**36**	**20**	**19**	**0**	**0**	**285**
Florence	22	5	3	-	-	-	-	30
Winchester	28	1	4	1	1	-	-	35
Charleston (Coos Bay)	72	36	11	14	12	-	1	146
Bandon	7	-	1	-	-	-	-	8
Coos Bay Total								
Port Orford	67	-	-	-	-	-	-	67
Gold Beach	23	-	-	-	-	-	-	23
Brookings	56	10	3	1	1	-	-	71
Brookings Total								
Crescent City	**70**	**35**	**22**	**6**	**8**	**-**	**-**	**141**
Orick	12	-	-	-	-	-	-	12
Trinidad	26	-	-	-	-	-	1	27
Eureka Area	36	24	11	5	1	1	-	78
Fields Landing	4	1	2	1	6	-	-	14
Eureka Total	**78**	**25**	**13**	**6**	**7**	**1**	**1**	**131**
Fort Bragg	95	18	9	5	2	-	1	130
Albion	17	-	-	-	-	-	-	17
Point Arena	19	-	-	-	-	-	-	19
Fort Bragg Total	**131**	**18**	**9**	**5**	**2**	**0**	**1**	**166**
Bodega Bay	138	24	6	2	1	-	-	171
Cloverdale	24	-	-	-	-	-	-	24
Yountville	14	-	-	-	-	-	1	15
Tomales Bay	1	-	-	-	-	-	-	1
Point Reyes	8	2	-	-	-	-	-	10
Sausilito	50	3	-	-	-	-	-	53
Oakland	1	-	-	-	-	-	-	1
Alameda	3	-	-	-	-	-	-	3

Table A.1. Number of vessels by port by length class during 2000-01 (2 pages).

	Vessel Length Category							
	<40'	40'-50'	50'-60'	60'-70'	70'-150'	>150'	Unspecified	Total
Berkeley	15	-	-	-	-	-	-	15
Richmond	9	-	-	-	1	-	-	10
San Francisco	120	23	5	4	3	-	-	155
Princeton	96	28	7	2	-	-	2	135
San Francisco Total	**479**	**80**	**18**	**8**	**5**	**0**	**3**	**593**
Gilroy	8	-	1	-	-	-	1	10
Santa Cruz	41	5	-	-	-	-	-	46
Moss Landing	90	20	16	4	2	-	-	132
Monterey	76	1	1	-	1	-	2	81
Monterey Total	**215**	**26**	**18**	**4**	**3**	**0**	**3**	**269**
San Simeon	6	-	-	-	-	-	-	6
Morro Bay	93	14	8	6	1	-	-	122
Avila	63	8	3	3	1	-	-	78
San Luis Obispo Total	**162**	**22**	**11**	**9**	**2**	**0**	**0**	**206**
Santa Barbara	118	14	1	1	1	-	1	136
Santa Cruz Island	1	-	-	-	-	-	-	1
Ventura	27	10	5	-	1	-	-	43
Oxnard	59	5	-	-	-	-	-	64
Port Hueneme	-	6	18	4	3	-	-	31
Santa Barbara Total	**205**	**35**	**24**	**5**	**5**	**0**	**1**	**275**
Terminal Island	70	19	2	1	34	-	-	126
San Pedro	64	11	14	9	14	-	-	112
Willmington	2	-	-	-	-	-	-	2
Catalina Island	40	-	-	1	-	-	-	41
Long Beach	5	1	-	-	-	-	-	6
Newport Beach	17	1	-	-	-	-	-	18
Dana Point	30	3	-	-	-	-	-	33
Los Angeles Total	**228**	**35**	**16**	**11**	**48**	**0**	**0**	**338**
North Shore	45	2	1	-	1	-	-	49
San Diego	41	16	4	1	3	-	-	65
Oceanside	21	3	-	-	2	-	-	26
San Diego Total	**107**	**21**	**5**	**1**	**6**	**0**	**0**	**140**
Other California	9	1	-	-	-	-	-	10
At-Sea Only	**-**	**-**	**-**	**-**	**15**	**-**	**6**	**21**
Grand Totals	**3068**	**712**	**384**	**178**	**208**	**2**	**28**	**4580**

NOTE: Does not include at-sea deliveries by catcher-processor. Include deliveries to motherships. Vessels delivering to motherships with other deliveries to shorebased processors were assigned to a port based on their shore based landings. Source: Derived from PacFIN monthly vessel summary files.

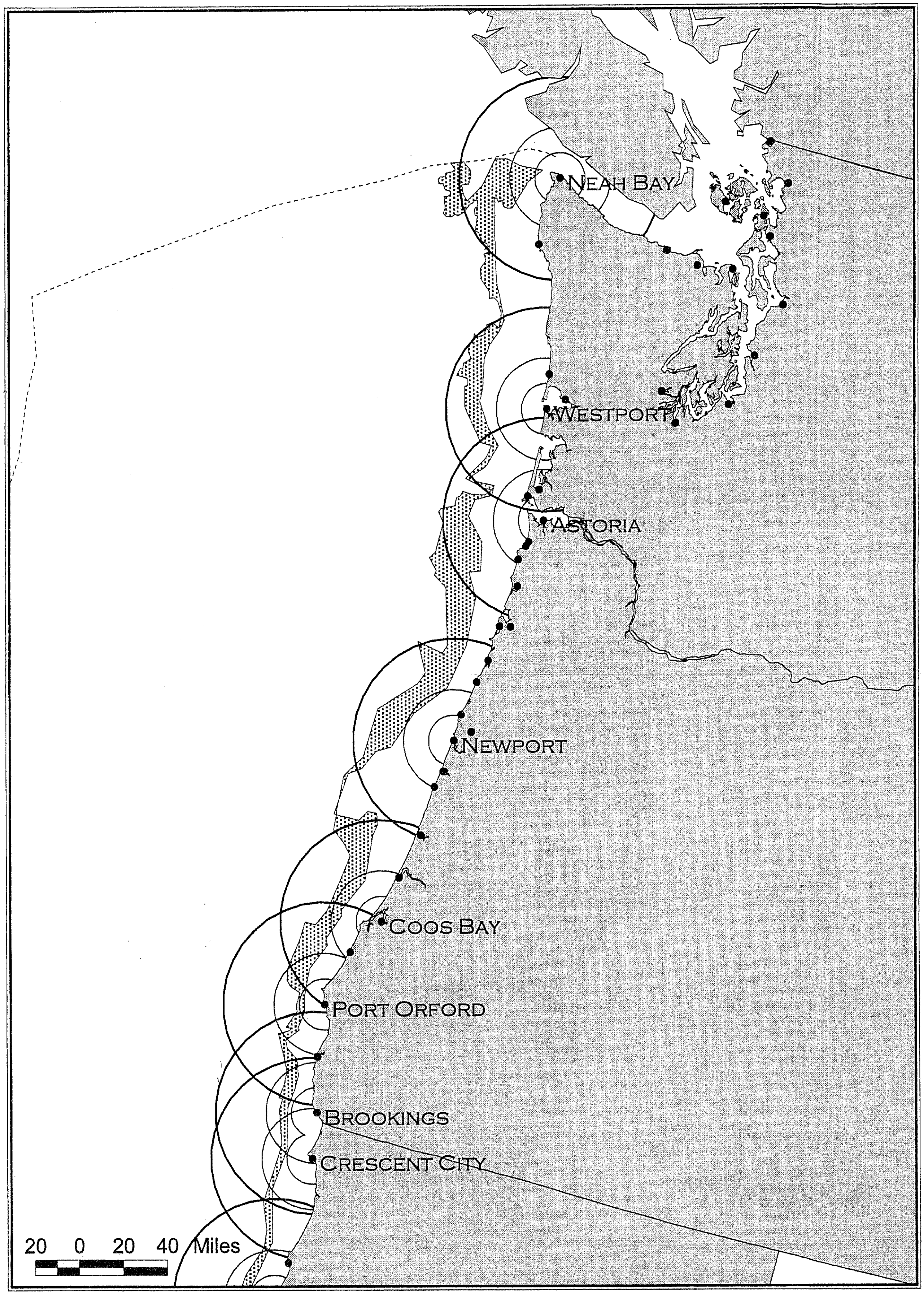


FIGURE A.1. Distance from ports compared to trawl GCA boundary, Oregon and Washington. Distance rings are at 10, 20, and 40 nm.

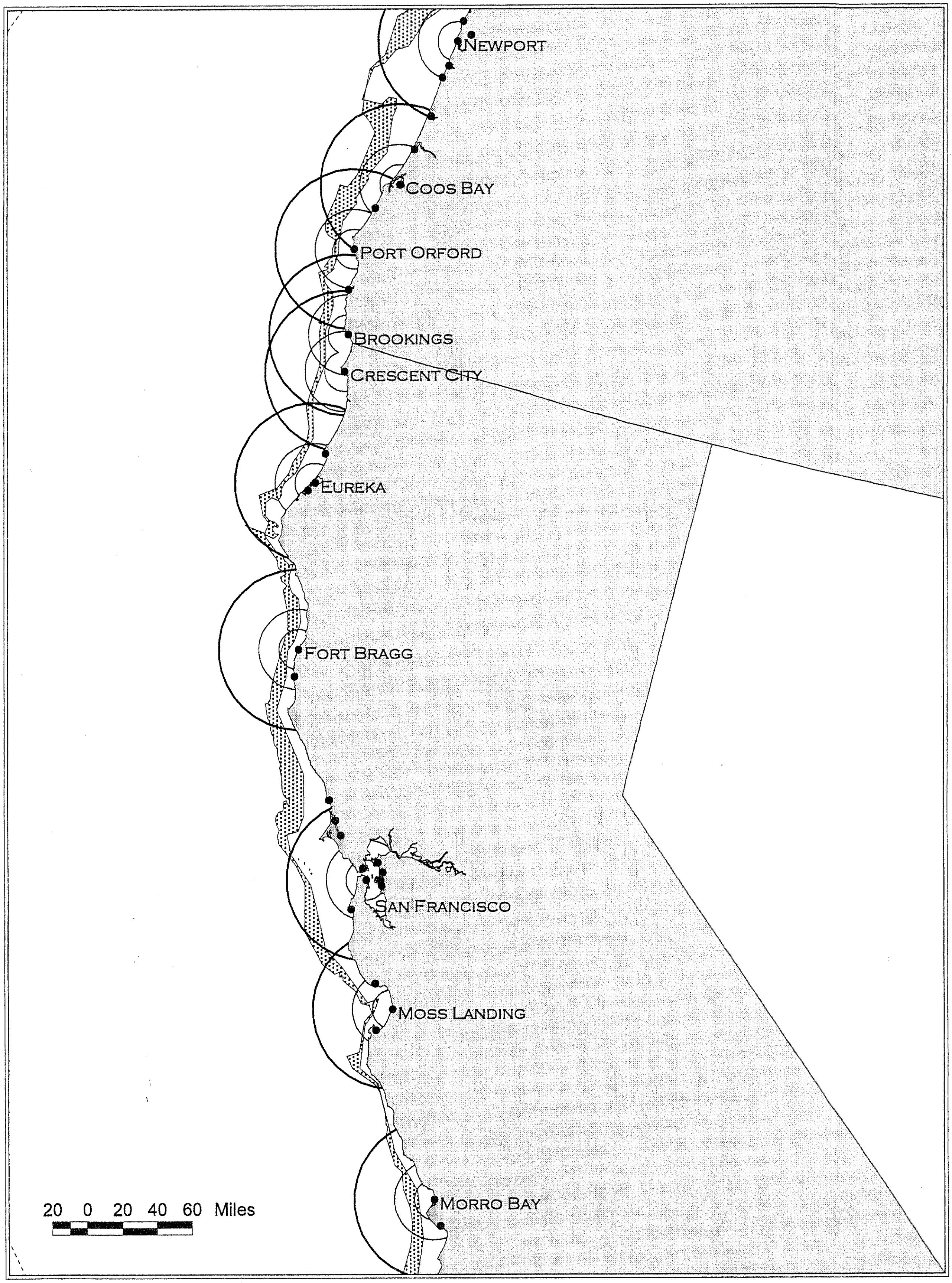


FIGURE A.2. Distance from ports compared to trawl GCA boundary, Central California.
Distance rings are at 10, 20, and 40 nm.

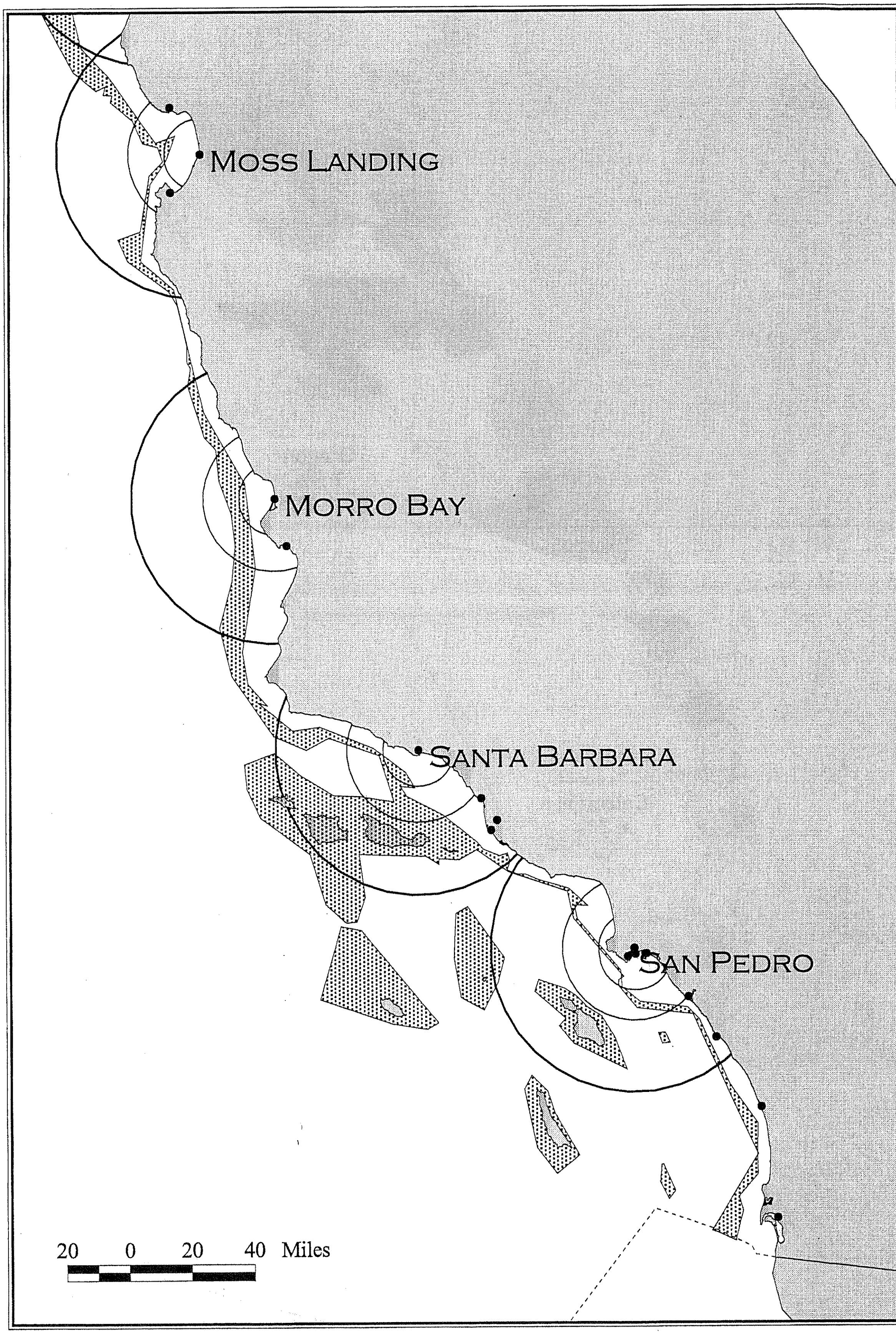


FIGURE A.3. Distance from ports compared to trawl GCA boundary, Southern California. Distance rings are at 10, 20, and 40 nm.

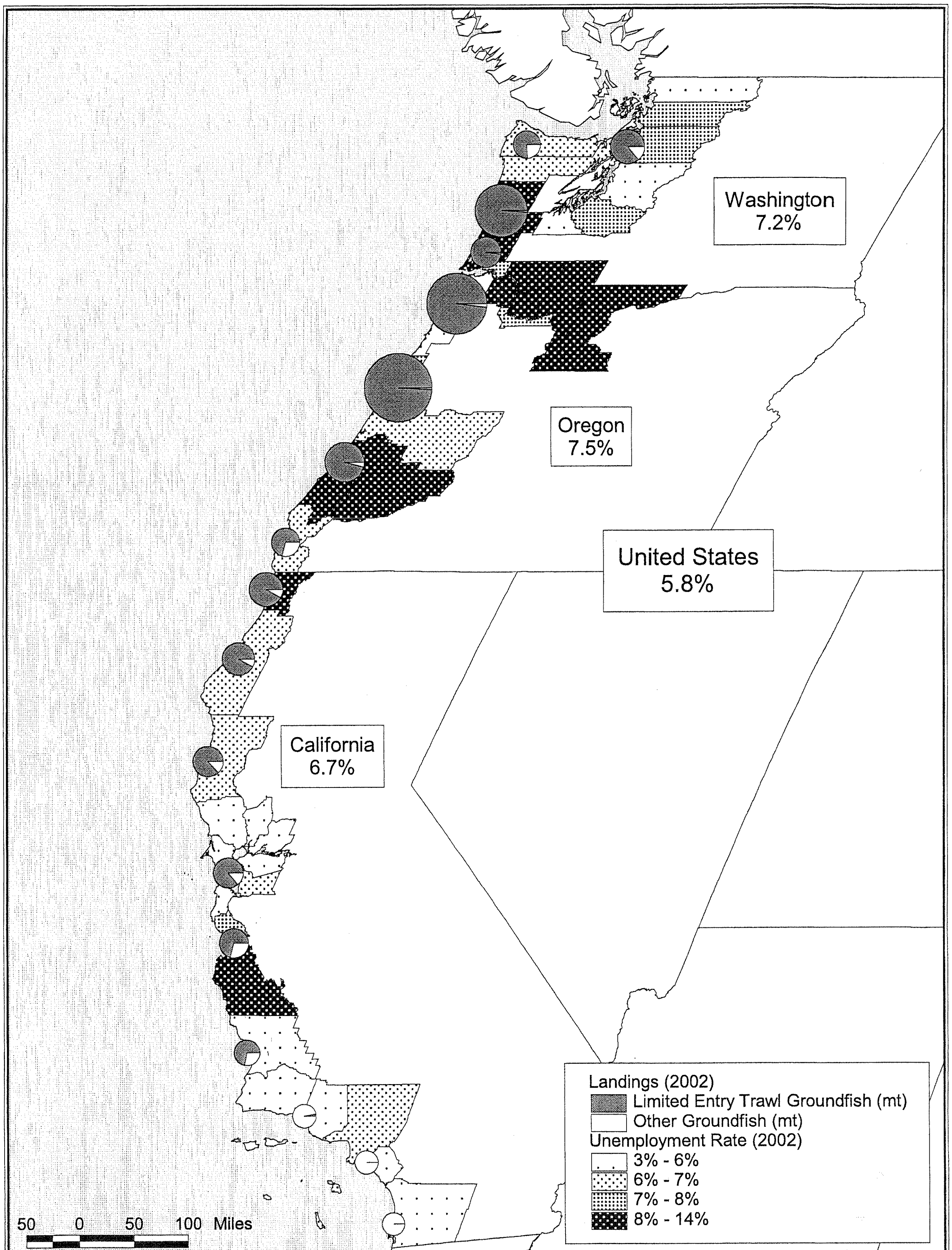


FIGURE A.4. Unemployment rate by county (quartiles) and groundfish landings by port group.

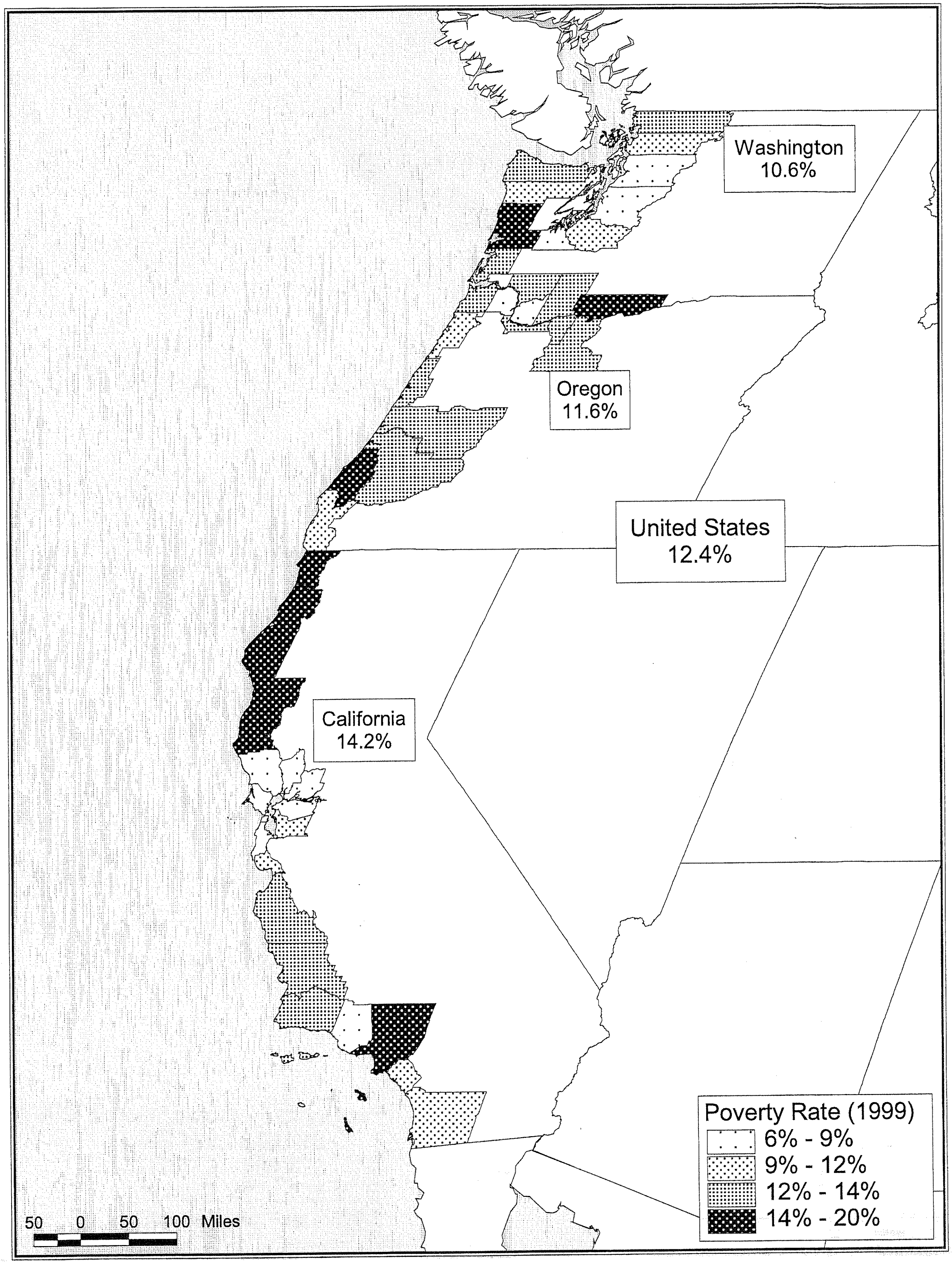


FIGURE A.5. Poverty rate by county (quartiles).

