

REVIEW OF SOME CALIFORNIA FISHERIES FOR 1995

CALIFORNIA DEPARTMENT OF FISH AND GAME

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Total annual landings of fishes, crustaceans, echinoderms, and mollusks in California increased by 29% from 1994, to 192,711 metric tons (MT). Ex-vessel economic value of California's 1995 commercial landings rose 6% from the prior year's level, to \$158.5 million.

Pelagic wetfish landings increased 53% from 1994. The largest share of this increase was attributed to a 224% increase in Pacific sardine landings (43,450 MT) and a record level of market squid landings (70,278 MT). Increases were also registered for jack mackerel and Pacific herring, but northern anchovy and Pacific mackerel were on the decline.

Groundfish fisheries reversed an eleven-year decline with an 18% increase in total landings and a 42% increase in total ex-vessel value in 1995. This change was due in part to increased take and higher ex-vessel prices for Dover sole and sablefish. California halibut landings also reflected this reversal with a dramatic increase of 50% from the prior year's level.

Statewide, Dungeness crab landings increased 116%, to 5,931 MT. Sea urchin landings were 7% less than in 1994 and declined 18% in northern California. Spot prawn catches decreased by 11%, and sea cucumber

catches by 9%. Commercial abalone landings, primarily red abalone, continued to decline in 1995, to a total of 118.6 MT. Commercial and recreational fisheries for pink, green, and white abalones were closed by the Fish and Game Commission as of March 1, 1996.

Swordfish, thresher shark, and mako shark landings decreased by 32%, 26%, and 20% in 1995. Declines in catch can be partly attributed to decreased effort by both drift gill net and longline fleets. California's longline fleet diminished from 22 vessels to 4 vessels by year's end.

California's live-fish fishery continued to expand in 1995 with respect to total landings, number of target species (54), fishing methods, and markets. Statewide landings of live fish were estimated at 449 MT, with a total estimated value of over \$3 million.

PACIFIC SARDINE

Rebuilding of the sardine fishery continued in 1995, with the year's directed landings of 41,490 MT ranking highest since the late 1950s. Total landings statewide were approximately 43,450 MT (table 1). Unlike recent years, throughout 1995 directed sardine fishing remained open in both northern and southern California waters,

TABLE 1
 Landings of Pelagic Wetfishes in California (Metric Tons)

Year	Pacific sardine	Northern anchovy	Pacific mackerel	Jack mackerel	Pacific herring	Market squid	Total
1974	6	73,810	60	11,362	2,348	13,111	100,697
1975	3	141,486	129	16,415	1,086	10,715	169,834
1976	24	111,503	293	19,882	2,151	9,211	143,064
1977	5	99,504	5,333	44,775	5,200	12,811	167,628
1978	4	11,253	11,193	30,755	4,401	17,145	74,751
1979	16	48,094	27,198	16,335	4,189	19,690	115,542
1980	34	42,255	29,139	20,019	7,932	15,385	114,764
1981	28	51,466	38,304	13,990	5,865	23,510	133,163
1982	129	41,385	27,916	25,984	10,106	16,308	121,828
1983	346	4,231	32,028	18,095	7,881	1,824	64,405
1984	231	2,908	41,534	10,504	3,786	564	59,527
1985	583	1,600	34,053	9,210	7,856	10,275	63,577
1986	1,145	1,879	40,616	10,898	7,502	21,278	83,318
1987	2,061	1,424	40,961	11,653	8,264	19,984	84,347
1988	3,724	1,444	42,200	10,157	8,677	36,641	102,843
1989	3,845	2,410	35,548	19,477	9,046	40,893	111,219
1990	2,770	3,156	36,716	4,874	7,978	28,447	83,941
1991	7,625	4,184	30,459	1,667	7,345	37,388	88,668
1992	17,946	1,124	18,570	5,878	6,318	13,110	62,946
1993	13,843	1,954	12,391	1,614	3,882	42,708	76,392
1994	13,420	3,680	10,040	2,153	2,668	55,395	85,929
1995*	43,450	1,881	8,667	2,640	4,475	70,278	131,391

