pallasi), smelt (*Osmeridae*), anchovies, and sardine. Many species of fish feed on forage fish. Major predators of herring include Pacific cod (42% of diet), whiting (32%), lingcod (71%), halibut (53%), coho (58%), and chinook salmon (58%) (Environment Canada 1994). Many species of seabirds depend heavily on forage fish for food as well. Marine mammals consuming forage fish include: harbor seals, California sea lions, Stellar sea lions, harbor porpoises, Dall's porpoises, and Minke whales (Calambokidis and Baird 1994). Forage fish are most commonly found in nearshore waters and within bays and estuaries, although some do spend of their lives in the open ocean where they may be incidentally taken by groundfish gears, particularly in trawls. Preliminary data from the 2001 at-sea whiting fishery indicates the fishery encounters very minor amounts of forage fish species (Pacific herring less than 5 mt and less than 1 mt of smelt and sardines combined). There is little information on the incidental take of forage fish by the other segments of the fishery, however given they are not associated with the ocean bottom, the interaction is expected to be minimal.

Miscellaneous Species Little information is available on nongroundfish species incidentally captured in the groundfish fishery. Other than those species mentioned above, documentation from the whiting fishery indicates species such as American shad and walleye pollock are taken incidentally. American shad, introduced in 1885, have flourished throughout the lower Columbia River, producing a record run of 2.2 million fish in 1988 (ODFW and WDFW 1989). American shad was also taken in the shore-based whiting fishery. Walleye pollock 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 in the Northwestern Pacific Ocean along the Canadian and U.S. West Coast to Carmel, California.

3.3 SOCIO-ECONOMIC ENVIRONMENT

Protecting Overfished Species Within the Specifications and Management Measures Process. The major goal of management of the groundfish fishery throughout the 1990's was to prevent overfishing while achieving the OYs and providing year-round fisheries for the major species or species groups. One of the primary goals of the Pacific Coast groundfish FMP is to keep the fishery open throughout the entire year for most segments of the fishery (See FMP goals and objectives at section 2.0). Harvest rates 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, bag limits in the recreational fisheries 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. Landings 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 target is not reached until the end of the year.

By 2000, lower OYs and growing awareness of reduced productivity of the groundfish resource had made it apparent that the goal of a year-round fishery was no longer achievable for a number of species. In addition, new legislative mandates under the Magnuson-Stevens Act gave highest priority to preventing overfishing and rebuilding overfished stocks to their MSY levels. The National Standard Guidelines at 50 CFR 600.310 interpreted this as "weak stock management,'' which means that harvest of healthier stocks must be curtailed to prevent overfishing or to rebuild overfished stocks. To meet initial rebuilding requirements for the three species declared overfished in 1999, bocaccio, lingcod, POP, the Council developed a new management strategy that diverts effort off the sea floor of the continental shelf, where many of the overfished species are found. Overfished species protection measures initially applied in 2000 included more restrictive trip limits for continental shelf species, reduced seasons for commercial hook-and-line gear and recreational fisheries off central and southern California, and trawl gear restrictions limiting the species and quantities of groundfish that could be taken with trawl nets using footropes of greater than 8 inches in diameter.

These 2000 restrictions were relatively severe when compared against allowable landings limits in the 1990s. At the urging of their coastal communities, the governors of the three West Coast states asked the Secretary of Commerce, through NMFS, to declare the West Coast groundfish fishery a commercial

fishery failure. At the time, NMFS estimated that allowable landings limits in 2000 would reduce the commercial harvest value of West Coast groundfish by 25% from 1999 harvest levels. NMFS did declare the groundfish fisheries to be a commercial fishery failure in January 2000 (Dalton, 2000). In its declaration, NMFS cited the potential causes of the fishery resource disaster to be declining productivity in groundfish stocks associated with recently discovered oceanic regime shifts, advancements in scientific information about West Coast rockfish productivity that showed West Coast rockfish stocks to be generally less productive than many similar rockfish species worldwide. Since 2000, management measures intended to eliminate directed catch and minimize incidental catch of overfished species have increased in number and in restrictiveness. Although year-round groundfish landings opportunities continue to be available to some gears in some areas, fishing opportunities have been eliminated for many vessels.

Bycatch and Discard Accounting Groundfish management measures include provisions to reduce trip limit-induced discards and to account for those discards when monitoring harvest levels (OYs). Historically, NMFS and the Council have accounted for dead discards by estimating the amounts of certain species OYs that would be discarded dead, and then subtracting those amounts from the total catch OYs to get landed catch levels for those species. These discard rates have been expressed as a percent of total catch OY, so that a 16 percent discard rate for a species meant that 16 percent of that species' total catch OY would be deducted to derive that species' landed catch OY. Then, management measures were set to achieve the landed catch OY for that species.

Using discard rates was intended to account for dead fish either as dead discard or in landed catch. For all species except lingcod, sablefish, and nearshore rockfish species, it is assumed that discarded fish are generally dead upon discard or die soon after being discarded. Rockfish, particularly deepwater species, are severely stressed by decompression and temperature shock; however, lingcod discard mortality studies show about a 50 percent discard survival rate. There is no exact measure of discard amounts in most fisheries. Assumed amounts are taken into account to determine the true fishing mortality level and to prevent overall harvest from exceeding the OYs.

For the 2002 specifications and management measures, the Council's Groundfish Management Team (GMT) and Scientific and Statistical Committee (SSC) considered how to improve historic methods of setting discard rates in annual groundfish management. In particular, analysts looked at ways to characterize the ratios of overfished species occurrence in fisheries targeting health groundfish stocks. This new approach for re-evaluated discard rates for five overfished species: bocaccio, lingcod, POP, canary rockfish, and darkblotched rockfish. The GMT also revised discard rates for other rockfish and rockfish complexes as a result of the new analysis.

This new bycatch and discard analysis calculated the co-occurrence of each of the 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 (targeting the deepwater 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. Not surprisingly, the analysis found seasonal variations in the co-occurrence rates between healthy and overfished stocks. The Council then used these baseline co-occurrence rates to set the discard rates for each of the overfished species that were to be deducted from their respective OYs. Further, the Council recommended setting a combination of trip limits and seasons intended to concentrate targeting on healthy stocks during times and in areas where incidental catch of overfished species was lowest. For any inseason management changes made during the year, the bycatch rate analysis was intended to guide Council decisions to ensure that no alterations could be made to trip limits for healthy stocks that would result in greater overfished species discard. Additional information on the bycatch analysis used in setting the 2002 specifications and management measures is available in the preambles to the proposed and final rules implementing that regulatory package, at 67 FR 1555 (January 11, 2002) and 67 FR 10490 (March 7, 2002,) respectively. Discard rates for individual groundfish species or species groups are provided in the footnotes to Table 1 of this notice.

In setting its 2003 specifications and management measures, the Council's advisory bodies did not re-evaluate the data and methods used in the 2002 specifications bycatch analysis. NMFS anticipates revising the co-occurrence rates in the bycatch analysis in early 2003, based the agency's evaluation of how those rates compare with rates recorded in the first year (August 2001 through August 2002) of the federal at sea observer program. Revised co-occurrence rates will be used to guide Council decisions on inseason actions in 2003, just as the original bycatch analysis guided those decisions in 2002.

To develop management measures for 2003 that would minimize bycatch and discard, the GMT and the SSC primarily discussed how best to modify the bycatch analysis so that it would account for varying fishing strategies by depth. As discussed earlier in this notice, the Council has introduced new closed areas for 2003, intended to prevent vessels from fishing in waters where overfished species are commonly found. The Council and its advisory bodies expected that introducing new depth-based management measures would require adjusting the bycatch analysis to better recognize fishing patterns in the areas remaining open to fishing. Additionally, 2003 depth-related revisions to the bycatch analysis would have to account for expected effort shift by vessels that had historically operated in the formerly open areas.

To account for varying fishing patterns by depth, the GMT estimated the percentage of effort shift to the remaining open fishing areas, then estimated the percentage of target species OYs that would be taken in the nearshore and offshore open areas. Some deepwater species, such as sablefish, may only be taken in the offshore open area, with similar harvest patterns in the nearshore open area for primarily nearshore species. Other species, such as Dover sole, are distributed more broadly and may be taken in both the nearshore and offshore open areas. Once it had set formulas to account for effort shift and target species availability in open fishing areas, the GMT could address expected bycatch rates within those open areas.

Using the bycatch rates approved by the Council for the 2002 groundfish fisheries, the GMT analyzed bycatch rates for the same combinations of healthy and overfished stocks shown by depth and by two-month fishing period in trawl logbooks. Because the bycatch rates shown in trawl logbooks for the total fishing area were less conservative than those chosen by the Council for 2002 management, the GMT assumed that depth-specific bycatch rates shown in the trawl logbooks were also not adequately conservative to meet the Council's guidance on bycatch rates. Thus, the GMT adjusted depth-specific trawl logbook bycatch rates by the ratio between the Council's 2001/2002 selected rates for all areas and the logbook rates for all areas. From these adjustments, the GMT set new depth and fishing period-specific bycatch rates that were compatible with the more conservative all areas bycatch rates the Council set in 2002. In designing trip limits, season closures, and other management measures, the GMT crafted trip limit scenarios for target and bycatch species taken in the open areas that were calculated to keep the total catch (landed + discard) of healthy target species and overfished species below their respective OYs.