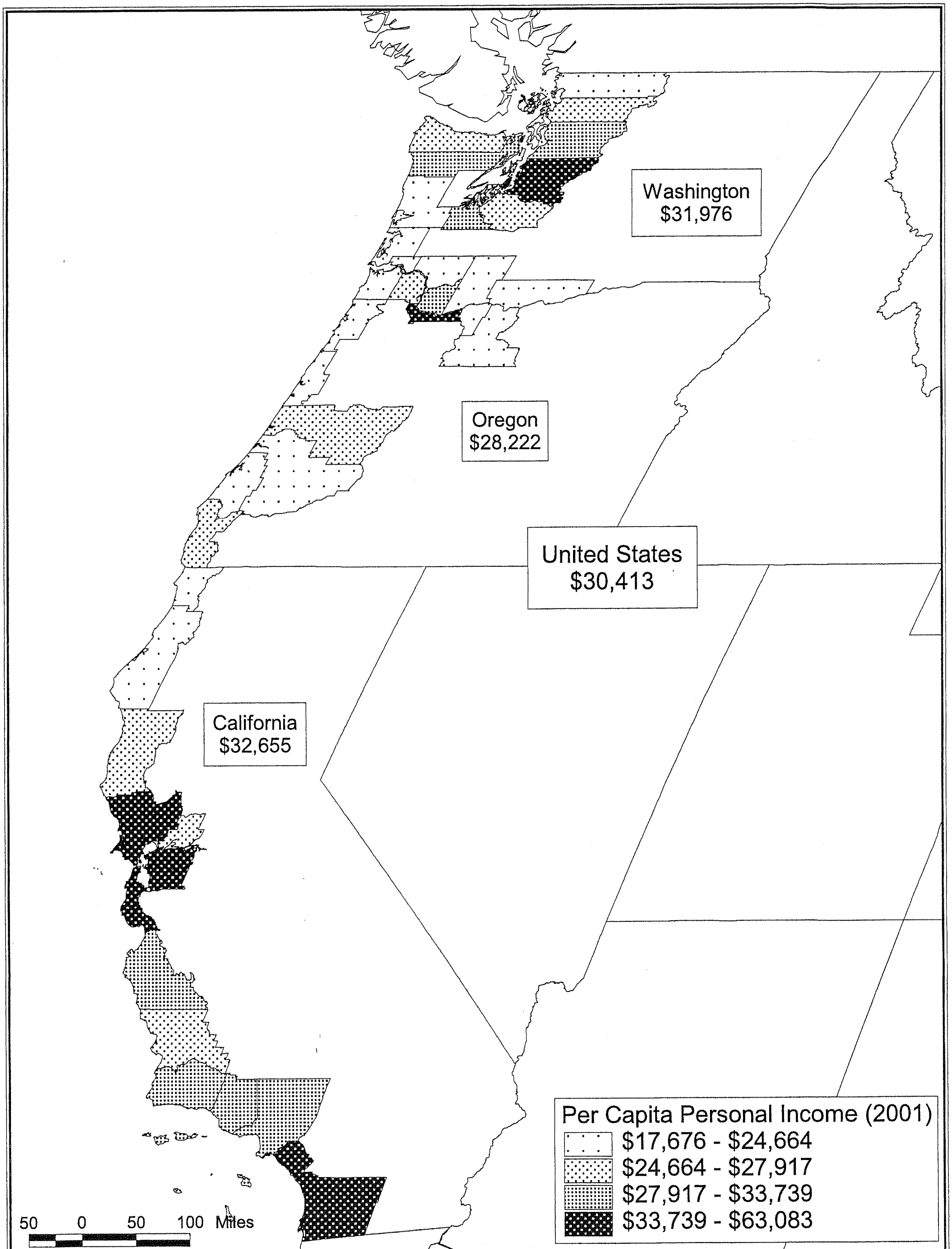


FIGURE A.6. Per capita income by county (quartiles).

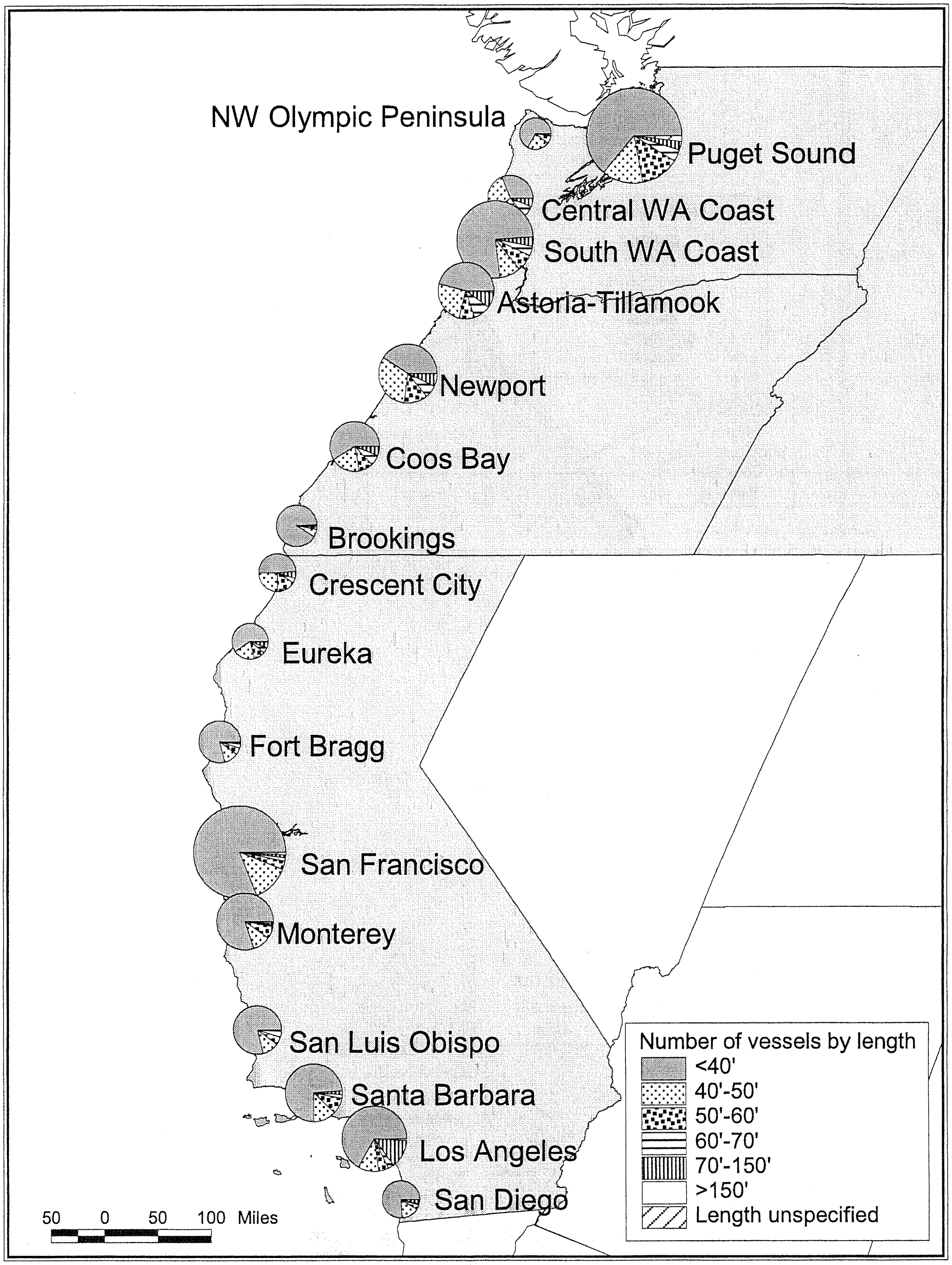


FIGURE A.7. Number of vessels by length, by port groups.

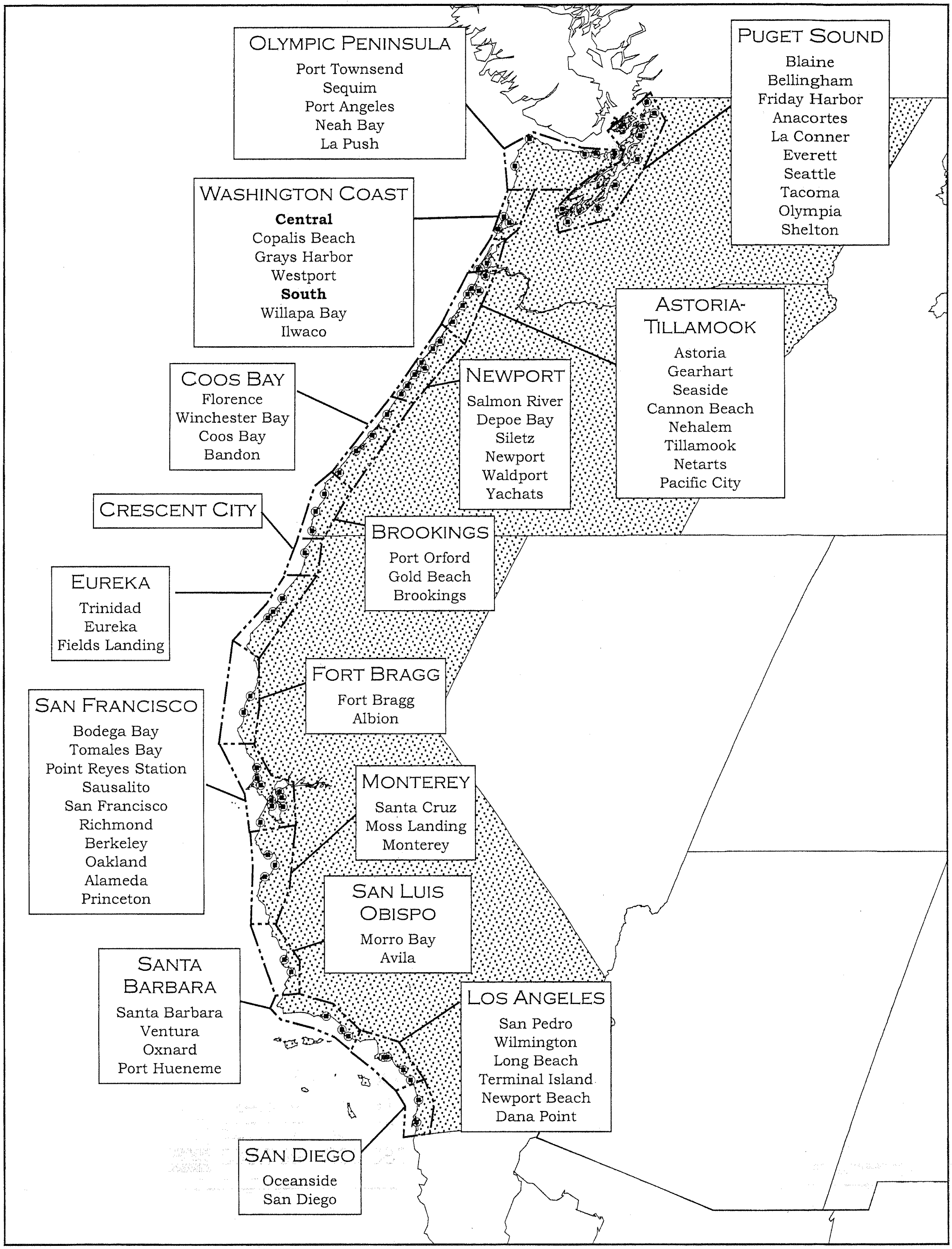


FIGURE A.8. Port areas and ports used in economic analyses.

Part B - Species managed under the Groundfish FMP

Tables and figures in this section:

TABLE B.1. Latitudinal and depth distributions of groundfish species (adults) managed under the Pacific Coast Groundfish Fishery Management Plan.

TABLE B.2. Rockfish species found on the U.S. West Coast continental slope.

TABLE B.3. Groundfish FMP species found on the U.S. West Coast continental shelf.

TABLE B.4. Groundfish FMP species found on the U.S. West Coast in nearshore areas of the continental shelf.

Table B.1. Latitudinal and depth distributions of groundfish species (adults) managed under the Pacific Coast Groundfish Fishery Management Plan.[a] (Page 1 of 2)

Common Name	Scientific Name	Latitudinal Distribution Overall	Latitudinal Distribution Highest Density	Depth Distribution (fm) Overall	Depth Distribution (fm) Highest Density
		Flatfish Species			
Arrowtooth flounder	*Atheresthes stomias*	N. 34° N. lat.	N. 40° N. lat.	10-400	27-270
Butter sole	*Isopsetta isolepis*	N. 34° N. lat.	N. 34° N. lat.	0-200	0-100
Curlfin sole	*Pleuronichthys decurrens*	Coastwide	Coastwide	4-291	4-50
Dover sole	*Microstomus pacificus*	Coastwide	Coastwide	10-500	110-270
English sole	*Parophrys vetulus*	Coastwide	Coastwide	0-300	40-200
Flathead sole	*Hippoglossoides elassodon*	N. 38° N. lat.	N. 40° N. lat.	3-300	100-200
Pacific sanddab	*Citharichthys sordidus*	Coastwide	Coastwide	0-300	0-82
Petrale sole	*Eopsetta jordani*	Coastwide	Coastwide	10-250	160-250
Rex sole	*Glyptocephalus zachirus*	Coastwide	Coastwide	10-350	27-250
Rock sole	*Lepidopsetta bilineata*	Coastwide	N. 32°30' N. lat.	0-200	summer 10-44
Sand sole	*Psettichthys melanostictus*	Coastwide	N. 33°50' N. lat.	0-100	0-44
Starry flounder	*Platichthys stellatus*	Coastwide	N. 34°20' N. lat.	0-150	0-82
		Rockfish Species			
Aurora rockfish	*Sebastes aurora*	Coastwide	Coastwide	80-420	82-270
Bank rockfish	*Sebastes rufus*	S. 39°30' N. lat.	S. 39°30' N. lat.	17-135	115-140
Black rockfish	*Sebastes melanops*	N. 34° N. lat.	N. 34° N. lat.	0-200	0-30
Black-and-yellow rockfish	*Sebastes chrysomelas*	S. 40° N. lat.	S. 40° N. lat.	0-20	0-10
Blackgill rockfish	*Sebastes melanostomus*	Coastwide	S. 40° N. lat.	48-420	125-300
Blue rockfish	*Sebastes mystinus*	Coastwide	Coastwide	0-300	13-21
Bocaccio b/	*Sebastes paucispinis*	Coastwide	S. 40° N. lat.,	15-180	54-82
Bronzespotted Rockfish	*Sebastes gilli*	S. 37° N. lat.	S. 37° N. lat.	41-205	110-160
Brown rockfish	*Sebastes auriculatus*	Coastwide	S. 40° N. lat.	0-70	0-50
Calico rockfish	*Sebastes dallii*	S. 38° N. lat.	S. 33° N. lat.	10-140	33-50
California scorpionfish	*Scorpaena gutatta*	S. 37° N. lat.	S. 34°27' N. lat.	0-100	0-100
Canary rockfish	*Sebastes pinniger*	Coastwide	Coastwide	50-150	50-100
Chameleon rockfish	*Sebastes phillipsi*	37°- 33° N. lat.	37°- 33° N. lat.	95-150	95-150
Chilipepper	*Sebastes goodei*	Coastwide	34°- 40° N. lat.	27-190	27-190
China rockfish	*Sebastes nebulosus*	N. 34° N. lat.	N. 35° N. lat.	0-70	2-50
Copper rockfish	*Sebastes caurinus*	Coastwide	S. 40° N. lat.	0-100	0-100
Cowcod	*Sebastes levis*	S. 40° N. lat.	S. 34°27' N. lat.	22-203	100-130
Darkblotched rockfish	*Sebastes crameri*	N. 33° N. lat.	N. 38° N. lat.	16-300	96-220
Dusky rockfish[c]	*Sebastes ciliatus*	N. 55° N .lat.	N. 55° N. lat.	0-150	0-150
Dwarf-Red rockfish[d]	*Sebastes rufinanus*	33° N. lat.	33° N. lat.	>100	>100
Flag rockfish	*Sebastes rubrivinctus*	S. 38° N. lat.	S. 37° N. lat.	17-100	17-100
Freckled rockfish	*Sebastes lentignosus*	S. 33° N. lat.	S. 33° N. lat.	22-92	22-92
Gopher rockfish	*Sebastes carnatus*	S. 40° N. lat.	S. 40° N. lat.	0-30	0-16
Grass rockfish	*Sebastes rastrelliger*	S. 44°40' N. lat.	S. 40° N. lat.	0-25	0-8
Greenblotched rockfish	*Sebastes rosenblatti*	S. 38° N. lat.	S. 38° N. lat.	33-217	115-130
Greenspotted rockfish	*Sebastes chlorostictus*	S. 47° N. lat.	S. 40° N. lat.	27-110	50-100
Greenstriped rockfish	*Sebastes elongatus*	Coastwide	Coastwide	33-220	27-136
Halfbanded rockfish	*Sebastes semicinctus*	S. 36°40' N. lat.	S. 36°40' N. lat.	32-220	32-220
Harlequin rockfish[e]	*Sebastes variegatus*	N. 40° N. lat.	N. 51° N. lat.	38-167	38-167
Honeycomb rockfish	*Sebastes umbrosus*	S. 36°40' N. lat.	S. 34°27' N. lat.	16-65	16-38
Kelp rockfish	*Sebastes atrovirens*	S. 39° N. lat.	S. 37° N. lat.	0-25	3-4
Longspine thornyhead	*Sebastolobus altivelis*	Coastwide	Coastwide	167->833	320-550
Mexican rockfish	*Sebastes macdonaldi*	S. 36°20' N. lat.	S. 36°20' N. lat.	50-140	50-140
Olive rockfish	*Sebastes serranoides*	S. 41°20' N. lat.	S. 40° N. lat.	0-80	0-16
Pacific ocean perch	*Sebastes alutus*	Coastwide	N. 42° N. lat.	30-350	110-220
Pink rockfish	*Sebastes eos*	S. 37° N. lat.	S. 35° N. lat.	40-200	40-200
Pinkrose rockfish	*Sebastes simulator*	S. 34° N. lat.	S. 34° N. lat.	54-160	108
Puget Sound rockfish	*Sebastes emphaeus*	N. 40° N. lat.	N. 40° N. lat.	6-200	6-200
Pygmy rockfish	*Sebastes wilsoni*	N. 32°30' N. lat.	N. 32°30' N. lat.	17-150	17-150

Table B.1. Latitudinal and depth distributions of groundfish species (adults) managed under the Pacific Coast Groundfish Fishery Management Plan.[a/] (Page 2 of 2)

Common Name	Scientific Name	Latitudinal Distribution		Depth Distribution (fm)	
		Overall	Highest Density	Overall	Highest Density
Quillback rockfish	*Sebastes maliger*	N. 36°20' N. lat.	N. 40° N. lat.	0-150	22-33
Redbanded rockfish	*Sebastes babcocki*	Coastwide	N. 37° N. lat.	50-260	82-245
Redstripe rockfish	*Sebastes proriger*	N. 37° N. lat.	N. 37° N. lat.	7-190	55-190
Rosethorn rockfish	*Sebastes helvomaculatus*	Coastwide	N. 38° N. lat.	65-300	55-190
Rosy rockfish	*Sebastes rosaceus*	S. 42° N. lat.	S. 40° N. lat.	8-70	30-58
Rougheye rockfish	*Sebastes aleutianus*	Coastwide	N. 40° N. lat.	27-400	27-250
Semaphore rockfish	*Sebastes melanosema*	S. 34°27' N. lat.	S. 34°27' N. lat.	75-100	75-100
Sharpchin rockfish	*Sebastes zacentrus*	Coastwide	Coastwide	50-175	50-175
Shortbelly rockfish	*Sebastes jordani*	Coastwide	S. 46° N. lat.	50-175	50-155
Shortraker rockfish	*Sebastes borealis*	N. 39°30' N. lat.	N. 44° N. lat.	110-220	110-220
Shortspine thornyhead	*Sebastolobus alascanus*	Coastwide	Coastwide	14->833	55-550
Silvergray rockfish	*Sebastes brevispinis*	Coastwide	N. 40° N. lat.	17-200	55-160
Speckled rockfish	*Sebastes ovalis*	S. 38° N. lat.	S. 37° N. lat.	17-200	41-83
Splitnose rockfish	*Sebastes diploproa*	Coastwide	Coastwide	50-317	55-250
Squarespot rockfish	*Sebastes hopkinsi*	S. 38° N. lat.	S. 36° N. lat.	10-100	10-100
Starry rockfish	*Sebastes constellatus*	S. 38° N. lat.	S. 37° N. lat.	13-150	13-150
Stripetail rockfish	*Sebastes saxicola*	Coastwide	Coastwide	5-230	5-190
Swordspine rockfish	*Sebastes ensifer*	S. 38° N. lat.	S. 38° N. lat.	38-237	38-237
Tiger rockfish	*Sebastes nigrocinctus*	N. 35° N. lat.	N. 35° N. lat.	30-170	35-170
Treefish	*Sebastes serriceps*	S. 38° N. lat.	S. 34°27' N. lat.	0-25	3-16
Vermillion rockfish	*Sebastes miniatus*	Coastwide	Coastwide	0-150	4-130
Widow rockfish	*Sebastes entomelas*	Coastwide	N. 37° N. lat.	13-200	55-160
Yelloweye rockfish	*Sebastes ruberrimus*	Coastwide	N. 36° N. lat.	25-300	27-220
Yellowmouth rockfish	*Sebastes reedi*	N. 40° N. lat.	N. 40° N. lat.	77-200	150-200
Yellowtail rockfish	*Sebastes flavidus*	Coastwide	N. 37° N. lat.	27-300	27-160
Roundfish Species					
Cabezon	*Scorpaenichthys marmoratus*	Coastwide	Coastwide	0-42	0-27
Kelp greenling	*Hexagrammos decagrammus*	Coastwide	N. 40° N. lat.	0-25	0-10
Lingcod	*Ophiodon elongatus*	Coastwide	Coastwide	0-233	0-40
Pacific cod	*Gadus macrocephalus*	N. 34° N. lat.	N. 40° N. lat.	7-300	27-160
Pacific whiting	*Merluccius productus*	Coastwide	Coastwide	20-500	27-270
Sablefish	*Anoplopoma fimbria*	Coastwide	Coastwide	27->1,000	110-550
Shark and Skate Species					
Big skate	*Raja binoculata*	Coastwide	S. 46° N. lat.	2-110	27-110
California skate	*Raja inornata*	Coastwide	S. 39° N. lat.	0-367	0-10
Leopard shark	*Triakis semifasciata*	S. 46° N. lat.	S. 46° N. lat.	0-50	0-2
Longnose skate	*Raja rhina*	Coastwide	N. 46° N. lat.	30-410	30-340
Soupfin shark	*Galeorhinus zyopterus*	Coastwide	Coastwide	0-225	0-225
Spiny dogfish	*Squalus acanthias*	Coastwide	Coastwide	0->640	0-190
Other Species					
Finescale codling	*Antimora microlepis*	Coastwide	N. 38° N. lat.	190-1,588	190-470
Pacific rattail	*Coryphaenoides acrolepis*	Coastwide	N. 38° N. lat.	85-1,350	500-1,350
Ratfish	*Hydrolagus colliei*	Coastwide	Coastwide	0-499	55-82

a/ Data from Casillas *et al.* 1998, Eschmeyer *et al.* 1983, Hart 1973, Miller and Lea 1972, and NMFS survey data. Depth distributions refer to offshore distributions, not vertical distributions in the water column.

b/ Only the southern stock of bocaccio south of 40°10' N latitude is listed as overfished.

c/ Dusky rockfish do not occur on the U.S. West Coast south of 49° N latitude. The species needs to be removed from the FMP.

d/ Dwarf-Red rockfish are a very rare species with only one occurrence listed in the literature (2 specimens from an underwater explosion off San Clemente Island., California in 1970; Eschmeyer *et al.* 1983). The species is not in the FMP.

e/ Only 2 occurrences of harlequin rockfish south of 51° N latitude (off Newport, Oregon and La Push, Washington; Casillas *et al.* 1998).