*Preliminary

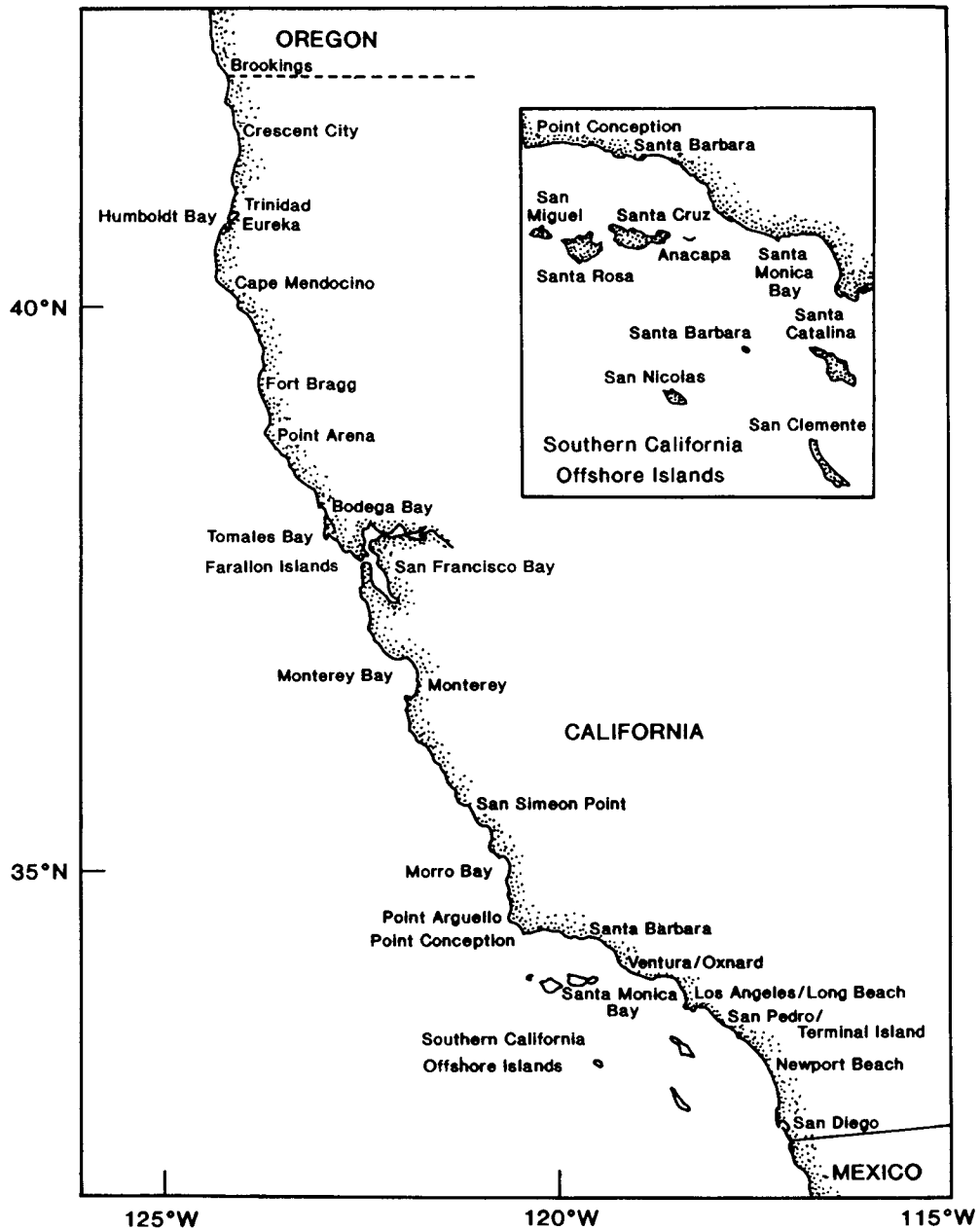


Figure 1. California ports and fishing areas.

because the 48,215 MT quota (up from 9,979 MT in 1994) was not filled by year's end.

Approximately 80% of sardines landed in 1995 were sold at fresh fish markets, while less than 20% were canned as pet food. This ratio has changed dramatically since 1992, when canners were purchasing about 75% of sardines landed.

Fish and Game Code (Section 8150.8) states that annual sardine quotas shall be allocated two-thirds to southern California (south of San Simeon Point, San Luis Obispo County) and one-third to northern California (north of San Simeon Point; figure 1). On October 1,

1995, the California Department of Fish and Game (CDFG) reallocated uncaught quota portions along with 907 MT of incidental reserve and divided evenly between north and south (table 2).