3.3.1 Depth-Based Management.

Since 1998, groundfish management measures have been shaped by the need to rebuild overfished groundfish stocks. The over 80 species in the West Coast groundfish complex mix with each other to varying degrees throughout the year and in different portions of the water column. Some species, like Pacific whiting, are strongly aggregated, making them easier to target with relatively little bycatch of other species. Conversely, other species like canary rockfish may occur in species specific clusters, but are also found co-occurring with a wide variety of other groundfish species. Over the past several years, groundfish management measures have been more carefully crafted to recognize the tendencies of overfished species to co-occur with healthy stocks in certain times and areas.

With the 2002 specifications and management measures, the Council introduced a new bycatch analysis model, discussed earlier, that allowed managers to set trip limits so that more abundant stocks were more strongly targeted 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). For 2003, the Council has recommended 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.

Depth based management restrictions for the continental shelf were first introduced on September 13, 2002 (67 FR 57973,) with an emergency rule that closed trawling in the months of September-December 2002 in waters north of 40°10' N. lat. (approximately at Cape Mendocino) at depths where darkblotched rockfish commonly occurs. At its June 2002 meeting, the Council had found that the darkblotched rockfish estimated total catch was expected to exceed the OY before the end of 2002. In order to protect darkblotched rockfish from overharvest while still allowing fisheries access to underharvested healthy stocks, the Council asked NMFS to implement an emergency rule that would allow trawl gear only shoreward of 100 fm (184 m) and offshore of 250 fm (461 m). NMFS reviewed and implemented the Council's request, revising the restrictions to allow fishing shoreward of 100 fm (184 m) only in October-December and offshore of 250 fm (461 mt) in September-December, to prevent overharvest of canary rockfish and darkblotched rockfish in September.

The September-December 2002 closure was intended to specifically protect darkblotched rockfish, which are commonly caught by trawl gear in waters of 70-250 fm (128-457 m) depth. In designing 2003 management measures, the Council considered depth restrictions that would provide protection for several overfished species. 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. POP, for example, is almost exclusively caught in trawl fisheries, whereas yelloweye rockfish tends to be caught by hook-and-line gear.

For the limited entry bottom trawl fisheries north of 40°10' N. lat., canary rockfish tends to be available in 20-200 fm (37-366 m) depths, with higher catches in more shallow areas during the summer. As mentioned earlier, darkblotched rockfish tends to be found in 70-250 fm (128-457 m). To provide protection for all of these stocks in 2003, the Council recommended a closed area for bottom trawl fisheries north of 40°10' N. lat. of 100-250 fm (184-461 m) depths, with the inshore closed area boundary line moving to 75 fm (137 m) for the months of July-August. This closure is expected to protect canary and darkblotched rockfish in areas where they have historically been taken by trawl fisheries. In the months of January-February and November-December, the offshore closed area boundary would be revised to allow some bottom trawling in areas where petrale sole tends to aggregate. This closed area is also expected to protect other northern continental shelf and slope overfished species, such as lingcod, widow rockfish, POP, and yelloweye rockfish. Large footrope bottom trawling would be prohibited shoreward of the closed areas. Midwater trawling, as defined at 50 CFR §660.322(b)(6) would be permitted within the closed area for Pacific whiting, yellowtail and widow rockfish because these fishing strategies have historically encountered only small amounts of overfished species as bycatch. Trawling with open access exempted gear for species other than groundfish (spot prawn off Oregon and pink shrimp north of 40°10' N. lat) would be permitted within the closed area. However, the states require groundfish excluder devices to be used in the pink shrimp fishery.

In the limited entry bottom trawl and open access exempted trawl fisheries south of 40°10' N. lat., bocaccio tend to be found in 45-160 fm (82-293 m) depths and the greatest number of bocaccio tend to be taken between 40°10' N. lat. and 34°27' N. lat. (Point Conception). Although darkblotched rockfish are considered a northern species, they are also found between 40°10' N. lat. and 38° N. lat. To protect these overfished species, the Council recommended closing bottom trawling between 40°10' N. lat. and 38° N. lat. in 60-250 fm (110-457 m) depths, except that the inshore closed area boundary would be at 50 fm (91 m) in January-February. Between 38° N. lat. and 34°17' N. lat., bottom trawling would be closed in 60-150 fm (110-274 m) depths, except that the inshore closed area boundary would be at 50 fm (91 m) in January-February. South of 34°27' N. lat., bottom trawling would be permitted along the mainland coast (not off California islands) inside of 100 fm (183 m). Around the California islands, bottom trawling would be prohibited shoreward of 150 fm (274 m). Midwater trawling, as defined at 50 CFR §660.322(b)(6), would be permitted within the closed areas only for widow rockfish and whiting. For all areas, large footrope bottom trawling would be prohibited shoreward of the closed areas. Small footrope trawls are less able to fish in the rocky habitat preferred by many of the overfished rockfish species. In addition to

these depth restrictions, the Cowcod Conservation Areas (CCAs) will remain closed to fishing offshore of 20 fm (37 m).

North of Cape Mendocino, limited entry fixed gear and open access hook-and-line fisheries have a greater effect on yelloweye rockfish and a lesser effect on darkblotched rockfish than trawl gear fisheries. Thus, depth restrictions for these fisheries were designed to prevent hook-and-line gear from operating in depths where yelloweye rockfish are commonly found, 100 fm (183 m) and shallower. The Council has recommended closing limited entry and open access hook-and-line fishing shoreward of the 100 fm (183 m) contour off the Washington coast, and between 27 fm (49 m) and 100 fm (183 m) off the Oregon coast and off California north of 40°10' N. lat. The 27 fm (49 m) contour occurs entirely in state waters off the state of Washington and commercial fishing for groundfish is prohibited in state waters off Washington, making an inshore closed area boundary moot for that state. Fishing is permitted shoreward of the 27 fm (49 m) boundary off Oregon and northern California because this area tends to be inshore of the areas where overfished species occur.

South of 40°10' N. lat., limited entry fixed gear and open access fisheries will be primarily constrained by management measures to protect bocaccio. Fishing will be prohibited between the 20 fm (37 m) and 150 fm (274 m) depth contours throughout the year. The Council recommended an exception to this prohibition for commercial vessels using hook-and-line gear with no more than 12 hooks per line and up to 1 lb (.45 kg) weight per line, using hooks no larger than “Number 2” hooks, which measure 11 mm (0.44 inches) point to shank. This type of gear is used by vessels fishing for Pacific sanddabs, an abundant species that does not usually co-occur with overfished species. Hook-and-line vessels will also be permitted to fish in waters of 20-60 fm (37-110 m) depths during July and August. In addition to these depth restrictions, the Cowcod Conservation Areas (CCAs) will remain closed to fishing offshore of 20 fm (37 m).

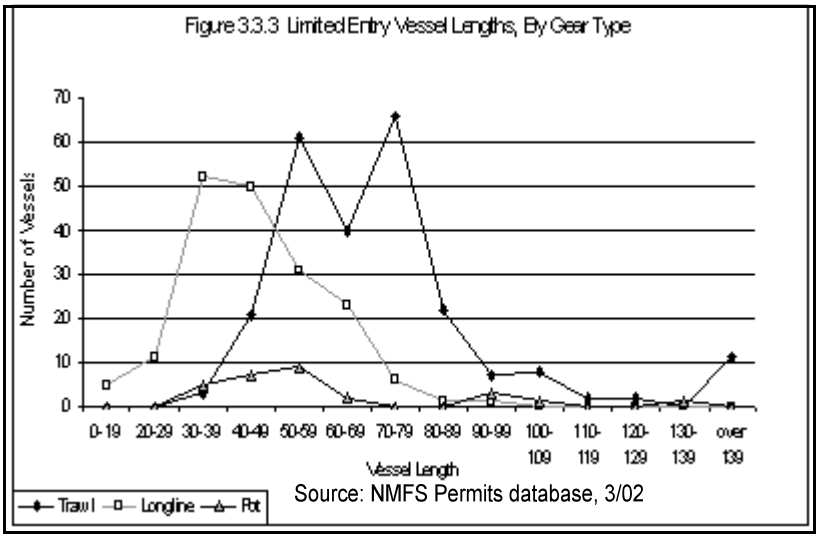
Recreational fisheries off Washington, Oregon, and California north of 40°10' N. lat. will be subject to fewer depth restrictions than the commercial fisheries, primarily because most recreational vessels tend to operate in the nearshore area inside state waters. Off Washington, recreational fishing for groundfish and halibut will be prohibited inside the Yelloweye Rockfish Conservation Area (YRCA,) a C-shaped closed area off the northern Washington coast. Coordinates for the YRCA will be defined at 50 CFR §660.304(d). Off Oregon and California north of 40°10' N. lat., recreational fishing for groundfish will be closed outside of 27 fm (49 m) if either the yelloweye or canary rockfish recreational fisheries set asides are projected to be achieved.

As in past years, recreational fisheries off California south of 40°10' N. lat., will be constrained by depth in order to reduce catch of bocaccio and other overfished rockfish species. Recreational fishing for groundfish will be prohibited entirely in waters offshore of the 20 fm (37 m) depth contour. The Cowcod Conservation Areas (CCAs) will also remain closed to fishing offshore of 20 fm (37 m). Coordinates defining the CCAs have changed modestly to ensure that the CCAs comply with depth-based restrictions for waters off southern California. CCA coordinates will be defined at 50 CFR 660.304(c).