Table B.2. Rockfish species found on the U.S. West Coast continental slope. (Page 1 of 1)

Principal Species		Secondary Species	
Common name	Scientific name	Common name	Scientific name
North of Cape Mendocino			
Aurora rockfish	*Sebastes aurora*	Bank rockfish	*Sebastes rufus*
Darkblotched rockfish	*Sebastes crameri*	Blackgill rockfish	*Sebastes melanostomus*
Pacific ocean perch	*Sebastes alutus*		
Redbanded rockfish	*Sebastes babcocki*		
Rougheye rockfish	*Sebastes aleutianus*		
Sharpchin rockfish	*Sebastes zacentrus*		
Shortraker rockfish	*Sebastes borealis*		
Splitnose rockfish	*Sebastes diploproa*		
Yellowmouth rockfish	*Sebastes reedi*		
South of Cape Mendocino			
Aurora rockfish	*Sebastes aurora*	Darkblotched rockfish	*Sebastes crameri*
Bank rockfish	*Sebastes rufus*	Pacific ocean perch	*Sebastes alutus*
Blackgill rockfish	*Sebastes melanostomus*	Sharpchin rockfish	*Sebastes zacentrus*
Redbanded rockfish	*Sebastes babcocki*	Shortraker rockfish	*Sebastes borealis*
Rougheye rockfish	*Sebastes aleutianus*	Yellowmouth rockfish	*Sebastes reedi*
Splitnose rockfish	*Sebastes diploproa*		

Table B.3. Groundfish FMP species found on the U.S. West Coast continental shelf. (Page 1 of 1)

Principal Species		Secondary Species	
Common name	**Scientific name**	**Common name**	**Scientific name**
North of Cape Mendocino			
Arrowtooth flounder	*Atheresthes stomias*	Greenstriped rockfish	*Sebastes elongatus*
Canary rockfish	*Sebastes pinniger*	Redstripe rockfish	*Sebastes proriger*
Lingcod	*Ophiodon elongatus*	Rosethorn rockfish	*Sebastes helvomaculatus*
Tiger rockfish	*Sebastes nigrocinctus*	Sablefish (seasonal)	*Anoplopoma fimbria*
Vermillion rockfish	*Sebastes miniatus*	Silvergray rockfish	*Sebastes brevispinis*
Widow rockfish	*Sebastes entomelas*	Spiny dogfish	*Squalus acanthias*
Yelloweye rockfish	*Sebastes ruberrimus*	Yellowtail rockfish	*Sebastes flavidus*
South of Cape Mendocino			
Bocaccio	*Sebastes paucispinis*	Mexican rockfish	*Sebastes macdonaldi*
California scorpionfish	*Scorpaena gutatta*	Sablefish (seasonal)	*Anoplopoma fimbria*
Canary rockfish	*Sebastes pinniger*	Spiny dogfish	*Squalus acanthias*
Chilipepper	*Sebastes goodei*	Tiger rockfish	*Sebastes nigrocinctus*
Cowcod	*Sebastes levis*	Yellowtail rockfish	*Sebastes flavidus*
Lingcod	*Ophiodon elongatus*		
Vermillion rockfish	*Sebastes miniatus*		
Widow rockfish	*Sebastes entomelas*		
Yelloweye rockfish	*Sebastes ruberrimus*		

Table B.4. Groundfish FMP species found on the U.S. West Coast in nearshore areas of the continental shelf. (Page 1 of 1)

Principal Species		Secondary Species	
Common name	Scientific name	Common name	Scientific name
North of Cape Mendocino			
Black rockfish	*Sebastes melanops*	Brown rockfish	*Sebastes auriculatus*
Blue rockfish	*Sebastes mystinus*	Vermillion rockfish	*Sebastes miniatus*
Cabezon	*Scorpaenichthys marmoratus*		
China rockfish	*Sebastes nebulosus*		
Copper rockfish	*Sebastes caurinus*		
Lingcod	*Ophiodon elongatus*		
Kelp greenling	*Hexagrammos decagrammus*		
Quillback rockfish	*Sebastes maliger*		
South of Cape Mendocino			
Black rockfish	*Sebastes melanops*	Black-and-yellow rockfish	*Sebastes chrysomelas*
Blue rockfish	*Sebastes mystinus*	Calico rockfish	*Sebastes dallii*
Brown rockfish	*Sebastes auriculatus*	Grass rockfish	*Sebastes rastrelliger*
Cabezon	*Scorpaenichthys marmoratus*	Kelp rockfish	*Sebastes atrovirens*
California scorpionfish	*Scorpaena gutatta*		
Copper rockfish	*Sebastes caurinus*		
Gopher rockfish	*Sebastes carnatus*		
Lingcod	*Ophiodon elongatus*		
Olive rockfish	*Sebastes serranoides*		
Treefish	*Sebastes serriceps*		

Part C - Bycatch information on the Pacific whiting and selected open access fisheries

Tables and figures in this section:

Table C.1. Bycatch of overfished groundfish species in the West Coast Pacific whiting fishery, 1998 through 2001.

Whiting Fishery Sector	Year	Estimated Bycatch (mt)						
		Canary	Dark-blotched	Lingcod	POP	Widow	Whiting	Yelloweye
At-Sea	1998	0.55 a/	2.44 a/	0.16 a/	2.82 a/	307	120,452	NA
	1999	3.85 a/	3.87 a/	0.01 a/	2.70 a/	149	115,259	NA
	2000	1.42	2.93 a/	0.18 a/	9.61	221	114,655	4.04 a/
	2001	1.61	6.36 a/	0.15 a/	19.74	169	94,451	NA
Shoreside	1998	0.38	3.97	0.44	27.26	366	87,626	0.05
	1999	0.61	0.42	0.61	7.47	192	83,272	0.02
	2000	0.52	1.21	0.83	0.22	76	85,652	0.00
	2001	0.45	0.81	0.76	0.04	42	73,326	0.00
Tribal	1998	NA	NA	NA	NA	14	24,509	NA
	1999	NA	NA	NA	NA	37	25,844	NA
	2000	NA	NA	NA	NA	10	6,251	NA
	2001	NA	NA	NA	NA	NA	NA	NA

a/ Estimates reflect only landed catch from PacFIN.

Table C.2. Catch and bycatch in the Gillnet fishery, 1996-2000, by depth strata, number of fish or number of pounds (information on average weight per fish is required to sum the number of fish and pounds rows, generating a single number to represent bycatch). (2 pages)

Year	Unit	Species Caught (in thousands of the specified unit)																										
		Bocaccio	California halibut	California sheephead	Canary rockfish	Chilipepper rockfish	Cowcod	CPS	Dungeness crab	Gillnet complex	HMS	HMS shark	Lingcod	Monitored HMS	Nearshore rockfish	Ocean whitefish	Other crustacean	Other fish	Other flatfish	Other nearshore sp.	Other shark	Other shelf flatfish	Other shelf sp.	Pacific whiting	Petrale sole	Sablefish	Shelf rockfish	Slope rockfish	Unspecified rockfish	Widow rockfish
		No Depth Reported																												
'96	Number	1.7	36.2	0.0	_	_	_	1.6	0.0	0.2	_	0.0	8.9	0.3	0.2	_	0.6	0.4	0.4	0.0	3.3	_	_	_	0.0	0.1	0.3	_	3.2	_
	Lbs	0.0	10.4	_	_	_	_	2.8	_	0.3	_	0.1	0.0	0.4	0.2	_	0.4	0.9	0.1	_	12.7	_	_	_	_	_	1.4	_	1.4	_
'97	Number	0.0	10.5	0.0	_	_	_	0.2	0.0	1.0	_	0.1	0.0	0.0	0.1	_	0.2	1.1	0.3	0.0	2.7	_	0.1	_	0.0	_	_	_	0.1	_
	Lbs	_	_	4.5	_	_	_	0.5	0.3	0.0	_	0.5	_	0.1	0.4	_	0.0	0.2	10.0	0.3	10.1	_	_	_	0.0	_	_	_	0.2	_
'99	Number	_	3.6	0.0	_	_	_	0.0	_	0.8	0.0	0.3	0.0	0.0	0.2	0.0	0.0	4.0	0.1	0.0	1.4	_	_	_	_	_	_	_	0.0	_
	Lbs	_	12.7	0.0	_	_	_	4.4	_	10.2	_	0.4	0.0	0.2	0.0	_	0.5	0.2	0.1	_	5.3	_	_	_	_	_	_	_	_	_
'00	Number	_	2.9	0.0	_	_	_	_	_	0.3	_	0.0	_	0.0	0.1	_	_	_	0.3	0.0	0.7	_	0.1	_	_	_	_	_	_	_
	Lbs	_	1.9	_	_	_	_	2.1	_	6.5	_	_	_	_	_	_	0.0	0.2	_	_	0.6	_	2.2	_	_	_	_	_	_	_
		1-20 fathoms																												
'96	Number	_	6.3	0.0	_	_	_	0.0	_	0.2	_	0.1	0.0	5.6	0.3	_	0.0	0.3	0.1	0.0	1.5	_	_	0.0	_	_	_	_	0.1	_
	Lbs	_	1.7	0.0	_	_	_	4.9	_	15.4	_	_	_	0.4	0.0	_	0.2	0.7	0.1	_	8.9	_	_	0.0	_	_	_	_	_	_
'97	Number	0.5	13.2	0.1	_	5.6	_	1.8	0.1	1.4	_	0.2	1.1	0.6	0.6	0.0	0.4	1.1	0.4	0.1	3.3	_	0.1	_	0.1	_	_	_	0.1	0.8
	Lbs	_	0.0	_	_	_	_	11.8	_	25.2	_	_	_	_	0.2	_	0.2	0.7	0.0	_	17.3	_	_	_	_	_	_	_	_	_
'98	Number	_	7.8	0.1	_	_	_	_	0.1	1.0	_	0.2	0.0	0.5	0.3	0.0	0.2	1.7	0.1	0.0	2.4	_	1.1	_	_	_	_	_	0.1	_
	Lbs	_	5.9	0.0	_	_	_	_	_	0.5	_	0.2	_	1.2	0.5	_	0.8	0.6	_	_	8.6	_	_	_	_	_	_	_	0.0	_
'99	Number	_	18.4	0.1	_	_	_	2.6	_	2.8	_	0.6	_	1.1	0.7	0.0	0.6	1.0	0.2	0.0	3.5	_	0.3	_	0.0	_	_	_	0.1	_
	Lbs	_	7.3	_	_	_	_	6.1	_	9.5	_	3.1	0.0	0.9	0.4	_	0.3	0.5	0.0	_	6.6	_	_	_	_	_	_	_	0.2	_
'00	Number	_	4.8	0.0	_	_	_	0.7	_	0.6	_	0.0	_	0.1	0.0	_	_	0.0	0.1	_	1.8	_	0.0	_	_	_	_	_	0.0	_
	Lbs	_	1.3	_	_	_	_	0.6	_	2.8	_	_	_	0.1	0.0	_	_	0.1	_	_	1.1	_	_	_	_	_	_	_	_	_
		20-150 fathoms																												
'96	Number	2.3	13.6	0.0	_	0.0	0.0	2.1	0.1	2.4	_	0.4	0.8	3.1	0.3	0.0	0.0	3.8	0.4	0.1	3.2	0.0	_	0.0	0.0	0.0		_	15.8	_
																													183.	
	Lbs	6.3	21.3	0.0	_	2.7	0.1	25.9	_	20.8	_	0.7	2.2	0.7	0.3	0.0	0.3	4.5	0.5	_	2.8	0.3	_	0.1	0.1	0.3	0.2	_	7	0.2
'97	Number	8.9	29.9	0.1	_	14.5	_	7.6	0.5	10.1	_	0.8	11.0	3.5	3.9	0.1	0.1	7.5	0.8	0.0	2.6	0.1	0.0	_	0.0	0.4	1.4	_	9.4	10.5
																													112.	
	Lbs	2.4	_	0.0	_	0.1	_	6.1	0.1	4.4	_	_	0.0	0.0	1.5	0.1	0.0	0.9	2.0	_	0.2	_	_	_	_	_	_	_	2	0.0
'98	Number	4.9	17.0	0.1	0.0	2.1	0.2	1.3	0.1	2.7	_	0.7	0.4	1.9	0.3	0.1	0.6	10.7	0.4	0.0	4.2	_	4.5	0.0	0.0	0.1	9.1	_	17.2	_
																													105.	
	Lbs	8.4	0.1	_	_	0.5	_	1.6	_	1.7	_	0.1	_	2.0	0.8	0.0	0.3	8.5	0.2	_	1.6	_	_	_	_	_	0.1	0.3	3	_
'99	Number	0.4	20.2	0.0	_	1.0	_	5.5	0.4	3.2	_	0.8	0.1	3.4	0.5	0.0	0.5	3.5	0.7	0.0	3.8	_	4.0	0.3	0.0	_	_	_	0.6	_
	Lbs	0.8	39.0	_	_	1.3	0.2	0.7	_	12.4	_	0.5	0.1	2.4	0.2	_	0.2	5.8	0.0	_	2.9	_	0.0	_	_	_	0.6	0.8	11.0	_
'00	Number	_	4.9	0.0	_	_	_	0.1	0.1	1.9	_	0.1	_	0.3	0.0	_	0.3	0.1	0.4	_	1.5	_	0.0	0.0	_	_	_	_	0.0	_
	Lbs	_	_	_	_	_	_	0.1	_	27.6	_	_	_	_	_	_	0.0	_	_	_	_	_	_	_	_	_	_	_	_	_
		1-50 fathoms																												

Table C.2. Catch and bycatch in the Gillnet fishery, 1996-2000, by depth strata, number of fish or number of pounds (information on average weight per fish is required to sum the number of fish and pounds rows, generating a single number to represent bycatch). (2 pages)

		Species Caught (in thousands of the specified unit)																												
Year	Unit	Bocaccio	California halibut	California sheephead	Canary rockfish	Chilipepper rockfish	Cowcod	CPS	Dungeness crab	Gillnet complex	HMS	HMS shark	Lingcod	Monitored HMS	Nearshore rockfish	Ocean whitefish	Other crustacean	Other fish	Other flatfish	Other nearshore sp	Other shark	Other shelf flatfish	Other shelf sp.	Pacific whiting	Petrale sole	Sablefish	Shelf rockfish	Slope rockfish	Unspecified rockfish	Widow rockfish
'96	Number	0.8	19.8	0.0	_	0.0	0.0	1.7	0.1	2.5	_	0.4	0.4	6.3	0.5	0.0	0.0	3.0	0.4	0.1	4.5	_	_	0.0	0.0	0.0	_	_	0.2	_
	Lbs	0.6	22.9	0.0	_	_	_	30.8	_	36.2	_	0.5	0.5	1.1	0.3	0.0	0.6	4.0	0.5	_	11.7	0.0	_	0.1	_	_	0.0	_	0.6	_
'97	Number	0.5	43.0	0.2	_	5.6	_	9.2	0.6	11.5	_	0.9	1.2	1.9	4.6	0.1	0.5	4.1	1.0	0.1	5.7	_	0.1	_	0.1	_	_	_	0.4	0.8
	Lbs	_	0.0	_	_	_	_	17.8	0.1	29.7	_	_	_	_	1.6	0.1	0.3	1.6	2.0	_	17.5	_	_	_	_	_	_	_	_	_
'98	Number	_	24.7	0.2	_	_	_	1.3	0.2	3.6	_	0.8	0.0	1.6	0.6	0.0	0.8	11.9	0.5	0.0	6.5	_	5.6	0.0	0.0	0.0	_	_	0.4	_
	Lbs	_	6.0	0.0	_	_	_	1.6	_	2.2	_	0.2	_	2.0	1.3	_	1.1	8.8	0.1	_	9.9	_	_	_	_	_	_	_	0.2	_
'00	Number	_	9.7	0.0	_	_	_	0.7	0.1	2.5	_	0.1	_	0.3	0.1	_	0.3	0.2	0.5	_	3.3	_	0.0	0.0	_	_	_	_	0.0	_
	Lbs	_	1.3	_	_	_	_	0.7	_	30.3	_	_	_	0.1	0.0	_	0.0	0.1	_	_	1.1	_	_	_	_	_	_	_	_	_
50-150 fathoms																														
'96	Number	1.5	0.1	_	_	_	0.0	0.4	_	0.0	_	0.1	0.4	2.4	0.1	_	_	1.0	0.1	_	0.2	0.0	_	_	_	_	_	_	15.6	_
	Lbs	5.7	_	_	_	2.7	0.1	0.0	_	0.0	_	0.2	1.7	0.0	_	_	_	1.2	_	_	0.1	0.2	_	_	0.1	0.3	0.2	_	183.2	0.2
'97	Number	8.9	0.1	_	_	14.5	_	0.1	_	_	_	0.1	10.9	2.2	0.0	0.0	_	4.5	0.1	_	0.1	0.1	_	_	_	0.4	1.4	_	9.2	10.5
	Lbs	2.4	_	0.0	_	0.1	_	0.1	_	_	_	_	0.0	0.0	_	0.0	_	_	0.0	_	0.0	_	_	_	_	_	_	_	112.2	0.0
'98	Number	4.9	0.1	_	0.0	2.1	0.2	_	_	0.1	_	0.1	0.4	0.8	0.0	0.0	_	0.4	0.1	_	0.1	_	_	_	_	0.1	9.1	_	17.0	_
	Lbs	8.4	_	_	_	0.5	_	_	_	_	_	0.1	_	1.2	_	0.0	_	0.3	0.0	_	0.3	_	_	_	_	_	0.1	0.3	105.1	_
'99	Number	0.4	0.2	_	_	1.0	_	_	_	0.1	_	0.1	0.0	1.7	0.0	_	_	0.0	_	_	0.0	_	0.8	_	_	_	_	_	0.4	_
	Lbs	0.8	_	_	_	1.3	0.2	_	_	_	_	0.1	0.1	1.1	_	_	0.2	2.4	_	_	0.1	_	_	_	_	_	0.6	0.8	11.0	_
'00	Number	_	0.0	_	_	_	_	_	_	_	_	_	_	0.0	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_
	Lbs	_	_	_	_	_	_	_	_	0.2	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_
150 + fathoms																														
'96	Number	0.7	_	_	_	0.5	_	_	_	_	_	0.0	0.5	0.0	_	_	_	0.2	0.0	_	0.0	0.0	_	_	_	0.3	_	_	0.6	_
	Lbs	0.9	_	_	_	0.4	_	_	_	_	_	_	_	_	_	_	_	0.0	0.0	_	0.0	0.1	_	_	_	1.1	_	_	5.4	_
'97	Number	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	3.0	1.4	_
	Lbs	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	25.4	_
'98	Number	_	0.0	_	_	_	_	_	_	0.0	_	0.0	0.0	_	_	_	_	_	_	_	0.0	_	_	_	_	_	_	_	_	_
	Lbs	1.1	_	_	_	0.4	_	_	_	_	_	_	_	_	_	_	_	3.3	_	_	_	_	_	_	_	_	_	0.7	_	_
'99	Number	_	0.0	_	_	_	_	0.4	_	_	_	0.0	_	0.0	0.0	_	_	0.0	_	_	0.1	_	_	_	_	_	_	_	_	_
	Lbs	_	_	_	_	_	_	_	_	_	_	_	_	0.2	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_

NOTE: "0.0" indicates more than one but less than fifty.

Table C.3. Catch and bycatch in the Market Squid fishery from vessel logbooks.

			Fleet Average CPUE																	
						Pounds of Bycatch						Pounds of Bycatch per Pound of Targeted Species								
Area	Depth	Year	Number of Sets	Pounds of Targeted Species Landed	Catch Per Set of Targeted Species	Bocaccio	Canary	Cowcod	Yelloweye	Lingcod	Unspecified Rockfish	Bocaccio	Canary	Cowcod	Yelloweye	Lingcod	Unspecified Rockfish			
North	<20 fm	1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA			
		2000	386	5,288,000	13,699	0	0	0	0	0	500	0	0	0	0	0	0			
		2001	356	9,362,000	26,298	0	0	0	0	0	0	0	0	0	0	0	0			
		2002	645	14,598,000	22,633	0	0	0	0	0	0	0	0	0	0	0	0			
	>20 and <150 fm	1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA			
		2000	8	226,000	28,250	0	0	0	0	0	0	0	0	0	0	0	0			
		2001	31	700,000	22,581	0	0	0	0	0	0	0	0	0	0	0	0			
		2002	246	5,436,000	22,098	0	0	0	0	0	0	0	0	0	0	0	0			
		1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA			
		2000	7	120,000	17,143	0	0	0	0	0	0	0	0	0	0	0	0			
		2001	18	412,000	22,889	0	0	0	0	0	0	0	0	0	0	0	0			
		2002	15	550,000	36,667	0	0	0	0	0	0	0	0	0	0	0	0			
	>10 and <150 fm	1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA			
		2000	387	5,394,000	13,938	0	0	0	0	0	500	0	0	0	0	0	0			
		2001	369	9,650,000	26,152	0	0	0	0	0	0	0	0	0	0	0	0			
		2002	876	19,484,000	22,242	0	0	0	0	0	0	0	0	0	0	0	0			
South	<20 fm	1999	6	496,000	82,667	0	0	0	0	0	0	0	0	0	0	0	0			
		2000	1,512	58,664,000	38,799	0	0	0	0	0	0	0	0	0	0	0	0			
		2001	1,159	44,280,000	38,205	0	0	0	0	0	0	0	0	0	0	0	0			
		2002	497	15,498,000	31,183	0	0	0	0	0	0	0	0	0	0	0	0			
	>20 and <150 fm	1999	27	2,168,000	80,296	0	0	0	0	0	0	0	0	0	0	0	0			
		2000	1,085	48,262,000	44,481	0	0	0	0	0	0	0	0	0	0	0	0			
		2001	1,020	42,486,000	41,653	0	0	0	0	0	0	0	0	0	0	0	0			
		2002	554	20,946,000	37,809	0	0	0	0	0	0	0	0	0	0	0	0			
	<10 fm	1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
		2000	19	692,000	36,421	0	0	0	0	0	0	0	0	0	0	0	0			
		2001	26	796,000	30,615	0	0	0	0	0	0	0	0	0	0	0	0			
		2002	3	36,000	12,000	0	0	0	0	0	0	0	0	0	0	0	0			
	>10 and <150 fm	1999	33	2,664,000	80,727	0	0	0	0	0	0	0	0	0	0	0	0			
		2000	2,578	106,234,000	41,208	0	0	0	0	0	0	0	0	0	0	0	0			
		2001	2,153	85,970,000	39,930	0	0	0	0	0	0	0	0	0	0	0	0			
		2002	1,048	36,408,000	34,740	0	0	0	0	0	0	0	0	0	0	0	0			

Table C.4. Estimated bycatch (mt) of overfished groundfish in the Oregon Pink Shrimp Trawl fishery with and without Bycatch Reduction Devices (BRDs) based on 1995-1999 average landings and a fish excluder study conducted in 1995 (Hannah *et al.* 1996).