Sardine total biomass as of July 1, 1994, was estimated at 330,493 MT, based on output from CANSAR (Catch-at-age ANalysis of SARdines model). CANSAR, a forward-casting stock assessment model, incorporates both fishery-dependent and fishery-independent data into biomass estimates, including catch and weight-at-age information, landings data, egg and larval abundance, and spotter pilot observations.

TABLE 2
**Pacific Sardine Quota Allocations (Metric Tons)
 for California, 1995**

	Initial quota	Reallocated quota	Landings
North	15,768	10,708	4,928
South	31,538	37,507	36,562
Dead bait	454	No limit	0
Live bait	907	No limit	1,960
Total	48,667	48,215	43,450

Current regulations give considerable latitude to CDFG in setting annual sardine quotas. When biomass is estimated to be in excess of 20,000 MT, Fish and Game Code requires that allowable catch must be consistent with resource rehabilitation. The 1995 quota was based on a formula of 15% of total estimated biomass, consistent with pending state sardine legislation.

The price paid to fishermen for sardines held steady this year at approximately \$77 per MT at fresh fish markets and \$94 per MT at canneries. Two-thirds of this year's sardine catch was landed during the first semester, because tuna availability in summer months and squid availability in November and December shifted fleet attention away from sardine. These species earn a significantly higher market price: \$154–\$330 per MT for squid and a minimum of \$882 per MT for tuna. Industry representatives stated that sardine prices were comparatively low because production costs were high and the end product is of relatively low quality.

In August 1995, the last southern California canner, Pan Pacific, ended production when forced into Chapter 11 bankruptcy. Although Pan Pacific primarily canned tuna, it also canned sardines for human consumption.

While some fish markets are planning to expand production facilities to fill more sardine orders, representatives of others state that they cannot rely on a U.S. quota that could fluctuate widely in volume from year to year because Mexican fisheries are unregulated. Sardine landings from Mexico have equaled or exceeded California's in recent years, and could ultimately affect allowable catch in state waters.

Industry representatives purport that international interest in Pacific sardine is increasing, particularly in China and Japan, which intend to import more sardine. Frozen sardine blocks are increasingly exported for use as fish food in aquaculture facilities. Sardines are also canned abroad for human consumption.

Legislative actions in 1995 also affected sardine fishery management. Most notably, the National Oceanic and Atmospheric Association denied a proposed Coastal Pelagic Fishery Management Plan (CPS). If approved, CPS would have streamlined wetfish management and made it subject to Pacific Fishery Management Council (PFMC) process, shifting management authority of sar-

dines away from California's state legislature. Under development since 1990, CPS had strong support from the commercial fishing industry, CDFG, PFMC, and the sportfishing industry.

During 1995, much effort was devoted to analysis of California State Assembly Bill 76, which proposed several changes in sardine management. Passed in September, the bill eliminated quotas on both live and dead bait fisheries.

PACIFIC MACKEREL

Pacific mackerel (*Scomber japonicus*) landings in 1995 totaled only 8,667 MT, down from 10,042 MT in 1994 (table 1). Since 1990, landings have declined between 14% and 39% annually, with this year's harvest ranking lowest since 1977.

The Pacific mackerel fishing season is specified in Fish and Game Code as July 1 through June 30 of the following calendar year. The 1994–95 fishing season ended with landings of only 9,372 MT against a 14,710 MT quota, and by year's end only 3,428 MT had been landed toward the 1995–96 quota of 9,798 MT.

California Fish and Game Code Section 8412 states that if total Pacific mackerel biomass is less than 18,144 MT, no directed landings are allowed, and if total biomass is greater than 136,080 MT, no limitation on total catch is imposed. A season quota is established for commercial fishing when total biomass determined by CDFG is greater than 18,144 MT, but less than 136,080 MT. Allowable harvest is defined as 30% of total biomass in excess of 18,144 MT.

Despite sharp decreases in allowable take, the 1994–95 fishing season marked the third in a row that the quota was not filled by season's end. Although low mackerel availability is claimed by wetfish fleet representatives to be the largest contributor to lower landings, there was significant wetfish fleet participation in lucrative winter squid and summer tuna fisheries, as well as a fourfold increase in Pacific sardine quota, thus diverting fishing effort from mackerel in 1995.

The ex-vessel price for Pacific mackerel has declined since the early 1980s to almost an all-time low. During 1995, prices ranged from \$88 to \$198 per MT, and averaged \$131. As a result, the 1995 statewide ex-vessel value was \$1.2 million, approximately 15% less than in 1994.

