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ECONOMIC STATUS OF THE WASHINGTON, OREGON, AND CALIFORNIA GROUNDFISH FISHERY IN 1988

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U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Southwest Region

NOAA Technical Memorandum NMFS

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EXECUTIVE SUMMARY

This report reviews the economic status of the 1988 Washington, Oregon, and California (West Coast) groundfish fishery. The West Coast groundfish fishery is managed and regulated under the Pacific Fishery Management Council's Groundfish Fishery Management Plan (FMP). The FMP establishes federal jurisdiction over more than 100 groundfish species, namely various species of roundfish, rockfish, and flatfish. Several different user groups harvest these groundfish resources: domestic commercial fishing vessels that deploy trawl nets, fish pots, longlines, hook-and-lines, set nets and other assorted gears; foreign catcher-processor vessels permitted to harvest in the U.S. 200-mile Exclusive Economic Zone (EEZ); U.S. catcher vessels operating in joint ventures; foreign floating processing vessels; and recreational fishermen. The harvesting sector is linked to an extensive industry that processes and markets groundfish products in many different forms for domestic and/or foreign consumption, including domestic shore-based processors and foreign floating processors.

Data on landings, exvessel values, and fleet size were supplied or compiled from state agency reports, Pacific Fishery Information Network (PacFIN) tabular statistics, or data files obtained from the PacFIN research database (RDB). Changes in the economic condition of the fishery between 1987 and 1988 are reviewed. The fleet's economic performance is measured in terms of gross revenues accruing from all marine fish landed in West Coast ports and in joint venture fisheries. The economic condition of the processing and market sectors is reviewed by evaluating changes in the value of domestic processed groundfish products and magnitude of groundfish imports and exports.

The West Coast groundfish fishery continued to expand in 1988, exceeding 1987 landings by 10 percent. Domestic commercial landings (shoreside and joint venture) set a new record at 217,500 metric tons (mt). This increase was fueled by the significant growth in joint venture landings of Pacific whiting, since shoreside landings fell slightly in 1988. Joint venture Pacific whiting landings broke the record high set in 1987. However, the total exvessel value of groundfish landings was slightly lower than in 1987, since the decline in the value of shoreside landings more than offset the increase in the value of joint venture landings. The quantity and value of state groundfish landings were relatively stable in Oregon and Washington, but fell significantly in California. The directed foreign harvest of West Coast groudfish continued to fall in 1988.

Generally lower landings and values in the groundfish fishery plus a significant decrease in the value of pink shrimp landings led to a poorer economic performance by the trawl fleet in 1988. The other major segments of the groundfish harvesting sector had mixed results, with earnings for sablefish pot vessels higher and sablefish longline vessels lower than in 1987.

Economic Status of the Washington, Oregon and California Groundfish Fishery in 1988

I. Introduction

This is the fifth annual report describing the economic status of the Washington, Oregon, and California (West Coast) groundfish fishery.[1] It focuses on factors affecting the economic performance of business firms which harvest, process, and market groundfish stocks regulated under the Pacific Fishery Management Council's (PFMC) Groundfish Fishery Management Plan (FMP).[2] The FMP establishes federal jurisdiction over more than 100 species of groundfish. These include flatfish (e.g., Dover sole, English sole, petrale sole, rex sole and flounders), roundfish (e.g., sablefish, Pacific cod, lingcod, and Pacific whiting), and several varieties of Sebastes and Sebastolobus rockfishes (e.g., yellowtail, canary, widow, boccacio, chilipepper, shortbelly and thornyhead). Those business firms that utilize these assorted groundfish stocks include domestic commercial fishing vessels, foreign processing vessels operating in joint ventures with U.S. vessels, foreign catcher-processor vessels, shoreside fish processing plants, and domestic sportfishing vessels. Recreational fishermen also catch groundfish from private boats, piers, jetties, banks, and shore.

Domestic commercial vessels catch and deliver groundfish primarily to shoreside processing plants. A variety of gears are used in the harvesting process, including otter trawls, longlines, fish pots, hook-and-lines, and entanglement nets. Most (if not all) domestic harvesting firms are multi-species operations; in addition to groundfish they harvest an array of valuable non-groundfish species such as pink shrimp, salmon, tuna, and halibut. Moreover, it is not uncommon for domestic groundfish vessels to exhibit a significant amount of geographic mobility up and down the coast. That is, vessels frequently shift fishing areas and primary landing ports in response to changes in species availablity, management regulations, and market conditions (Huppert and Korson, 1987).

Business firms owned and operated by foreign countries are an important component of the commercial groundfish fishery. Foreign floating processor vessels are increasingly involved in joint ventures with U.S. commercial fishing vessels. Under this arrangement U.S. vessels harvest groundfish and deliver the catch to foreign floating processor vessels for at sea processing. Since 1978 agreements between domestic trawl fishermen and foreign processors have been an important factor in the development of the Pacific whiting fishery and provide an important source of income for mid-water trawlers. Foreign catcher-processor vessels also may be allowed to catch groundfish directly when the U.S. fishing industry has not demonstrated the intent or capacity to harvest the entire acceptable biological catch (ABC) from West Coast groundfish stocks. In that case, a

foreign country negotiates a Governing International Fishery Agreement with the U.S. State Department in order to engage in a directed foreign fishery within the U.S. 200-mile EEZ. The West Coast direct foreign fishery is gradually being phased out from the EEZ; the 1988 foreign harvest was the lowest on record, about 18,000 metric tons (mt).

The business firms in the groundfish processing and marketing sector consist of domestic shore-based processing plants, wholesale fish brokers, and retailers who ultimately sell groundfish products directly to consumers. Just as groundfish vessels fish for many different species, groundfish processors are muti-product firms, producing and selling a wide variety of seafood products. West Coast groundfish products are distributed for final consumption to institutions, supermarkets, restaurants, and specialty stores in the United States, as well as for export, primarily to Japan.

This report reviews the economic condition of domestic business firms in the groundfish fishery in 1988 and compares it to the 1987 fishing year. Section II provides a general overview of the past fishing year, and summarizes those management actions which impacted the progress of the fishery during the year. Section III reviews the economic condition and performance of vessels in the domestic commercial groundfish harvesting sector and describes developments in other fisheries which impact the West Coast groundfish fishery. The economic status of the West Coast groundfish processing sector is covered in Section IV. The report concludes with a section on trends and changes in domestic and foreign markets for West Coast groundfish products.

II. Overview of the Fishery in 1988

The West Coast groundfish fishery expanded for the third consecutive year in 1988. The rate of growth, however, slowed following increases in production of 33 percent in 1987 and 21 percent in 1988. Domestic commercial landings increased 15 percent to 227,400 mt, breaking the previous record high (198,400 mt) set in 1987 (Table 1). Despite this improvement, the nominal exvessel value of commercial groundfish landings fell slightly (1.5 percent) to $82.3 million. After adjusting for the annual rate of inflation (1986=1.0), the real value of groundfish landings was $77.8 million or 5 percent below the real value of groundfish landings in 1987. In the previous two years, groundfish landings and values increased concurrently (Figure 1).

The surge in groundfish landings was fueled entirely by the continued growth in the joint venture sector, since shoreside landings decreased slightly from 92,300 mt in 1987 to 91,600 mt in 1988. Landings in the joint venture Pacific whiting fishery set a new record, totaling 135,800 mt or 28 percent above the previous record set in 1987 (Table 1). Joint venture landings rose for the third consecutive year (Figure 2). Shoreside

landings have remained almost constant over the last two years, and except for a drop in 1986, have been generally stable since 1983 (Figure 3).

The exvessel value of joint venture landings increased 26 percent, while the value of shoreside landings fell 6 percent (Table 1). Shoreside exvessel prices for rockfish species, which comprise the largest percentage of groundfish landed, decreased noticeably in 1988, but sablefish exvessel prices reached a new, 10-year high (Table 2). Due to a substantial increase in joint venture landings, the exvessel value of the joint venture fishery exceeded the previous record high established in 1984.

Within the individual states, shoreside groundfish landings were stable or slightly higher in Washington and Oregon, but fell in California (Table 3). The decline in California landings resulted from lower sablefish, Dover sole and widow rockfish catches, which more than offset a 45 percent increase in Pacific whiting landings (Table 4). In contrast, higher Dover sole and other rockfish landings offset the decline in sablefish and widow rockfish landings in Washington and Oregon. The mixed outcome in sofar as state landings and generally lower exvessel prices for some major species led to lower exvessel values in Washington and California. The exvessel value of groundfish landings in Oregon was slightly lower in 1988.

The economic importance of the West Coast groundfish fishery is reflected in Table 5. It remains the most important fishery on the West Coast in terms of its contribution to the total exvessel value of all marine fish landings in 1987 and 1988. The economic dominance of groundfish declined, however, in 1988 due to the resurgence of especially the West Coast Pacific salmon fishery, and more modest increases in crab, wetfish, and other marine fisheries.

The landings and exvessel value of landings for the principal species/species groups in the West Coast groundfish fishery are reviewed below and summarized in Table 6.