Species	Bycatch Without BRDs	Bycatch With BRDs	Bycatch Reduction Rate Using BRDs[a/]
Canary Rockfish	12.70	0.19	98.5%
Darkblotched Rockfish	3.10	1.10	65.0%
Pacific Ocean Perch	0.31	0.01	98.5%
Lingcod	20.30	0.41	98.0%
Widow Rockfish	4.03	0.07	98.5%
Pacific Whiting Adults	3,294	494	85.0%
Pacific Whiting Juveniles[b/]	1,581	1,522	35.0%

a/ Data from Hannah *et al.* (1996).

b/ Juvenile whiting ($\leq$33 cm) are rare off Oregon but were high in 1995 when the Hannah et al. (1996) study was done.

Table C.5. Incidental overfished groundfish landings (lbs) in non-tribal commercial Salmon Troll fisheries by salmon management area for 2000 and 2001. a/

Port Area Year	Lingcod	Bocaccio	Species Canary	Darkblotched	Widow	Yelloweye b/	All Groundfish c/
Neah Bay-La Push							
2000	NA	NA	469	NA	65	205	5,788
2001	NA	NA	175	NA	40	101	5,900
Westport-Astoria							
2000	NA	NA	119	NA	15	-	2,399
2001	NA	NA	97	NA	-	-	835
Central Oregon							
2000	NA	NA	2,332	NA	102	132	18,250
2001	NA	NA	1,264	NA	136	99	18,274
Oregon KMZ							
2000	NA	NA	167	NA	9	4	1,693
2001	NA	NA	185	NA	70	9	1,867
California KMZ							
2000	-	NA	-	-	-	-	249
2001	40	NA	-	-	-	-	64
Fort Bragg							
2000	50	12	91	-	-	NA	711
2001	121	9	61	-	22	NA	470
San Francisco							
2000	455	106	115	-	6	NA	2,971
2001	439	2	51	-	-	NA	807
Monterey-Conception							
2000	183	311	65	-	-	NA	2,308
2001	-	16	8	-	-	NA	166
Total							
2000	688	429	3,357	-	197	341	34,369
2001	600	27	1,841	-	268	209	28,382
Total (mt)							
2000	0.31	0.20	1.53	0.00	0.09	0.16	15.62
2001	0.27	0.01	0.84	0.00	0.12	0.10	12.90

a/ Salmon troll landings are defined as those for which salmon represents at least 50% by weight of the total ticketed landing. N/A indicates that individual species estimates were not made. Data from PacFIN.

b/ Yelloweye rockfish were not separated on landing tickets, so a proxy of shelf rockfish with an exvessel value of >$1.00/lb was used for areas north of Cape Mendocino. For areas south of Cape Mendocino yelloweye catch was not estimated, however landings are assumed negligible because of species distribution, the absence of commercial landings in the area between Cape Mendocino and the OR/CA border, and the scarcity of recreational landings in California.

c/ All Groundfish category includes species where individual estimates were not available.

Table C.6. Estimated bycatch of overfished groundfish species in Spot Prawn Trawl and Trap fisheries south of Cape Mendocino.

Species	Pounds of Bycatch/1,000 Pounds of Prawns	Estimated Total Catch (lbs)
	Trawls	
South of Pt. Conception		
Bocaccio	0.8	1,223
Cowcod	< 0.1	62
Darkblotched	0.2	249
Pacific Whiting	4,569	209,260
North of Pt. Conception		
Bocaccio	31.11	4,381
Canary	0.32	45
Cowcod	6.95	978
Darkblotched	99.86	14,060
Lingcod	212.63	29,938
Pacific Whiting	1,741	267,813
Widow	33.03	4,651
Yelloweye	0.64	90
	Traps	
South of Pt. Conception		
Bocaccio	4.0	574
Cowcod	3.0	370
Lingcod	37.0	4,982
North of Pt. Conception		
Cowcod	0.20	5
Darkblotched	0.10	2
Lingcod	4.40	104
Widow	0.30	7
Yelloweye	0.60	15

Source: Estimates from Reilly and Geibel (2002) for the October 2000 through September 2001 period.

Table C.7. Annual coastwide and area participation in the Highly Migratory Species gillnet fishery by open-access vessels, with associated groundfish on the same landing day, 1990 through 2001. (2 pages)

Area/Landings	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
CA: N of Cape Mendocino											
Metric tons											
HMS gillnet		1	11	28	1	5	5	14	4	12	1
Groundfish		0	0	0	0	0	0	0	0	0	0
% of HMS gillnet		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Number of vessels											
HMS gillnet		1	13	15	2	9	8	13	6	5	2
with groundfish		0	0	0	0	0	0	0	0	0	0
Percent of HMS gillnet		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Number of trips											
HMS gillnet		3	17	27	3	16	13	25	11	14	4
with groundfish		0	0	0	0	0	0	0	0	0	0
Percent of HMS gillnet		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
CA: Cape Mendocino - Pt Conception											
Metric tons											
HMS gillnet	1	2	14	40	58	93	89	67	62	25	73
Groundfish	0	0	0	0	0	0	0	0	0	0	0
Percent of HMS gillnet	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Number of vessels											
HMS gillnet	6	12	31	43	52	54	54	45	34	26	20
with groundfish	0	0	0	0	1	1	3	2	0	0	3
Percent of HMS gillnet	0%	0%	0%	0%	2%	2%	6%	4%	0%	0%	15%
Number of trips											
HMS gillnet	6	15	51	82	148	160	204	149	101	68	52
with groundfish	0	0	0	0	1	1	3	2	0	0	4
Percent of HMS gillnet	0%	0%	0%	0%	1%	1%	1%	1%	0%	0%	8%
CA: S of Pt. Conception											
Metric tons											
HMS gillnet	0	0	3	11	79	24	55	110	73	75	75
with Groundfish	0	0	0	1	0	1	4	10	12	6	3
Percent of HMS gillnet	0%	0%	8%	13%	0%	4%	6%	9%	16%	8%	4%
Number of vessels											
HMS gillnet	3	3	24	56	71	75	74	101	88	78	64
with groundfish	0	0	4	6	8	17	24	32	30	38	16
Percent of HMS gillnet	0%	0%	17%	11%	11%	23%	32%	32%	34%	49%	25%
Number of trips											
HMS gillnet	3	4	37	115	219	251	412	769	499	548	223
with groundfish	0	0	7	6	13	38	110	228	129	116	47
Percent of HMS gillnet	0%	0%	19%	5%	6%	15%	27%	30%	26%	21%	21%

Table C.7. Annual coastwide and area participation in the Highly Migratory Species gillnet fishery by open-access vessels, with associated groundfish on the same landing day, 1990 through 2001. (2 pages)

Area/Landings	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Coastwide											
Metric tons											
HMS gillnet	1	3	27	79	138	122	150	192	141	113	149
with Groundfish	0	0	0	1	0	1	4	10	12	6	3
Percent of HMS gillnet	0%	0%	1%	2%	0%	1%	3%	5%	8%	5%	2%
Number of vessels											
HMS gillnet	9	14	53	84	95	104	103	110	105	86	71
with groundfish	0	0	4	6	9	18	27	34	31	38	19
Percent of HMS gillnet	0%	0%	8%	7%	9%	17%	26%	31%	30%	44%	27%
Number of trips											
HMS gillnet	9	22	105	224	371	430	631	953	615	630	279
with groundfish	0	0	7	6	14	39	113	230	130	116	51
Percent of HMS gillnet	0%	0%	7%	3%	4%	9%	18%	24%	21%	18%	18%

Table C.8. Annual coastwide and area participation in the Highly Migratory Species seine fishery by open-access vessels, with associated groundfish on the same landing day, 1990 through 2001.

Area / Landings	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
CA: Cape Mendocino - Pt. Conception												
Metric tons												
HMS seine			0					0		98		110
with groundfish			0					0		0		0
Percent of HMS seine			0%					0%		0%		0%
Number of vessels												
HMS seine			1					1		3		4
with groundfish			0					0		0		0
Percent of HMS seine			0%					0%		0%		0%
Number of trips												
HMS seine			1					1		10		13
with groundfish			0					0		0		0
Percent of HMS seine			0%					0%		0%		0%
CA: S of Pt. Conception												
Metric tons												
HMS seine	9,977	5,938	3,804	3,145	5,713	9,014	12,448	12,742	11,085	5,175	2,167	776
with groundfish	0	0	0	0	0	0	0	0	0	0	0	0
% of HMS seine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Number of vessels												
HMS seine	30	17	27	26	25	21	23	33	35	12	18	13
with groundfish	0	0	1	1	0	0	0	0	0	0	0	0
Percent of HMS seine	0%	0%	4%	4%	0%	0%	0%	0%	0%	0%	0%	0%
Number of trips												
HMS seine	151	70	119	95	129	150	192	148	127	38	52	40
with groundfish	0	0	1	1	0	0	0	0	0	0	0	0
Percent of HMS seine	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%
Coastwide												
Metric tons												
HMS seine	9,977	5,938	3,804	3,145	5,713	9,014	12,448	12,742	11,085	5,273	2,167	885
with groundfish	0	0	0	0	0	0	0	0	0	0	0	0
Percent of HMS seine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Number of vessels												
HMS seine	30	17	28	26	26	21	23	35	35	14	18	15
with groundfsih	0	0	1	1	0	0	0	0	0	0	0	0
Percent of HMS seine	0%	0%	4%	4%	0%	0%	0%	0%	0%	0%	0%	0%
Number of trips												
HMS seine	151	70	120	95	130	150	192	150	127	48	52	53
with groundfish	0	0	1	1	0	0	0	0	0	0	0	0
Percent of HMS seine	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%

Part D - Recreational fisheries background information

This section contains the following tables:

Table D.1. Estimated recreational catch of selected overfished species in ocean waters by subregion for charter and private boats.

Table D.2. Estimated recreational fishery harvest by region for charter and private boats for 2002.

Table D.3. Estimated seasonal groundfish effort by region for charter and private recreational fisheries in 2002.

Table D.1 shows ocean recreational catch over the past five years of the main overfished species that are likely to be caught in the recreational fishery. This information is broken out by sub-region (Washington, Oregon, Northen California and Southern California) and by mode of trip (charter or private).

Table D.2 breaks out the distribution of total estimated 2002 recreational catch by mode, sub-region and depth/management category. These totals include catch from non-ocean areas.

Table D.3 shows the distribution of estimated recreational effort in 2002 (angler trips) by mode, sub-region and bi-monthly period.

Table D.1. Estimated recreational catch of selected overfished species in ocean waters by subregion for charter and private boats (mt).

		S. California			N. California			Oregon			Washington			Coast Wide		
Year	Species	Charter	Private	Total	Charter	Private	Total	Charter	Private	Total	Charter	Private	Total	Charter	Private	Total
1998	Bocaccio	12.9	15.3	28.2	20.0	2.7	22.7	0.2	0.1	0.3	0.1	0.1	0.2	33.2	18.1	51.4
	Canary Rockfish	1.1	0.3	1.5	12.7	11.4	24.1	25.3	17.9	43.3	9.6	1.5	11.1	48.7	31.2	80.0
	Cowcod	0.7	2.1	2.8	-	-	-	-	-	-	-	-	-	0.7	2.1	2.8
	Widow Rockfish	0.3	0.0	0.3	32.4	3.2	35.5	15.3	0.7	16.0	-	-	-	47.9	3.9	51.8
	Yelloweye Rockfish	-	-	-	3.2	2.3	5.5	8.3	10.5	18.8	9.9	4.5	14.4	21.4	17.3	38.7
	Lingcod	7.2	9.6	16.9	32.6	165.1	197.7	17.7	51.3	69.0	20.0	7.0	27.0	77.5	233.0	310.6
1999	Bocaccio	38.7	27.9	66.6	45.8	6.4	52.2	0.2	0.2	0.4	0.2	0.2	0.4	84.9	34.7	119.6
	Canary Rockfish	1.7	0.1	1.8	47.2	15.1	62.3	15.3	13.4	28.7	4.2	0.7	4.9	68.3	29.4	97.7
	Cowcod	2.2	1.5	3.8	1.8	-	1.8	-	-	-	-	-	-	4.0	1.5	5.6
	Widow Rockfish	0.1	-	0.1	27.6	2.6	30.3	0.9	1.1	2.0	-	-	-	28.7	3.7	32.4
	Yelloweye Rockfish	1.6	-	1.6	7.3	3.7	11.0	8.9	8.4	17.3	8.0	10.4	18.5	25.8	22.5	48.4
	Lingcod	19.6	10.6	30.2	93.2	195.3	288.6	30.5	49.5	80.0	21.6	12.4	34.0	164.9	267.8	432.7
2000	Bocaccio	32.1	11.1	43.2	53.6	5.3	58.9	0.7	-	0.7	0.3	0.1	0.3	86.7	16.5	103.2
	Canary Rockfish	0.4	-	0.4	62.1	14.2	76.3	10.3	4.2	14.5	1.8	0.9	2.8	74.7	19.3	94.0
	Cowcod	0.5	3.7	4.2	-	1.7	1.7	-	-	-	-	-	-	0.5	5.4	5.9
	Widow Rockfish	0.1	-	0.1	11.5	0.2	11.6	3.0	-	3.0	-	-	-	14.5	0.2	14.7
	Yelloweye Rockfish	-	-	-	3.8	3.7	7.5	9.0	0.5	9.5	4.4	6.3	10.7	17.2	10.5	27.7
	Lingcod	3.1	2.0	5.1	56.0	107.1	163.1	22.6	27.4	50.0	17.8	10.4	28.2	99.5	146.9	246.4
2001	Bocaccio	25.9	28.4	54.3	45.9	3.0	48.8	0.5	0.2	0.7	0.7	0.2	0.9	73.0	31.8	104.8
	Canary Rockfish	-	-	-	20.5	11.8	32.3	6.1	4.7	10.9	1.2	1.2	2.4	27.9	17.7	45.6
	Cowcod	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pacific Ocean Perch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Widow Rockfish	-	0.3	0.3	9.1	0.1	9.2	4.1	-	4.1	-	-	-	13.2	0.4	13.6
	Yelloweye Rockfish	-	-	-	3.0	1.7	4.6	4.5	0.2	4.7	6.3	8.3	14.7	13.8	10.2	24.0
	Lingcod	3.1	19.2	22.3	39.7	76.6	116.3	28.6	31.4	60.0	17.5	14.7	32.2	88.9	141.9	230.8
2002 a/	Bocaccio	53.4	20.0	73.3	7.7	0.5	8.2	0.4	0.4	0.8	-	-	-	61.5	20.9	82.3
	Canary Rockfish	0.0	0.2	0.2	2.5	3.2	5.7	3.8	4.6	8.4	0.1	3.5	3.6	6.4	11.5	17.9
	Cowcod	-	0.5	0.5	0.1	-	0.1	-	-	-	-	-	-	0.1	0.5	0.6
	Pacific Ocean Perch	0.0	-	0.0	0.2	0.2	0.4	-	-	-	-	-	-	0.2	0.2	0.4
	Widow Rockfish	0.7	-	0.7	0.9	0.0	0.9	1.0	-	1.0	-	-	-	2.5	0.0	2.6
	Yelloweye Rockfish	0.6	-	0.6	0.4	1.1	1.5	0.7	2.4	3.1	-	-	-	1.7	3.5	5.2
	Lingcod	28.7	35.0	63.7	187.6	216.7	404.3	10.7	64.3	75.0	4.0	23.0	27.1	231.0	339.1	570.1

a/ preliminary estimate

Table D.2. Estimated recreational fishery harvest by region for charter and private boats for 2002 (mt).

Area	Fishing Mode	Lingcod	Nearshore Rockfish	Shelf Rockfish	Other Nearshore Groundfish	Other Shelf Groundfish	Other Groundfish	Total Groundfish	Salmon	Halibut	Highly Migratory Species	Other	Total
Washington	Charter	36	139	3	1	0	1	180	648	21	41	1	891
	Private	46	42	3	7	5	1	103	965	27	3	0	1,097
	Total	81	181	5	8	5	2	283	1,613	48	44	2	1,988
Oregon	Charter	43	219	11	11	0	19	303	30	1	16	0	350
	Private	31	83	3	9	0	4	129	85	1	12	0	227
	Total	74	302	14	20	0	23	432	115	2	27	1	577
N. California	Charter	192	270	20	9	0	13	504	366	8	99	34	1,011
	Private	232	391	6	41	0	16	686	1,117	164	467	84	2,519
	Total	424	661	26	50	0	29	1,190	1,483	173	565	119	3,530
S. California	Charter	29	97	76	89	3	1	295	4	16	187	894	1,396
	Private	45	118	41	46	0	3	253	80	369	166	1,389	2,256
	Total	74	214	117	135	3	4	547	85	385	353	2,283	3,653
California	Charter	221	367	96	97	3	13	799	370	24	286	929	2,629
Total	Private	277	509	46	87	0	19	939	1,198	533	633	1,473	5,052
	Total	498	876	143	185	3	33	1,737	1,568	557	919	2,402	7,681
West Coast	Charter	300	725	109	110	4	34	1,282	1,049	46	342	930	3,949
Total	Private	353	633	52	103	5	24	1,170	2,247	561	647	1,474	6,453
	Total	653	1,358	162	212	9	58	2,452	3,296	607	990	2,404	10,401

Source: RecFIN data. Includes estimated catch from non-ocean areas.

Table D.3. Estimated seasonal groundfish effort by region for charter and private recreational fisheries in 2002 (1,000's angler trips) .

Region	Mode	Jan-Feb	Mar-Apr	May-Jun	Jul-Aug	Sep-Oct	Nov-Dec	Total
Washington	Charter	0	0	8	1	0	0	9
	Private	0	0	8	2	0	0	10
	Total	0	0	16	3	0	0	20
Oregon	Charter	1	5	14	19	6	1	46
	Private	0	3	13	14	5	1	36
	Total	2	8	27	33	11	2	82
OR/CA border to Cape Mendocino	Charter	0	0	1	2	0	0	3
	Private	0	0	12	16	2	0	29
	Total	0	0	13	17	2	0	32
Central California	Charter	0	0	8	26	15	1	50
	Private	38	10	42	63	60	10	224
	Total	38	10	51	89	75	10	274
Southern California	Charter	10	46	42	31	52	9	189
	Private	78	56	71	53	73	59	391
	Total	88	102	112	84	125	68	579
California Total	Charter	10	46	51	58	67	10	242
	Private	117	66	125	132	134	69	643
	Total	126	112	176	190	202	79	885
Grand Total	Charter	11	50	74	78	73	11	297
	Private	117	69	145	149	139	70	690
	Total	128	120	219	227	212	80	986

Source: Washington and Oregon estimates from state port sampling programs. California estimates from RecFIN.

Part E - The Historic Use of the "B" Platoon and Implications for its Use in 2004 and Beyond

The "B" platoon was first introduced as a management measure in the 1997 fishing year. Limited entry trawlers were allowed to choose whether they would participate in the "A" or "B" platoon, with each platoon being subject to different fishing periods:

A Platoon	1/1 - 2/28	3/1 - 4/30	5/1 - 6/30	7/1 - 8/31	9/1 - 10/31	11/1 - 12/31	
B Platoon		1/16 - 3/15	3/16 - 5/15	5/16 - 7/15	7/16 - 9/15	9/16 - 11/15	11/16 - 12/31

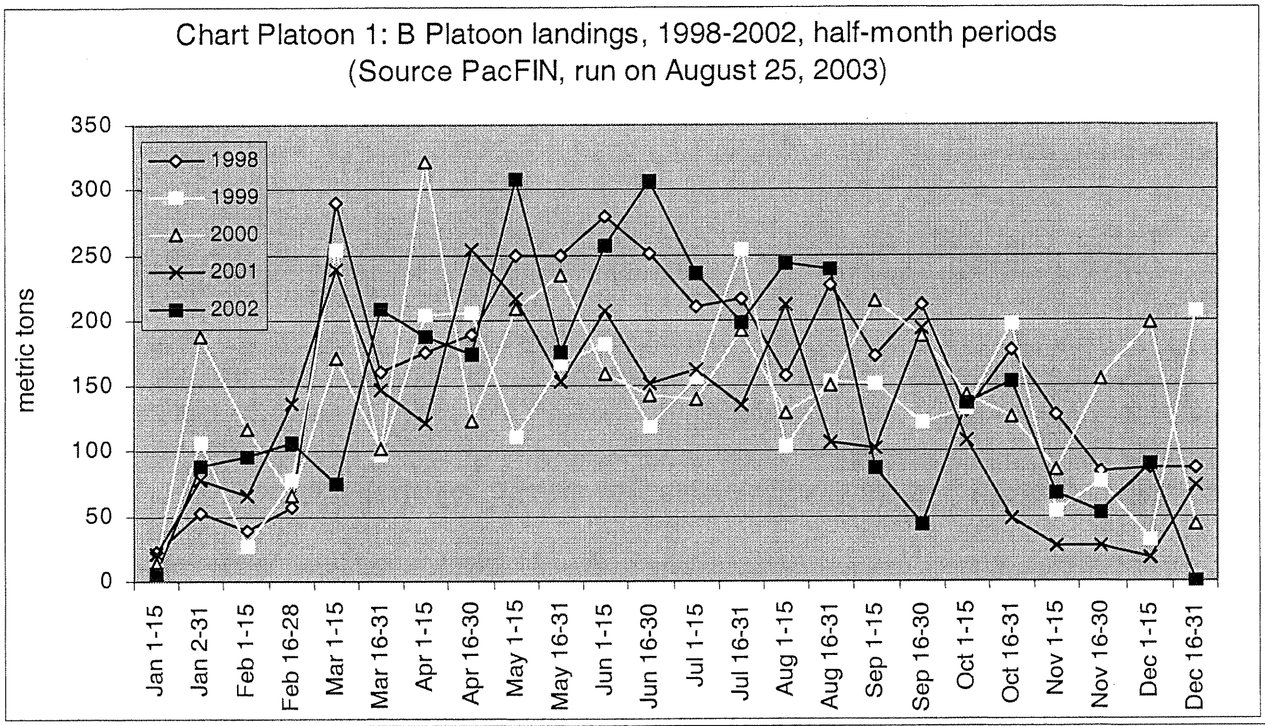
Limited entry trawl permit owners are allowed to choose their platoon participation each year as part of their permit renewal process. Limited entry trawl vessels are automatically placed in the "A" platoon, unless the permit owner chooses the "B" platoon, which is then indicated on the permit. If a vessel is in the "A" platoon, its cumulative trip limit periods begin and end on the beginning and end of a calendar month. For vessels in the "B" platoon, cumulative trip limit periods begin on the 16th of the month and end on the 15th of the month. Thus, for example, trip limits and other management measures that are effective September 1 through October 31 for the "A" platoon will be effective September 16 through November 15 for the "B" platoon. "B" platoon vessels are prohibited from landing groundfish during the January 1 through January 15 period. For the November 16 through December 31 period, a "B" platoon vessel will have the same cumulative trip limits as an "A" platoon vessel would have for November 1 through December 31.

Since 1997, the number of vessels participating in the "B" platoon has been fairly consistent. Out of the roughly 250 limited entry trawl permits, the following number of vessels have signed up for the "B" platoon:

Year	Number of Vessels
1997	21
1998	23
1999	18
2000	24
2001	24
2002	31
2003	29

Of the vessels that have participated in the "B" platoon, 9 vessels have signed up as "B" platoon vessels in every year the program has been offered.

A review of the effects of the "B" platoon program requires a look at the periods when "B" platoon vessels are fishing on cumulative limits and within allowable fishing areas that differ from those limits and areas applying to the "A" platoon. Those periods in each fishing year have been March 1-15, May 1-15, July 1-15, September 1-15, and November 1-15. "B" platoon vessels are not permitted to land groundfish during the January 1-15 period, although it appears from PacFIN data that some vessels have done so. We reviewed landings by "B" platoon vessels by half-month periods for the years 1998-2002 and found that "B" platoon vessels are most likely to take advantage of their lagged 15-day period in March 1-15, but that landings for the May, July, September, and November lagged periods are either not markedly different or are actually lower than their landings in the half-month periods they share with "A" platoon vessels. The following charts show landings by "B" platoon vessels, by half-month periods.