Pacific mackerel is a transboundary stock supporting U.S. and Mexican commercial fisheries, and fish have been found as far north as British Columbia in recent years. Several sources of information on the status of Pacific mackerel stocks confirm a decline in biomass compared to late 1970s and 1980s levels. Landing statistics are available since 1978 for both U.S. and Mexican fisheries, and both fleets show reduced catches during

recent years. Catch rates for the southern California commercial passenger fishing vessel (CPFV) fleet have also shown declining trends since 1980. Fishery-independent data from aerial observations (spotter pilots) and plankton surveys (California Cooperative Oceanic Fisheries Investigations larval samples) verify declines in abundance compared to the early 1980s. Biomass for July 1, 1995, was estimated at 50,800 MT, based on output from an age-structured stock assessment model known as ADEPT.

A warm-water oceanic regime has dominated the California Current region for about 15 years. This may be responsible for a northern emigration of Pacific mackerel, exacerbating problems of availability to southern California's wetfish fleet. Bycatch of large, presumably older mackerel in Oregon's whiting fishery has been notable in recent years, although incidental catches have remained small (<500 MT) compared to California's directed fishery.

PACIFIC HERRING

Statewide landings for the Pacific herring (*Clupea pallasii*) roe fishery during the 1994–95 fishing season (December to March) totaled 4,475 MT (table 1). Three gill net platoons (376 permittees) in San Francisco Bay's fishery landed a total of 3,155 MT, which was 5.2% over their 2,999 MT quota. Twenty-nine round haul (purse seine and lampara) permittees fishing in San Francisco Bay landed 994 MT, 0.6% less than their 1,000 MT quota. Regulations for Tomales Bay contain provisions for an increased quota based on in-season estimates of spawn escapement. The initial quota of 227 MT for Tomales Bay was increased during the season to 408 MT. Thirty-nine Tomales Bay permittees landed 250 MT. Three of four Humboldt Bay permittees participated in this fishery and landed 49 MT, 9% under their 54 MT quota. Three Crescent City permittees landed one-half ton less than their quota of 27 MT.

Ex-vessel prices for herring caught during the 1994–95 fishing season with 10% roe recovery ranged from \$1,200 to \$1,400 per short ton; an additional \$120 to \$140 per short ton was paid for each percentage point over 10%. The total ex-vessel value of roe fisheries was \$8.2 million, slightly lower than the 10-year average of approximately \$9 million.

Ten permittees participated in the San Francisco Bay herring roe-on-kelp fishery. They harvested 12 MT of roe-on-kelp, which was 15% of the quota. Total estimated ex-vessel value of roe-on-kelp fishing was \$310,000, with prices ranging from \$12 to \$15 per pound.

CDFG biologists estimated spawning biomass for San Francisco and Tomales Bay populations. No estimates were made for Humboldt Bay or Crescent City Harbor.

Hydroacoustic and spawn-deposition surveys were used to estimate spawning biomass in San Francisco Bay, and spawn-deposition surveys were used in Tomales Bay.

Herring spawning biomass estimated for San Francisco Bay in 1994–95 was 36,288 MT, identical to last season's estimate but below the long-term average of 49,900 MT. Approximately 66% of the spawning population was composed of two- and three-year-old fish from the 1992 and 1993 year classes. These two year classes, in addition to four-year-olds from the 1991 year class, represented the highest number of two-, three-, and four-year-olds seen in the spawning population in recent years, an encouraging sign for the future.

The 1994–95 spawning biomass estimate for Tomales Bay was 3,610 MT, an increase of 62% from last season's estimate of 2,234 MT. The spawning biomass estimate was slightly above the 13-year (post-El Niño) average of 3,192 MT, but below the 22-year average of 4,574 MT. The increase in spawning biomass was attributable to good recruitment of two- and three-year-old herring as well as to adequate representation of older year classes. Historical data indicate that the spawning biomass in Tomales Bay usually drops following warm water conditions (as occurred in early 1995); thus the spawning biomass in Tomales Bay is expected to drop next season.

MARKET SQUID

California's market squid (*Loligo opalescens*) landings in 1995 were 70,278 MT (table 1), including 67,080 MT (95.4%) in southern California ports and 3,198 MT (4.6%) in central and northern California ports. Total landings are a statewide record high and 26.8% above the previous high record of 55,405 MT in 1994 (table 1). Southern California landings increased 69.9% (27,608 MT) over 1994 total landings of 39,472 MT. Conversely, central-northern California landings decreased 79.9% (12,735 MT) from 1994's total of 15,933 MT.