Sablefish

Sablefish accounted for the greatest value of shoreside landings for the third consecutive year. Round weight landings, however, fell significantly (15 percent) to 10,800 mt (Table 6). This occurred because the sablefish optimum yield (OY) was reduced from 12,000 mt in 1987 to 10,000 mt $\pm$ 8 percent (9,200 mt to 10,800 mt) in 1988. The PFMC's intent was to manage sablefish at the mid-point of this range (10,000 mt) but allow for incidental sablefish landings should the "quota" be reached early in the fishing year. The exvessel value of the landed catch was $12.5 million, down 6 percent from 1987. Coastal exvessel prices established a new record, increasing to an average of over $0.52 per pound (round weight basis). After adjusting for inflation, the exvessel price approached the record prices paid in 1979 (Table 2).

As in 1987, the PFMC allocated 52 percent of the 1988 sablefish quota (5,200 mt) for trawl gear and 48 percent (4,800 mt) for non-trawl gear. The fishing year began with trawl trip landings and frequency limits to reduce target fishing and extend the length of the fishing season. Trawl landings were limited to 6,000 pounds or 20 percent of all legal fish, whichever was less, with no more than two landings allowed per week. Fishing effort and catches by sablefish vessels were higher during the year, probably due to the second consecutive season of record breaking exvessel prices. Consequently, on August 3 the trawl sablefish fishery was restricted further through the imposition of 2,000 pound, once-a-week trip limits. At the same time the 800 mt reserve was added to the trawl sablefish allocation to prevent early attainment of the trawl quota. The non-trawl fishery for sablefish closed August 26 when the quota of 4,800 mt was attained.

For the entire year, sablefish landings exceeded the non-trawl quota by 343 mt (Table 7). The proportion of sablefish landings accruing to trawlers declined slightly in 1988. In comparison pot vessels' share of non-trawl sablefish landings increased, while longline vessels' share fell significantly. In terms of the absolute change in landings, longliners caught less sablefish, while pot vessel landings were constant. Thus, the cut in the non-trawl allocation was absorbed completely by the longline sablefish fleet in 1988 (Table 7). Similarly, the exvessel value of sablefish landings was stable for trawlers, improved for pot vessels, and declined for longline vessels.

Widow Rockfish

Widow rockfish landings totaled 10,847 mt in 1988, down 15 percent from 1987, and were 10.3 percent under the OY quota of 12,100 mt. The exvessel value of landings was $6.8 million, or 24 percent less than in 1986. A significant decrease in landings combined with lower exvessel prices resulted in a considerably less valuable widow rockfish fishery in 1988.

The PFMC continued its management practice of attempting to extend the widow rockfish fishery as long as possible through the year. A coastwide weekly trip limit of 30,000 pounds per vessel was established at the start of the season. By August the PFMC projected that landings would exceed OY by September 21, and subsequently reduced the trip limit to 3,000 pounds per vessel per trip to avoid an early closure of the fishery, reduce target fishing, and allow for incidental landings the rest of the year. The more restrictive limit was successful in averting an early closure of the widow rockfish fishery in 1988.

Pacific Ocean Perch (POP)

POP landings totaled 803 mt, down 18 percent from 1987. The exvessel value of landings was $514,000, compared to $700,000 in 1987. The PFMC regulates this species with trip limits and

quotas to prevent directed fishing and to rebuild depressed stocks in the INPFC Vancouver and Columbia subareas.

Other Rockfish

West Coast rockfish landings (excluding widow rockfish and POP) were about 28,900 mt in 1988, or 8 percent higher than in 1987. This was the second consecutive year that landings of other rockfish increased since the 1983 adoption of trip limit regulations for the Sebastes complex. As a result of the drop in the average exvessel price, from $0.350 in 1987 to $0.323 per pound in 1988, the exvessel value of rockfish landings remained constant at about $21.5 million equalled the previous record set in 1987.

As in 1984-87, the Sebastes rockfish complex continues to be managed with trip poundage and frequency regulations to protect yellowtail rockfish stocks (S. flavidus) and to keep overall landings close to the harvest guideline of 10,200 mt north of Coos Bay, Oregon. The PFMC has the perogative to limit Sebastes landings further should the harvest guideline or yellowtail rockfish ABC be exceeded during the year. For the second consecutive year, yellowtail rockfish landings were excessively high despite efforts to control the harvest by implementing trip limits. Consequently, yellowtail rockfish trip limits were reduced in October after the PFMC determined that the ABC was already exceeded in September. The overall Sebastes trip limit remained unchanged for the remainder of the year.

Flatfish

The combined landings of all flatfish species were 26,900 mt in 1988, down 7 percent from 1987. Each individual species of flatfish also declined both in terms of landings and value (Table 6). In absolute numbers, Dover sole exhibited the largest decrease in tonnage and dollar value, whereas the other flatfish category had the largest percentage decrease. Despite this relatively down year for flatfish, Dover sole was still the second most valuable shoreside groundfish species because of the sheer magnitude of landings.

Exvessel prices paid for flatfish species remained relatively constant in 1988 (Table 3). Therefore, the decline in flatfish production is apparently due to other factors unrelated to shifts in demand or supply. It is unknown how much of the decline is attributable to such variables as environmental conditions, changes in resource abundance, successes in alternative or complementary fisheries, or costs of production. Reportedly, some trawl effort is diverted from Dover sole fishing when landings in the high valued pink shrimp and Pacific whiting joint venture fisheries are higher (Korson and Kinoshita, 1989; Korson and Silverthorne, 1987). In 1988, as in 1986, the decline in flatfish production coincides with an increase in pink shrimp and Pacific whiting joint venture landings.

Pacific whiting

In 1988 the quantity of shoreside Pacific whiting landings surged 43 percent and exvessel value climbed 72 percent (Table 6). This set a new record and continued the rapid growth in shoreside deliveries witnessed the last few years. Pacific whiting is now commonly marketed as a headed-and-gutted product in vacuum packed trays to retail supermarket chains and institubtions.

The joint venture fishery for Pacific whiting harvested a record 135,783 mt. Five foreign nations, represented by eight joint venture companies and 31 foreign processing vessels, participated in 1988. As a result, 42 U.S. trawlers were employed by foreign joint venture companies in 1988, compared to 31 in 1987 (Table 17). Moreover, U.S. trawlers accrued over $14.6 million in revenue from at-sea sales of Pacific whiting in 1988.

III. Commercial Harvesting Sector

Otter Trawl Fleet

Otter trawl vessels (bottom, roller, and midwater) harvested and landed slightly over 209,200 mt of groundfish (shoreside and joint venture) in 1988, or 92 percent of the West Coast total for that year. The trawl fleet's total production of groundfish surpassed the previous record established in 1987 (180,800 mt) by 16 percent. Despite the significant increase in output, the exvessel value of otter trawl groundfish landings fell slightly (1.7 percent) to $62.7 million. This is attributable to somewhat poorer performances by the shoreside trawl fleet both in terms of production and value (Tables 8 and 9, Figure 4). In contrast, joint venture trawlers generated record landings and exvessel values (Figure 2).

As reported by the state fishery agencies, the shoreside otter trawl fleet, defined as vessels landing groundfish with legal bottom, roller, or midwater trawl gear, totaled 346 vessels in 1988. The shoreside fleet increased by about 5 percent over 1987 (Table 10). A total of 42 mid-water trawl vessels participated in the 1988 Pacific whiting joint venture fishery, an increase of 35 percent over 1987 (Table 17). Of these, 18 joint venture trawlers did not land groundfish in Washington, Oregon, or California in 1988. Thus, the West Coast groundfish trawl fleet totaled 364 vessels, up 9 percent from 334 vessels in 1987.

This was the second consecutive year that trawl fleet capacity increased rather significantly on the West Coast. For the shoreside fleet, there was a proportionally larger increase in small (under 30 feet) and mid-sized (60-69 feet) trawl vessels than for any other size categories in 1988 (Table 11). With

regard to the joint venture fleet, it is interesting to note that a much larger percentage of these mid-water trawlers also fished in Alaska joint ventures in 1988 (50 percent) than in 1987 (19 percent).

The shoreside trawl fleet expanded by 16 vessels due to the entry of 68 vessels and departure of 52 vessels. Table 12 reveals the disposition of trawl vessels that left the shoreside groundfish fishery in 1988. Compared to 1987, trawl vessels shifted into Alaskan joint venture fisheries and fished with other gears to a greater degree in 1988. In contrast, there was a decline in the relative percentage of trawlers sinking or transferring to the pink shrimp fishery. For the second consecutive year, no vessels were known to have departed because of financial reasons.

Several factors apparently interacted simultaneously to cause a net increase in the size of the West Coast trawl fleet in 1988. First, fishermen's expectations of another good fishing year were heightened after trawlers had record gross earnings from groundfish landings in 1987. Thus, in an open access fishery, the fleet expands when economic returns are positive. Second, joint venture quotas in Alaska began to fall in 1988. As a result, domestic catcher-processor trawlers are rapidly replacing joint venture trawlers in the harvesting of groundfish off Alaska. Alaskan joint venture trawlers have entered the West Coast groundfish fishery in greater numbers, since more joint venture companies participated, pulling in some of their Alaskan boats. Finally, the PFMC developed a preliminary proposal to limit effort in the West Coast groundfish fishery during 1987. The original proposal established that a vessel must have landed groundfish with legal trawl gear during a specified time frame (mid-1984 through mid-1987) in order to be eligible to receive a groundfish fishing permit. However, in 1988 the PFMC extended the proposed window qualifying period to August 1, 1988. It appears that the large increase in small trawl vessels landing groundfish may be in response to the PFMC's announcement to extend the limited entry qualifying period to mid-1988.