Many of the closed areas and boundary lines are generally described using a fathom contour line. All of these lines, except the 20 fm (37 m) contour off California south of 40°10' N. lat. and the 3 nautical mile state management line off California, are specifically defined in the regulations at IV.A. (19), using latitude/longitude waypoints. These waypoint coordinates provide straight-line boundaries that approximate the depth-contours to provide clarity to the closed area boundaries for enforcement purposes. To ensure that consistent nomenclature is used coastwide, an area closed to fishing for groundfish will be referred to as a “Groundfish Conservation Area” in general, regardless of whether the boundaries of that area change during the year. The YRCA and the CCA are defined by coordinates that are fixed throughout the year. The larger, gear or sector-specific closed areas described by depth contour boundaries for the 2003 fishing year will be referred to as “Rockfish Conservation Areas,” or RCAs. For example, there will be both a trawl RCA and a non-trawl RCA north of 40°10' N. lat. Boundaries for the RCAs will be referred to as either the “inshore boundary,” meaning the RCA boundary or borderline that is

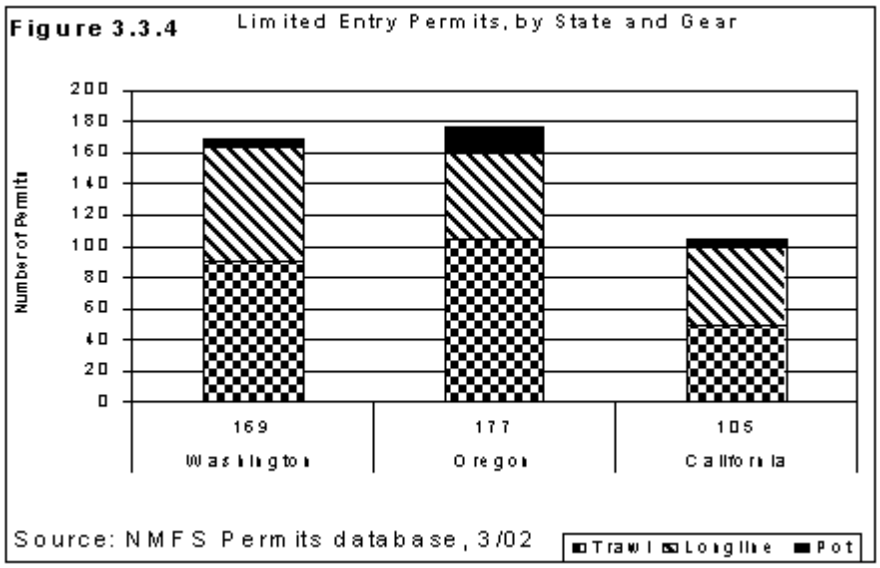
closest to shore, or the "offshore boundary," meaning the RCA boundary or borderline that is farthest offshore.

At its September meeting, the Council adopted the state of California's recommendation to create a California Rockfish Conservation Area (CRCA) in waters south of 40°10' N. lat. To ensure consistent coastwide nomenclature, this area will be referred to as an RCA in federal regulations. NMFS anticipates that the Council and the state of California may continue to refer to the CRCA in management discussions. This RCA south of 40°10' N. lat. will be an area of restricted or no fishing intended to protect overfished rockfish species. This restricted area is proposed as ocean waters of 20-250 fm (37-457 m) depth between 40°10' N. lat. and 38° N. lat and waters of 20-150 fm (37-274 m) depth between 38° N. lat. and the U.S. border with Mexico. The restrictions for that area that apply to the groundfish fisheries and the exceptions to those restrictions are described earlier in the section on depth based management. Any vessel allowed to fish within the CRCA based on an exception to a fishing restriction would be required to accommodate a state or federal observer, if requested. In creating this RCA, the Council and the state of California wished to ensure that they had accounted for all fisheries that operate in waters where overfished rockfish species occur, whether state or federally managed. Several of the restrictions within the RCA affect only state-managed species and will be implemented through state regulations. Other restrictions affect federally-managed species other than groundfish, such as salmon, and will be implemented through federal salmon regulations.



3.3.2 Commercial Fisheries

Limited Entry Groundfish Fisheries. The Pacific Coast groundfish fishery is a year-round, multi-species fishery that takes place off the coasts of Washington, Oregon, and California. Most of the Pacific Coast non-tribal, commercial groundfish harvest is taken by the limited entry fleet. The groundfish limited entry program was established in 1994 for trawl, longline, and trap (or pot) gears with Amendment 6 to the FMP; a license limitation program intended to restrict vessel participation in the directed commercial groundfish fisheries off Washington, Oregon, and California. The limited entry permits that were created through that program specify the gear type that a 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 (Amendment 9) and that allow up to three sablefish-endorsed permits to be used per vessel (Amendment 14).

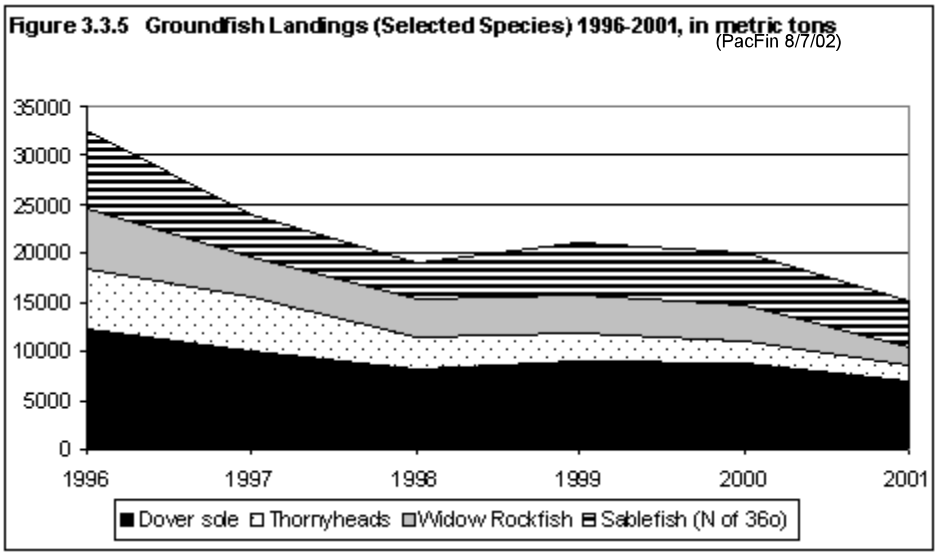
During 2001, 424 vessels were registered to Pacific Coast groundfish limited entry permits, of these 257 were trawl vessels, 140 were longline vessels, 11 were trap vessels, and 16 vessels that were capable of using a combination of gears. Of the 424 vessels that were registered to limited entry permits in 2001, only 386 actually landed groundfish, this included 233 trawl vessels, 129 longline vessels and 24 pot vessels. Trawl vessels that landed whiting in the at sea sector were included in this estimate. It should be noted that the number of vessels registered for use with limited entry permits has decreased since the 2001 implementation of the permit stacking program for sablefish-endorsed limited entry fixed gear permits.

Table 3.3.2.1 Limited Entry Vessels by gear, 2001

	Gear group	Number of Limited Entry Vessels
Vessels registered to limited entry permits	Trawl (including catcher processors)	257
	Longline	140
	Pot	11
	Combined gears	16
	TOTAL	**424**
Vessels registered to limited entry permits that landed groundfish, including at-sea whiting, in 2001	Trawl (including catcher processors)	233
	Longline	129
	Pot	24
	TOTAL	**386**

Source: (Permits Database 10/02)

Because limited entry permits may be sold and leased out by their owners, the distribution of permits between the three states often shifts. In 2002, roughly 23 percent of the limited entry permits were assigned to vessels making landings in California, 39 percent to vessels making landings in Oregon, and 37 percent to vessels making landings in Washington. In 1999, this division of permits was approximately 41 percent for California, 37 percent for Oregon, and 21 percent for Washington. This change in state distribution of limited entry permits may also be due to the implementation of the fixed-gear permit stacking program. Vessels operating from northern ports may have purchased or leased sablefish-endorsed permits from vessels that had been operating out of California ports.



Limited entry fishers focus their efforts on many different species, with the largest landings by volume (other than Pacific whiting) being from the following

species: Dover sole, arrowtooth flounder, petrale sole, sablefish, thornyheads, and yellowtail rockfish. There are 55+ rockfish species managed by the Pacific Coast groundfish FMP, of which seven species have been declared overfished in the past four years. Protective fisheries regulations intended to reduce the directed and incidental catch of overfished rockfish and other depleted species have significantly reduced the harvest of rockfish in recent years.

By weight, Pacific whiting represents the vast majority of West Coast groundfish landings. The whiting mid-water trawl fishery is a distinct component from the trawl groundfish trip limit fisheries. In 2001, whiting accounted for about 85 percent, by weight, of all commercial shore-based groundfish landings. Whiting is taken by treaty tribe catcher vessels delivering to a mothership (17.5% of total OY in 2002,) by non-tribal catcher vessels delivering to shore-based processing plants (42% of non-tribal OY,) by non-tribal catcher-vessels delivering to motherships (24% of non-tribal OY,) and by non-tribal catcher-processor vessels (34% of the non-tribal OY). In 2001, 29 catcher vessels delivered whiting to shore-based processing plants. This number is down from previous years, when the number of participating vessels was in the mid- to upper-30s. Some vessels move between the West Coast and Alaska fisheries; some remain entirely off Washington, Oregon, and California. In 2001, the v ast majority of whiting (about 73%) was landed in Oregon; Washington landings represented 24% of the total and California landings represented about 3.1%. Approximately 20 catcher vessels delivered to five motherships in 2001, and seven catcher-processor vessels participated in the whiting fishery. Also in 2001, four tribal catcher vessels delivered whiting to one mothership.