Southern California squid fishing typically occurs during fall and winter, but landings continued throughout 1995. Southern California landings for the first quarter of 1995 totaled 15,304 MT. April and May were the slowest months, with 163 and 232 MT landed, respectively. From June through September, normally a period when very little or no squid are landed, 6,577 MT were landed. Landings from October through December totaled 44,804 MT.

Three ports received most (98%) of southern California's landings. Port Hueneme received 41,188 MT (61.4%); San Pedro, 17,409 MT (26%); and Ventura, 7,271 MT (10.8%). Port Hueneme dominated landings, primarily because many central-northern California boats fished Channel Island locations near Santa Barbara and made landings there. Squid landed by central-northern

California boats were trucked to Monterey Bay for processing.

Squid fishing in central–northern California typically takes place in spring through fall. In past seasons, squid landings have begun in late April, sometimes continuing into December. In 1995, fishing began in May, when 7 MT were landed. In June, 388 MT were landed; in July, 508 MT. Landings peaked in August with 1,443 MT; 84 MT were landed in October; and 1 MT was landed in November. In 1995, Monterey Bay area landings were 2,449 MT, an 82% decrease from 13,627 MT in 1994. Landings in ports north of Monterey Bay totaled 749 MT, a 68% decrease from 2,306 MT in 1994.

As in previous years, most squid was frozen or canned for human consumption, mostly to supply overseas markets. Exports to Europe continued strong in 1995. Developing markets in other parts of the world, notably China, continued to expand, contributing to increased demand for squid. Internationally, market demand in 1995 far exceeded fishery ability to meet demand. Domestically, a small percentage of squid was used for bait, both live and frozen, and a very small percentage was used for human consumption. Live bait fishing continued to be centered mostly in southern California, with only a minimal amount caught in Monterey Bay.

Ex-vessel prices in 1995 were slightly higher for squid landed in central and northern California than in southern California. This represents a change from previous patterns. Ex-vessel price for squid averaged \$282 per short ton in southern California, and about \$291 per ton in central–northern California. By comparison, 1994's ex-vessel price averaged \$255 per ton in southern California, \$294 per ton in Monterey Bay, and \$260 per ton in northern California. In 1995, southern California ex-vessel prices fluctuated from \$160 to \$300 per ton from January through October, depending upon size and availability of squid. In November, prices reached \$400 per ton and declined to about \$250 per ton in December. In central–northern California, prices were more uniform and fluctuated near annual averages of \$291 per ton.

In many years previous to 1995, southern California ex-vessel prices were substantially lower than those in the rest of the state. Southern California's average annual prices have ranged from about \$150 to \$250 per ton, while in central–northern California, prices have generally averaged around \$300 per ton. During the low supply years of 1983–84 (El Niño period), ex-vessel prices in central–northern California averaged approximately \$400 and \$480 per ton.

In 1995, the total ex-vessel value for squid was approximately \$21.9 million, a 35% increase from 1994's \$16.2 million. Total ex-vessel value in southern California was approximately \$20.9 million, 95.4% of the statewide total.

A growing concern by California fishermen has developed in recent years over expanding fleet capacity spurred on by increased landings in recent years and increased market demand. Because of this, fishermen have attempted to introduce legislation to control the number of boats participating in California's squid fishery. In 1993 and 1994, limited entry was supported mainly by central–northern California fishermen, but no limited-entry regulations resulted from those efforts. In 1995, southern California fishermen took a more active interest and, by the end of the year, limited entry was supported by nearly all squid fishermen as well as by southern California's recreational fishing fleet. By year's end, fishermen were again attempting to introduce legislation to control the number of squid boats. By this time, many previously opposed processors supported limited entry. However, management measures such as limited entry, seasons, and quotas will not control resource fluctuations caused by changing environmental conditions, so bonanza-bust scenarios in squid landings will likely remain.

CDFG is concerned about the rapidly expanding squid fishery, but does not believe that squid resources are overharvested. Although landings are up, the quality and size of squid remain good. Furthermore, in Monterey Bay from Moss Landing south to Yankee Point, 64% of each week is closed to squid fishing (from noon Friday to midnight Sunday and from noon to midnight Monday–Thursday). North of Moss Landing, squid fishing is closed only from noon Friday to midnight Sunday. Closures provide some protection for squid to spawn undisturbed in Monterey Bay. There are no similar restrictions on squid fishing in southern California.