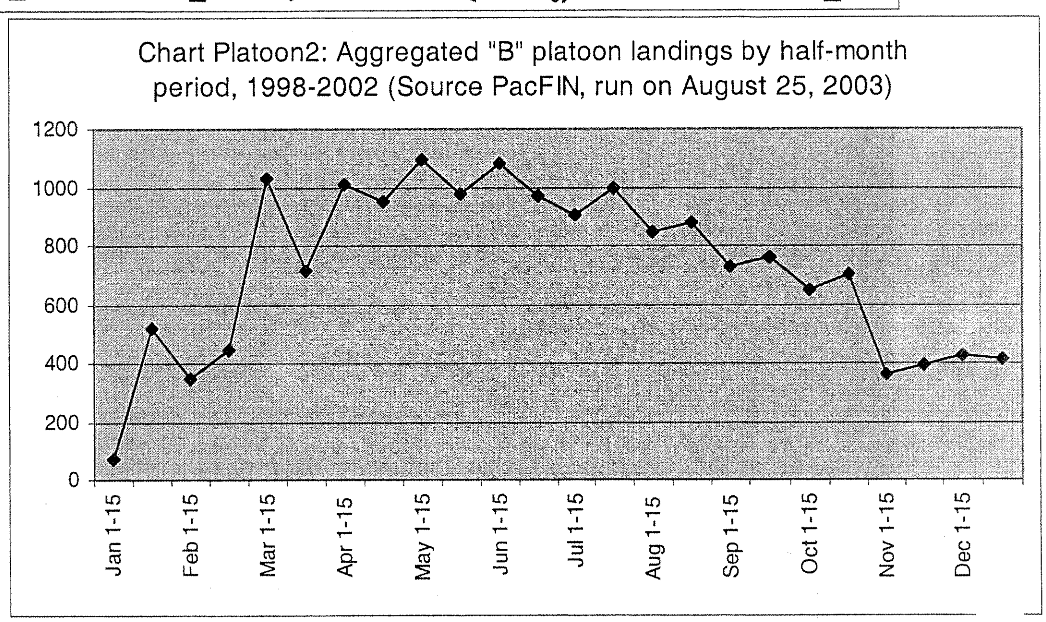


Chart "Platoon1" shows landings for each year between 1998 and 2002. Chart "Platoon 2" shows landings aggregated for each half-month period over 1998-2002. Thus, for example, Chart "Platoon 2" shows an aggregation of all of the landings for March 1-15 for each of the years 1998-2002.

Platoon designation is essentially a regulatory measure used to separate vessel groundfish landings, a separation that could otherwise be accomplished through processor arrangements with their delivering vessels.

Implementing this separation via regulation was initially challenging for fishery biologists and managers who were trying to account for landings made for the trawl fleet as a whole in different landings periods. In 2002, the use of the "B" platoon became more challenging for biologists and managers because "B" platoon vessels were operating out of sync with the bycatch model, which estimates bycatch levels for the fleet as a whole based on the major two-month cumulative limit periods used by the rest of the commercial fleet. The confusion of separate delivery periods for the "A" and "B" platoons increased exponentially in 2003 with the introduction of trawl Rockfish Conservation Areas (RCAs). "B" platoon vessels have had both their cumulative limits and their closed fishing areas lagged by two weeks. Thus, for 15 days every two months, "B" platoon vessels have been operating with different closed area rules from "A" platoon vessels. Management with RCA boundaries that change on a regular basis is already complex for the fishing fleet and for enforcement officers; allowing different closed areas for "B" platoon vessel doubles this complexity for all involved in the fishery management process.

WINCHESTER BAY MERCHANTS ASSOCIATION
C/O COYNE
20 Eighth Street
P. O. Box 1663
Winchester Bay, Oregon 97467
541-271-2103

RECEIVED
AUG 2 9 2003
PFMC

August 22 2003

Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 200
Portland, OR 97467 FAX Number 503-820-2299

Re: Groundfish Fisheries - Winchester Bay Area

Dear Sir or Madam,

This letter is written in support of a waiver of the current pending rules prohibiting fishing for goundfish inside of the 50 fathom line beacuse of its unique geological makeup. Winchester Bay is located in the Oregon Dunes National Recreation Area and has some of the highest dunes in the state. The dune structure does not stop at the ocean's edge but continues for miles offshore. The area within the 50 fathom line does not have any coastal reefs which support groundfish. The closest reefs to Winchester Bay are beyond the 50 fathom line both North and South of the mouth of the Umpqua River. These reefs, one offshore of Ten Mile Creek to the South, the other off the Takenitch Creek area to the North, provide our recreational fishermen opportunities to fish for groundfish.

If areas outside of the 50 fathom line are closed to recreational anglers, we would not have any opportunity to

fish for groundfish.

Recreational angling provides a great economic stimulus for Winchester Bay and the surrounding area. If recreational angling for groundfish were stopped, we would experience the ripple effect from the another loss of fishing species. We experienced this in the 80's and 90's with the closure of coho salmon fishing along the Oregon coast. Many fishing related businesses closed and this area lost all our charter fishing businesses. We currently have only four charter offices providing offshore angling opportunities for our visitors.

Recreational angling for groundfish in the Winchester Bay area has not had a detrimental effect on the groundfish population. Recent ODFW statistics show that the port of Winchester Bay has about a 1% impact on all the sport groundfish caught in Oregon.

If Winchester Bay were allowed to be able to land fish similar to the "bubble salmon fisheries" allowed for Tillamook Bay or Port Orford, it would restore some fairness in the allocation of the groundfish quota. Winchester Bay would not be handicapped because of the unique geologic conditions of the area.

We would ask the PFMC to consider the economic and geologic conditions of the port of Winchester Bay and allow this port to have a sport groundfish season.

Sincerely,

Joe Coyne, President
Wincheater Bay Merchants

Subject: [Fwd: Pot by catch]
From: PFMC Comments <pfmc.comments@noaa.gov>
Date: Wed, 27 Aug 2003 10:50:42 -0700
To: John.Devore@noaa.gov
CC: Mike Burner <Mike.Burner@noaa.gov>

-------- Original Message --------
Subject: Pot by catch
Date: Tue, 26 Aug 2003 18:04:00 -0700
From:larry demmert <larrynbrenda@comcast.net>
To:<pfmc.comments@noaa.gov>

I am proposing that pots fishing for sablefish not have a depth restristion, as there is little or no roskfish bycatch. The observer data should back this up as I have an observer on board and any bycatch usually comes up alive and would live if thrown back,but the observer keeps them for data so they die. I would also like to propose an increase to 6(six) licenses on a vessel,as this would help for stacking lower tiered permits.

Larry Demmert

Exhibit C.6.e
Supplemental EC Report
September 2003

ENFORCEMENT CONSULTANTS REPORT ON GROUNDFISH MANAGEMENT MEASURES FOR 2004: TENTATIVE ADOPTION

The Enforcement Consultants (EC) strongly recommend the Council consider eliminating the B Platoon option, so that one set of regulations apply to the entire limited entry trawl fleet beginning in the year 2004. The B Platoon option creates a situation of where full implementation of management measures are staggered by fifteen days, adding complexity to an already challenging regulatory regime. We have already experienced confusion on the part of fishers related to which limits apply, particularly when there is an inseason adjustment. Additionally, the implementation of a Vessel Monitoring System (VMS) can be hampered. From the beginning of discussions of VMS, the EC has advised the Council to keep depth based management simple. Unfortunately, the system now incorporates multiple lines during multiple periods. At any given time of year, the depth based management is defined by a series of way points numbering over 1,000. When the lines are changed, new lines must be programmed, and new alerts must be incorporated. OLE best estimate is that reprogramming could take two to five days. Additionally, every change of lines creates opportunity for error, effecting everyone involved.

It has come to the attention of the EC that, due to an oversight, intended language restricting fixed gear vessel activity in the fixed gear Rockfish Conservation Area (RCA) was left out of the proposed VMS rule. For 2004, the EC recommends the following addition to the Prohibitions section of the VMS rule (660.306(z)(5)):

"(cc) Operate any vessel registered to a limited entry permit with a fixed gear endorsement in a non-trawl RCA (as defined in 660.302), except for purposes of continuous transiting."

That same restriction already exists for trawl vessels operating in the trawl RCA and adoption of this recommendation creates consistency throughout the limited entry fleet. In the case of a fixed gear vessel, the same argument applies that was made for restricting the activities of trawl vessels when in an RCA. A VMS signature left by a vessel drifting in the RCA, and one left by a vessel fishing, are similar. Allowing drifting would require costly investigatory responses when law enforcement assets are limited.

PFMC
09/10/03

GROUNDFISH MANAGEMENT TEAM REPORT ON FINAL 2004 GROUNDFISH MANAGEMENT MEASURES

The Groundfish Management Team (GMT) received guidance on 2004 management measures from the Council on Wednesday, September 10, including the setting of ABCs and OYs, preferred recreational fisheries measures for all three states, the direction to refine commercial fishery measures, and the black rockfish catch sharing recommendation of 58% to Oregon and 42% to California. After receiving this guidance, the GMT discussed a suite of management measures for the 2004 commercial and recreational groundfish fisheries with the Groundfish Advisory Panel (GAP,) and recommends the following management measures for 2004:

CREATION OF NEW MANAGEMENT LINES

The GMT supports the creation of the following latitudinal lines for groundfish management purposes:

1. Line at the Washington/Oregon border (46°16'N latitude)
2. Line at the Oregon/California border (42°00'N latitude)
3. Pedro Point (37°33'N latitude) - For use in the California commercial non-trawl and recreational groundfish fisheries.

COMMERCIAL MANAGEMENT MEASURES

The GMT received guidance from the Council on harvest levels and management measures, then discussed those recommendations with the GAP. The GMT's recommendations for commercial fishery management measures in 2004 are contained in the attached trip limit tables for limited entry trawl, fixed gear, open access, and exempted trawl fisheries. The GMT also discussed the following issues and has the following recommendations:

<u>Trawl "B" Platoon</u>
The GMT continues to believe that the costs to our management and regulatory systems resulting from offering the "B Platoon" option to the groundfish trawl fishery currently outweigh the benefits to the industry. Implementation and enforcement of inseason line movements, administration of vessel monitoring systems, bycatch modeling, real time catch accounting and observer scheduling are all complicated by a trawl fleet fishing under two different regulatory time periods. Additionally, the GMT notes that only 28 vessels are currently in the B platoon and that the smoothing of product flow should be accomplished by the scheduling of landings between the vessel and processor, rather than via regulations. Also, should an emergency fishing closure be required as a result of attaining an OY for an overfished species, the B platoon could be deprived of fishing time equal to the rest of the fleet or, the Council could be faced with the decision of allowing continued fishing in order to provide equal opportunity to the B platoon. Therefore, the GMT recommends that the B platoon be removed from management measures for 2004 and beyond.

<u>Widow Rockfish Catch in the Whiting Fishery</u>
In response to the Council's direction in June, the GMT reviewed the widow rockfish bycatch

estimates in the whiting fishery. Based on the average bycatch rates for 1998-2002, and applying those by sector, the GMT estimates that the U.S. whiting OY would have to be constrained to around 120,000 mt in order to stay within the widow rockfish rebuilding OY of 284 mt.

Exception to Trawl Footrope Limits for Vessels Participating in the Primary Whiting Fishery

Under current federal regulations, vessels participating in the directed trawl groundfish fisheries have different trip limits which apply depending on the type of gear used, and are constrained to the lower limits if different gear types are used in a fishing period. The GMT recommends that an exception to this rule be granted to those vessels participating in the primary whiting fishery, as the midwater trip limits are considerably more constraining than either the large or small footrope limits and the primary whiting fishery typically begins and ends in the middle of a fishing period. The exception would allow the following:

- Before the primary whiting fishery, vessels can use either small or large footrope (or both) during a cumulative period, but are subject to the more restrictive current trip limits for the entire cumulative period.
- Once that vessel enters the primary whiting fishery, then the midwater trip limits apply and are additive to the other limits for that fishing period (i.e., the vessel is not constrained by the lower midwater limits and can harvest up to the footrope-specific trawl limits plus the midwater limits for that period).
- Following the primary whiting fishery, the vessel can access either the small or large footrope limits, but whatever the vessel landed during the primary fishery counts against the respective cumulative limits for that period.

ODFW Proposal for Selective Flatfish Trawl Implementation

The GMT discussed the ODFW proposal to move their selective flatfish trawl EFP into regulations. First of all, the GMT fully supports moving forward with proposals that develop and implement more selective gears; however, the provision of alternative limits or exemptions to the RCA is a complex regulatory and monitoring issue. The GMT recommends that these issues be explored more fully this winter.

With regard to the specific options being proposed by ODFW, the majority of the GMT supports 100% observer coverage, particularly if the fishery is to take place within the trawl RCA, and to monitor bycatch caps. The GMT also supports full retention of all rockfish species, and recommends that bycatch caps (total for selective trawl fishery) be established for the following species: canary, darkblotched, and yelloweye rockfish, and Pacific ocean perch. The GMT also endorses the higher limits be limited to the May-August timeframe and to the area where the gear has been tested (i.e., off Oregon and north to Destruction Island).

With regard to the process and timeline, the GMT recommends that the Council decide whether to approve this proposal for 2004 and the specific regulatory measures that would be in place at this meeting in concert with the full suite of 2004 management measures. However, given the amount of time needed to develop and analyze the regulations, the GMT recommends that this occur through a separate process over the winter months. This would let industry members know what regulations would be in place for this fishery and give interested fishermen time to plan and prepare; it should also allow adequate time to develop the regulations as well as the analyses for a separate NEPA document prior to implementation in May 2004.

Timing of the Season Opening for the Limited Entry Primary Season for Sablefish

Late during this week's deliberations, the GMT came to the realization that the timing of reviewing new bycatch and discard data for the fixed-gear fleet in April is incompatible with the opening of the primary season on April 1. New discard data may indicate that the currently used assumptions for discard mortality in the fixed-gear sector require adjustment. Such adjustments would alter cumulative limit poundage for the primary fishery. In the event that a reduction in tier poundage were recommended at the April meeting and the season were already open, vessels would have a clear incentive to take the larger limits before the reduction could be published in the federal register.

The GMT would prefer that the start of the primary season be delayed until May 1. This would still allow for a six month opening, and would also be more consistent with the timing of the management process of the International Pacific Halibut Commission. Barring this change, the GMT feels that it will be imperative to review at the March meeting any new fixed-gear information that would affect limit size in the 2004 fishery. Moving the schedule for providing this information forward to March will place greater demands on NMFS staff and may result in a less complete analysis.

Additionally, the GMT recommends the following state-specific management measures:

COMMERCIAL MANAGEMENT MEASURES - CALIFORNIA

TRAWL

Specific Rockfish Conservation Area (RCA) Boundary Changes for California Trawl Gear

S. of 40°10' to the Mexico border:

- Move seaward RCA line in from 200 fathoms to 150 fathoms for periods 1-6.
- Set shoreward RCA line to 75 fathoms for periods 1 - 2, and 5 - 6; set shoreward RCA line to 100 fathoms for periods 3 - 4.

Trawl Limits

S. of 40°10'
Establish chilipepper rockfish limit of 2,000 pounds/2 months; a bocaccio limit of 100 pounds per month and a minor shelf limit of 300 pounds/month outside the seaward RCA boundary.

S. of 38°
Increase slope rockfish limit to 40,000 pounds/2 months. Limits from previous years had been reduced to minimize incentives for effort shift from northern area to southern area in response to a large north-south trip limit differential. For 2004, this trip differential will be reduced. While the industry's request to increase limits to 50,000 pounds/2 months could be accommodated within the OY, the GMT recommends that an increase in trip limit to 40,000 be implemented now, and further increases be considered inseason after examination of OY tracking and, especially, blackgill harvest rates.

NON-TRAWL

Specific Rockfish Conservation Area (RCA) Boundary Changes for California Non-Trawl Gear

- N. of 40°10': No changes to RCA boundaries, except to conform to Oregon inseason changes.
- S. of the Oregon border to the Mexico border: Set seaward RCA line to 150 fathoms for periods 1 - 6.
- S. of 40°10' to 34°27': Set shoreward RCA line to 30 fathoms for periods 1, 5 and 6; set shoreward RCA line to 20 fathoms for periods 3-4; closed for period 2.
- S. of 34°27': Set shoreward RCA line to 60 fathoms for periods 2-6; closed for period 1.

California Commercial Limited Entry Fixed Gear and Open Access Trip Limits

a. Shallow Nearshore
For the shallow nearshore area, the GMT is recommending a slight increase in period trip limits as a result of state regulations which will be implemented to prevent individuals from taking multiple limits from different vessels which will reduce harvest. The GMT reviewed the current landings for 2003 which are tracking on target as of August, and increases for each period were considered in light of the corresponding shoreward RCA boundary that is in place.

b. Deeper Nearshore
The GMT is recommending an increase in period trip limits for the deeper nearshore area for 2004 because a review of the 2003 landings indicate that harvest levels are tracking lower than anticipated, and inseason action has been taken twice this year to increase these limits. Further, there has been an increase in the black rockfish component of the deeper nearshore OY based on the latest stock assessment, and state regulations will be implemented to prevent individuals from taking multiple limits from different vessels. Finally, the increases for each period were considered in light of corresponding shoreward RCA boundary.

c. Shelf Rockfish
N. of 34° 27': Increase over status quo in periods where shoreward RCA boundary increased to 30 fathoms which increases access to shelf areas.

S. of 34° 27': Substantial increase in trip limits over status quo due to shoreward RCA boundary increase to 60 fathoms with increase in access to the shelf.

d. Bocaccio
The GMT recommends increasing trip limits to accommodate incidentally caught bycatch associated with increased shelf opportunites and to reduce regulatory discards. The increase in the bocaccio OY allows for these higher limits and we expect the harvest to be well below the sector allocation provided in the scorecard.
The GMT wishes to note that inseason tracking of commercial bocaccio harvest is complicated by the inability to distinguish between fixed gear and trawl sectors. Therefore, if tracking of commercial bocaccio take is high, the GMT recommends that inseason action be taken to reduce

clarified in the QSM

shelf trip limits south of 34° 27' despite uncertainty as to the source of the higher landings.

e. Black Rockfish N. of 40° 10':

The GMT recommends an increase in trip limits because of higher OY resulting from black rockfish stock assessment.

Proposed GMT trip limit changes for 2004 California Fixed Gear fisheries (lbs/2 mo. period unless otherwise specified)

Species/Groups	JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
South of 40° 10'						
Shallow NS Rockfish						
N of 34° 27' - 20fm			500	600		
N of 34° 27' - 30fm	300				500	300
S of 34° 27' - 60 fm		300	500	600	500	300
2003 Status quo	200		400	400	300	200
Deep NS Rockfish						
N of 34° 27' - 20fm			500	500		
N of 34° 27' - 30fm	500				400/mo	500
S of 34° 27' - 60 fm		500	600	600	600	400
2003 Status quo	200		200	500	400	400
CA Scorpionfish						
Medium OY		300	300	400	400	300
2003 Status quo			800	800		
Shelf Rockfish						
N of 34° 27' - 20fm			200	200		
N of 34° 27' - 30fm	300				300	300
LE - S of 34° 27'		2000	2000	2000	2000	2000
OA - S of 34° 27'		500	500	500	500	500
2003 Status quo	100		200	250	200	100
Bocaccio						
N of 34° 27' - 20fm			100	100		
N of 34° 27' - 30fm	200				200	200
LE - S of 34° 27'		300	300	300	300	300
OA - S of 34° 27'		100	100	100	100	100
2003 Status quo	0		0	0	0	0
North of 40° 10'						
Nearshore Rockfish	5000*	5000*	6000*	6000*	6000*	6000*
2003 Status quo	4000*	4000*	4000*	4000*	4000*	4000*
* No more than 1,200 pounds may be other than Blue/Black						

✓ Michele

COMMERCIAL MANAGEMENT MEASURES - OREGON

The GMT recommends the following management measures for Oregon commercial fisheries:

redefined in trawl spot shallower than 50 fm

- Include defined winter petrale trawl fishing areas for Periods 1 and 6 seaward of RCA
- Define fixed gear RCA as 30-fms to 100-fms
- Allow a commercial halibut fishery seaward of a revised 100-fm line
- Stay within state commercial nearshore catch caps

RECREATIONAL MANAGEMENT MEASURES

The GMT received guidance from the Council on recreational fisheries management measures. Recreational fisheries measures for 2004 are intended to reduce take of overfished species, primarily bocaccio in the southern area, yelloweye rockfish in the northern area, and canary rockfish coastwide. Following advice received from the Council, the GMT recommends prohibiting retention of both canary and yelloweye rockfish. This prohibition is intended to discourage any targeting by recreational fisheries to reduce the potential of additional targeted catch of those species beyond true unavoidable catch, some of which would be expected to survive if encountered in shallow water. These prohibitions are recommended even in light of the possibility that they may result in creating some limited discard (estimated to be very small by the states). The prohibitions are recommended to address the low and uncertain stock status of those species, the uncertainty in our ability to track actual removals in all fisheries and the disproportionate effects of recreational removals on rebuilding trajectories. Retention prohibitions for cowcod would also continue in 2004. The GMT recommends the following specific recreational fishery management measures for 2004:

<u>Washington</u>

Off the coast of Washington, the groundfish bag limit would continue to be 15 groundfish, including rockfish and lingcod, and is open year-round (except for lingcod). The following sublimits and closed areas would apply under a medium OY canary rockfish scenario:

(a) The Yelloweye Rockfish Conservation Area would continue in 2004, the "C" shaped closed area in WDFW Marine Catch Area 3 (La Push) to protect yelloweye rockfish; this area would be closed to recreational bottomfish and halibut fishing. This area is defined by the following coordinates:

48°18'00"	125°18'00"
48°18'00"	124°59'00"
48°11'00"	125°11'00"
48°11'00"	124°59'00"
48°04'00"	125°11'00"
48°04'00"	124°59'00"
48°00'00"	125°18'00"
48°00'00"	124°59'00"

(b) Rockfish: There would be a 10 rockfish per day bag limit, which would be a sublimit of the 15 groundfish per day limit. Taking and retaining canary rockfish and yelloweye rockfish would be prohibited.

(c) Lingcod: Season would open on March 13 (the Saturday closest to March 16th) and would close on October 17 (the Sunday closest to October 15th. The lingcod bag limit would continue to be 2 lingcod per day, with a 24-inch minimum size limit.

NOTE: Under any of the options listed above, WDFW plans to monitor its recreational catches inseason and may take action to restrict recreational fishing, by area, to inside a line that approximates 30 fathoms (defined by lat/long).

Oregon

Off the coast of Oregon, the following limits and time/area closures would apply under the medium OY canary scenario:

(a) A recreational marine fish bag limit of 10 (including rockfish, greenling, cabezon, and other species, and excluding salmon, lingcod, perch species, sturgeon, sand dabs, striped bass, tuna and baitfish–herring, smelt, anchovies and sardines). There would be no retention of canary and yelloweye rockfish. There would be an additional lingcod 2-fish bag limit, with a 24-inch minimum size. The cabezon size limit would be increased from 15 inches to 16 inches. For greenling species, there would be a 10-inch size limit.

(b) Groundfish fishery would be open year-round, except that from June 1 through September 30, the fishery would be closed offshore of the 40 fm depth contour.

(c) No retention of canary or yelloweye rockfish during the recreational halibut fishery.

(d) Stay within state nearshore catch caps for the ocean boat fishery.