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. Factory trawlers and motherships fishing for or processing Pacific whiting off of the West Coast usually also participate in the Alaska pollock seasons, allowing the vessels and crews to spend a greater percentage of the year at work on the ocean. Commercial fisheries landings for species other than groundfish vary along the length of the coast. Dungeness crab landings are particularly high in Washington state, squid, anchovies, and other coastal pelagics figure heavily in California commercial landings, with salmon, shrimp, and highly migratory species like albacore more widely distributed, and varying from year to year.

Table 3.3.2.2. Number of at-sea whiting processors by sector, 1997 - 2001

	Catcher-processor	Mothership	Tribal
1997	10	6	1[1]
1998	7	6	1[1]
1999	6	6	1[1]
2000	8	6	1[1]
2001	7	5	1[1]

Summarized from NMFS NORPAC observer data
1/ this vessel participates in both the tribal and mothership fisheries

Table 3.3.2.3. Whiting landings (retained) by at-sea processing sectors, 1997 - 2000, metric tons

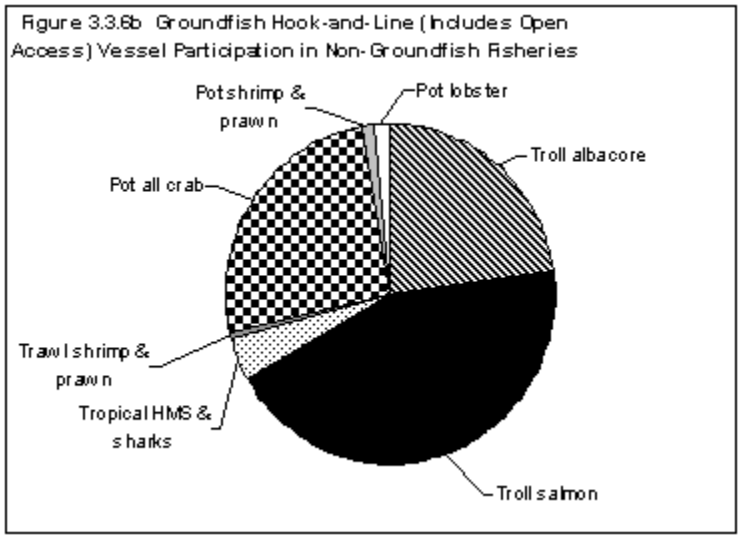
	Catcher-processor	Mothership	Tribal	All Sectors
1997	68,796	49,460	24,748	143,004
1998	69,692	49,705	23,846	143,243
1999	67,679	47,580	25,844	141,103
2000	67,649	46,710	6,251	120,610
2001	58,422	35,658	6,080	100,160

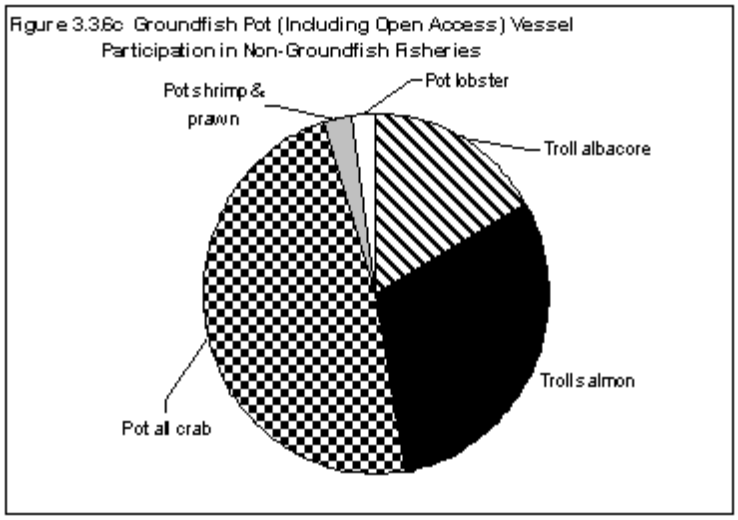
Summarized from NMFS NORPAC observer data

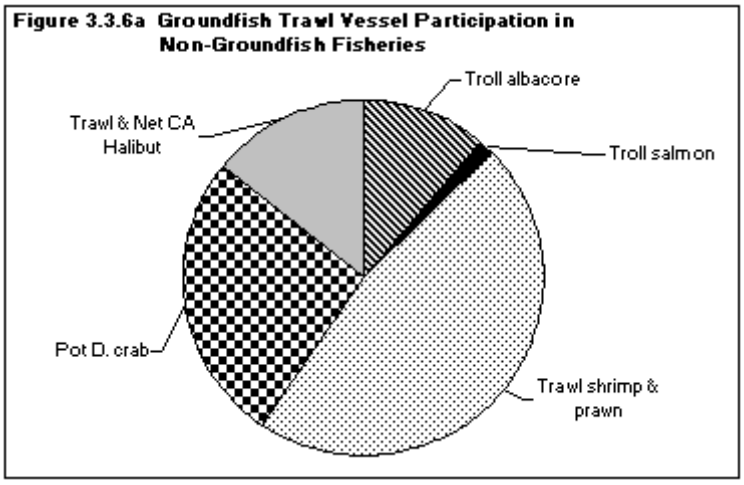
Table 3.3.2.4 Summary whiting catch and ex-vessel value by sector for the 2001 fishery

Number of mothership s	Catch of Pacific whiting (mt) 1/	Range of Pacific whiting caught by catcher vessels (mt)	Average catch of Pacific whiting per catcher vessel (mt) 1/	Estimated Pacific whiting revenue per mothership ($1000) 2/	Estimated average Pacific whiting revenue per catcher vessel ($1000) 2/
5	35,823	5 - 4,339	1,327	553	106
Number of catcher processors		**Pacific whiting (mt) 1/**		**Estimated revenue per catcher processor for Pacific whiting ($1000) 2/**	
7		58,628		646	
Number of states with shoreside processors		**Catch of Pacific whiting (mt) 3/**		**Estimated revenue per state for Pacific whiting ($1000) 2/**	
3		73,326		1,886	
Number of tribal processors	**Catch of Pacific whiting (mt) 1/**	**Range of Pacific whiting caught by catcher vessels (mt)**	**Average catch of Pacific whiting per catcher vessel (mt) 1/**	**Estimated Pacific whiting revenue per mothership ($1000) 2/**	**Estimated average Pacific whiting revenue per catcher vessel ($1000) 2/**
1	6,080	881 - 1,900	1,517	469	117

1/ The source of catch information was NORPAC observer data.
2/ The price ($.035/lb) of whiting was obtained from PacFin. It is the price for July 2001; July had the greatest number of whiting landings coastwide.
3/ The source of catch information was the report "Shoreside Whiting Observer Program: 2001" prepared by Steve Parker, Marine Resource Program, Oregon Department of Fish and Wildlife, Newport, Oregon, 97365.







Figures 3.3.6a-c, based on data from an ongoing project by Council staff to create an economic profile of groundfish fishery participants, shows the approximate concentration of groundfish vessels in fisheries for non-groundfish West Coast species, 1994-1998. These pie charts exclude some non-groundfish fisheries (such as lobster, urchin, sea bass, and California gillnet complex) where participation by groundfish vessels was so minimal that a viewer could not reasonably see the corresponding portion of the pie chart. Data for these charts came from an ongoing Council staff project to create a socio-economic profile of groundfish fishery participants.

It is clear from these three charts that there is some degree of gear loyalty for groundfish vessels participating in non-groundfish fisheries. For example, a notable proportion of the non-groundfish fishery participation by groundfish trawl vessels occurs in the shrimp and prawn trawl fisheries. Similarly, the hook-and-line groundfish fisheries show high participation in the troll albacore and troll salmon fisheries. And, while all three gear groups participate in pot fisheries for crab, groundfish pot vessels show the greatest percentage of gear group participation in pot fisheries for crab and other crustaceans.

Open Access Groundfish Fisheries. Unlike the limited entry sector, the open access fishery has unrestricted participation and is comprised of vessels targeting or incidentally catching groundfish with a variety of gears, excluding groundfish trawl gear. While the open access groundfish fishery is under federal management and does not have participation restrictions, some state and federally managed fisheries that land groundfish in the open access fishery have implemented their own limited entry (restricted access) fisheries or enacted management provisions that have affected participation in groundfish fisheries.

The commercial open access groundfish fishery consists of vessels that do not necessarily depend on revenue from the fishery as a major source of income. Many vessels that predominately fish for other

species inadvertently catch and land groundfish. Or, in times and areas when fisheries for other species are not profitable, some vessels will transition into the groundfish open access fishery for short periods. The commercial open access fishery for groundfish is split between vessels targeting groundfish (*directed fishery*) and vessels targeting other species (*incidental fishery*). The number of unique vessels targeting groundfish in the open access fishery between 1995-1998 coastwide was 2,723, while 2,024 unique vessels landed groundfish as incidental catch (1,231 of these vessels participated in both) (SSC's Economic Subcommittee, 2000).

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 refers to the state of the fish when they are landed. The dead fish fishery has historically been the most common way to land fish. The dead fish fishery made up 80% of the directed open access landings by weight coastwide in 2001. More recently, the market value for live fish has increased landings of live groundfish. The other component of the open access fishery is the incidental catch of groundfish in fisheries targeting other species (e.g., shrimp, salmon, highly migratory species, squid). Combining both the directed and incidental fisheries, the commercial groundfish open access fishery is potentially very large and includes a variety of gear types.