GROUND FISH

The California commercial groundfish harvest for 1995 was 28,571 MT, with an ex-vessel value of approximately \$34 million. Total 1995 landings increased nearly 18%, or 4,415 MT, from 1994. Total ex-vessel value increased by 42%. Dover sole (*Microstomus pacificus*), thornyheads (*Sebastolobus* spp.), sablefish (*Anoplopoma fimbria*), rockfish (*Sebastes* spp.), and Pacific whiting (*Merluccius productus*) continued to dominate harvests. In 1995, downward trends in total harvest since 1990 were reversed in spite of more restrictive Washington–Oregon–California (WOC) landing regulations, and significant increases in harvest were noted for most categories (table 3). Reasons for increases include higher ex-vessel prices for species such as sablefish and thornyheads, and a general increase in market demand for groundfish.

Distribution of 1995 landings by gear showed trends evident during three past years. The bottom and mid-water trawl component rose to 84.6%, up from 82.0% in 1994, 77.9% in 1993, and 75.2% in 1992. The line

TABLE 3
 California 1995 Groundfish Landings (Metric Tons)

Species	1994	1995	Percent change
Dover sole	4,462	6,043	35
English sole	432	499	16
Petrale sole	524	593	13
Rex sole	548	691	26
Other flatfish	682	1,253	84
Widow rockfish	930	1,712	46
Bocaccio	887	785	-11
Other rockfish	5,406	5,514	2
Thornyhead	3,282	3,609	10
Lingcod	546	538	-1
Sablefish	2,151	2,716	26
Pacific whiting	3,662	4,091	12
Other groundfish	644	527	-18
Total	24,156	28,571	18

portion of the catch continued to drop, from 17.7% in 1992 to 15.8% in 1993, 14.0% in 1994, and 11.4% in 1995. Trap components rose slightly to 1.3% in 1995 from 1.0% in 1993 and 1994. Setnet groundfish landings dropped from 5.3% in 1993 to 3.0% in 1994, and to 2.7% in 1995.

License limitation, implemented by PFMC in 1994, continued in 1995. Annual harvest guidelines were again allocated between a permitted limited-entry (L.E.) fleet and nonpermitted open-access (O.A.) fleet, with separate trip limits for each sector. PFMC continued harvest guidelines that affected California's Dover sole, thornyhead, and trawl-caught sablefish (the DTS complex), *Sebastes* complex, widow rockfish (*Sebastes entomelas*), bocaccio rockfish (*S. paucispinis*), yellowtail rockfish (*S. flavidus*), lingcod (*Ophiodon elongatus*), and Pacific whiting fisheries. In addition, PFMC established a harvest guideline for canary rockfish (*Sebastes pinniger*), and separate harvest guidelines for shortspine thornyhead (*Sebastes alascanus*) and longspine thornyhead (*Sebastes altivelis*). PFMC continued to use cumulative landing limits as well as trip limits during 1995 in order to meet its objective of staying within annual harvest guidelines while providing a year-round groundfish fishery. Cumulative landing limits were applied to full calendar months during 1995. Lingcod were added to species lists with trip and size limits in 1995.

As in 1992, 1993, and 1994, WOC-area Pacific whiting resources were allocated between at-sea and shore-side processors. This was the second year of a three-year allocation plan which reserves 40% of annual harvest guidelines for shore-based processing after the first 60% is taken in open competition. At-sea processing of whiting was again restricted to waters north of California. In 1995 the WOC area 176,571 MT harvest was near the 178,400 MT harvest guidelines. In California, six mid-water trawl vessels fishing off Eureka and Crescent City landed 4,091 MT shoreside, a small increase from the

3,662 MT landed in 1994. A whiting observation program, established in 1992 to monitor bycatch in shore-side whiting landings, continued through 1995. The California salmon bycatch rate was 0.017 salmon per metric ton of Pacific whiting—a slight increase from last year's 0.012 rate. All salmon observed were chinook (*Oncorhynchus tshawytscha*). The nonsalmon bycatch rate in observed landings for 1995 was 28.8 pounds per metric ton of whiting.