The indicator of vessel economic performance used in this report is total gross revenues accruing to trawl vessels from all West Coast marine fish landings. In the absence of data on fishing costs needed to compute vessel profit, such an indicator is the most comprehensive index of vessel fishing activity available. It does not, however, include revenue from fishing activity in Alaska or income derivable from such non-fishing pursuits as tendering, chartering services, leasing, or renting gear or vessels.

A complete list of trawl vessels landing groundfish in the three West Coast states was developed by matching a state agency list of trawl vessels with vessels having recorded groundfish trawl landings in the integrated three-state landings file maintained by the National Marine Fisheries Service in its RDB. The purpose of this comparison is to eliminate vessels which are

not trawlers, but are listed as making one or more landings due to gear coding errors. This procedure generated matches for 325 vessels in 1987 and 344 trawl vessels in 1988.[3] Average vessel gross revenues are provided for the West Coast shoreside trawl fleet in Tables 13 and 14. For the shoreside fleet as a whole, gross revenue per vessel fell from a mean of $260,500 in 1987 to $221,800 per vessel in 1988, taking into account all species landed and after adjusting for inflation (Table 13).[4] Those trawl vessels principally dependant on Dover sole, other flatfish, and Dungeness crab were the only components of the fleet which had higher mean gross revenues in 1988 compared to 1987.[5] Trawl vessels participated less intensively in the pink shrimp fishery in 1988, as exhibited by a large decrease in the number of vessels which relying on this important alternative for their principal source of revenue. Mean gross revenue per vessel also decreased within all but the largest (over 80 feet) length classes in 1988 (Table 14). The greatest percentage decline in revenues occurred in the intermediate (51-70 feet) vessel size class, consisting of over 50 percent of the fleet. Thus, the combined effects of lower groundfish production, reduced exvessel prices (i.e., rockfish, Dover sole), and a sharp drop in the value of pink shrimp trawl landings (from $46.5 million in 1987 to $29.1 million in 1988) resulted in a poorer fishing year for the shoreside groundfish trawl fleet in 1988.

The Pacific whiting joint venture fleet was also analyzed by vessel size class to examine the economic condition of this important segment of the trawl fleet.[6] In 1988, the fleet generated an average of $407,400 from all West Coast marine fish landings, compared to a mean of $561,000 in 1987, after adjusting for inflation (Table 18). Mean gross revenues decreased in all vessel size classes. In percentage terms, the over 80 feet vessel class suffered the largest decline in mean gross revenues. Thus, even though the exvessel value of Pacific whiting joint venture landings reached an all-time high in 1988, it did not compensate for the fact that a greater number of vessels shared in the increase, resulting in lower joint venture fleet revenues. Since Alaskan earnings are not integrated in the RDB, however, these values will underestimate fishing revenues for the larger mid-water trawlers which also fish in Alaska.

Those groundfish trawl vessels which fish in Alaska generate additional revenue to augment earnings from West Coast marine fish landings. The 1988 Alaskan joint venture fishery yielded 1.3 million mt, valued at $204.6 million. Compared to 1987, this was about 9 percent higher in value, but 6 percent lower in terms of quantity.

The majority of groundfish landings (shoreside and joint venture) are harvested by a small percentage of the fleet. For example, about 20 percent of the trawl vessels (including joint venture trawl vessels that also deliver to shore) accounted for almost 80 percent of the groundfish landed in 1988 (Table 15). The groundfish harvest was similarly concentrated in the top 20 percent of the fleet in 1987 (Table 16).

Pot/Trap Vessels

West Coast groundfish pot landings remained quite low in relation to the fleet's level of production over the last eight years. A total of only 2,200 mt was landed coastwide in 1988, up slightly from the seven-year low of just over 2,000 mt taken in 1987 (Table 8). The exvessel value of groundfish pot landings rose more than proportionally because exvessel prices paid for sablefish continued to climb (Table 2, Table 9).

Sablefish is the dominant groundfish species harvested by the West Coast fish pot fleet. For this reason, vessels which landed sablefish with fish pot gear were analyzed for their economic performance. The target fleet was selected based on whether a vessel landed at least 1,000 pounds of sablefish with fish pot gear, according to vessel landing records in the RDB. This minimum landing threshold eliminated "marginal" fish pot vessels which landed only small quantities of sablefish in a year.[7]

The target sablefish pot fleet consisted of 28 vessels in 1987 and 25 vessels in 1988. The economic performance of the sablefish pot vessels, measured in terms of average gross revenues accruing from West Coast marine fish landings, is summarized by principal species group in Table 19. The sablefish pot fleet is primarily dependent on sablefish and Dungeness crab for their principal source of revenue. Over 80 percent of the fleet relies on one of these species as principal species in each year. In 1988, mean gross revenues were higher for vessels in each principal species group and for the entire sablefish pot fleet was up 47 percent to $185,800 per vessel, after adjusting for inflation. Moreover, within vessel size class, mean gross revenues increased across each length category in 1988 (Table 20). In particular the 51-70 feet and over 70 feet vessel size classes recorded the highest gain in mean gross revenues per vessel, namely, 50 and 67 percent, respectively. Consequently, with somewhat higher pot landings, favorable exvessel price trends, and a substantially improved coastal Dungeness crab fishery, sablefish pot fleet revenues were well above 1987 levels during the 1988 fishing year. The sablefish pot fleet's most important alternative fishery, Dungeness crab, was worth about $45 million in calendar year 1988, compared to approximately $27 million in 1987.

The concentration of the sablefish harvest among the pot fleet in 1987 and 1988 is shown in Tables 21 and 22. The top 40 percent of the fleet contributed about 75 percent of the sablefish production in 1988, compared to about 80 percent of the production in 1987. In general there is a slight reduction in the pot fleet's concentration of sablefish in 1988.

Longline/Setline Vessels

The West Coast longline fleet landed about 5,700 mt of groundfish in 1988, down 18 percent from the record year in 1987 (Table 8).[8] The total exvessel value of longline landings in 1988 was $8.6 million, 10 percent below the record set in 1987, but still the second highest landed value since 1981. Sablefish is the principal West Coast groundfish species harvested by longline vessels.

Given the importance of sablefish, those longline vessels which landed this groundfish species were analyzed as the target longline fleet. This, of course, is a sub-set of the longline vessels which may have landed other groundfish species with this designated gear type. Because of gear code problems on landing receipts in the RDB, however, it is not always possible to identify non-sablefish groundfish associated with "true" longline gear. For the purposes of assessing the change in economic performance, those sablefish longline vessels which landed at least 1,000 pounds of sablefish with longline/setline/pole-and-line gear were selected for analysis to eliminate "marginal" producers of sablefish (see Footnote 8).

The sablefish longline fleet consisted of 134 vessels in 1987 and 139 vessels in 1988. Earnings for the sablefish longline fleet were substantially lower in 1988 than in 1987. Mean gross revenues from West Coast landings were $91,000 per vessel in 1988, compared to about $113,500 per vessel in 1987 (Table 23). The principal species/species groups for this fleet are sablefish and California and Pacific halibut. Longline vessels that were principally dependant on sablefish experienced a 21 percent reduction in average gross revenues over 1987. With the exception of the smallest vessel size classes (40 feet or less), mean gross revenues declined by a substantial amount in 1988 (Table 24). This reduction in fleet earnings occurred even though the average round weight equivalent exvessel price paid for longline caught sablefish increased to $0.78 per pound in 1988, compared to $0.68 per pound in 1987. Thus, because of the severe cut in the fleet's share of the sablefish OY in 1988, the economic status of the sablefish longline fleet deteriorated, as the value of production fell 10 percent.

The concentration of sablefish landings for longline vessels reveals changes in the underlying pattern of fleet performance between 1987 and 1988 (Tables 25 and 26). Landings were distributed more evenly (less concentrated) amongst the fleet than in 1987. For example, the top 40 percent of the longline fleet accounted for about 83 percent of the sablefish production in 1988, compared to over 88 percent of the catch in 1987.

Other Gear Vessels

The quantity of groundfish landed with other gears, including set net, troll, jig, shrimp trawl and miscellaneous, was about 10,350 mt in 1988. This compares to a total of almost

8,650 mt in 1987. The unknown gear category accounted for the significant increase in the magnitude of other gear landings. Most of this unknown groundfish production was associated with California landings.

Groundfish landings by set net vessels fell for the second consecutive year in 1988 (Table 8). The exvessel value of the landings declined proportionally and was the lowest since 1984 (Table 9). Over the last five years, groundfish set net production has declined appreciably (Figure 5). However, given the unreliability in gear codes from California and the magnitude of unknown gear landings, this trend may be misleading.

IV. Groundfish Processing Sector

The National Marine Fisheries Service annually surveys processing plants on the West Coast to obtain the volume and value of processed fish and shellfish products, and monthly employment in the fish processing sector. The survey is voluntary and the degree of response can vary by year and state. In recent years, the response from Washington and Oregon has been fairly high, although a few large processors did not report. The data presented in this section includes data from 54 reporting companies.