Table 3.3.2.5. Open Access Fishery Landings in 1996 and 2001, by state, weight and value (PFMC 2002)

Open Access Sector	1996 landings by weight	2001 landings by weight
Coastwide Directed	3,291 mt	1,086 mt
Coastwide Incidental	802 mt	197 mt
Washington Directed	225 mt	66 mt
Washington Incidental	296 mt	28 mt
Oregon Directed	458 mt	237 mt
Oregon Incidental	384 mt	98 mt
California Directed	2,608 mt	776 mt
California Incidental	122 mt	70 mt

Landings, Revenue, and Participation by State Fisheries are generally distributed along the coast in patterns governed by factors such as location of target species, location of ports with supporting marine supplies and services, and restrictions/regulations of various state and federal governments. For the open access directed groundfish fishery, the majority of landings by weight that target groundfish occur off California. Oregon's directed groundfish open access fishery has the next highest landings, followed by Washington's. In the incidental groundfish fisheries, Oregon and California both have similar landings in their open access fisheries. Washington again has the lowest landings by weight of incidental groundfish (PFMC 2001e). Participation in "both directed and bycatch components of the open access fishery is much greater in California than in Oregon and Washington combined. For instance, in 1998, 779 California boats, 232 Oregon boats and 50 Washington boats participated in the directed fishery. In that same year, 520 California boats, 305 Oregon boats and 40 Washington boats participated in the bycatch fishery" (SSC's Economic Subcommittee, 2000).

Open access fisheries have been examined for their landings in the years 1996 and 2001, two randomly chosen years following the implementation of the limited entry program. Overall and in each individual state, open access landings decreased between 1996 and 2001. Federally, open access landings limits were sharply reduced between 1996 and 2001. Ex-vessel value for open access groundfish fisheries also decreased coastwide between 1996 and 2001. The directed fishery decreased from over $7 million in 1996 to under $5 million in 2001 and the incidental fishery decreased by half, from roughly $800,000 in 1996 to roughly $400,000 in 2001.

Table 3.3.2.3 Estimated Number of Open Access Incidental Catch Vessels by Fishery and the Number Estimated to Fish Within Any of the Conservation Areas

	Depth range of fishery	Number of vessels (2001) g/	Proportion estimated to operate within any of the conservation areas during 2003
North of 40°10 min			
Dungeness Crab	10- 50 fm c/ 10-40 fm c/	WA - 190 (232 permits) a/ OR - 306 (1999) a/ CA north - 330 a/	WA - 100% (190 -9 mo/year) OR - 50% est. (153 -9 mo/yr) CA - 50% est. (165- 8 mo/yr)
Pink shrimp- Trawl	25-200 fm a/	WA - 19 and OR - 84 a/	100% - 103
Spot prawn Trawl d/ Trap	80 -110 fm b/	WA-3 a/, OR-2 WA-10 a/, OR-10	100% - 25 (trap only WA)
Pacific Halibut	Primarily found 20-300fm	184 (238 including LE sablefish vessels) e/	100% - 184
Coastal Pelagic Species - wetfish	10-???	WA-11(44 permits) OR-15 (60 permits) CA -6 a/	WA-100% - 11 OR-50% est- 8 CA-50% est- 3
Sea cucumber	20-50 fm /f	OR- 0 (26 permits)	100% - 0
Other fisheries (Hagfish)	Fishery occurs out to 110 **	7 e/	100% - 7
South of 40°10 min			
CA Halibut Trawl Other	Primarily 20-50 fm, but some years inside 20 /f	92 h/ 356 h/	100%-448
Coastal Pelagic Species - squid	8-25 fm c/	115 a/ (197 permits c/)	20% est- 23
Coastal Pelagic Species - wetfish	10-???	107 a/	50% est - 54
Dungeness Crab	10-40 fm c/	central CA- 100 c/	50% est - 50
Gillnet complex	>50 fm some inside 20 fm f/	127 c/	80% est - 102 (6" footrope)
Pink shrimp - Trawl	25-200 fm a/	8 a/	100% - 8
Ridgeback prawn	25-88 fm a/	32 a/	100% -32
Sea cucumber	20-50 fm f/	13 a/	100% -13
Spot Prawn Trawl d/ Trap	25-267 fm a/ 100-180 fm (S. CA bight) a/	41 a/ 12 a/	100% - 53 (trap only)
CA Sheephead	<45 fm c/	124 c/	50% est - 62
Other fisheries	spiny lobster <70 fm c/	spiny lobster -251permits rock crab, sheep crab, surfperch, shark ???	50% est - 125 Others Unknown
Fisheries that occur both North and South of 40°10 min			
Salmon troll	??	1,194 a/	100% -1,194
Highly Migratory Species Longline Pole/line Gillnet/Driftnet Purse Seine		41 a/ 222 a/ 71 a/ 15 a/	0%
Total Number of Vessels (vessels that fish in multiple fisheries may be counted more than once)		**All commercial….. 4,098** **All OA…… 3,840**	**All Commercial….. 3,013** **All OA……. 2,881**

a/ Based the Pacific Coast Groundfish Open Access Fishery Report, June 2002
b/ Personal communication with ODF&W staff
c/ CA living Marine Resources: Status Report
d/ Most prawnfishing will be pot only in 2003
e/ IPHC personal communication
f/ 2003 annual specification and management measures EIS
g/ Vessels that fished in multiple fisheries may be represented more than one time
h/CDFG personal communications

3.3.3 Tribal Groundfish Fisheries.

In addition to the non-tribal commercial fisheries, members of the Makah, Quileute, Hoh, and Quinault tribes participate in commercial, and ceremonial and subsistence fisheries for groundfish off the Washington coast.

In 1994, the U.S. government formally recognized that the four Washington Coastal Tribes (Makah, Quileute, Hoh, and Quinault) have treaty rights to fish for groundfish, and concluded that, in general terms, the quantification of those rights is 50 percent of the harvestable surplus of groundfish available in the tribes' usual and accustomed (U and A) fishing areas (described at 60 CFR 660.324). West Coast treaty tribes have formal allocations for sablefish, black rockfish, and Pacific whiting. Members of the four coastal treaty tribes participate in commercial, ceremonial, and subsistence fisheries for groundfish off the Washington coast. Participants in the tribal commercial fisheries operate off Washington and use similar gear to non-tribal fishers. Groundfish caught in the tribal commercial fishery pass through the same markets as non-tribal commercial groundfish catch.

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 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.

There are several groundfish species taken in tribal fisheries for which the tribes have no formal allocations. For some species on which the tribes have a modest harvest, no specific allocation has been determined. Rather than try to reserve specific allocations of these species, the tribes annually recommend trip limits for these species to the Council that accommodate modest tribal fisheries. Tribal trip limits for groundfish species without tribal allocations are usually intended to constrain direct catch and incidental retention of overfished species in the tribal groundfish fisheries.

The bulk of tribal groundfish landings occur during the March-April halibut and sablefish fisheries. Most continental shelf species taken in the tribal groundfish fisheries are taken during the halibut fisheries and most slope similarly taken during the tribal sablefish fisheries. Approximately 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 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 are split between the sablefish tribes according to a mutually agreed-upon allocation scheme. Tribe-specific sablefish allocations are managed by the individual sablefish 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.

In addition to these hook-and-line fisheries, the Makah tribe annually harvests a whiting allocation using mid-water trawl gear. Since 1996, a portion of the U.S. whiting OY has been allocated to the Pacific Coast treaty tribes. The tribal allocation is subtracted from the whiting OY before allocation to the nontribal sectors. Since 1999, the tribal allocation has been based on a framework that is a sliding scale related to the U.S. whiting OY. To date, only the Makah tribe has fished on the tribal whiting allocation.

Table 3.3.3.1 Tribal Framework for Whiting Allocation, Adopted in 1999	
U.S. Optimum Yield	Tribal Allocation
Up to 145,000 mt	17.5% of the U.S. OY
145,001 mt to 175,000 mt	25,000 mt
175,001 mt to 200,000 mt	27,500 mt
200,001 mt to 225,000 mt	30,000 mt
225,001 mt to 250,000 mt	32,500 mt
Over 250,000 mt	35,000 mt

Makah vessels fit with mid-water trawl gear have also been targeting widow and yellowtail rockfish with mid-water gear in recent years.

Table 3.3.3.2 Treaty Tribe Groundfish Landings, 1995-2001. In pounds, except for whiting, which is in mt.

Species	1995	1996	1997	1998	1999	2000	2001
Lingcod	2,162	1,616	1,555	3,477	4,086	4,054	6,757
Rockfish (general)	110,673	38,105	48,969	54,638	41,379	32,827	131
Rockfish (red)	211	137	87	619	1,067	431	2,141
Widow Rockfish					73	2,012	8,445
Yellowtail Rockfish	734	1,087	2,528	10,370	29,281	71,124	150,254
Shortspine thornyhead	15,476	7,408	12,483	4,916	7,984	8,705	11,008
Sablefish	1,177,704	1,128,795	1,078,875	634,512	812,511	958,490	907,399
Whiting (in metric tons)		15,000	24,840	24,509	25,844	6,251	6,080

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 Area 2A TAC. In 1993, judicial confirmation of treaty halibut rights occurred and treaty entitlement was established at 50 percent of the harvestable surplus of halibut in the tribes' combined U and A 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 be transferring at least 25,000 lb per year to the tribal fisheries, for a total of 200,000 lb to be transferred to the tribal fisheries over that period. Tribal allocations are divided into a tribal commercial component and the year-round ceremonial and subsistence (C &S) 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 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 18th, a 24-hour opening on April 2nd, and a 36-hour opening on April 30th. 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 20th

through April 19th and from May 5th through 9th. Similar to the unrestricted openings, these restricted openings are available for vessels from all halibut tribes.