NOTE: Under any of the options listed above, ODFW plans to monitor its recreational catches inseason and may take action to restrict recreational fishing, by area, to inside a line that approximates 30 fathoms (defined by lat/long).

California

Recreational fisheries data south of 40°10'N. lat. have been analyzed to provide management options that do not exceed expected sector catch limits for target species and overfished groundfish. The same methodology that was presented at the June PFMC meeting (re: Exhibit B.8.b, Supplemental GMT Report 2, June 2003) was employed to estimate total catch by depth, area, and wave. As noted in the June GMT report, CPUE (or effort shift) was not included in the original analyses, and the methodology would be improved if information were available to account for effort shift. Consequently, it is likely that the available estimated impacts in the June analysis represent minimum values, and have therefore been adjusted by a effort shift estimate, as described according to the following approach:

> Restricting the rockfish fishery to less than 20 fms or 30 fms north of 34°27' will affect the behavior of rockfish anglers. Some will choose to forgo rockfish fishing because the most desirable species are found in the deeper waters. Others will move from the closed deeper waters to the shallow waters that remain open. The net effect is very difficult to analyze or predict, but the performance of the fishery during recent periods when only nearshore fishing was allowed may provide some insight. The areas/periods when this was in effect are: Central area (40°10' to 34°27') during May-June, 2001 and May-June 2002; Southern area

(south of 34°27') during Jan-Feb 2001 and Nov-Dec 2001. The apparent effort shift during those four recent nearshore fishing periods ranged from +6.2 percent to +63.4 percent. Medium effort shift was 27.7 percent. Consequently, expected change in nearshore fishing effort for 2003 may be bounded by the lower quartile (14.7 percent increase) and the upper quartile (47.8 percent increase) from those observations, In order to attempt to account for effort shift in 2004, estimates from the minimum impact methodology (as used in the analyses for the June 2003 PFMC meeting) may be multiplied by 1.147 to account for effort shift in waters north of 34°27'. The lower quartile was employed because the expected effort shift would be lower for the 30 fm portion of the season, and because of lower bag limits for rockfish in 2004 compared to the base years.

To maintain scorpionfish mortality within prescribed limits, additional measures are necessary in addition to the season and depth limits that are applied to the other species in the nearshore fishery. Since scorpionfish do not possess a swim bladder, it is possible to release captured fish with high survival, estimated at 83% based on a tagging study of nearshore rockfish by CDFG. Thus, fishing for scorpionfish is recommended to be closed for 8 months, and in-season adjustments to the closure periods may be considered.

One scorpionfish proposal is to open fishing during Jan-Feb within 20 fms. The GMT believes it is not advisable to allow scorpionfish to be taken during this period for several reasons. Since other groundfish would be closed, it would create a situation with the potential for discards. If scorpionfish could not be cleanly targeted, the expected take of groundfish within 20 fm during Jan-Feb would be 9.1 mt, which is roughly equal to the expected catch of scorpionfish. Mortality of the released groundfish in this example would be roughly 3 mt. Also, efforts have been made to simplify regulations for 2004, by coupling the recreational and commercial season and depth restrictions. Also, a provision for recreational sculpin fishing during Jan-Feb would possibly create confusion and enforcement problems with the angling public. Finally, the estimated catch including a Jan-Feb 20 fm fishery would slightly exceed the available allocation to the recreational fishery.

Bag limits and size limit measures would be used in concert with the proposed depth and season limits as described in the following tables:

Recreational Bag and Size Limits **north of 40°10':**

SPECIES	DAILY BAG LIMIT	SIZE LIMIT
Rockfish	10 fish in combination	N/A
cowcod, yelloweye and canary rockfish	NO RETENTION	N/A
cabezon	10 per person	15 inch TL
kelp greenlings	10 per person	12 inch TL
lingcod	2 per person	24 inch TL

Recreational Bag and Size Limits **south of 40°10':**

SPECIES	DAILY BAG LIMIT	SIZE LIMIT
RCG Complex (including all species of rockfish, cabezon and greenling) Dorarrio	10 fish in combination; see sub-limits for shallow nearshore rockfish, cabezon and greenling	see specifics
Shallow Nearshore Rockfish includes black-and-yellow, China, grass, gopher and kelp rockfish)	2 fish in combination; this is a sub-limit of the 10-fish aggregate RCG complex bag limit	N/A
cabezon	3 fish; this is a sub-limit of the 10-fish aggregate RCG complex bag limit.	15 inch TL
kelp and other greenlings	2 fish in combination; this is a sub-limit of the 10-fish aggregate RCG complex bag limit.	12 inch TL
cowcod, yelloweye and canary rockfishes	NO RETENTION	N/A
lingcod	2 per person	24 inch TL
CA scorpionfish	5 ~~10~~ per person	~~N/A~~ 10"
bocaccio	1 bag limit of RCG complex	10"

10-30 fm ... when 0-10 fm fishing is allowed

One additional proposed measure is to prohibit fishing in waters around the Farallon Islands from 0-10 fms, in addition to other depth and season restrictions that would otherwise be in effect. This depth restriction is expected to reduce the take of shallow nearshore rockfish.

In order to provide the maximum open season, waters open to fishing between 34°27' and 40°10' are limited to <20 fm for four months, and <30 fm for six months. Proposed seasons, depth restrictions, and management areas are summarized in the following table, with the associated minimum estimates of catch (increased to account for effort shift, as described above) for target species and overfished species.

CA Recreational Nearshore Season and Depth Restrictions

	Jan-Feb	Mar-Apr	May-Jun	Jul-Aug	Sep-Oct	Nov-Dec
40°10′ to 34°27′	30 fm	Closed	20 fm	20 fm	30 fm	30 fm
34°27′ to Mexico Border	Closed	60 fm	60 fm *	60 fm *	60 fm *	60 fm

*** CA Scorpionfish closed during these months**

Species	Estimated Catch		
	North	South	Total
Shallow NS	57.0	8.0	65.7
Deeper NS	298.7	47.7	346.4
CA Scorpionfish	0.0	55.4	55.4
Bocaccio	3.1	59.7	62.8
Canary	7.1	0.5	7.6
Cowcod	0.5	1.3	1.8
Lingcod	138.3	13.5	151.8
Widow	0.3	0.1	0.4
Yelloweye	0.7	0.6	1.3

Table C.6.O.Trawl-1--Management parameters for the Council-adopted OYs

Period	Shallow line (fm)	Deep line (fm)	Bi-monthly trip limits sablefish	longspine	shortspine	dover	arrowtooth	petrale	otr. flatfish
N. of 40°10'									
If only large footrope is used in period									
1	75	200 [2]	6,200	10,000	2,100	45,000	999,999	999,999	100,000
2	60	200	6,200	10,000	2,100	45,000	150,000	100,000	100,000
3	60	200	8,700	10,000	2,100	21,000	150,000	100,000	100,000
4	75	150	8,700	10,000	2,100	21,000	150,000	100,000	100,000
5	75	200	8,700	10,000	2,100	21,000	150,000	100,000	100,000
6	75	200 [2]	6,200	10,000	2,100	45,000	999,999	999,999	100,000
If small footrope is used in period									
1	75	200	2,000	1,000	1,000	10,000	4,000	10000 [1]	30,000
2	60	200	2,000	1,000	1,000	10,000	4,000	10000 [1]	30,000
3	60	200	5,000	1,000	1,000	21,000	6,000	25000 [1]	60,000
4	75	150	5,000	1,000	1,000	21,000	6,000	25000 [1]	60,000
5	75	200	5,000	1,000	1,000	21,000	6,000	25000 [1]	60,000
6	75	200	2,000	1,000	1,000	10,000	4,000	10000 [1]	30,000
38°-40°10'									
1	75	150	7,500	10,000	2,000	26,000	999,999	999,999	100,000
2	75	150	7,500	10,000	2,000	26,000	10,000	20,000	100,000
3	100	150	7,500	10,000	2,000	26,000	10,000	20,000	100,000
4	100	150	7,500	10,000	2,000	26,000	10,000	20,000	100,000
5	75	150	7,500	10,000	2,000	26,000	10,000	20,000	100,000
6	75	150	7,500	10,000	2,000	26,000	999,999	999,999	100,000
S. of 38°									
1	75	150	7,500	10,000	2,000	26,000	999,999	999,999	100,000
2	75	150	7,500	10,000	2,000	26,000	10,000	20,000	100,000
3	100	150	7,500	10,000	2,000	26,000	10,000	20,000	100,000
4	100	150	7,500	10,000	2,000	26,000	10,000	20,000	100,000
5	75	150	7,500	10,000	2,000	26,000	10,000	20,000	100,000
6	75	150	7,500	10,000	2,000	26,000	999,999	999,999	100,000

Note: a trip limit of amount of 999,999 represents no limit on the amount of the species that may be landed during that period

[1] The small footrope limit for petrale is specified as a sub-limit of the limit for other flatfish.

[2] In the north during periods 1 and 6, use of petrale areas between 150fm and 200 fm is assumed.

Table C.6.O.Trawl-2. Projected catch, landings, and discard of major target species.

	sablefish	longspine	shortspine	dover	arrowtooth	petrale	otr. flatfish
Total catch/mortality (mt)							
N. of 40°10'	2,628	1,218	628	4,936	2,158	1,210	2,597
38°-40°10'	479	288	190	1,334	24	425	1,299
S. of 38°	362	262	120	972	3	105	193
Coastwide	3,469	1,769	938	7,241	2,184	1,740	4,089
Retained catch (mt)							
N. of 40°10'	1,411	988	419	4,283	1,418	1,155	1,551
38°-40°10'	278	234	124	1,156	15	391	804
S. of 38°	249	212	78	840	2	102	120
Coastwide	1,938	1,434	621	6,279	1,435	1,648	2,475
Discard mortality (mt)							
N. of 40°10'	1,217	230	209	653	739	55	1,046
38°-40°10'	201	55	67	178	9	34	495
S. of 38°	113	50	42	132	1	4	73
Coastwide	1,531	335	318	963	749	93	1,614

Table C.6.O.Trawl-3. Projected total bycatch of rebuilding species.

	period	lingcod	canary	POP	darkblotched	widow	yelloweye	bocaccio	cowcod
N. of 40°10'									
	1	1.0	0.208	9.3	8.8	0.1	0.0	0.0	0.0
	2	2.6	0.239	11.7	11.1	0.1	0.0	0.0	0.0
	3	10.5	0.972	8.0	7.8	0.2	0.0	0.0	0.0
	4	20.9	4.363	21.1	23.6	0.4	0.2	0.0	0.0
	5	11.2	2.356	9.5	8.9	0.2	0.1	0.0	0.0
	6	1.9	0.390	8.0	7.5	0.1	0.0	0.0	0.0
	Total	48.0	8.528	67.8	67.7	1.0	0.3	0.0	0.0
S. of 40°10'									
	1	3.2	0.1	0.1	5.3	0.1	0.0	1.3	0.0
	2	3.9	0.1	0.1	4.9	0.1	0.0	1.7	0.0
	3	7.7	0.3	0.1	4.3	0.1	0.0	8.7	0.2
	4	8.2	0.2	0.1	5.8	0.1	0.0	8.0	0.2
	5	4.1	0.1	0.1	6.2	0.1	0.0	1.7	0.0
	6	3.3	0.1	0.1	6.6	0.1	0.0	1.2	0.0
	Total	30.5	1.0	0.4	33.0	0.5	0.1	22.6	0.6
Coastwide									
	1	4.2	0.3	9.4	14.1	0.1	0.0	1.3	0.0
	2	6.5	0.4	11.8	16.1	0.2	0.0	1.7	0.0
	3	18.2	1.2	8.1	12.1	0.3	0.0	8.7	0.2
	4	29.1	4.6	21.2	29.4	0.5	0.2	8.0	0.2
	5	15.3	2.5	9.6	15.0	0.2	0.1	1.7	0.0
	6	5.1	0.5	8.1	14.1	0.1	0.0	1.2	0.0
	Total	78.4	9.5	68.1	100.7	1.5	0.4	22.6	0.6
							assuming higher CPUE for 1999 year class ->	**45**	

Table C.6.O.Trawl-4. Summary of changes in projected 2004 vessel groundfish revenue from 2002.

Fleet/ Avg. 2002 revenue / Direction of change	< 20% change in projected revenue					> 20% change in projected revenue					All vessels				
	# of ves.	Avg. 2002 GF ($)	Proj. 2004 GF ($)	Average change in GF revenue		# of ves.	Avg. 2002 GF ($)	Proj. 2004 GF ($)	Average change in GF revenue		# of ves.	Avg. 2002 GF ($)	Proj. 2004 GF ($)	Average change in GF revenue	
				$	%				$	%				$	%
Non-whiting vessels															
$21 - $100,000															
Lower 2004 revenue	12	61,067	54,603	-6,464	-10%	17	54,143	30,581	-23,562	-45%	29	57,008	40,521	-16,487	-31%
Higher 2004 revenue	10	81,117	87,669	6,552	8%	22	42,207	75,870	33,663	146%	32	54,366	79,557	25,191	103%
Total	22	70,180	69,633	-547	-2%	39	47,410	56,129	8,719	63%	61	55,622	60,999	5,377	40%
> $100,000															
Lower 2004 revenue	39	143,967	127,939	-16,028	-11%	46	192,255	110,139	-82,116	-41%	85	170,099	118,306	-51,793	-27%
Higher 2004 revenue	7	135,886	146,955	11,069	8%	21	138,418	199,922	61,504	44%	28	137,785	186,680	48,895	35%
	46	142,738	130,833	-11,905	-8%	67	175,381	138,280	-37,101	-14%	113	162,092	135,248	-26,844	-12%
All															
Lower 2004 revenue	51	124,461	110,684	-13,778	-11%	63	154,987	88,671	-66,316	-42%	114	141,331	98,519	-42,812	-28%
Higher 2004 revenue	17	103,669	112,081	8,412	8%	43	89,194	136,454	47,260	96%	60	93,295	129,548	36,253	71%
Total	68	119,263	111,033	-8,230	-6%	106	128,297	108,054	-20,243	14%	174	124,767	109,218	-15,548	6%
Whiting vessels															
$21 - $100,000															
Lower 2004 revenue	1	89,276	72,143	-17,133	-19%	1	85,149	33,879	-51,270	-60%	2	87,212	53,011	-34,201	-40%
Higher 2004 revenue						4	41,191	105,904	64,713	1058%	4	41,191	105,904	64,713	1058%
Total	1	89,276	72,143	-17,133	-19%	5	49,982	91,499	41,516	834%	6	56,531	88,273	31,742	692%
> $100,000															
Lower 2004 revenue	8	237,306	220,291	-17,015	-8%	8	281,675	174,038	-107,636	-38%	16	259,490	197,165	-62,326	-23%
Higher 2004 revenue	8	221,871	242,180	20,309	10%	3	212,304	288,858	76,554	37%	11	219,262	254,910	35,648	17%
Total	16	229,589	231,236	1,647	1%	11	262,755	205,353	-57,403	-18%	27	243,101	220,691	-22,410	-7%
All															
Lower 2004 revenue	9	220,858	203,830	-17,028	-9%	9	259,838	158,465	-101,374	-40%	18	240,348	181,148	-59,201	-25%
Higher 2004 revenue	8	221,871	242,180	20,309	10%	7	114,525	184,313	69,788	620%	15	171,776	215,175	43,399	295%
Total	17	221,335	221,877	542	0%	16	196,264	169,773	-26,491	249%	33	209,179	196,615	-12,565	120%
All vessels															
$21 - $100,000															
Lower 2004 revenue	13	63,237	55,953	-7,284	-11%	18	55,866	30,764	-25,102	-46%	31	58,957	41,327	-17,630	-31%
Higher 2004 revenue	10	81,117	87,669	6,552	8%	26	42,051	80,491	38,440	287%	36	52,902	82,485	29,582	209%
Total	23	71,011	69,742	-1,268	-2%	44	47,702	60,148	12,446	150%	67	55,704	63,442	7,738	98%
> $100,000															
Lower 2004 revenue	47	159,855	143,659	-16,196	-10%	54	205,502	119,605	-85,897	-41%	101	184,260	130,799	-53,462	-27%
Higher 2004 revenue	15	181,745	197,742	15,997	9%	24	147,654	211,039	63,385	43%	39	160,766	205,925	45,159	30%
Total	62	165,151	156,743	-8,407	-6%	78	187,703	147,739	-39,964	-15%	140	177,715	151,727	-25,989	-11%
All															
Lower 2004 revenue	60	138,921	124,656	-14,265	-10%	72	168,093	97,395	-70,698	-42%	132	154,833	109,786	-45,047	-28%
Higher 2004 revenue	25	141,494	153,713	12,219	9%	50	92,740	143,154	50,414	170%	75	108,991	146,673	37,682	116%
Total	85	139,678	133,202	-6,476	-5%	122	137,211	116,149	-21,062	45%	207	138,224	123,151	-15,072	24%

Table 3 (North). Trip Limits and Gear Requirements[1/] for Limited Entry Trawl Gear North of 40°10' N. Latitude[2/]

Other Limits and Requirements Apply – Read Sections IV. A. and B. NMFS Actions before using this table 9/12/03 12:15

	JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
Rockfish Conservation Area10/ (RCA): North of 40°10' N. lat.	75 fm - 200 fm (line modified to incorporate petrale sole fishing grounds)	60 fm - 200 fm		75 fm - 150 fm	75 fm - 200 fm	75 fm - 200 fm (line modified to incorporate petrale sole fishing grounds)
Small footrope or midwater trawl gear is required shoreward of the RCA; all trawl gear (large footrope, midwater trawl, and small footrope gear) is permitted seaward of the RCA.						
A vessel may have more than one type of limited entry bottom trawl gear on board, but the most restrictive trip limit associated with the gear on board applies for that trip and will count toward the cumulative trip limit for that gear. A vessel may not have limited entry bottom trawl gear on board if that vessel also has trawl gear on board that is permitted for use within a RCA, including limited entry midwater trawl gear, regardless of whether the vessel is intending to fish within a RCA on that fishing trip. **See IV.A.(14)(iv) for details.**						
1 **Minor slope rockfish**[3/]	4,000 lb/ 2 months					
2 **Pacific ocean perch**	3,000 lb/ 2 months					
3 **DTS complex**						
4 Sablefish	6,200 lb/ 2 months, providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, shoreward or seaward of RCA) during the entire limit period, then the sablefish limit is 2,000 lb/2 months.		8,700 lb/ 2 months, providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, shoreward or seaward of RCA) during the entire limit period, then the sablefish limit is 5,000 lb/2 months.			6,200 lb/ 2 months, providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, shoreward or seaward of RCA) during the entire limit period, then the sablefish limit is 2,000 lb/2 months.
5 Longspine thornyhead	10,000 lb/ 2 months, providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, shoreward or seaward of RCA) during the entire limit period, then the longspine thornyhead limit is 1,000 lb/ 2 months.					
6 Shortspine thornyhead	2,100 lb/ 2 months, providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, shoreward or seaward of RCA) during the entire limit period, then the shortspqine thornyheads limit is 1,000 lb/2 months.					
7 Dover sole	45,000 lb/ 2 months, providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, shoreward or seaward of RCA) during the entire limit period, then the Dover sole limit is 10,000 lb/ 2 months.		21,000 lb/ 2 months			45,000 lb/ 2 months, providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, shoreward or seaward of RCA) during the entire limit period, then the Dover sole limit is 10,000 lb/ 2 months.
8 **Flatfish**						
9 All other flatfish[4/]						
10 large footrope trawl	100,000 lb/ 2 months providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period.					
11 small footrope trawl[7/]	All other flatfish plus petrale & rex sole: If small footrope gear is used at any time in any area (North or South, inshore or offshore of RCA) during the entire limit period, then 30,000 lb/ 2 months, no more than 10,000 lb/ 2 months of which may be petrale sole.		All other flatfish plus petrale & rex sole: If small footrope gear is used at any time in any area (North or South, inshore or offshore of RCA) during the entire limit period, then 60,000 lb/ 2 months, no more than 25,000 lb/ 2 months of which may be petrale sole.			All other flatfish plus petrale & rex sole: If small footrope gear is used at any time in any area (North or South, inshore or offshore of RCA) during the entire limit period, then 30,000 lb/ 2 months, no more than 10,000 lb/ 2 months of which may be petrale sole.
12 Petrale sole						
13 large footrope trawl	Not limited providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period.	100,000 lb/ 2 months providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period.				Not limited providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period.
14 small footrope trawl[7/]	Included in all other flatfish (small footrope trawl)					
15 Rex sole	Included in all other flatfish (large and small footrope trawl)					
16 Arrowtooth flounder	Not limited providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, inshore or offshore of RCA) during the entire limit period, then 4,000 lb/2 mo.	150,000 lb/ 2 months providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, inshore or offshore of RCA) during the entire limit period, then 8,000 lb/2 mo.				Not limited providing that only large footrope or midwater trawl gear is used to land any groundfish species during the entire limit period. If small footrope gear is used at any time in any area (North or South, inshore or offshore of RCA) during the entire limit period, then 4,000 lb/2 mo.
17 **Whiting**[5/]	20,000 lb/ trip		Primary Season (only mid-water trawl permitted in the RCA)		10,000 lb/ trip	
18 **Other Fish**[6/]	Not limited					
19 **Use of small footrope bottom trawl**[7/] **or mid-water trawl is required for landing all of the following species:**						
20 **Minor shelf rockfish and widow rockfish**[3/]	300 lb/ month		1,000 lb/ month, no more than 200 lb/ month of which may be yelloweye rockfish			300 lb/ month
21 **Widow rockfish**						
22 mid-water trawl - permitted within the RCA	CLOSED[8/]		During primary whiting season, in trips of at least 10,000 lb of whiting: combined widow and yellowtail limit of 500 lb/ trip, cumulative widow limit of 1,500 lb/ month		CLOSED[8/]	12,000 lb/ 2 months
23 **Canary rockfish**	100 lb/ month		300 lb/ month		100 lb/ month	
24 **Yellowtail**						
25 mid-water trawl - permitted within the RCA	CLOSED[8/]		During primary whiting season, in trips of at least 10,000 lb of whiting: combined widow and yellowtail limit of 500 lb/ trip, cumulative yellowtail limit of 2,000 lb/ month			18,000 lb/ 2 months
26 small footrope trawl[7/]	In landings without flatfish, 1,000 lb/ month. As flatfish bycatch, per trip limit is the sum of 33% (by weight) of all flatfish except arrowtooth flounder, plus 10% (by weight) of arrowtooth flounder. Total yellowtail landings not to exceed 10,000 lb/ 2 months, no more than 1,000 lb of which may be landed without flatfish.					
27 **Minor nearshore rockfish**	300 lb/ month					
28 **Lingcod**[6/]	800 lb/ 2 months		1,000 lb/ 2 months		800 lb/ 2 months	

Table 3 (South). Trip Limits and Gear Requirements[1/] for Limited Entry Trawl Gear South of 40°10' N. Latitude[2/]

Other Limits and Requirements Apply – Read Sections IV. A. and B. NMFS Actions before using this table

9/12/03 12:16

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area[10/] (RCA):						
	40°10' - 38° N. lat.	75 fm - 150 fm		100 fm - 150 fm		75 fm - 150 fm	
	South of 38° N. lat.	75 fm - 150 fm along the mainland coast; shoreline - 150 fm around islands		100 fm - 150 fm along the mainland coast; shoreline - 150 fm around islands		75 fm - 150 fm along the mainland coast; shoreline - 150 fm around islands	

Small footrope or midwater trawl gear is required shoreward of the RCA; all trawl gear (large footrope, midwater trawl, and small footrope gear) is permitted seaward of the RCA.