The results of the Processed Product Survey were used to compute weighted average wholesale prices received by processors of selected fresh and frozen West Coast groundfish products in 1988. The change in average wholesale prices was mixed in 1988 compared to 1987. Until 1988, most prices had risen steadily over the 1976-88 period (Table 27).

The Processed Product Survey indicates product form but does not reveal where products are sold. Based on past studies, most of the flatfish and rockfish products were sold as fresh fillets to wholesalers, brokers, supermarkets, restaurants, or retail fish markets. Sablefish continued to be an important export commodity.

The number of processing plants reporting production of some groundfish products in 1988 totaled 54, with 16 in California, 14 in Oregon, and 24 in Washington (Table 28). This year's data were revised to exclude any at-sea processors of groundfish and to prorate plant or company employment by the volume of groundfish to total plant production. Since most plants also process salmon, crab and shrimp in addition to groundfish, production of non-groundfish species may run from only 10 percent to as high as 90 percent of total plant production. Therefore, employment numbers were substantially lower than in last years's report, when total employment figures were used.

Employment in the reporting West Coast groundfish processing plants is presented for 1987 and 1988 (Table 29). Due to the

undetermined amount of groundfish production for the non-respondents and employment in these plants, the employment numbers do not represent the entire West Coast processing sector; it does, however, include employment for most of the major groundfish processors on the coast. Data for California in 1987 were omitted because a number of large groundfish companies did not respond to the survey. Average 1988 monthly employment in the 54 plants reporting in 1988 totaled 2,206, with California averaging 1,051 per month. Monthly employment in Oregon was 552 in 1988, up from 532 in 1987, with two more plants reporting groundfish production in 1988. Employment in Washington was 603 in 1988 compared to 578 in 1987, and this increase was also based mostly on the two additional plants reporting.

VI. West Coast Groundfish Markets

West Coast supplies of groundfish were lower in 1988, as imports declined and domestic shoreside landings were virtually unchanged. The strong consumer demand in 1987 resulted in record high prices for many groundfish species. For example, average West Coast wholesale prices of flatfish and rockfish increased by 17 percent and for rockfish increased by 23 percent, respectively from 1986 to 1987. Consumer demand weakened in 1988; this was reflected by a 5 percent drop in U.S. consumption of all fillets and steaks (U.S. Dept. of Commerce, 1989). In 1988, West Coast flatfish prices were up by $0.013 per pound, while wholesale rockfish prices fell 14.8 percent from 1987 levels (Table 27). Apparently many of the higher priced species suffered the major declines and the more moderately priced species experienced little change or modest increases in prices. Among the flatfish category, for example, the price of petrale sole fell 11.5 percent, from over $4.00 per pound to $3.57 per pound, while Dover sole prices gained 6.9 percent, to $2.14 per pound.

West Coast imports of orange roughy from New Zealand were 3,746 mt in 1988, down 4.6 percent from 1987 (Table 30). The decline was explained by lower catches due to declining population abundance in New Zealand and higher prices. Wholesale prices of orange roughy in 1988, after starting the year in the $2.70-3.15 per pound range in the first four months, advanced to $3.40-3.55 per pound range during the remaining two-thirds of 1988. In 1987, wholesale prices began at $3.70 per pound in the first quarter and gradually weakened and closed at $2.75 per pound in December 1987.

Japan continued to be the major export market for sablefish. West Coast exports of sablefish amounted to 10,958 mt, or 24.2 million pounds, up 3.3 percent from 1987 (U.S. Bureau of Census, 1987, 1988). Exports from Washington included sablefish caught off Alaska and shipped to Washington for market distribution. Although the volume of exports was up slightly, the value increased by 22.6 percent, from $41.5 million in 1987 to $50.9 million, as higher prices contributed to most of the increase.

The average export price advanced from $1.77 per pound in 1987 to $2.11 per pound in 1988. The elevation in price was due to the appreciation of the Japanese yen relative to the U.S. dollar. The average of the U.S. dollar decreased 11.3 percent in 1988 to 128.2 yen/U.S. dollar from 144.6 yen/U.S. dollar in 1987 (Table 31). This decline followed a 14.1 percent drop in 1987 and a 29.4 percent decline in 1986. The yen price in the Japanese wholesale market from all sources was only 3.3 to 5.4 percent above 1987 levels depending on the size of fish (Table 32).

Footnotes

1. The West Coast refers to all catches taken from International Pacific Fishery Commission statistical areas under the jurisdiction of the Pacific Fishery Management Council and which are landed in the three states. It does not include Puget Sound groundfish catches.

2. Previous reports have included data on the recreational groundfish harvesting sector. At the time of this writing, however, data obtained normally from the NMFS Marine Recreational Fishery Statistics Survey were not available.

3. The number of vessels recorded in the RDB as landing groundfish with groundfish trawl gear did not appear on the state inventory list. These vessels are, therefore, not included in the analysis of trawl vessel performance.

4. All average values are adjusted for inflation using the GNP implicit price deflator, where the base year is 1986 = 1.00.

5. Principal species is defined as that species which accounts for more of a vessel's revenue than any other species.

6. As a result of joint venture trawl vessels landing shoreside, the analysis will include double-counting of vessels included in the shoreside trawl fleet analysis.

7. Using this minimum landings criterion, the number of pot vessels will necessarily be lower than the number appearing in Table 10, which gives the number of vessels making at least one groundfish landing with that gear.

8. Commercial pole-and-line landings of groundfish are included because most of the sablefish landed in California is associated with commercial pole-and-line gear, according to the PacFIN management database. This sablefish catch is probably mostly longline, which is coded as pole-and-line by the state.

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Table 1 - Groundfish landings and exvessel values for Washington, Oregon, and California, including joint venture deliveries in waters off these states, 1987-1988.

	1988	1987	% Change
Shoreside (mt)	91,636	92,298	-0.7
Joint Venture (mt)	135,783	106,095	+28.0
Total WOC Landings	227,419	198,424	+14.6
Shoreside Values ($)			
Current	67,647,000	71,881,000	-5.9
Real[1]	63,902,000	70,210,000	-8.9
Joint Venture Value			
Current	14,682,000	11,663,000	+25.9
Real	13,869,000	11,392,000	+21.7
Total WOC Groundfish Landed Value			
Current	82,329,000	83,544,000	-1.5
Real	77,771,000	81,602,000	-4.7

Source: Pacific Coast Fishery Information Network (PacFIN), Groundfish report series, May 1989
NMFS, Northwest Region

1/ Real values are current values adjusted to eliminate the effects of inflation. This adjustment has been made by dividing current values by the current year GNP implicit price deflator, with a base year of 1986. The GNP deflators are 1.0238 in 1987 and 1.0586 in 1988.

Table 2 - Average annual exvessel prices ($ per pound) paid for some commercially important groundfish species, 1979-1988.

	Sablefish		All Rockfish Combined		Widow Rockfish		Dover Sole		English Sole		Petrale Sole	
	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real
1979	.356	.518	.199	.290	-	-	.215	.313	.286	.416	.447	.651
1980	.199	.256	.159	.212	-	-	.211	.281	.328	.437	.458	.611
1981	.215	.262	.169	.206	.135	.164	.223	.270	.297	.362	.512	.624
1982	.252	.289	.195	.224	.157	.180	.233	.267	.318	.365	.606	.696
1983	.237	.262	.223	.246	.192	.212	.224	.247	.322	.356	.682	.755
1984	.218	.232	.251	.267	.225	.240	.231	.246	.321	.343	.709	.755
1985	.334	.343	.281	.289	.250	.257	.240	.246	.333	.342	.736	.756
1986	.374	.374	.313	.313	.275	.275	.258	.258	.360	.360	.777	.777
1987	.472	.461	.350	.343	.322	.314	.305	.298	.402	.393	.816	.797
1988	.525	.496	.323	.305	.286	.270	.304	.287	.392	.370	.816	.771

Source: PacFIN, Groundfish Report Series, May 1989

NOTE: Real prices were adjusted for inflation using the GNP implicit price deflator, where 1986=1.00. All prices are weighted averages.

Table 3 - Washington, Oregon, and California shoreside commercial groundfish landings (metric tons) and exvessel values (thousands of dollars), 1979-1988.

Year	California		Oregon		Washington		Total Coast	
	mt	$	mt	$	mt	$	mt	$
1979	36,392	19,566	28,935	17,264	22,508	11,112	87,835	47,942
1980	36,862	16,551	28,515	11,425	22,514	9,119	87,891	37,095
1981	42,578	21,448	37,502	14,721	23,093	10,100	103,173	46,269
1982	52,608	27,795	41,023	20,445	25,368	11,405	118,999	59,645
1983	39,498	21,984	35,158	18,345	22,970	11,257	97,626	51,586
1984	40,570	22,914	28,209	15,234	21,080	10,474	89,859	48,622
1985	43,062	26,516	29,023	17,095	19,229	12,449	91,314	56,060
1986	41,246	28,522	24,931	16,813	16,081	10,905	82,298	56,420
1982-86 Average	43,397	25,546	31,669	17,586	20,946	11,298	96,019	54,431
1987	41,410	30,682	30,627	24,328	20,283	16,866	92,320	71,875
1988	39,420	28,213	31,845	23,748	20,371	15,686	91,636	67,647

Source: State Fishery Agencies
PacFIN, Groundfish Report Series, 1981-1988

Table 4 - Commercial landings (mt) of individual groundfish species by state, 1987-1988.