Table 3.3.3.3 Treaty Tribe Halibut Allocations and Catches, Dressed Weight, 1996-2001

Year	Commercial Allocation	Commercial Catch	C and S Allocation	C and S Catch
1996	168,000	166,200	14,000	15,000
1997	230,000	228,500	15,000	14,800
1998	272,000	296,600	15,000	10,500
1999	256,000	271,500	10,000	10,500
2000	305,000	300,100	10,500	17,500
2001	406,500	411,600	17,500	16,000

3.3.4 Recreational Fishery

The recreational or sport fishery, where fishing is done for pleasure and not sale, has been part of the culture and economy of West Coast fishing communities for more than 50 years. Most recreational anglers use hook and line gear that is held directly in the hand or is attached to a pole or rod that is held in the hand. Recreational fishing occurs along the entire coast. Anglers fish from man-made structures such as piers, jetties, docks; natural shore areas; privately owned or rental boats; and charter vessels.

Licenses for the individual sport anglers are issued by the states of Washington, Oregon and California , with each state having its own specific requirements. Sport fishing licences are issued to residents and non-residents and may vary in cost by the level of participation (i.e.: 1-day, 2-day, annual), fishery, and fishing location. In addition, there may be a few special days each year where anyone can fish without a fishing license. In California, anyone 16 years and older must have a fishing license to take any kind of marine fish, except for persons angling from a public pier in ocean or bay waters. Only a basic fishing license is required for fishing in the ocean north of Point Arguello (34° 35' N. lat.) in Santa Barbara County, while an Ocean Enhancement Stamp is required for ocean fishing south of Point Arguello (except when fishing under authority of a two-day sport fishing license). One-day Pacific Ocean-only licenses, with or without an Ocean Enhancement Stamp are also issued. In Oregon, anyone 14 years or older is required to have a general angling license to fish for or land marine fish except when fishing for smelt or when they are a resident landowner or member of their immediate family and are angling on land they own and reside upon. In Oregon, all anglers, regardless of age, need a Combined Harvest Tag to fish for salmon, steelhead, sturgeon, and halibut. When angling in the Pacific ocean within 3 miles of shore between Cape Falcon, Oregon and Leadbetter point, Washington, either a resident Washington license or an Oregon license is valid. In Washington, a saltwater license is required for anyone who is 16 years or older and allows the license holder to fish for any species existing in saltwater, including salmon, steelhead, sturgeon, halibut, rockfish, etc.

Similarly, the states register and issue licenses for recreational boats owned and operated by state residents. The registration requirements and fees vary between the states and are based on type and size of vessel. In California, every sail-powered vessel over 8 feet in length (except wind surfing boards) and every motor driven boat not registered by the U. S. Coast Guard that is used in California state waters is

In 1998, an economic survey funded by NMFS and coordinated with the PSMFC was conducted. Anglers were asked to participate in a telephone interview in addition to the interview conducted in the field. The following are some highlights from the survey that provide general socio-economic information on the recreational fishery:

1) 81% of the 37,570 anglers interviewed in California, Oregon and Washington provided trip information, including fishing expenditures.

2) Average year of birth for anglers was 1953.

3) Average rank of saltwater fishing ability on a scale of 1 to 5 was 3.2.

4) Average years of saltwater fishing experience was 20 years.

5) Average annual personal income before taxes was $57,000.

6) Average annual household income before taxes was $58,000.

7) Average hourly wage was $20.

8) Average hours worked per week was 45.

9) Average annual expenditure on fishing gear was $545.

10) Average annual expenditure on fishing licenses was $82.

11) Average annual expenditure on maintenance and repair of boats used for saltwater fishing was $640.

12) 20% of anglers stayed away from home overnight when they went fishing.

13) 64% of anglers whose fishing involved an overnight stay away from home indicated that the primary purpose of their trip was fishing

14) Average expenditure per trip for gear, bait, boat fuel, boat fees, parking fees and daily license was $29.

15) For those anglers who gave up income to make a fishing trip, average income foregone for such trips was $162.

subject to registration. In Oregon, the Oregon State Marine Board is responsible for registering and titling all recreational boating vessels. Registration and title fees and marine fuel taxes support boating facilities, marine law enforcement and boating safety education. All motorized boats, regardless of length or type, must be registered and sailboats 12 feet or longer must also be registered, In Oregon . In Washington state, motorized vessels and any vessel that is 16 feet or longer must be registered with the state.

Charter fishing as defined in section 2101(21a) of title 46, United States Code, is fishing from a vessel that is hired to carry passengers who engage in recreational fishing. In the Pacific Coast groundfish fishery, there are two categories of charter vessels, party boats (also called "Six-Packs") and U.S.C.G. Certified passenger vessels (also called commercial passenger fishing vessels). The party boats are authorized by the U.S. Coast Guard to carry no more than six paying passengers. In general, these boats are smaller (although not necessarily small), are not required to pass rigorous Coast Guard inspection requirements and can be operated by skipper with a lower license rating. Commercial passenger fishing vessels are certified by the U.S. Coast Guard to carry a specific number of passengers. The vessels undergo a rigorous inspection every two years and must meet strict standards. Captains must also have a license to operate the vessel. In addition, if the certified boat is out for more than 12 hours, as in an over night trip, a second licensed captain must be on board. Table 3.3.4.1 shows the number of recreational charter vessels by port for 2001.

Within the recreational fishery, groundfish are both targeted and caught incidentally when other species such as salmon, are targeted. Until recent years, it was thought that commercial fisheries took the vast majority of marine fishery catch in the EEZ. However, recent data indicate that catches by the recreational fisheries are a significant portion of the total landings of some groundfish species. For some overfished species, such as lingcod (55% of OY for recreational fishery), canary rockfish (34% of OY for recreational fishery), bocaccio (25% of OY for recreational fishery), and yelloweye rockfish (% of OY for recreational fishery), there are significant recreational catches. Table 3.3.4.2 shows the relationship of recreational and commercial total rockfish harvests, 1993-2001.

Table 3.3.4.1 Number of Recreational Charter Vessels Fishing in Ocean Waters in 2001, by Port

State	Port/area	Number of Recreational Charter Vessels
Washington	Neah Bay	15
	La Push	2
	Westport	32
	Ilwaco	28
	TOTAL	77
Oregon	Astoria	22
	Tillamook	51
	Newport	45
	Coos Bay	13
	Brookings	15
	Unknown	86
	TOTAL	232
California	Crescent City	1
	Eureka	4
	Fort Bragg	14
	San Francisco	67
	Monterey	33
	Conception (north)	129
	San Diego	95
	Unknown	72
	TOTAL	415
	TOTAL FOR ALL STATES	724

Table 3.3.4.2 Landings of All Rockfish by Commercial and Recreational Sectors 1993- 2001 (PacFin/RecFin)

Year	Recreational (mt)	Commercial (mt)	Total	Percent Recreational
1993	2,741	38,274	41,015	7%
1994	2,378	31,656	34,034	7%
1995	1,726	30,257	31,983	5%
1996	2,141	28,919	31,060	7%
1997	2,583	24,680	27,263	9%
1998	2,325	20,867	23,192	10%
1999	2,580	14,952	17,532	15%
2000	2,578	13,358	15,936	16%
2001	1,985	7,674	9,659	21%

Data source: PacFin data were extracted November 25, 2002

Marine recreational fishing on the West Coast has been on an increasing trend since 1996 (PFMC 2002). In 2001, 2.5 million marine recreational anglers took 5.2 million trips (1 million of these trips occurred in the federal EEZ) and are estimated to have caught 11,676 mt of fish of which 3,084 mt were groundfish. Most angling occurs during the summer months with fewer anglers fishing northward during the winter. Eighty eight percent of the trips in all ocean waters (state and federal waters) were made in California, followed by 9 percent in Washington, and 3 percent in Oregon. The number of participants has increased from 1.6

million in 1999 and 2.2 million in 2000. The number of trips has also increased from 3.1 million (0.64 million in the Federal EEZ) in 1999 and 4.6 million in 2000 (1.1 million in the Federal EEZ).

A portion of the increased recreational fishing effort is likely the result of longer salmon seasons that are associated with increased abundance and availability of salmon. Prior to 1996 when salmon seasons were shortened to protect declining populations, target effort shifts from recreational salmon fishing to groundfish targeting likely occurred. It is uncertain how much groundfish catch contributes to the overall incentive to engage in a recreational fishing. However, it seems likely that the frequency of groundfish catch on a trip adds to overall enjoyment and perceived value. Tables 3.3.4.3-3.3.4.5 identify the number of participants, fishing trips, and catch by fishing mode for 2001.

In southern California, most angling effort takes place from private/rental boats (43% of all ocean and trips or 49% of trips into the EEZ) and from charter vessels (27% of all ocean and trips or 51% of trips into the EEZ). Approximately 13 percent of the charter vessels take spear fishing divers. The recreational fishery in southern California targets a variety of species including: shelf and nearshore rockfishes (including California scorpion fish); lingcod; cabezon; California barracuda; yellowtail; ocean whitefish; tuna (including yellowfin and albacore); flatfish (including California halibut and sanddabs); kelp bass; barred sand bass, and spotted sandbass; white sea bass and California sheephead. Salmon are infrequently taken in southern California. Shelf rockfish, lingcod, California barracuda, yellowtail, ocean whitefish, and tunas are primarily taken by anglers aboard private/rental and charter vessels. The other species are taken by anglers from all modes. Divers primarily take nearshore rockfishes, lingcod, California sheephead, and Kelp bass.