One particular problem for PFMC during 1995 was management of the DTS complex. The rate of thornyhead landings increased substantially in 1993 and 1994 due to increased ex-vessel value and reduced opportunities for other species. For two thornyhead species, PFMC decided to establish separate harvest guidelines. This had previously been considered impractical because of the difficulty in distinguishing species. However, preliminary efforts by the trawl industry and processors in late 1994 indicated that most fishermen are able to identify species with a minimum of training. This provided an opportunity to protect less abundant shortspine thornyhead without overly restricting longspine thornyhead landings. For the first time, regulations required sorting of all four DTS species. Sablefish prices remained high, making Dover sole the least valuable of the complex.

Cumulative monthly limits for the DTS complex were initially set at 35,000 pounds for north of Cape Mendocino and 50,000 pounds for south of Cape Mendocino. Within those monthly limits, total thornyhead landings were limited to 20,000 pounds, of which not more than 4,000 pounds could be shortspine thornyhead. Trawl-caught sablefish was initially limited to 6,000 pounds per month. Sablefish was further limited to 1,000 pounds or 25% of the total DTS complex per trip (whichever was greater). Thornyhead landings escalated rapidly in February. In a March conference call, PFMC opted to reduce thornyhead landings to 15,000 pounds, of which no more than 3,000 pounds could be shortspine, effective April 1.

At its April 1995 meeting, PFMC increased trawl-caught sablefish monthly limits to 7,000 pounds, in conjunction with increasing harvest guidelines, effective May 1. Trip restrictions on trawl-caught sablefish were removed on July 14, 1995. In September, PFMC further reduced the total thornyhead monthly limit to 8,000 pounds, of which no more than 1,500 pounds could be shortspine thornyhead. It became evident by October that the sablefish and shortspine thornyhead components of the DTS complex continued to be harvested at a high rate and that harvest guidelines would be exceeded by year's end. As a consequence, PFMC opted to prohibit the take of thornyheads and trawl-caught sablefish, while limiting Dover sole to 3,000 pounds cumulative per vessel during December.

Coastwide catch of Dover sole was 10,618 MT, an increase of 1,278 MT from 1994 landings but still 2,982 MT lower than the 13,600 MT harvest guideline in 1995. Reduced market demand and a redirection of effort toward more valuable sablefish and thornyheads within the DTS complex resulted in reduced production. California 1995 landings of 6,043 MT represent a 35% increase over last year's total, and made up 57% of the total WOC Dover sole landings.

For 1995, PFMC set the shortspine thornyhead harvest guideline at 1,500 MT and the longspine harvest guideline at 6,000 MT. Total WOC-area landings of shortspine and longspine thornyhead were 5,823 MT and 1,782 MT. Shortspine landings exceeded the harvest guideline by 19%. California landed 3,609 MT, or 48% of the total WOC thornyhead catch.

On the basis of sablefish stock assessments conducted in 1994, PFMC recommended that acceptable biological catch (ABC) be increased from 7,000 MT in 1994 to 7,800 MT for 1995 (excluding INPFC Conception area), and an ABC of 425 MT was established for the INPFC Conception area. The WOC-area L.E. trawl/L.E. fixed-gear sablefish allocation remained at 58/42. After respective tribal and open-access allotments of 780 MT and 463 MT were granted, 6,557 MT remained for allocation between L.E. trawl (3,803 MT; 58%) and L.E. fixed-gear (2,754 MT; 42%) fisheries. Total nontribal WOC-area landings of sablefish in 1995 were 7,095 MT, about equal to the combined L.E./O.A. harvest guideline. California accounted for 2,716 MT, or 38% of the total WOC nontribal catch. WOC-area trawl sablefish landings were 3,734 MT, about 2% under trawl harvest guidelines. California trawl vessels landed 1,482 MT, or about 40% of the WOC-area trawl-caught sablefish.

Management of the 1995 L.E. fixed-gear sablefish fishery was substantially different from previous years. In past years, the PFMC attempted to start unrestricted season ("derby") fishing concurrent with Alaska fisheries, forcing vessels to choose between Alaska or the WOC area. In spite of this strategy and the implementation of limited entry for groundfish, the 20-day 1994 season was the shortest yet. In 1995, Alaska went to an individual quota (IQ) system with a longer season, and effort in West Coast derby fishing was expected to increase dramatically. Since there was no longer a reason to tie the derby opening to the Alaska fishery, the fixed-gear industry recommended that PFMC delay the derby until August, when larger fish are more available and wind patterns more favorable. To help keep landings within harvest guidelines, and as a compromise between large and small producers, PFMC intended that the derby be managed to take no more than 70% of the nontrawl L.E. allocation, with the remainder to be taken in a cumulative-limit mop-up fishery. The season was set to last 7

days, August 6–13. The derby fishery took about 78% of the allocation, and a monthly limit for the mop-up fishery was set at 5,500 pounds.