Species	California		Oregon		Washington	
	1988	1987	1988	1987	1988	1987
Lingcod	873	929	999	719	756	1,023
Pacific Cod	5	73	1,022	659	2,305	1,545
Pacific Whiting	6,541	4,518	246	183	88	95
Sablefish	3,784	4,347	4,068	5,239	2,926	3,144
Pacific Ocean Perch	26	96	728	549	49	332
Widow Rockfish	1,847	2,274	5,445	6,300	3,555	4,113
Other Rockfish	14,345	14,309	8,898	7,856	5,686	4,581
Dover Sole	8,176	10,761	7,583	6,058	2,241	1,622
English Sole	1,062	1,322	577	595	454	560
Petrale Sole	785	824	894	855	452	526
Other Flatfish	1,709	1,771	1,369	1,572	1,553	2,403

Source: PacFIN, Groundfish Report Series, May 1989

Table 5 - Percentage contribution of West Coast groundfish landings to the total exvessel value (thousands of dollars) of West Coast marine fish landings, 1987-1988.[1]

Fishery	1988 Exvessel Value of Landings	%	1987 Exvessel Value of Landings	%
Tuna	39,822	11.2	39,193	12.9
Groundfish	82,328	23.2	83,544	27.5
Crab	44,886	12.6	27,123	8.9
Salmon[2]	76,692	21.6	46,323	15.3
Shrimp	30,781	8.7	47,971	15.8
Wetfish[3]	18,703	5.3	15,471	5.1
Other	61,939	17.4	43,850	14.5
Total	355,151		303,475	

1/ Includes all marine fish landed in Washington, Oregon, and California, excluding fish taken from Puget Sound and landed in these three states.

2/ Excludes Columbia River salmon landings.

3/ Excludes live-bait anchovy landings in California, and a trace amount landed in Oregon.

4/ Excludes a small amount of miscellaneous landings from Washington.

Table 6 - Landings and exvessel value of individual groundfish species landed in Washington, Oregon, and California, 1987-1988.[1]

Species	1988		1987		% Change	
	mt	$	mt	$	mt	$
Lingcod	2,629	2,122,100	2,586	2,152,800	+1.7	-1.4
Pacific Cod	3,332	1,945,700	2,270	1,644,900	+46.6	+18.3
Pacific Whiting	6,876	1,145,400	4,795	666,100	+43.3	+72.5
Sablefish	10,778	12,468,300	12,730	13,244,600	-15.3	-5.9
Pacific Ocean Perch	803	514,300	976	704,400	-17.7	-30.0
Widow Rockfish	10,847	6,827,500	12,687	9,002,300	-14.5	-24.1
Other Rockfish	28,928	21,550,800	26,746	21,477,300	+8.1	+0.3
Dover Sole	18,000	12,053,500	18,441	12,400,400	-2.4	-2.8
English Sole	2,093	1,809,800	2,477	2,195,400	-15.6	-17.7
Petrale Sole	2,131	3,835,200	2,204	3,964,700	-3.4	-3.3
Other Flatfish	4,631	2,698,000	5,747	3,763,500	-19.4	-21.1
TOTAL	91,048	67,240,600	91,659	71,214,400	-0.7	-5.6

Source: PacFIN, Groundfish Report Series, May 1989

1/ Includes domestic landings from U.S. coastal waters off WOC, but not Puget Sound; a small amount of landings of miscellaneous groundfish species are not included in the totals.

Table 7 - Washington, Oregon, California landings and exvessel value (thousands of dollars) of sablefish by gear, 1987-1988.[1]

	Total WOC 1988				Total WOC 1987			
	mt		$		mt		$	
Ground. trawl	5,262.4	(48.8)	4,169.5	(33.4)	6,430.0	(50.0)	4,625.5	(34.9)
Pot	2,018.7	(18.7)	2,651.7	(21.3)	2,017.0	(15.8)	2,293.7	(17.3)
Longline[2]	3,124.2	(29.0)	5,326.9	(43.0)	4,152.0	(32.6)	6,231.6	(47.0)
Net	60.2	(0.6)	41.0	(0.3)	36.4	(0.3)	21.1	(0.2)
Other	312.3	(2.9)	243.2	(1.9)	94.7	(0.7)	72.7	(0.6)
Total	10,777.8		12,468.3		12,730.1		13,244.6	

Source: PacFIN, Groundfish Report Series, May 1989

1/ Figures in parentheses are the percentages each gear group contributed to the total landed catch and exvessel value.

2/ Includes commercial pole-and-line gear.

Table 8 - Washington, Oregon, and California groundfish shoreside landings (metric tons) by gear group, 1981-1988.

	Trawl	Trap/ Pot	Setline[1]/ Longline	Gill/Set[2] Net	Other/Misc.
1981	90,797	3,956	3,997	1,632	2,791
1982	103,299	6,530	4,384	2,077	2,709
1983	81,668	5,423	2,191	2,243	6,101
1984	72,693	3,854	1,989	2,199	9,124
1985	75,352	3,703	4,603	3,918	3,737
1986	61,249	2,216	5,894	4,205	8,734
1987	74,719	2,076	6,952	3,903	4,740
1988	73,460	2,186	5,679	2,864	7,487

Source: PacFIN, Groundfish Report Series, May 1989

1/ Includes commercial pole catch for California landings, because large quantities of sablefish are landed with this gear in PacFIN. Consequently values will differ from previous annual reports.

2/ Includes gill net, set net, and other net; but not dip, trammel, seine, or miscellaneous nets.

Table 9 - Exvessel value (thousands of dollars) of Washington, Oregon, and California groundfish landings by gear group, 1981-1988.

	Trawl	Trap/Pot	Set/Longline[1]	Gill/Set[2] Net	Other/Misc.
1981	37,855	2,081	3,696	1,468	2,169
1982	46,987	4,863	4,551	1,814	1,430
1983	40,578	3,598	2,091	1,742	3,578
1984	36,885	2,338	2,083	1,955	5,361
1985	41,264	3,154	5,329	3,367	2,946
1986	36,916	2,171	6,811	3,715	6,627
1987	52,162	2,347	9,527	3,806	4,032
1988	48,010	2,797	8,573	2,709	3,928

Source: PacFIN, Groundfish Report Series, May 1989

1/ Includes commercial pole catch for California landings, because large quantities of sablefish are landed with this gear in PacFIN.

2/ Includes gill net, set net, and other net; but not dip, trammel, seine, or miscellaneous nets.

Table 10 - Number of shoreside vessels in Washington, Oregon, and California commercial groundfish fleets, 1981-1988.

Year	Otter Trawl	Pot/Trap[1]	Longline[1]
1981	408	66	191
1982	444	82	208
1983	436	59	185
1984	397	34	96[2]
1985	358	32	129[2]
1986	307	30	190[2]
1987	330	30	186[3]
1988	346	26	156[3]

Source: State Fishery Agencies

1/ Vessels landing fish caught with this gear type in two or more states are counted in each state for years 1981-83. These numbers therefore are an upper bound for the true number of vessels using this gear type.

2/ Represents number of longline vessels landing in Oregon and Washington, where double counting has been eliminated; California data unavailable for those years.

3/ Includes only sablefish longline vessels landing in California and Oregon, and all groundfish longline vessels landing in Washington.

Table 11 - Washington, Oregon, and California groundfish shoreside trawl fleet characteristics, 1985-1988.

	1985	1986	1987	1988
Total Number Landing	358	307	330	346
Frequency by Length Class (Fleet)				
under 30 feet	2	1	1	7
30-39	15	9	10	10
40-49	96	73	77	74
50-59	93	86	89	94
60-69	98	90	96	96
70-79	39	37	40	47
80-89	6	6	10	9
over 90	9	5	7	6
missing	-	-	-	3
Vessel Characteristics:				
Average Length	57.6	58.2	58.7	58.4
Average Horsepower	309.7	310.8	318.5	319.3
Average Net Tonnage	45.8	47.6	49.5	49.4
Number Vessels Based in Each State[1]				
California	157	125	127	133
Oregon	121	110	120	129
Washington	80	72	83	84
Vessels Landing in More Than One State	41	35	36	40

Source: State Fishery Agencies

1/ A vessel's home state is assigned according to which state accounts for the majority of groundfish landings in a year.

Table 12 - Disposition of vessels departing from the Washington, Oregon and California shoreside groundfish trawl fleet, 1987-1988.

Status	Number		Relative Percentage (%)	
	1988	1987	1988	1987
Joint Ventures	12	4	23.1	16.7
West Coast Shrimp Fishery	9	6	17.3	25.0
Other Gears (Longline, gillnet, etc.)	20	7	38.5	29.2
Bank Repossession	-	-	-	-
Lost at Sea (Sank, Burned[1])	4	3	7.7	12.5
Idle	1	-	1.9	-
Unknown	6	4	11.5	16.7
TOTAL	52	24		

Source: PacFIN research database
State Fishery Agencies

1/ Includes vessels that were damaged, but which may not be permanent losses.