In northern California, most of recreational angling effort takes place from private/rental boats and from shore (46% of all ocean and trips or 61% of trips into the EEZ). Spear fishing represents a very small amount of the effort with less than 2 percent of the charter vessels catering to divers. The recreational fishery in northern California primarily targets shelf and nearshore rockfishes, lingcod and salmon. In addition, cabezon, greenling, albacore, and flatfish (including sanddabs and California halibut) may be targeted. Shelf rockfish, lingcod, salmon, and albacore are primarily taken by charter vessels and private/rental boats. Greenling are primarily taken by private /rental boats and shore anglers. The other species are taken by anglers from all modes.

In Oregon, most recreational angling effort takes place from private/rental boats (62% of all ocean and trips or 67% of trips into the EEZ). The recreational fishery in Oregon primarily targets shelf and nearshore rockfishes, lingcod, greenling, Pacific halibut, salmon, cabezon, and albacore. Salmon and nearshore species such as greenling and cabezon are primarily taken by private/rental vessels, while the remaining species are more equally divided between the charter and private/rental boats.

In Washington, most recreational angling effort takes place from private/rental vessels (57% of all ocean trips or 58% of trips into the EEZ). The recreational fishery in Washington primarily targets shelf, and nearshore rockfishes, lingcod, greenling, Pacific halibut, salmon, sablefish, and albacore. Nearshore rockfish is primarily taken by charter vessels, while catch of the other species are more closely divided between the charter and private/rental boats.

Table 3.3.4.3 Estimated Number of Anglers in Ocean Fisheries 2001, by Fishing Mode, Thousands of Anglers (MRFSS)

	Coastal Residents	Non-coastal Residents	Out-of state Residents	Total
Southern California	1,054	15	185	1,255
Northern California	454	72	63	589
Oregon	312	30	84	426
Washington	571	36	49	655
Coastwide	2,390	154	n/a	2,544

Table 3.3.4.4 Estimated Number of Fishing Trips in Ocean Waters 2001 by Fishing Mode, Millions of Trips (EEZ only) (MRFSS)

	Party/charter Vessel	Private/Rental Vessel	Shore	Total
Southern California	0.99 (0.32)	1.39 (0.31)	0.86	3.24 (0.63)
Northern California	0.26 (0.09)	0.62 (0.14)	0.46	1.34 (0.23)
Oregon	0.10 (0.02)	0.31 (0.04)	0.09	0.50 (0.06)
Washington	0.05 (0.05)	0.08 (0.07)	0.01	0.14 (0.12)
Total	1.40 (0.47)	2.41 (0.56)	1.41	5.22 (1.03)

Table 3.3.4.5. Estimated Recreational Groundfish Catch in Ocean Waters 2001 by Fishing Mode, Metric Tons (MRFSS)

	Party/charter Vessel	Private/Rental Vessel	Total
Southern California	165	252	419
Northern California	728	945	1,675
Oregon	370	387	759
Washington	182	48	231
Total	1,445	1,632	3,084

Regulatory management measures available to manage the West Coast recreational groundfish catch include, but are not limited to, harvest guidelines, quotas, landing limits, frequency limits, gear restrictions, time/area closures, bag and size limits, permits, other forms of effort control. For 2003, recreational fisheries effort will be constrained to protect overfished species, particularly for lingcod, canary rockfish, bocaccio, and yelloweye rockfish. Washington, Oregon, and California will adopt through state regulation seasons, bag limits, and size limits to best fit the needs of their recreational fisheries in their states while also meeting conservation goals of the FMP.

For 2003, recreational fisheries management off Washington and Oregon have been structured to maintain low yelloweye rockfish catch, an overfished species primarily taken with hook and line gear.. In reviewing the take of yelloweye rockfish in their recreational fisheries, the states of Washington and Oregon found that yelloweye rockfish is most frequently taken by vessels that travel offshore to target Pacific halibut. However, yelloweye rockfish are not taken while the vessel is fishing for halibut, but rather after the vessel has completed its halibut fishing and is headed for port. Recreational fishing restrictions proposed by California are intended to ensure that fishing mortality of bocaccio, canary rockfish, cowcod, and lingcod do not exceed limits associated with rebuilding these overfished species. Because California's recreational fisheries management measures were not sufficiently conservative to prevent their fisheries from exceeding their set asides for overfished rockfish species in 2001 and 2002, more restrictive measures will be used for 2003. South of 40°10' N. lat., where the significant majority of California recreational fisheries occur, recreational fishing will be closed entirely January through June and open only shoreward of 20 fm (37 m) July through December. The season was restructured to maximize recreational harvest opportunity while ensuring that nearshore groundfish, California scorpionfish, and lingcod shoreward of 20 fm (37 m) are not overharvested. Management measures adopted for 2003 are fully described in the proposed rule for 2003 Annual Specifications and Management Measures (January 7, 2003; 68 FR 936).

In addition to the leisure benefits that recreational anglers receive from participating in marine fisheries, they generate monetary benefits in the form of sales, income, and employment throughout the Pacific Coast region. A wide variety of goods and services are purchased by anglers from sporting goods stores, speciality stores, bait and tackle shops, guide services, marinas, grocery stores, automobile service

stations, and restaurants. The economic impacts of these purchases occur throughout the Pacific Coast economy and provide income and jobs in manufacturing, transportation industries, and service sectors. Across Washington, Oregon, and California, it is estimated that recreational anglers spent $4.5 billion on marine recreational fishing in 2000, with Southern California anglers spending the most ($2.5 billion). Nationwide, recreational fishing expenditures total $21 billion (Genter et al. 2001). The recreational fishery in Washington, Oregon, and California are associated with $254 Million in personal income and almost 10,000 jobs; the groundfish fishery represented $71 Million and 2,800 jobs, respectively or about 28% of the total (Genter et al. 2001) (Table 3.3.4.7).

Table 3.3.4.6 Recreational Fishery Harvest by Region for Party/charter Boats and Private/rental Boats, 2001, in Metric Tons (RecFin)

	Lingcod	Nearshore Rockfish	Shelf Rockfish	Other Nearshore Groundfish	Other Shelf Groundfish	Other Groundfish	Total Groundfish	Salmon	Halibut	Highly Migratory Species	Other	Total
Washington												
Charter	17	153	11	1	0	0	182	33	105	0	0	320
Private	15	20	10	3	0	0	48	38	103	0	0	189
Total	32	175	21	3	0	0	231	70	208	0	0	509
Oregon												
Charter	53	274	33	10	0	0	370	91	21	0	7	489
Private	60	282	12	33	0	0	387	1,108	3	11	176	1,685
Total	114	557	46	42	0	0	759	1,199	24	11	183	2,176
Northern California												
Charter	41	351	316	20	0	0	728	187	0	80	53	1,048
Private	90	290	111	439	15	0	945	1,384	0	387	1,048	3,764
Total	131	642	426	460	16	0	1,675	1,572	0	467	1,100	4,814
Southern California												
Charter	4	26	73	47	14	1	165	0	0	348	1,088	1,601
Private	19	15	112	78	26	2	252	0	0	411	1,907	2,570
Total	23	41	186	125	41	3	419	0	0	759	2,999	4,177
Coastwide												
Charter	115	804	433	78	14	1	1,445	311	126	428	1,148	3,458
Private	184	607	245	553	41	2	1,632	2,530	106	809	1,148	3,458
Total	**300**	**1,415**	**679**	**630**	**57**	**3**	**3,084**	**2,841**	**232**	**1,237**	**4,282**	**11,676**

Table 3.3.4.7. Total Pacific Coast Region Expenditures by Resident Status, 2000 (millions of dollars) (Gentner et al. 2001)

Pacific Coast Region	Total	Upper Bound	Lower Bound	Total	Upper Bound	Lower Bound
Trip Expend	**Residents ($)**			**Non- Residents ($)**		
Private Transportation	111	142	80	32	35	29
Food	75	81	70	13	14	12
Lodging	32	36	28	16	19	14
Public Transportation	3	4	2	49	60	38
Boat Fuel	46	51	40	3	4	2
Party/Charter Fees	64	70	58	8	9	6
Access/Boat Launching	10	11	9	1	2	1
Equipment Rental	8	10	7	7	9	5
Bait and Ice	31	34	27	3	3	2
Trip Sub-Totals	380	413	347	132	144	120
Annual Expenditures						
Rods and Reels	144	160	128			
Other Tackle	115	127	103			
Gear	27	30	23			
Camping Equipment	16	21	11			
Binoculars	5	6	3			
Clothing	19	23	15			
Magazines	5	5	4			
Club Dues	4	5	3			
License Fees	72	78	66			
Boat Accessories	371	462	279			
Boat Purchase	1,066	1,234	899			
Boat Maintenance	304	343	266			
Fishing Vehicle	1,326	1,669	983			
Fishing Vehicle Maintenance	285	332	239			
Vacation Home	98	161	34			
Vacation Home Maintenance	103	199	8			
Equipment and Durable Goods Sub-total	3,959	4,361	3,546			
All Sub-totals	4,339	4,743	3,925	132	144	120
Pacific Coast Region Total	4,471	4,875	4,057			

Table 3.3.4.8 Coastal Community Income Impacts for the Recreational Fishery by Area, 2001 (PFMS 2002)

Area		Charter ($1000s)	Private ($1000s)	Total ($1000s)	Jobs
Washington Coast	**Total**	$5,335	$3,285	$8,620	392
	Groundfish	$1,134	$385	$1,519	69
Oregon	**Total**	$6,382	$4,911	$11,293	514
	Groundfish	$4,227	$783	$5,011	228
California	**Total**	$99,616	$135,195	$234,811	8,899
	Groundfish	$43,983	$21,481	$64,465	2,468
Total	**Total**	$111,332	$143,392	$254,724	9,823
	Groundfish	$48,345	$22,649	$70,994	2,765

Processing Sector. 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 2002). 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.