A vessel may have more than one type of limited entry bottom trawl gear on board, but the most restrictive trip limit associated with the gear on board applies for that trip and will count toward the cumulative trip limit for that gear. A vessel may not have limited entry bottom trawl gear on board if that vessel also has trawl gear on board that is permitted for use within a RCA, including limited entry midwater trawl gear, regardless of whether the vessel is intending to fish within a RCA on that fishing trip. **See IV.A.(14)(iv) for details.**

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
1	**Minor slope rockfish[3/]**						
2	40°10' - 38° N. lat.	7,000 lb/ 2 months					
3	South of 38° N. lat.	40,000 lb/ 2 months					
4	**Splitnose**						
5	40°10' - 38° N. lat.	7,000 lb/ 2 months					
6	South of 38° N. lat.	40,000 lb/ 2 months					
7	**DTS complex**						
8	Sablefish	7,500 lb/ 2 months					
9	Longspine thornyhead	10,000 lb /2 months					
10	Shortspine thornyhead	2,000 lb/ 2 months					
11	Dover sole	26,000 lb/ 2 months					
12	**Flatfish**						
13	All other flatfish[4/]	100,000 lb/ 2 months	All other flatfish plus petrale & rex sole: 100,000 lb/ 2 months, no more than 20,000 lb/ 2 months of which may be petrale sole				100,000 lb/ 2 months
14	Petrale sole	No limit					No limit
15	Rex sole	Included in all other flatfish					
16	Arrowtooth flounder	No limit	10,000 lb/ 2 months				No limit
17	**Whiting[5/]**	20,000 lb/ trip		Primary Season (only mid-water trawl permitted within the RCA)		10,000 lb/ trip	
	Minor shelf rockfish[3/]	300 lb/ month, providing that only large footrope trawl gear is used to land any groundfish species during the entire limit period.					
	Chilipepper rockfish	2,000 lb/ 2 months, providing that only large footrope trawl gear is used to land any groundfish species during the entire limit period.					
	Bocaccio	100 lb/month, providing that only large footrope trawl gear is used to land any groundfish species during the entire limit period.					
18	**Other Fish[9/]**	Not limited					
19	**Use of small footrope bottom trawl[7/] or mid-water trawl is required for landing all of the following species:**						
20	**Minor shelf rockfish, widow, and chilipepper rockfish[3/]**	300 lb/ month					
21	**Widow rockfish**						
22	mid-water trawl - permitted within the RCA	CLOSED[6/]					
23	**Canary rockfish**	100 lb/ month		300 lb/ month		100 lb/ month	
24	**Bocaccio**	CLOSED[6/]					
25	**Cowcod**	CLOSED[6/]					
26	**Minor nearshore rockfish**	300 lb/ month					
27	**Lingcod[8/]**	800 lb/ 2 months		1,000 lb/ 2 months		800 lb/ 2 months	

Table 4 (North). Trip Limits for Limited Entry Fixed Gear North of 40°10' N. Latitude[1/]

Other Limits and Requirements Apply -- Read Sections IV. A. and B. NMFS Actions before using this table

9/12/03 12:16

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
Rockfish Conservation Area[6/] (RCA):							
	North of 46°16' N. lat.	shoreline - 100 fm					
	46°16' N. lat. - 40°10' N. lat.	30 fm - 100 fm					
1	Minor slope rockfish[4/]	4,000 lb/ 2 months					
2	Pacific ocean perch	1,800 lb/ 2 months					
3	Sablefish	300 lb/ day, or 1 landing per week of up to 900 lb, not to exceed 3,600 lb/ 2 months					
4	Longspine thornyhead	10,000 lb/ 2 months					
5	Shortspine thornyhead	2,100 lb/ 2 months					
6	Dover sole	5,000 lb/ month					
7	Arrowtooth flounder	5,000 lb/ month					
8	Petrale sole	5,000 lb/ month					
9	Rex sole	5,000 lb/ month					
10	All other flatfish[2/]	5,000 lb/ month					
11	Whiting[3/]	10,000 lb/ trip					
12	Minor shelf rockfish, widow, and yellowtail rockfish[4/]	200 lb/ month					
13	Canary rockfish	CLOSED[5/]					
14	Yelloweye rockfish	CLOSED[5/]					
15	Cowcod	CLOSED[5/]					
16	Minor nearshore rockfish	5,000 lb/ 2 months, no more than 1,200 lb of which may be species other than black or blue rockfish[6/]					
17	Lingcod[7/]	CLOSED[5/]		400 lb/ month			CLOSED[5/]
18	Other fish[9/]	Not limited					

Table 4 (South). Trip Limits for Limited Entry Fixed Gear South of 40°10' N. Latitude[1/]

Other Limits and Requirements Apply -- Read Sections IV. A. and B. NMFS Actions before using this table 9/12/03 12:16

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area[7/] (RCA):						
	40°10' - 34°27' N. lat.	30 fm - 150 fm (also applies around islands, there is an additional closure between the shoreline and 10 fm around the Farallone Islands)		20 fm - 150 fm (also applies around islands, there is an additional closure between the shoreline and 10 fm around the Farallone Islands)		30 fm - 150 fm (also applies around islands, there is an additional closure between the shoreline and 10 fm around the Farallone Islands)	
	South of 34°27' N. lat.	60 fm - 150 fm (also applies around islands)					
1	**Minor slope rockfish[4/]**						
2	40°10' - 38° N. lat.	7,000 lb/ 2 months					
3	South of 38° N. lat.	40,000 lb/ 2 months					
4	**Splitnose**						
5	40°10' - 38° N. lat.	7,000 lb/ 2 months					
6	South of 38° N. lat.	40,000 lb/ 2 months					
7	**Sablefish**						
8	40°10' - 36° N. lat.	300 lb/ day, or 1 landing per week of up to 900 lb, not to exceed 3,600 lb/ 2 months					
9	South of 36° N. lat.	350 lb/ day, or 1 landing per week of up to 1,050 lb					
10	**Longspine thornyhead**	10,000 lb/ 2 months					
11	**Shortspine thornyhead**	2,000 lb/ 2 months					
12	**Dover sole**	5,000 lb/ month When fishing for Pacific sanddabs, vessels using hook-and-line gear with no more than 12 hooks per line, using hooks no larger than "Number 2" hooks, which measure 11 mm (0.44 inches) point to shank, and up to 1 lb (0.45 kg) of weight per line are not subject to the RCAs.					
13	**Arrowtooth flounder**						
14	**Petrale sole**						
15	**Rex sole**						
16	**All other flatfish[2/]**						
17	**Whiting[3/]**	10,000 lb/ trip					
18	**Minor shelf rockfish, widow, and yellowtail rockfish[4/]**						
19	40°10' - 34°27' N. lat.	300 lb/ 2 months	CLOSED[5/]	200 lb/ 2 months		300 lb/ 2 months	
20	South of 34°27' N. lat.	CLOSED[5/]	2,000 lb/ 2 months				
	Chilipepper rockfish	2,000 lb/ 2 months, this opportunity only available seaward of the nontrawl RCA					
21	**Canary rockfish**	CLOSED[5/]					
22	**Yelloweye rockfish**	CLOSED[5/]					
23	**Cowcod**	CLOSED[5/]					
24	**Bocaccio**						
25	40°10' - 34°27' N. lat.	200 lb/ 2 months	CLOSED[5/]	100 lb/ 2 months		200 lb/ 2 months	
26	South of 34°27' N. lat.	CLOSED[5/]	300 lb/ 2 months				
27	**Minor nearshore rockfish**						
28	Shallow nearshore						
29	40°10' - 34°27' N. lat.	300 lb/ 2 months	CLOSED[5/]	500 lb/ 2 months	600 lb/ 2 months	500 lb/ 2 months	300 lb/ 2 months
30	South of 34°27' N. lat.	CLOSED[5/]	300 lb/ 2 months				
31	Deep nearshore						
32	40°10' - 34°27' N. lat.	500 lb/ 2 months	CLOSED[5/]	500 lb/ 2 months		400 lb/month	500 lb/ 2 months
33	South of 34°27' N. lat.	CLOSED[5/]	500 lb/ 2 months	600 lb/ 2 months			400 lb/ 2 months
34	California scorpionfish	CLOSED[5/]	300 lb/ 2 months		400 lb/ 2 months		300 lb/ 2 months
35	**Lingcod[6/]**	CLOSED[5/]		400 lb/ month, when nearshore open			CLOSED[5/]
36	**Other fish[8/]**	Not limited					

Table 5 (North). Trip Limits for Open Access Gears North of 40°10' N. Latitude[1/]

Other Limits and Requirements Apply -- Read Sections IV. A. and C. NMFS Actions before using this table 9/12/03 12:17

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area[5/] (RCA):						
	North of 46°16' N. lat.	shoreline - 100 fm					
	46°16' N. lat. - 40°10' N. lat.	30 fm - 100 fm					
1	**Minor slope rockfish[2/]**	Per trip, no more than 25% of weight of the sablefish landed					
2	**Pacific ocean perch**	100 lb/ month					
3	**Sablefish**	300 lb/ day, or 1 landing per week of up to 900 lb, not to exceed 3,600 lb/ 2 months					
4	**Thornyheads**	CLOSED[5/]					
5	**Dover sole**	3,000 lb/month, no more than 300 lb of which may be species other than Pacific sanddabs.					
6	**Arrowtooth flounder**						
7	**Petrale sole**						
8	**Rex sole**						
9	**All other flatfish[3/]**						
10	**Whiting**	300 lb/ month					
11	**Minor shelf rockfish, widow and yellowtail rockfish[2/]**	200 lb/ month					
12	**Canary rockfish**	CLOSED[5/]					
13	**Yelloweye rockfish**	CLOSED[5/]					
14	**Cowcod**	CLOSED[5/]					
15	**Minor nearshore rockfish**	5,000 lb/ 2 months, no more than 1,200 lb of which may be species other than black or blue rockfish[6/]					
16	**Lingcod[6/]**	CLOSED[5/]		300 lb/ month			CLOSED[5/]
17	**Other Fish[7/]**	Not limited					
18	**PINK SHRIMP EXEMPTED TRAWL** *(not subject to RCAs)*						
19	North	**Effective April 1 - October 31, 2004:** groundfish 500 lb/day, multiplied by the number of days of the trip, not to exceed 1,500 lb/trip. The following sublimits also apply and are counted toward the overall 500 lb/day and 1,500 lb/trip groundfish limits: lingcod 300 lb/month (minimum 24 inch size limit); sablefish 2,000 lb/month; canary, thornyheads and yelloweye rockfish are PROHIBITED. All other groundfish species taken are managed under the overall 500 lb/day and 1,500 lb/trip groundfish limits. Landings of these species count toward the per day and per trip groundfish limits and do not have species-specific limits. The amount of groundfish landed may not exceed the amount of pink shrimp landed.					
22	**SALMON TROLL**						
23	North	Salmon trollers may retain and land up to 1 lb of yellowtail rockfish for every 2 lbs of salmon landed, with a cumulative limit of 200 lb/month, both within and outside of the RCA. This limit is within the 200 lb per month combined limit for minor shelf rockfish, widow rockfish and yellowtail rockfish, and not in addition to that limit. All groundfish species are subject to the open access limits, seasons and RCA restrictions listed in the table above.					

Table 5 (South). Trip Limits for Open Access Gears South of 40°10' N. Latitude[1/]

Other Limits and Requirements Apply -- Read Sections IV. A. and C. NMFS Actions before using this table 9/12/03 12:17

	JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
Rockfish Conservation Area[7/] (RCA):						
40°10' - 34°27' N. lat.	30 fm - 150 fm (also applies around islands, there is an additional closure between the shoreline and 10 fm around the Farallone Islands)		20 fm - 150 fm (also applies around islands, there is an additional closure between the shoreline and 10 fm around the Farallone Islands)		30 fm - 150 fm (also applies around islands, there is an additional closure between the shoreline and 10 fm around the Farallone Islands)	
South of 34°27' N. lat.	60 fm - 150 fm (also applies around islands)					
1 **Minor slope rockfish[2/]**						
2 40°10' - 38° N. lat.	Per trip, no more than 25% of weight of the sablefish landed					
3 South of 38° N. lat.	10,000 lb/ 2 months					
4 **Splitnose**	200 lb/ month					
5 **Sablefish**						
6 40°10' - 36° N. lat.	300 lb/ day, or 1 landing per week of up to 900 lb, not to exceed 3,600 lb/ 2 months					
7 South of 36° N. lat.	350 lb/ day, or 1 landing per week of up to 1,050 lb					
8 **Thornyheads**						
9 40°10' - 34°27' N. lat.	CLOSED[5/]					
10 South of 34°27' N. lat.	50 lb/ day, no more than 1,000 lb/ 2 months					
11 **Dover sole** 12 **Arrowtooth flounder** 13 **Petrale sole** 14 **Rex sole** 15 **All other flatfish[3/]**	3,000 lb/month, no more than 300 lb of which may be species other than Pacific sanddabs. When fishing for Pacific sanddabs, vessels using hook-and-line gear with no more than 12 hooks per line, using hooks no larger than "Number 2" hooks, which measure 11 mm (0.44 inches) point to shank, and up to 1 lb of weight per line are not subject to the RCAs.					
16 **Whiting**	300 lb/ month					
17 **Minor shelf rockfish, widow and chilipepper rockfish[2/]**						
18 40°10' - 34°27' N. lat.	300 lb/ 2 months	CLOSED[5/]	200 lb/ 2 months		300 lb/ 2 months	
19 South of 34°27' N. lat.	CLOSED[5/]	500 lb/ 2 months				
20 **Canary rockfish**	CLOSED[5/]					
21 **Yelloweye rockfish**	CLOSED[5/]					
22 **Cowcod**	CLOSED[5/]					
23 **Bocaccio**						
24 40°10' - 34°27' N. lat.	200 lb/ 2 months	CLOSED[5/]	100 lb/ 2 months		200 lb/ 2 months	
25 South of 34°27' N. lat.	CLOSED[5/]	100 lb/ 2 months				
26 **Minor nearshore rockfish**						
27 Shallow nearshore						
28 40°10' - 34°27' N. lat.	300 lb/ 2 months	CLOSED[5/]	500 lb/ 2 months	600 lb/ 2 months	500 lb/ 2 months	300 lb/ 2 months
29 South of 34°27' N. lat.	CLOSED[5/]	300 lb/ 2 months				
30 Deep nearshore						
31 40°10' - 34°27' N. lat.	500 lb/ 2 months	CLOSED[5/]	500 lb/ 2 months		400 lb/month	500 lb/ 2 months
32 South of 34°27' N. lat.	CLOSED[5/]	500 lb/ 2 months	600 lb/ 2 months			400 lb/ 2 months
33 California scorpionfish	CLOSED[5/]	300 lb/ 2 months		400 lb/ 2 months		300 lb/ 2 months
34 **Lingcod[4/]**	CLOSED[5/]		300 lb/ month, when nearshore open			CLOSED[5/]
35 **Other Fish[6/]**	Not limited					
36 PINK SHRIMP EXEMPTED TRAWL GEAR *(not subject to RCAs)*						
37 South	**Effective April 1 - October 31, 2004:** Groundfish 500 lb/day, multiplied by the number of days of the trip, not to exceed 1,500 lb/trip. The following sublimits also apply and are counted toward the overall 500 lb/day and 1,500 lb/trip groundfish limits: lingcod 300 lb/ month (minimum 24 inch size limit); sablefish 2,000 lb/ month; canary, thornyheads and yelloweye rockfish are PROHIBITED. All other groundfish species taken are managed under the overall 500 lb/day and 1,500 lb/trip groundfish limits. Landings of these species count toward the per day and per trip groundfish limits and do not have species-specific limits. The amount of groundfish landed may not exceed the amount of pink shrimp landed.					
38 PRAWN AND, SOUTH OF 38°57'30" N. LAT., CALIFORNIA HALIBUT AND SEA CUCUMBER EXEMPTED TRAWL						
39 **EXEMPTED TRAWL Rockfish Conservation Area[7/] (RCA):**						
40 40°10' - 38° N. lat.	75 fm - 150 fm		100 fm - 150 fm		75 fm - 150 fm	
41 South of 38° N. lat.	75 fm - 150 fm along the mainland coast; shoreline - 150 fm around islands		100 fm - 150 fm along the mainland coast; shoreline - 150 fm around islands		75 fm - 150 fm along the mainland coast; shoreline - 150 fm around islands	
42	Groundfish 300 lb/trip. Trip limits in this table also apply and are counted toward the 300 lb groundfish per trip limit. The amount of groundfish landed may not exceed the amount of the target species landed, except that the amount of spiny dogfish landed may exceed the amount of target species landed. Spiny dogfish are limited by the 300 lb/trip overall groundfish limit. The daily trip limits for sablefish coastwide and thornyheads south of Pt. Conception and the overall groundfish "per trip" limit may not be multiplied by the number of days of the trip. Vessels participating in the California halibut fishery south of 38°57'30" N. lat. are allowed to (1) land up to 100 lb/day of groundfish without the ratio requirement, provided that at least one California halibut is landed and (2) land up to 3,000 lb/month of flatfish, no more than 300 lb of which may be species other than Pacific sanddabs, sand sole, starry flounder, rock sole, curlfin sole, or California scorpionfish (California scorpionfish is also subject to the trip limits and closures in line 25).					

ENFORCEMENT CONSULTANTS REPORT ON GROUNDFISH MANAGEMENT MEASURES FOR 2004: FINAL ACTION

The Enforcement Consultants (EC) have engaged in several discussions with members of the Groundfish Advisory Subpanel (GAP), both individually and as a group, related to our proposal that limited entry fixed gear vessels not be allowed to drift in the Rockfish Conservation Area (RCA). Members of GAP expressed strong concerns over safety; (i.e., drifting in areas where conflicts could increase with other vessel traffic, versus being able to drift in the RCA).

Members of the EC familiar with the vessel monitoring system (VMS) and its capabilities, advise that drifting vessels and vessels actively fishing will show similar signatures. Allowing drifting in the RCA will adversely effect our ability to use this tool for it's intended purpose and tax our limited resources. We agree that safety is paramount. We would point out that, consistent with safety and with current U.S.Coast Guard regulations, a full time look-out must be provided while a vessel is at sea. Thus, we would respectfully request adoption of the previously proposed language from our earlier statement on this subject (Exhibit C.6.e, Supplemental EC Report) as a regulation for 2004 groundfish management measures.

Concerning the B Platoon, the EC continues to advocate the abolishment of this reportedly underutilized marketing tool.

PFMC
09/12/03

GROUNDFISH ADVISORY SUBPANEL STATEMENT ON GROUNDFISH MANAGEMENT MEASURES FOR 2004: FINAL ACTION

The Groundfish Advisory Subpanel (GAP) has worked with the Groundfish Management Team (GMT) over the last few days to develop groundfish management measures for 2004. The GAP has reviewed the proposed trip limits and fathom boundaries described by the GMT in their statement and concurs with their recommendations.

In regard to other management measures, the GAP has the following comments and recommendations:

<u>Regulations to prevent "drifting" in the Rockfish Conservation Area (RCA)</u>: the GAP is quite concerned the final vessel monitoring system (VMS) regulations not only allegedly (we have not yet seen a copy) prevent trawl vessels from drifting in the RCA, but in addition, an attempt is being made to establish a further prohibition under 2004 groundfish management regulations. The GAP as a whole, and individual GAP members, submitted formal comments to NMFS on the vessel safety reasons that could require a vessel to drift for short periods in the RCA. These comments were evidently ignored. We were told by NMFS, when VMS equipment was first described, of how NMFS is able to track a vessel's activity through the VMS system. If - as claimed by NMFS - a VMS signature allows NMFS to determine when a vessel is fishing, then there is no reason to prohibit drifting. If VMS units are not able to perform as described, then we suggest the Council has been sold a bill of goods and perhaps we should re-examine the VMS system.

The GAP notes the Ad Hoc VMS Committee will be meeting in October. We expect further VMS regulations are contemplated. If that is the case, then the drifting issue should be handled under the VMS regulations and not under the groundfish specifications.

<u>Maintaining the "B" Platoon</u>: The majority of the GAP believes the "B" platoon system should be maintained. In winter months, platooning offers vessels - especially those fishing nearer shore - an opportunity to achieve their cumulative limits during a time of poor weather. In summer months, platooning offers processors a means to spread out the flow of product, thereby maintaining the efficiency of processing operations and providing a higher quality product to consumers.

Given concerns expressed by the Enforcement Consultants, the GAP is willing to recommend that fathom line changes apply on the date specified to all vessels, regardless of platoon. This will prevent the confusion of having to enforce multiple fathom lines, an issue identified by the Enforcement Consultants. However, the GAP notes that enforcement agencies have been able to deal with differential trip limits for many years, so there should be no increased problem with maintaining the "B" platoon. As the Council examines differential trip limits in conjunction with use of more selective gear, enforcement agencies will still have to handle differences in landed catch. There is no practical difference in dealing with different catch levels resulting from continuing the "B" platoon and dealing with different catch levels from use of selective gear designed to reduce bycatch.

A minority of the GAP believes the “B” platoon opportunity should be eliminated.

Sablefish fixed gear season start date: The GAP disagrees with the recommendation that the season start date be delayed by one month. Planning for next year’s fishery has already begun and markets have been established, based on standard season opening dates. If new discard data is going to be incorporated in-season - a practice opposed by the GAP - then it should be done so. The GAP notes that the fixed gear portion of the sablefish OY was not fully attained in 2003. The same situation is likely to occur in 2004, providing sufficient overhead to accommodate new discard data.

Oregon recreational management: The Oregon recreational members of the GAP recommend that the prohibition on retention of canary rockfish and yelloweye rockfish be removed. The impact of the recreational fishery has already been accounted for in the species scorecard; prohibiting retention would simply convert catch to discards.

Oregon selective flatfish trawl fishery: While the GAP generally concurs with the GMT recommendations, we suggest two changes: first, that the ability to use the selective trawl gear be available to fishermen along the entire coast of Oregon and Washington; and second, that the cap on incidental species include an appropriate cap on shortspine thornyheads.

Widow rockfish in the whiting fishery: The GAP notes that the 2003 fishery, which has not yet been completed, has exhibited substantially lower bycatch of widow rockfish. We expect that at such time as the whiting OY is selected next year, the 2003 bycatch data will be included as part of the average and that widow bycatch will not be a constraint on the whiting fishery.

The GAP also has two recommendations for issues that need to be analyzed in the environmental impact statement for the 2004 groundfish specifications. We request the Council agree to analyze the following:

* A 100-fathom line for fixed gear (both limited entry and open access) and midwater trawl gear in periods 2 through 5 in the area south of 38°. The GAP believes that bocaccio impacts will be minimal and can be handled by standard management measures. By analyzing the 100-fathom line, there will be an option for possible in-season adjustments if they are feasible.

* The impact of scorpionfish mortality in the area south of Point Conception. The figures currently used for scorpionfish mortality appear to be excessive.

Preliminary Report on Yelloweye Rockfish Catch Reduction in the Makah Halibut Fishery for 2002 and 2003

In the past two halibut seasons (2002 and 2003) the Makah Tribe has taken steps to reduce the bycatch of yelloweye rockfish during halibut openings. The majority of yelloweye catch in tribal fisheries is in the halibut fishery.

In 2002 we reduced our trip limit for yelloweye during the latter part of the restricted (trip limit) fishery to avoid any targeting on yelloweye and to encourage avoiding yelloweye hot spots. Full retention of rockfish was required and overages were forfeited to the Tribe. As a result the Makah harvest of yelloweye was reduced in the restricted halibut fishery and our catch was less than projected for 2002.