Table 13 - Average gross revenues[1] accruing from West Coast landings of marine fish for shoreside groundfish trawl vessels by principal species group, 1987-1988.

Vessel's Principal Species	Number of Vessels		Average Gross Revenues ($)	
	1988	1987	1988	1987
Salmon	11	7	42,000	47,197
Dover Sole	73	63	234,986	225,993
Petrale Sole	10	6	95,185	130,168
English Sole	9	12	63,406	92,726
Other Flatfish	16	17	113,818	96,731
Sablefsih	6	4	77,400	139,224
Rockfish	93	86	188,738	247,807
Pacific Whiting	23	23	615,830	622,024
Pink Shrimp	66	88	247,180	309,705
Dungeness Crab	21	16	131,390	130,412
Other	16	3	245,396	227,075
All Vessels	344	325	221,756	260,524

Source: PacFIN research database

1/ Values converted to 1986 dollars.

Table 14 - Average gross revenues[1] accruing from West Coast landings of marine fish for shoreside groundfish trawl vessels by length size class, 1987-1988.

Size Class (Feet)	Number of Vessels		Average Gross Revenues ($)	
	1988	1987	1988	1987
Under 40	22	22	57,775	61,717
41 - 50	92	87	133,466	161,234
51 - 60	73	72	189,077	238,796
61 - 70	106	99	298,467	367,632
71 - 80	43	38	336,041	347,885
81 - 90	3	3	389,014	369,509
Over 90	5	4	335,446	250,155

Source: PacFIN research database

1/ Values converted to 1986 dollars.

Table 15 - Concentration of groundfish landings among Washington, Oregon, and California Shoreside groundfish trawl vessels in 1987.

No. of Vessels	% of Fleet	Quantity of Landings (mt)	Cumulative Percentage of Landings
32	9.8	105,052	70.1
65	20.0	120,540	82.4
97	29.8	130,703	87.2
130	40.0	137,515	91.7
163	50.1	142,092	94.8
195	60.0	145,362	97.0
228	70.1	147,594	98.5
260	80.0	149,038	99.4
293	90.1	149,760	99.9
325	100.0	149,886	100.0

Source: PacFIN research database

Table 16 - Concentration of groundfish landings among Washington, Oregon, and California shoreside groundfish trawl vessels in 1988.

No. of Vessels	% of Fleet	Quantity of Landings (mt)	Cumulative Percentage of Landings
34	9.8	114,499	69.3
68	19.8	131,230	79.4
103	29.9	143,294	86.7
137	39.8	151,020	91.4
172	50.0	156,748	94.8
206	59.9	160,632	97.2
241	70.0	163,252	98.8
275	79.9	164,586	99.6
303	89.8	165,157	99.9
344	100.0	165,266	100.0

Source: PacFIN research database

Table 17 - Landings and participation in Pacific whiting joint venture fisheries off of Washington, Oregon, and California, 1979-1988.

Year	Landings (mt)	Estimated Dollar Value ($)	Number of Trawl Vessels
1979	9,054	1,162,000	11
1980	26,793	3,275,000	15
1981	43,758	6,345,000	21
1982	68,420	10,367,000	17
1983	72,140	10,217,000	19
1984	79,047	11,841,000	21
1985	31,567	3,751,000	17
1986	81,855	8,760,000	25
1987	106,095	11,663,000	31
1988	135,783	14,682,000	42

Source: PacFIN, Groundfish Report Series
NMFS, Northwest Regional Office

Table 18 - Estimated average gross revenues[1] accruing from West Coast landings of marine fish for Pacific whiting joint venture trawl vessels by length class, 1987-1988.

Length Class (feet)	Number of Vessels		Average Gross Revenues ($)	
	1988	1987	1988	1987
51 - 70	16	19	561,051	635,917
71 - 80	11	8	435,342	470,723
Over 80	15	4	223,087	385,886
Total Fleet	42	31	407,426	561,024

Source: PacFIN research database

1/ Values converted to 1986 dollars.

Table 19 - Average gross revenues[1] accruing from West Coast landings of marine fish for pot vessels landing at least 1,000 pounds of sablefish by principal species group, 1987-1988.

Principal Species	Number of Vessels		Average Gross Revenues ($)	
	1988	1987	1988	1987
Sablefish	15	19	190,927	142,268
Dungeness Crab	5	5	166,247	141,380
Other	5	4	189,951	31,689
All Vessels	25	28	185,795	126,312

Source: PacFIN research database

1/ Values converted to 1986 dollars.

Table 20 - Average gross revenues[1] accruing from West Coast landings of marine fish for pot vessels which landed at least 1,000 pounds of sablefish by vessel length class, 1987-1988.

Length Class (Feet)	Number of Vessels		Average Gross Revenues ($)	
	1988	1987	1988	1987
Under 40	6	9	102,897	78,978
41 - 50	7	9	203,615	160,575
51 - 70	6	5	246,619	163,910
Over 70	6	5	187,081	112,245

Source: PacFIN research database

1/ Values converted to 1986 dollars.

Table 21 - Concentration of sablefish landings among Washington, Oregon, and California sablefish pot vessels in 1987.

No. of Vessels	% of Fleet	Quantity of Landings (mt)	Cumulative Percentage of Landings
3	10.7	599.3	31.3
5	17.9	889.1	46.4
8	28.6	1,244.2	64.9
11	39.3	1,513.0	78.9
14	50.0	1,696.0	88.5
17	60.7	1,818.5	94.9
20	71.4	1,882.1	98.2
23	82.1	1,908.9	99.6
26	92.9	1,915.3	99.9
28	100.0	1,917.1	100.0

Source: PacFIN research database

Table 22 - Concentration of sablefish landings among Washington, Oregon, and California sablefish pot vessels in 1988.

No. of Vessels	% of Fleet	Quantity of Landings (mt)	Cumulative Percentage of Landings
2	8.0	418.5	19.8
5	20.0	969.3	46.0
9	28.0	1,240.6	58.8
10	40.0	1,560.6	74.0
13	52.0	1,818.0	86.2
15	60.0	1,924.3	91.3
18	72.0	2,017.8	95.7
20	80.0	2,058.3	97.6
23	92.0	2,099.0	99.6
25	100.0	2,108.4	100.0

Source: PacFIN research database

Table 23 - Average gross revenues[1] accruing from West Coast landings of marine fish for longline vessels landing at least 1,000 pounds of sablefish by principal species group, 1987-1988.

Principal Species	Number of Vessels		Average Gross Revenues ($)	
	1988	1987	1988	1987
Sablefish	76	70	92,235	116,568
Halibut	21	26	113,942	117,698
Rockfish	8	7	38,808	21,785
Crab	14	15	147,947	142,586
Salmon	14	5	36,690	34,914
Other	6	11	63,545	139,196
All Vessels	139	134	91,017	113,559

Source: PacFIN research database

1/ Values converted to 1986 dollars

Table 24 - Average gross revenues[1] accruing from West Coast landings of marine fish for longline vessels which landed at least 1,000 pounds of sablefish by vessel length class, 1987-1988.

Length (Feet)	Number of Vessels		Average Gross Revenues ($)	
	1988	1987	1988	1987
Under 30	10	8	28,565	20,662
31 - 40	44	39	53,447	50,632
41 - 50	39	45	98,809	118,203
51 - 60	29	23	119,801	188,889
Over 60	17	19	158,012	179,653

Source: PacFIN research database

1/ Values converted to 1986 dollars.

Table 25 - Concentration of sablefish landings among Washington, Oregon, and California sablefish longline vessels in 1987.

No. of Vessels	% of Fleet	Quantity of Landings (mt)	Cumulative Percentage of Landings
13	9.7	1,604.2	48.8
27	20.1	2,260.0	68.8
40	29.8	2,637.4	80.3
52	38.8	2,878.9	87.6
67	50.0	3,080.6	93.8
80	59.7	3,173.0	96.6
95	70.9	3,234.1	98.5
105	78.4	3,255.4	99.1
120	89.6	3,274.8	99.7
134	100.0	3,285.1	100.0

Source: PacFIN research database

Table 26 - Concentration of sablefish landings among Washington, Oregon, and California sabelfish longline vessels in 1988.

No. of Vessels	% of Fleet	Quantity of Landings (mt)	Cumulative Percentage of Landings
14	10.1	1,095.3	41.4
28	20.1	1,629.0	61.6
41	29.5	1,940.3	73.3
56	40.3	2,202.8	83.2
69	49.6	2,367.9	89.5
84	60.4	2,496.1	94.3
96	69.1	2,566.5	97.0
115	82.7	2,623.7	99.1
126	90.6	2,638.3	99.7
139	100.0	2,646.3	100.0

Source: PacFIN research database

Table 27 - Average wholesale prices ($/lb.) of West Coast groundfish processed products by species group, 1976-1988.[1]

Year	All Flounders	Dover	English	Patrale	Lingcod	Rockfish	Sablefish
1976	1.062	--	--	--	0.785	0.696	0.581
1977	1.255	--	--	--	0.887	0.800	0.516
1978	1.472	--	--	--	0.878	1.085	0.653
1979	1.608	--	--	--	1.198	1.044	0.797
1980	1.600	--	--	--	1.103	0.906	0.792
1981	1.598	--	--	--	1.157	0.985	0.814
1982	1.812	--	--	--	1.142	1.078	0.891
1983	1.866	--	--	--	1.232	1.276	0.823
1984	1.763	--	--	--	1.296	1.267	0.844
1985	1.776	1.743	1.783	3.183	1.454	1.388	1.158
1986	1.764	1.874	2.069	3.987	1.561	1.477	1.566
1987[1]	2.068	2.006	2.281	4.017	1.643	1.824	1.421
1988	2.085	2.144	2.103	3.569	1.663	1.554	1.542

Source: U.S. Dept. of Commerce, NOAA National Marine Fisheries Service, Fishery Statistics Division, Silver Spring, MD 20910. U.S. Production of fish Fillets and Steaks, 1976-85; and unpublished data from Processed Products Survey, 1986-87

1/ Average prices computed by dividing total value by pounds of processed product.