Shorebased Sector. Several thousand entities have permits to buy fish on the West Coast. Of these 1,780 purchased fish caught in the ocean area and landed on Washington, Oregon, or California state fish tickets in the year 2000 (excluding tribal catch) and 732 purchased groundfish. Larger buyers tend to handle groundfish more than smaller buyers. Of the 546 buyers purchasing in excess of $20,000 of West Coast landings, 59% bought groundfish. These 546 buyers bought 99% of all Council managed groundfish. Of the 1,234 buyers purchasing less than $20,000 from West Coast vessels, 33% bought groundfish. The number of buyers handling groundfish from trawl vessels is substantially lower than all of those handling groundfish. Only 17% (125) of all groundfish buyers (732) handled fish from trawl vessels. These 125 vessels comprise only 7% of all buyers (1,780). Buyers of trawl caught groundfish are important to nontrawl vessels as well, handling 60% (by value) of the groundfish caught by nontrawl vessels. Table 3.3.4.9 displays the number of buyers as compared to the groundfish buyers, grouped by total expenditures for the year 2000 (excluding at-sea whiting).

Table 3.3.4.9 Number of West Coast Buyers and Groundfish Buyers in 2000 (excluding at-sea whiting)

Buyers' Total Expenditures on West Coast Harvests	All Buyers	Nongroundfish Buyers	Groundfish Buyers	Groundfish Buyers as % of all Buyers
>$2 Million	21	2	19	90%
$1-$2 Million	33	14	19	58%
$300 Thousand - $1 Million	98	36	62	63%
$100-$300 Thousand	121	49	72	60%
$20-$100 Thousand	273	123	150	55%
$5 -$20 Thousand	372	224	148	40%
<$5 Thousand	862	600	262	30%
Total	1,780	1,048	732	41%

The largest buyers tend to handle trawl vessels more than smaller buyers. Of the 38 largest buyers of groundfish (those with purchases in excess of $1 million), 73% (28) bought from trawl vessels Seventy-eight percent of all groundfish purchases from trawl vessels go to the 28 trawl buyers with total purchases of all species in excess of $1 million. These 28 buyers also handle 39% of the exvessel value of the nontrawl purchases.

Table 3.3.4.10 Number of West Coast Groundfish Buyers in 2000 by gear group (excluding at-sea whiting)

Buyers' Total Expenditures on West Coast Harvests	Groundfish Buyers	Trawl caught groundfish buyers	Non-trawl caught groundfish buyers
>$2 Million	19	17	2
$1-$2 Million	19	11	8
$300 Thousand - $1 Million	62	33	29
$100-$300 Thousand	72	23	49
$20-$100 Thousand	150	19	131
$5 -$20 Thousand	148	11	137
<$5 Thousand	262	11	251
Total	732	125	607

Mid-size buyers tend to have greater importance for nontrawl vessels than for trawl vessels. Fifty percent of all nontrawl sales go to buyers with total purchases of between $20 thousand and $1 million, as compared to 22% for trawl vessels (PFMC 2002). Absent cost and exprocessor sale price data, very rough assumptions must be made to consider possible levels of dependence of processors on groundfish. However, it is assumed here that gross exvessel value of purchases is a rough indicator of relative levels of dependence. Large buyers of groundfish tend to have a lesser percentage of their overall purchases from groundfish than smaller buyers. Table 3.3.4.11 displays the value of purchases by west coast processors in 2000 (excluding at-sea whiting).

Table 3.3.4.11 Value of Purchases by west coast buyers in 2000 (PFMC 2002)

	All buyers	Groundfish buyers	
	Total purchases ($1,000)	Total purchases of all species ($1,000)	Total purchases of groundfish ($1,000)
>$2 Million	95,742	90,762	28,680
$1-$2 Million	45,343	25,851	8,585
$300 Thousand - $1 Million	56,115	36,527	11,278
$100-$300 Thousand	21,427	12,543	3,269
$20-$100 Thousand	12,881	7,297	2,023
$5 -$20 Thousand	3,989	1,519	501
<$5 Thousand	1,278	426	218
Total	236,775	174,926	54,554

At-Sea Sector. There are two classes of vessels in the at-sea processing sector of the whiting fishery, catcher-processors that harvest and process their own catch, and mothership vessels that process unsorted catch received from smaller catcher vessels. The processing vessels are large (>250 ft in length) and carry crews of 65-200, who mostly work in shifts to keep the factories operating day and night.

The first year of implementation of a license limitation program in the Pacific groundfish fishery was 1994. Vessels that did not initially qualify for a permit had to buy or lease one from qualifying vessels to gain access to the fishery. To harvest whiting, all at-sea catcher-processors had to purchase or lease permits. This changed the composition of the at-sea processing fleet considerably, increasing the number of motherships, because permits are not required for vessels that only process (PFMC 1998). Unlike catcher/processors and catcher vessels, motherships do not have permits to harvest groundfish in the WOC.

In 2001, 20 catcher vessels delivered whiting to 5 non-tribal mothership processors and 4 tribal catcher vessels delivered whiting to a single tribal mothership. Some vessels may deliver catch exclusively to motherships off Alaska and the West Coast, but in recent years, about half of the non-tribal vessels also delivered whiting to shore-based processing facilities in Washington, Oregon and California. Similarly, the tribal mothership also processes whiting in the non-tribal sector before the start of the tribal fishery. In 2001, 7 catcher/processors participated in the whiting fishery.

Since May 1997, when the Department of Justice approved allocation of whiting shares among the members of the Whiting Conservation Cooperative, the catcher-processor fishery has operated as a voluntary quota share program where each of the catcher-processor companies has agreed to take a specific share of the harvest. With harvests assured, the catcher-processors are able to operate more cautiously to avoid areas of salmon and rockfish abundance. The motherships, however, operate under more competitive conditions (first come first served) for their sector's allocation. The U.S. whiting allocation has been fully utilized by domestic processors since 1992.

Whiting is a high volume species, but it commands a relatively low price per pound. The at-sea processing vessels have onboard surimi production capacity and were initially designed to fish for pollock in the groundfish fisheries off Alaska. Because whiting is a similar species to pollock, harvesting and processing technology and equipment used in the Alaskan fisheries is also used for whiting. In addition, to surimi, most of these vessels have the capacity to produce frozen fillet blocks and have fish meal plants to process small whiting, incidentally caught groundfish species and fish offal.

Communities

Fishing communities, as defined in the Magnuson-Stevens Act, include not only the people who actually catch the fish, but also those who share a common dependency on directly related fisheries-dependent services and industries. In commercial fishing this may include boatyards, fish handlers, processors, and ice suppliers. Similarly, entities that depend on recreational fishing may include tackle shops, small marinas, lodging facilities catering to out-of-town anglers, and tourism bureaus advertising charter fishing opportunities. People employed in fishery management and enforcement make up another component of fishing communities.

Fishing communities on the West Coast depend on commercial and/or recreational fisheries for many species. Participants in these fisheries employ a variety of fishing gears and combinations of gears. Naturally, community patterns of fishery participation vary coastwide and seasonally, based on species availability, the regulatory environment, and oceanographic and weather conditions. Each community is characterized by its unique mix of fishery operations, fishing areas, habitat types, seasonal patterns, and target species. While each community is unique, there are many similarities. For example, all face danger, safety issues, dwindling resources, and a multitude of state and federal regulations.

Individuals make up unique communities with differing cultural heritages and economic characteristics. Examples include a Vietnamese fishing community of San Francisco Bay and an Italian fishing community of Southern California. Native American communities with an interest in the groundfish fisheries are also considered. In most areas, fishers with a variety of ethnic backgrounds come together to form the fishing communities within local areas, drawn together by their common interests in economic and physical survival in an uncertain and changing ocean and regulatory environment.

The EIS prepared for the 2003 Annual Specification and Management Measures looks closely at fishing communities and provides futher information on the following: geographic distribution of commercial fishing fleet and revenue; geographic distribution of groundfish buyers; geographic distribution of personal income; dependence on and engagement in fishing and fishing-related activities;demographics, ethnic, and social characteristics social structure: networks, values, identity; impact on the built environment in fishing communities. As required by E.O. 12898 (Environmental Justice), low income and minority populations affected by this action are described in the EIS for the annual specifications and management process. In addition, supplemental county level economic and demographic information has been compiled for a general baseline description of West Coast fishing communities (PFMC 1999). This information may be accessed on the Council website (http://www.pcouncil.org/communities/comdoc.html).

Enforcement

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

State enforcement assets may be compromised by pessimistic budget outlooks for next year that threaten to reduce these assets as state programs are rationalized under an increasingly more conservative fiscal environment. In 2002, State enforced declaration requirements were used to increase the efficiency of at-sea patrols and improve enforcement, particularly in areas closed to certain gear types or fishing strategies. Under declaration programs, legal incursions into closed areas must be reported to state

enforcement authorities prior to fishing. This requirement is generally reserved for vessels that would otherwise appear to be fishing illegally when viewed from an at-sea patrol craft.

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