Prior to the 2003 halibut season, the Makah Tribe proposed two actions to reduce yelloweye bycatch: an earlier opening date (March 1) to allow fishing while halibut are in deeper water, and use of bait that is less selective for rockfish.

Because the IPHC adopted a March 1 opening date, Makah vessels were able to target halibut in deeper water (average depth of about 200 fm) than in previous years when the unrestricted fishery opened later in March. Halibut begin moving into shallower water (i.e. 100 fm or less) by late March. The majority of Makah vessels used Pacific cod for bait, with some herring also used. Little or no squid or octopus was used.

Port sampling was conducted by Makah Fisheries, NWIFC, IPHC, and WDFW staff. No yelloweye were landed or reported to be taken by Makah fishermen in the March 1 opening (a 48 hr unrestricted fishery). In addition, catch of all rockfish except thornyheads was reduced from previous years.

A second unrestricted opening was held April 15 and 16. Makah vessels fished in shallower water than in the March 1 opening. Fishing depths ranged from 200 fm to less than 100 fm. Also some mixed bait was used including squid, octopus, herring, and Pacific cod. Overall rockfish harvest increased from the March 1 opening including about 400 lbs of yelloweye.

The preliminary results from the 2003 unrestricted fishery will be applied to management of both the restricted and unrestricted fisheries in 2004.

Preliminary 2003 Unrestricted Halibut Results

1st opening March 1-3 48 hrs		
2nd opening April 15-16 36 hrs		
	1st opening	2nd opening
No. vessels	25	25
Avg. depth	200 fm	70-200 fm
Bait	P.cod herring	P.cod herring squid octopus
Catch (lbs)		
halibut	141,356	133,115
lingcod	705	4,112
canary	219	617
shortspine	1,919	1,446
minor slope	2,198	2,779
yelloweye	0	400*
*C&S landings		

ODFW Supplemental Report

Selective Flatfish Trawl (SFFT) Implementation

- Rationale/Incentives
    - Increased trip limits
    - Access to species inside the RCA (e.g. cod, petrale)

- Trawl Specifications
    - Net must meet a specific set of specifications
    - Net must be certified that those specifications are met
    - (e.g. headrope to footrope ratio of 1.3 or greater, no floats in center of headrope, wings must be 3 feet high, etc.)

- Support for Implementation
    - Two summers of research data (1991 and 1993)
    - Exempted Fishing Permit (EFP) during 2003
    - Results applicable 0 – 150 fathoms

- Depth Applications
    - Option 1: shore-150 fathoms (using defined waypoints), including fishing inside the RCA
    - Option 2: Not allowed inside RCA

- Season
    - Option 1: All Year
    - Option 2: May-August

- Area
    - Option 1: Oregon and Washington (south of Destruction Island, 47°41')
    - Option 2: Oregon Only

- Bycatch Species Safeguards
    - Cap canary rockfish, darkblotched rockfish, Pacific Ocean perch, shortspine thornyhead and yelloweye rockfish
    - Full retention of rockfish
    - States monitor caps and rockfish retention and report to GMT and NOAA Fisheries

- Declaration
    - Vessels must opt in for using a certified (SFFT) for the entire 2-month cumulative period via a declaration process

- Trip Limits
  - Appropriate trip limits determined by GMT/GAP
  - Increased DTS limits may be available as modeled/advised by GMT
    - Option 1: Inside the RCA
    - Option 2: Only outside the RCA

- Observer Coverage
  - Option 1: As provided via the current randomized NMFS observer program
  - Option 2: All trips
  - Option 3: All trips inside the RCA
  - Option 4: x% of trips observed
  - Note: Options 2-4 may require supplemental observer capability via state agencies and/or industry funding

Tribal Motion Regarding Groundfish Fisheries for 2004

Black Rockfish - The 2004 tribal harvest guidelines will be set at 20,000 pounds for the management area between the US/Canada border and Cape Alava, and 10,000 pounds for the management area located between Destruction Island and Leadbetter Point. No tribal harvest restrictions are proposed for the management area between Cape Alava and Destruction Island.

Sablefish - The 2004 tribal set aside for sablefish will be set at 10 percent of the Monterey through Vancouver area OY minus 3% to account for expected discard mortality. This represents 728.5 mt based on the harvest levels approved by the Council for 2004. Allocations among tribes and among gear types, if any, will be determined by the tribes.

Lingcod - The tribes propose an overall harvest guideline of 25 mt for all tribal fisheries. Tribal fisheries will be restricted to 450 pound per day and 1350 pound per week limits for all fisheries, which may be adjusted inseason to stay within the overall harvest guideline.

For all other tribal groundfish fisheries the following trip limits will apply:

Thornyhead Rockfish - Tribal fisheries will be restricted to a 300 pound per trip limit. This trip limit will be for short and longspine thornyheads combined.

Canary Rockfish - Tribal fisheries will be restricted to a 300 pound per trip limit.

Other Minor Nearshore, Shelf and Slope Rockfish - Tribal fisheries will be restricted to a 300 pound per trip limit for each species group, or the limited entry trip limits if they are less restrictive than the 300 pound per trip limit.

Yelloweye Rockfish – The tribes will continue developing depth, area, and time restrictions in their directed Pacific halibut fishery to minimize impacts on yelloweye rockfish. Tribal fisheries will be restricted to 100 pounds per trip except during open competition fisheries for Pacific halibut.

Full Retention- The tribes will allow full retention of all rockfish species during open competition fisheries for Pacific halibut.

Tribal Motion Regarding
Makah Trawl fisheries for 2004

Pacific Whiting - For the 2004 Pacific whiting fishery, the tribal set aside will be as provided in the Makah Tribe's proposed allocation framework.

Mid-water Trawl Fishery- Treaty mid-water trawl fishermen will be restricted to a cumulative limit of yellowtail rockfish, based on the number of vessels participating, not to exceed 150,000 pounds per two month period for the entire fleet. Their landings of widow rockfish must not exceed 10% of the poundage of yellowtail rockfish landed in any given period. The tribe may adjust the cumulative limit for any two-month period to minimize the incidental catch of canary and widow rockfish, provided the average cumulative limit does not exceed 150,000 pounds for the fleet.

Bottom Trawl Fishery - Treaty fishermen using bottom trawl gear will be subject to the trip limits applicable to the limited entry fishery for Pacific cod, English sole, rex sole, arrowtooth flounder, and other flatfish. For petrale sole, fishermen would be restricted to 30,000 lbs/2 month period for the entire year. Because of the relatively small expected harvest, the trip limits for the tribal fishery will be those in place at the beginning of the season in the limited entry fishery and will not be adjusted downward, nor will time restrictions or closures be imposed, unless in-season catch statistics demonstrate that the tribes have taken ½ of the harvest in the tribal area. Fishermen will be restricted to PFMC approved trawl gear.

Observer Program – The Makah tribe has an observer program in place to monitor and enforce the limits proposed above.

Exhibit C.7.c
Supplemental GAP Report
September 2003

GROUNDFISH ADVISORY SUBPANEL STATEMENT ON PROPOSED MONITORING PROGRAM FOR THE SHORE-BASED PACIFIC WHITING FISHERY

The Groundfish Advisory Subpanel (GAP) reviewed the proposed alternatives for a shoreside whiting monitoring program as listed in the preliminary draft environmental assessment for Amendment 10.

While the GAP appreciates the effort by NMFS to come up with logical alternatives, the GAP notes there has been no opportunity for the whiting industry - either harvesters or processors - to help NMFS develop alternatives. Since there is very little chance that final regulations can be put in place prior to the start of the 2004 whiting season, and since there are tentative plans for a meeting between NMFS and industry this fall, the GAP suggests the Council defer choosing a range of alternatives until the November meeting, at which time a better set of alternatives can be presented.

PFMC
09/11/03

GROUNDFISH ADVISORY SUBPANEL STATEMENT ON STOCK ASSESSMENT OF CANARY ROCKFISH

The Groundfish Advisory Subpanel (GAP) discussed the issues surrounding the need to conduct a stock assessment for canary rockfish prior to final determinations of 2005 - 2006 harvest levels.

As the Council is painfully aware, the low optimum yield (OY) on canary that results from the most current stock assessment and rebuilding analysis has significant impacts on all sectors of the fishery along the entire coast. If a new stock assessment is not conducted prior to determination of 2005-2006 harvest levels, those impacts will continue for another three years. Given the controversies with the current assessment and the disconnect between modeled data and anecdotal data, the GAP believes we would be failing in our obligations to use the best scientific information available if no stock assessment were conducted before next April.

The GAP has heard several objections raised to conducting a stock assessment. First, the argument that there is no new data doesn't square with the fact that we have a new survey taking place this year and the fact that two states are expending considerable time and effort to assemble aging data.

Second, the concept that we are somehow conducting an assessment "out of cycle" makes absolutely no sense. We have done the same sort of "out of cycle" assessments for Pacific whiting, sablefish, yellowtail rockfish, and bocaccio rockfish. Our management system is designed to be flexible, and we should not consider ourselves slaves to some arbitrary timetable when doing otherwise could have substantial social and economic impacts.

Finally, the complaint that "we don't have the people or the money" is ridiculous. Several sectors of the fishery have already offered to contribute through whatever neutral party is appropriate to the coast of conducting the assessment. There are highly competent scientists within NMFS (in both the Northwest and Southwest Regions), in state agencies, in academia, and in the private sector who could be contacted about performing an assessment.

The GAP holds no illusions a new assessment will magically transform the fishery. We are prepared to live with scientifically valid results; but to refuse to even try to examine new data, and instead live for years on old data, is unconscionable and does a dis-service to the fish, the fishermen, and the Council process.

PFMC
09/11/03

Exhibit C.9.b
Supplemental PowerPoint Presentation (Jim Glock)
September 2003

West Coast Groundfish

Bycatch Program EIS

The Bycatch Mandate

The Magnuson-Stevens Fishery Conservation and Management Act has established policies, definitions, standards and requirements relating to bycatch.

SEC. 301. NATIONAL STANDARDS FOR FISHERY CONSERVATION AND MANAGEMENT

- (a) IN GENERAL. Any fishery management plan prepared, and any regulation promulgated to implement any such plan, pursuant to this title shall be consistent with the following national standards for fishery conservation and management:

  9. Conservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch.”

SEC. 303. CONTENTS OF FISHERY MANAGEMENT PLANS

- (a) REQUIRED PROVISIONS.

  Any fishery management plan which is prepared by any Council, or by the Secretary, with respect to any fishery, **shall**

(11) establish a standardized reporting methodology to assess the amount and type of bycatch occurring in the fishery, **and** include conservation and management measures that, to the extent practicable and in the following priority –

(A) minimize bycatch; and

(B) minimize the mortality of bycatch which cannot be avoided

(b) DISCRETIONARY PROVISIONS

- Any fishery management plan which is prepared by any Council, or by the Secretary, with respect to any fishery,

  may

  (8) require that one or more <u>observers</u> be carried on board a vessel of the United States engaged in fishing for species that are subject to the plan, <u>for the purpose of collecting data necessary for the conservation and management of the fishery</u>

DISCRETIONARY PROVISIONS (continued)

- (10) include, consistent with the other provisions of this Act, conservation and management measures that provide harvest **incentives** for participants within each gear group to employ fishing practices that result in lower levels of bycatch or in lower levels of the mortality of bycatch

DEFINITIONS

- The term "**bycatch**" means **fish** which are harvested in a fishery, but which are **not sold or kept** for personal use, and includes economic discards and regulatory discards.

- "**Fish**" means finfish, mollusks, crustaceans, and **all** other **forms of marine animal and plant life other than marine mammals and birds**.

Specifically, with respect to the groundfish fisheries, bycatch includes any capture of

- (1) all species of finfish that are not classified as groundfish by the FMP, and all species of crustaceans, mollusks, and marine plants, whether retained or not;
- (2) marine turtles;
- (3) marine mammals and seabirds;
- (4) Bycatch also includes all **discarded** groundfish.

Bycatch does not include groundfish that are legally retained and sold or kept for personal use.

GOALS AND OBJECTIVES
of the Bycatch Program

These were developed by the Council's ad hoc Environmental Impact Statement Oversight Committee and adopted by the Council

Eight Initial Goals and Objectives

- account for total fishing mortality by species
- establish monitoring and accounting mechanisms to keep total catch of each groundfish stock from exceeding the specified limits
- reduce unwanted incidental catch and bycatch of groundfish and other species
- reduce the mortality of animals taken as bycatch

- provide incentives for fishers to reduce bycatch and flexibility/opportunity to develop bycatch reduction methods
- monitor incidental catch and bycatch in manner that is accurate, timely, and not excessively costly
- reduce unobserved fishing-caused mortalities of all fish
- gather information on unassessed and/or non-commercial species to aid in development of ecosystem management approaches

ALTERNATIVES

- Six alternatives have been developed to address the purpose and need for action.
- Under NEPA, the first alternative is always no action or status quo.

Alternative 1 reduces incidental catch and bycatch through a combination of indirect measures: Optimum Yield (OY) specifications, area closures, gear restrictions, variable trip limits and bag limits, seasons and other measures. High priority to minimize cost of catch monitoring. Vessel trip limits are calculated using a computer model and incidental catch ratios from past years.

Alternative 2 would reduce groundfish bycatch by increasing the size of trip limits. This would be achieved by reducing the trawl fleet by 50%; the goal of maintaining a year-round fishery would continue. The focus on fleet reduction is based on the Council's Strategic Plan for Groundfish. This alternative includes the area/depth management and modeling approach of Alternative 1.

Alternative 3 would reduce groundfish bycatch by increasing the size of trip limits. This would be achieved by eliminating the goal of maintaining a year-round fishery and establishing a short season or series of seasons. This alternative reflects one of the conclusions in the Council's *Strategic Plan for Groundfish* that, if fleet size is not reduced, *"(m)aintaining a year-round fishery may not be a short-term priority."* This alternative includes the area/depth management and modeling approach of Alternative 1.

Alternative 4 would reduce bycatch by establishing **catch** limits for various fishery sectors, rather than **landing/ retention** limits. Inseason (real-time) monitoring procedures would be established, and sectors would be closed when the sector catch limit is reached (or projected to be reached). This alternative includes the area/depth management and modeling approach of Alternative 1.

Alternative 5 would reduce bycatch by establishing **groundfish catch quotas** for individual commercial fishers. Monitoring would be focused at the individual vessel level rather than at the sector level. Certain gear regulations would be relaxed to allow vessels to improve bycatch reduction methods. Vessels could continue fishing until any cap was reached, and vessels with low incidental or bycatch rates would have additional fishing opportunities.

Alternative 6 would reduce bycatch to near zero by closing large areas where overfished groundfish are most likely to be encountered and other areas of high bycatch of non-groundfish species, establishing individual vessel catch allowances (caps) for overfished groundfish species, and requiring every commercial vessel to carry onboard observers. This alternative would include expanded area/depth closures (MPAs) and bycatch limits or discard prohibitions.

- **FISHERY MANAGEMENT TOOLS**
- **(The Mitigation Toolbox)**
- **Harvest Levels**
- ABC/OY
- sector allocations
- trip (landing) limits
- catch limits
- individual quotas
- **Gear Restrictions**
- **Trawl** mesh size
- footrope diameter/length
- net height
- codend mesh and dimensions
- design: on-bottom or pelagic
- bycatch reduction devices (BRDs)
- **Line** number of hooks
- hook size
- line length
- retrieval requirements
- **Pot/trap** number of pots
- pot size
- escape panel in net/pot
- retrieval requirements
- **Other**
- setnets (gill and trammel nets)

- **Time/Area Restrictions**
- seasons
    - area closures
    - depth closures
    - marine reserves

- **Capacity (number of participants)**
    - permits/licenses/endorsements
- limited entry

- **Capacity (Vessel Restrictions)**
    - vessel size
    - engine power
    - vessel type
-
- **Monitoring/Reporting Requirements**
    - permits/licenses
    - registrations
- Fish tickets (commercial landings/sales receipts)
    - Vessel logbooks
    - Surveys
    - Punch cards/tags (recreational)
    - Port sampling/on-shore observers
    - On-board observers
    - Vessel monitoring systems (VMS)
    - Onboard video recording devices
    - Enforcement

FISHING METHODS AND MITIGATION TOOLS

1. Reducing Incidental (Unintended or Unwanted) Catch

- This “toolbox” includes all available management measures (“fishing regulations”) that could be used to reduce incidental catch. Incidental catch means accidental, unintentional and/or unwanted capture of any marine plant or animal. This includes all non-groundfish species and all groundfish that would be discarded for any reason.

  Each tool will be described, and any reporting/ monitoring requirements identified.

2. Reducing Bycatch Mortality (Including Unobserved Mortality)

- This “toolbox” includes all available management measures that could be used to reduce mortality of incidental catch, including unobserved mortalities resulting from gear encountering fish.

  Each tool will be described, and any reporting/monitoring requirements identified.

3. Bycatch Reporting and Monitoring

- This “toolbox” includes all available methods to record and/or report bycatch or fishing activities related to bycatch.

  Each tool will be described, including estimated costs.

THE ANALYTICAL APPROACH

1. Describe the Conditions That Are Related to Incidental Catch and Bycatch

- A. Co-occurrence in time and space
- B. Behavior patterns, size, and other species characteristics that make them vulnerable to the same fishing gears.

- 1. Describe the Conditions That Are Related to Incidental Catch and Bycatch
- 2. Describe/Evaluate the Effects (Impacts) and Effectiveness of Each Mitigation Tool that Relates to Fishing Gears and Methods
- 3. Describe/Evaluate the Effects and Effectiveness of Each Other Mitigation Tool
- 4. Apply the Effects/Effectiveness Ratings to Each of the Six Alternatives.

Exhibit C.9.c
Supplemental GAP Report
September 2003

GROUNDFISH ADVISORY SUBPANEL STATEMENT ON
GROUNDFISH BYCATCH PROGRAM ENVIRONMENTAL IMPACT STATEMENT

The Groundfish Advisory Subpanel (GAP) received an update on the Groundfish Bycatch Programmatic Environmental Impact Statement (EIS). While the GAP is interested in providing comments, we note that the document keeps changing as new information is received. Therefore, the GAP prefers to wait until a final document is presented before making final comments.

The GAP also urges NMFS and the Council to ensure that adequate opportunity for public comment is available on the final document.

PFMC
09/11/03

HABITAT COMMITTEE REPORT ON GROUNDFISH BYCATCH PROGRAM ENVIRONMENTAL IMPACT STATEMENT

The Habitat Committee received a briefing from Mr. Jim Glock on the Groundfish Bycatch Program Environmental Impact Statement (EIS). We felt the document was highly informative, useful, readable, and reflected the hard work of its authors. According to the Magnuson-Stevens Act, "bycatch" includes nearly all species of marine organisms except seabirds and marine mammals. This means bycatch includes biogenic species that are important as fish habitat. We concur that bycatch should include such elements. This produces an overlap with the Essential Fish Habitat EIS. This overlap is positive; however, the information in these two planning documents should be consistent. As these documents develop, we will continue to provide feedback to help ensure consistency.

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09/11/03

Exhibit C.6
Situation Summary
September 2003

GROUNDFISH MANAGEMENT MEASURES FOR 2004

Situation: Management measures adopted during the Council process are designed to implement new and existing rebuilding programs, achieve bycatch reduction mandates, keep total catch within the proposed harvest levels, and achieve optimum benefits to the various user groups and fishing communities. In the last four years the Council has implemented a substantial restructuring of the groundfish fishery that includes seasonal depth-based area closures, gear restrictions, and dramatically lower harvest levels consistent with previously-approved rebuilding programs for overfished species.

The Council is scheduled to adopt a preferred suite of harvest levels for groundfish species and complexes to recommend for 2004 management in agendum C.3. The *Draft Proposed Acceptable Biological Catch and Optimum Yield Specifications and Management Measures For The 2004 Pacific Coast Groundfish Fishery* documents (Exhibit C.6, Attachments 1, 2, and 3) provide analyses of the potential consequences of management measures estimated to conform to the considered range of harvest levels. Exhibit C.6, Attachment 1 contains Chapters 1 and 2 of what will eventually be incorporated in the Draft Annual Specifications Environmental Impact Statement (DEIS). Important text and tables describing key aspects of the affected environment and analyses of the potential consequences of management measures are presented in Attachment 2, and further analysis prepared subsequent to the briefing book deadline are provided in Attachment 3. These components of the Draft Annual Specifications EIS will eventually be incorporated in the DEIS; however, they are segregated in this attachment due to the expected focus the Council will need to bring to bear on this decision. Further analyses by the Council's advisory bodies will also be presented in supplemental reports prior to the Council's final decision and eventually incorporated as well in the DEIS. All of the adopted management measures and specifications for next year's fishery will be noted as the preferred alternative in the DEIS.

The referenced analyses indicate that rebuilding overfished groundfish species (especially canary, widow, and yelloweye rockfish) will significantly impact West Coast groundfish fisheries. Allocation of these species to the various states, regions, and sectors of the West Coast groundfish fishery to allow time and area access to healthy marine stocks may be the most contentious of actions contemplated under this agendum.

The Council task is to adopt final management measures for the 2004 West Coast groundfish fishery by the end of the week. This agendum is spread throughout the week to facilitate continuous narrowing of alternatives to a single set of management measures. Council deliberations of 2004 management measures are scheduled to begin on Wednesday, with a checkpoint on Thursday, before a final decision on Friday. This strategy is designed to allow the Council opportunities to assign analyses to the Groundfish Management Team (GMT) and Groundfish Advisory Subpanel (GAP) in order to evaluate tentatively adopted measures relative to harvest level limits, impacts to various sectors, and other Council goals and objectives, or to consider potential permutations of management alternatives. Allocation specifications consistent with adopted management measures should also be approved by the Council at this time.

While the deliberations on this matter begin on Wednesday, substantial progress should occur at that time in order to avoid deliberations on final action continuing late into the evening on Friday. The goal of the Wednesday agendum is to adopt a tentative set of final management measures, including such matters as the allocation decision on canary rockfish, area closure boundaries, commercial trip limits, and recreational bag limits.

Council Action:

1. Adopt final proposed 2004 management measures.

Reference Materials:

1. The Draft Proposed Acceptable Biological Catch and Optimum Yield Specifications and Management Measures For The 2004 Pacific Coast Groundfish Fishery (Exhibit C.6, Attachment 1).
2. Annual Specifications Data and Analyses (Exhibit C.6, Attachment 2).
3. Written public comments (Exhibit C.6.c, Public Comment).
4. Supplemental Annual Specifications Analyses (Exhibit C.6, Supplemental Attachment 3).

Agenda Order:

WEDNESDAY, SEPTEMBER 10, 2003:

a.	Agendum Overview	John DeVore
b.	Summary of State Hearings	Phil Anderson/Neal Coenen/Marija Vojkovich
c.	Summary of Written Public Comments	John DeVore
d.	Report of the GMT	Michele Robinson
e.	Reports and Comments of Advisory Bodies	
f.	Tribal Comments and Recommendations	Jim Harp
g.	Agency Comments and Recommendations	Agency Representatives
h.	Public Comment	
i.	**Council Action:** Tentatively Adopt 2004 Groundfish Management Measures for Analysis	

THURSDAY, SEPTEMBER 11, 2003:

j.	Agendum Overview	John DeVore
k.	Reports and Comments of Advisory Bodies	
l.	Public Comment	
m.	**Council Action:** Guidance and Direction as Needed	

FRIDAY, SEPTEMBER 12, 2003:

n.	Agendum Overview	John DeVore
o.	GMT Analysis of Impacts	Michele Robinson
p.	Reports and Comments of Advisory Bodies	
q.	Agency and Tribal Comments	Jim Harp/Agency Representatives
r.	Public Comment	
s.	**Council Action:** Adopt Final Proposed 2004 Management Measures	

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08/25/03