Table 28 - Number of reporting plants that processed groundfish on the West Coast, 1980-1988.

Year	California	Oregon	Washington	Total
1980	23	13	25	61
1981	21	16	38	75
1982	19	18	37	74
1983	32	16	34	82
1984	32	11	31	74
1985	30	11	32	73
1986	17	12	25	54
1987	11	12	22	45
1988	16	14	24	54

Source: U.S. Dept. of Commerce, NOAA, National Marine Fisheries Service, Fishery Statistics Division, Silver Spring, MD 20910, unpublished data from Processed Products Survey

Table 29 - Monthly employment in West Coast groundfish processing plants, 1987-1988.[1]

Year	California		Oregon		Washington		Total	
	1988	1987	1988	1987	1988	1987	1988	1987
Jan.	970	--	446	406	513	399	1,929	--
Feb.	977	--	436	432	599	463	2,012	--
Mar.	975	--	456	443	745	500	2,176	--
Apr.	1,083	--	553	539	659	594	2,295	--
May	1,123	--	596	563	614	595	2,333	--
June	1,171	--	633	614	573	575	2,377	--
July	1,118	--	635	632	609	643	2,362	--
Aug.	1,098	--	679	656	634	740	2,411	--
Sept.	1,042	--	697	615	576	661	2,315	--
Oct.	997	--	599	575	608	637	2,204	--
Nov.	948	--	401	439	547	638	2,896	--
Dec.	1,112	--	495	475	555	496	1,162	--
Avg.	1,051	--	552	532	578	603	2,206	--

Source: U.S. Dept. if Commerce, NOAA, National Marine Fisheries Service, Fishery Statistics Division, Silver Spring, MD 20910 unpublished data from Processed Products Survey

1/ Employment estimated using percent of the volume of groundfish production to total plant production.

Table 30 - Selected imports (metric tons) of groundfish into West Coast ports of entry by country of origin, 1984-1988.

Species	Country	1984	1985	1986	1987	1988[1]
Orange Roughy	New Zealand	2,154	3,829	4,750	4,030	3,846
	Other	387	36	103	849	924
Rockfish	Canada	2,566	4,252	8,749	7,340	6,472
Flatfish	Canada	505	457	645	598	555
Pacific Whiting	Canada	4,625	7,091	7,597	12,802	5,915

Source: National Marine Fisheries Service, Statistics and Market News, Southwest and Northwest Regions; New Zealand Trade Commission, New Zealand Consulate Office

1/ Data for 1988 not complete due to reduced coverage of customs office.

Table 31 - Average annual exchange rates (currency/dollar) for selected foreign countries, 1980-1988.

Year	Canada	Japan	New Zealand
1980	1.1693	226.63	1.0273
1981	1.1990	220.63	1.1513
1982	1.2344	249.06	1.3315
1983	1.2325	237.55	1.4972
1984	1.2953	237.45	1.7290
1985	1.3658	238.47	2.0100
1986	1.3896	168.35	1.9064
1987	1.3259	144.60	1.6856
1988	1.2306	128.17	1.5254

Source: Federal Reserve Bulletin, various years, Washington, D.C., p. A68

Table 32 - Annual average Tokyo wholesale price ($/lb. and yen/kg.) of sablefish by size of fish, 1985-1988.

Year	5-7 lb.		4-5 lb.		3-4 lb.	
	$/lb.	Yen/kg.	$/lb.	Yen/kg.	$/lb.	Yen/kg.
1985	2.27	1195	2.12	1117	2.00	1054
1986	2.68	1005	2.39	895	2.01	754
1987	2.72	867	2.51	800	2.37	756
1988	3.17	896	2.98	842	2.82	797

Note: Average exchange rate; 1985 - 238 yen/$, 1986 - 168 yen/$, 1987 - 144.4 yen/$, 1988 - 128.2 yen/$

Source: Foreign Fishery Information Release, National Marine Fisheries Service, 300 South Ferry Street, Terminal Island, CA 90731

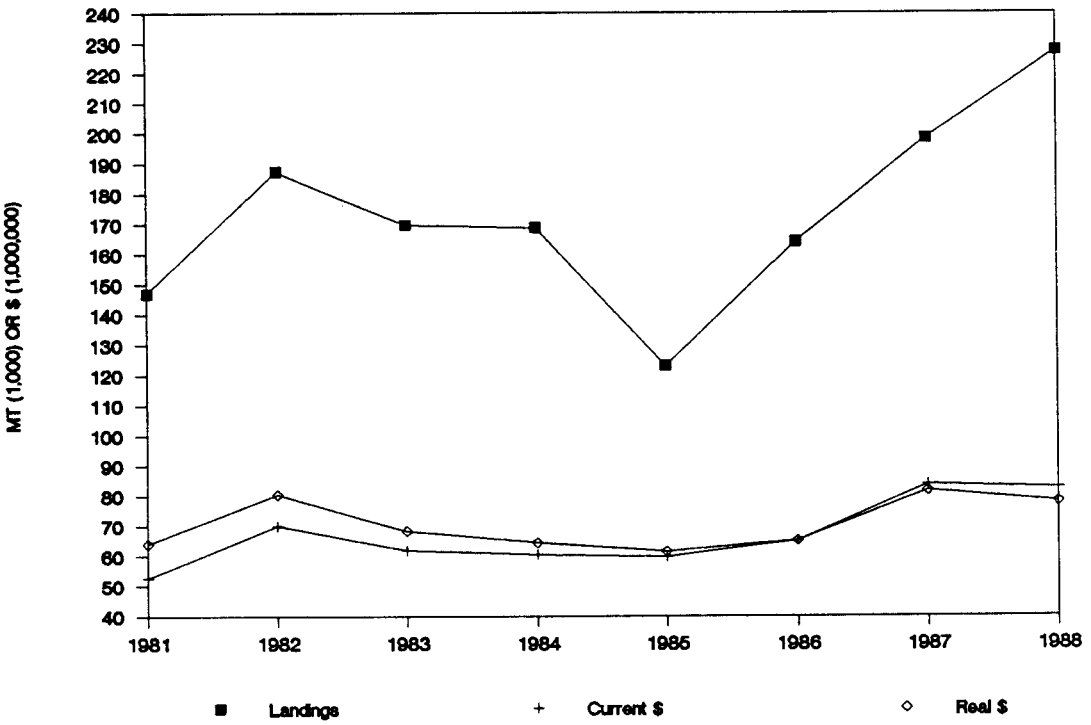

FIGURE 1. West Coast shoreside and joint venture groundfish landings and exvessel value, 1981-1988.

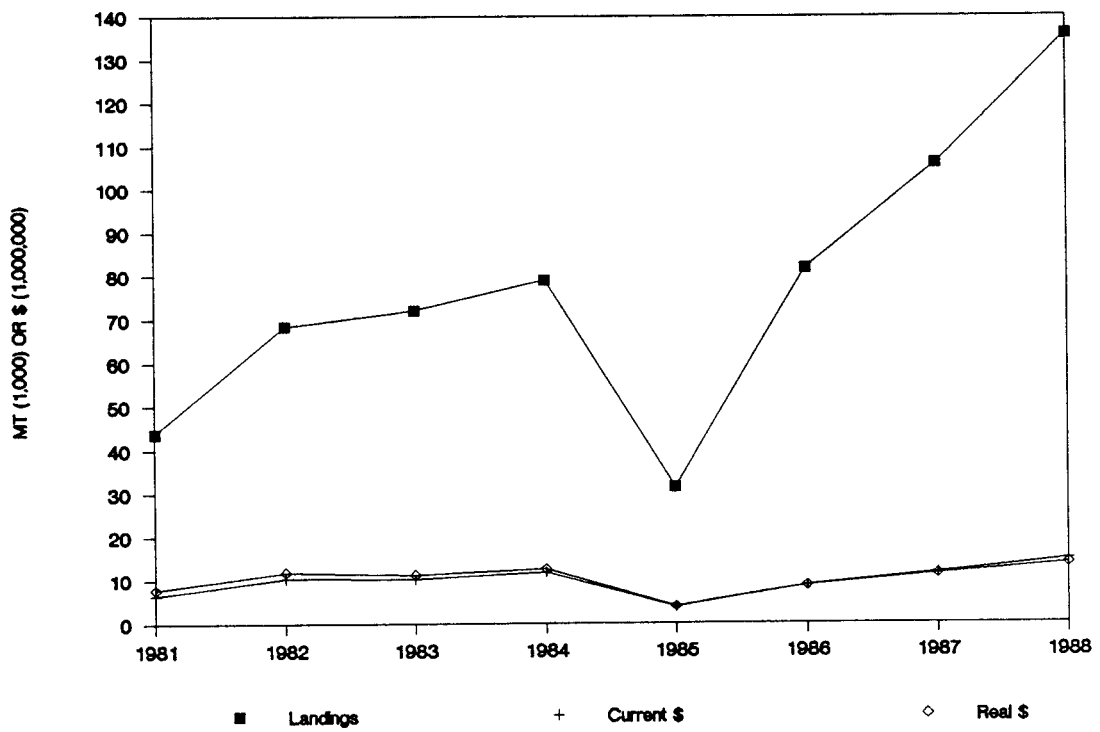

FIGURE 2. West Coast joint venture landings and exvessel value, 1981-1988.

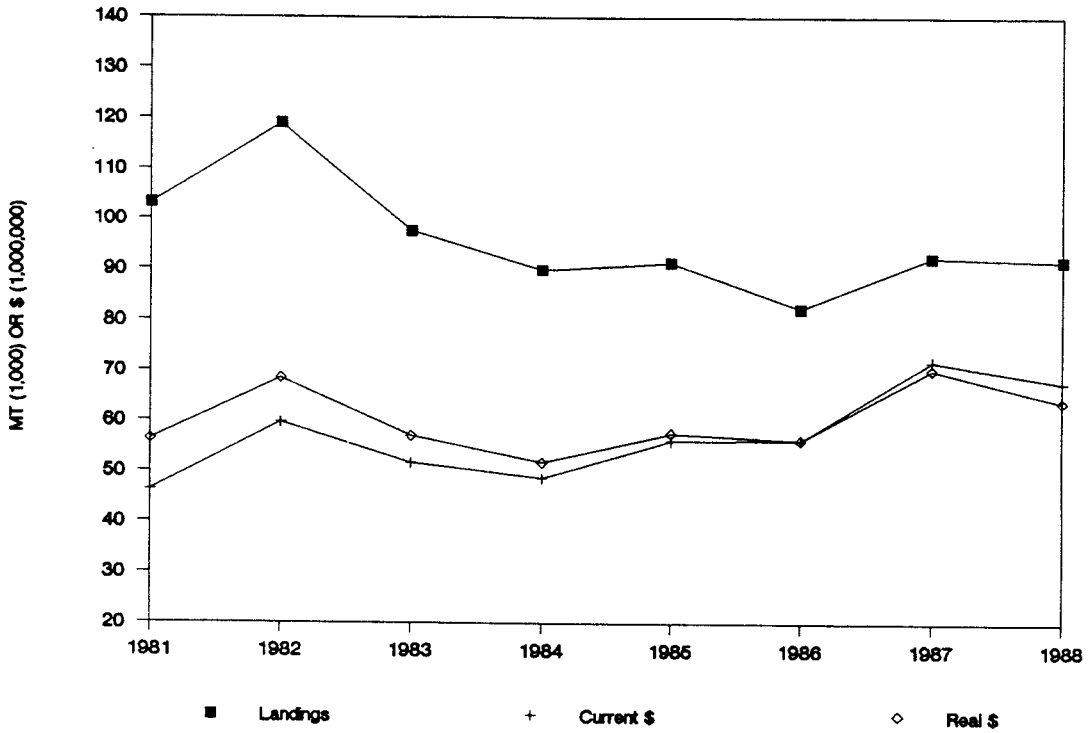

FIGURE 3. West Coast shoreside groundfish landings and exvessel value, 1981-1988.

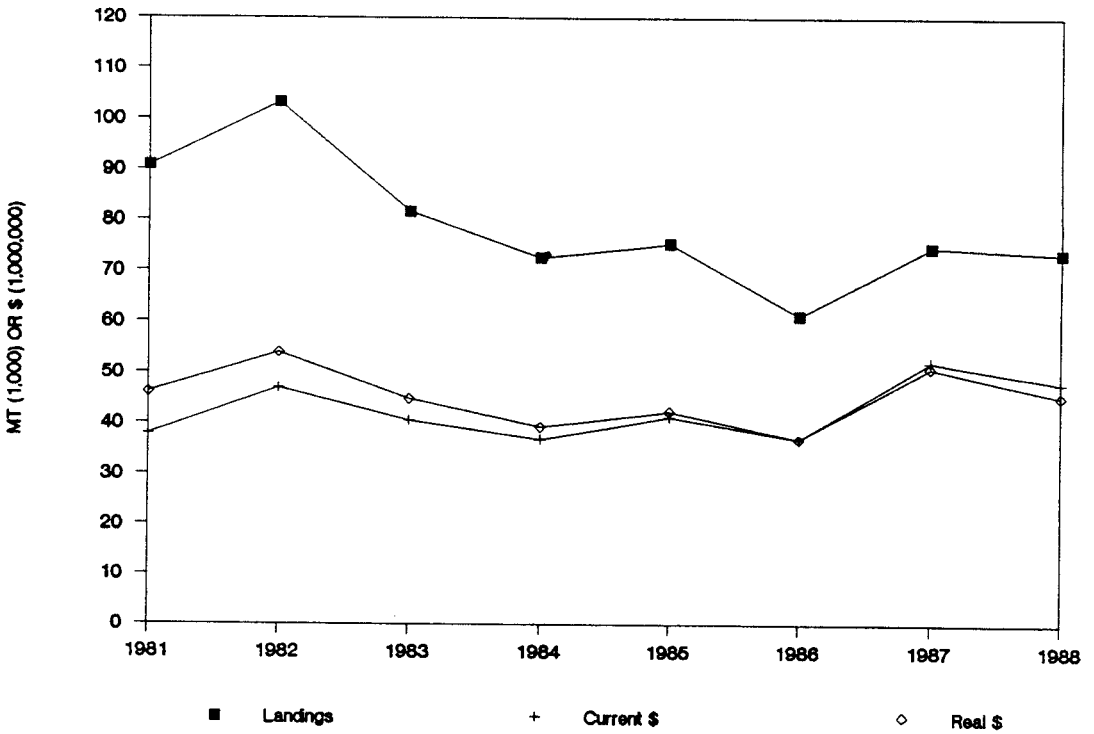

FIGURE 4. West Coast trawl groundfish landings and exvessel value, 1981-1988.

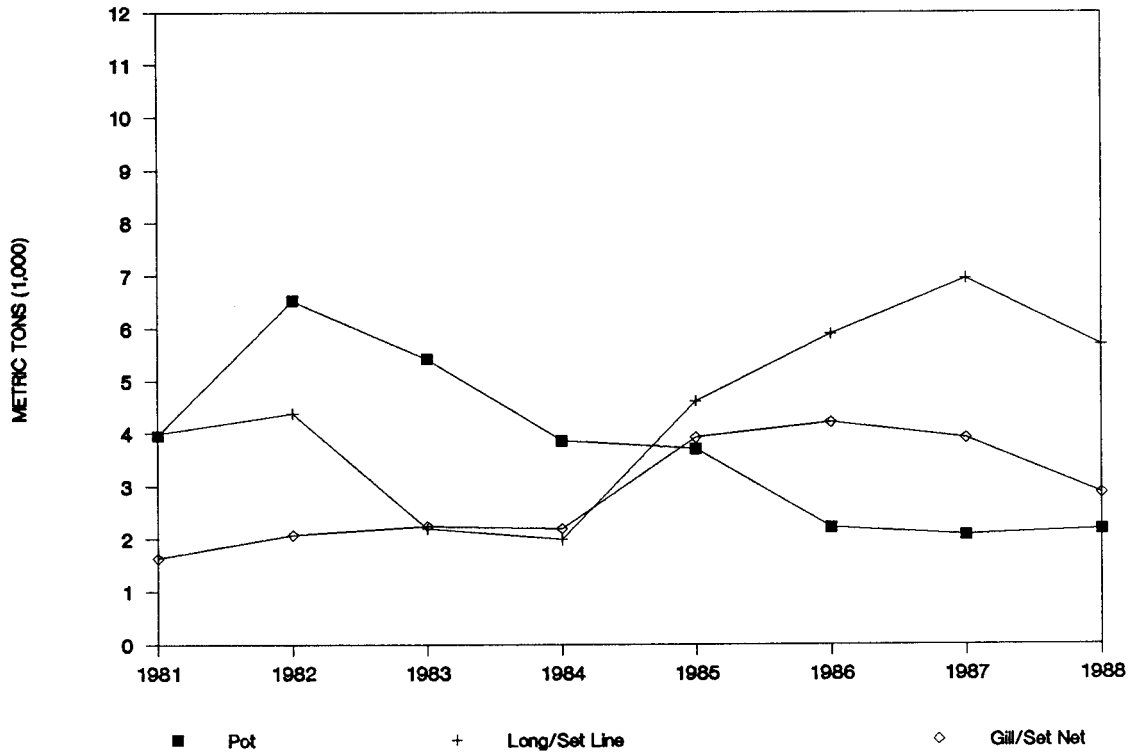

FIGURE 5. West Coast fixed gear groundfish landings, 1981-1988.

☆ U.S. Government Printing Office: 1990-780-556/10060