Total WOC-area L.E. fixed-gear sablefish landings of 3,361 MT were about 18% higher than L.E. fixed-gear allocations. The O.A. fishery, limited to 300 pounds per trip, landed approximately 502 MT, exceeding the 460 MT O.A. allocation by about 8%. California fishermen (L.E. and O.A.) landed 1,234 MT, or about 38% of total nontribal WOC-area fixed-gear landings.

On January 1, the L.E. monthly cumulative limit for the *Sebastes* complex (including yellowtail, canary, and bocaccio rockfish; excluding widow rockfish) was set at 100,000 pounds south of Cape Mendocino and 50,000 pounds north of Cape Mendocino to Cape Lookout, Oregon. Within the 100,000-pound limit, no more than 30,000 pounds could be bocaccio rockfish, and no more than 6,000 pounds could be canary rockfish. Within the 50,000-pound limit, no more than 30,000 pounds could be yellowtail rockfish and no more than 6,000 pounds could be canary rockfish. The O.A. cumulative limit was set at an overall 40,000 pounds with no more than 10,000 pounds per trip for vessels using line gear. Bocaccio, yellowtail rockfish, and canary rockfish limits were set equal to L.E. limits.

California's *Sebastes* complex landings (southern harvest guideline) dropped from 8,863 MT in 1992 to 7,315 MT in 1993, and to 6,293 MT in 1994, but in 1995 total landings increased to 7,119 MT. The 1995 rockfish harvest included 785 MT of bocaccio, an 11% drop from 1994's 887 MT.

For 1995, PFMC set widow rockfish harvest guidelines at 6,500 MT and initially set the cumulative limit at 30,000 pounds. Because early landings were well below those for the same time last year, PFMC increased monthly cumulative trip limits from 30,000 to 45,000 pounds on July 14. The fishery was allowed to run at this level through December. The total 1995 landed catch of 6,797 MT in WOC was 297 MT over harvest guidelines. California landings of 1,712 MT were 25% of the WOC total.

A WOC-area harvest guideline for lingcod was set at 2,400 MT. This included 900 MT set aside for recreational gear and 1,500 MT allocated for all commercial gears. The PFMC adopted a 22-inch minimum size limit and a cumulative monthly limit of 20,000 pounds for all commercial gear. Total WOC-area commercial lingcod landings were near commercial allocations at 1,415 MT. California commercial fishermen landed 538 MT, or 36% of the WOC commercial allotment.

In 1996, PFMC will be considering a number of options for long-term management of limited-entry fixed-gear sablefish fishing for 1997 and beyond. Also, the current whiting allocation plan expires in 1996, so during

1996 PFMC will begin to establish a new allocation plan. A new bocaccio rockfish assessment, incorporating information collected during 1995 shelf surveys, is scheduled for 1996, and results will be used to reevaluate harvest guidelines for 1997. PFMC is also working on an analysis of remaining rockfish, to be completed in 1996. Results will be used to derive a quantitative ABC. For the L.E. fishery, PFMC has recommended that all monthly cumulative vessel limits be increased to two months in 1996.

ABALONE

Abalone (*Haliotis* spp.) have historically supported valuable commercial and recreational fisheries in California. In recent times, landings and resources have declined from disease, excessive harvest, and reestablishment of California sea otter populations. Statewide preliminary 1995 landings were: red abalone, 110.0 MT (down 22%); pink abalone, 7.9 MT (up 11%); green abalone, 0.7 MT (down 6%); and white abalone, 17.2 kg (up 15%). Red abalone constituted 92.6% of total commercial landings, with pink making up most of the remaining 6.7%. Green and white abalone made up only 0.06% and 0.01% of total landings. Increased landings of pink abalone were probably due to the anticipated closure of the fishery for this species. Black abalone has been closed since 1993.

A CEQA document describing abalone fishery conditions was completed in 1995, and caused the Fish and Game Commission to close all commercial and recreational harvest of pink, green, and white abalone for two years, beginning March 1, 1996. It is anticipated that this closure will be extended.

The condition of the white abalone resource has been the subject of fishery-independent research. Few live white abalone have been found in the traditional habitat. For example, after a CDFG survey of about 30,600 m² of suitable habitat at 15 locations, only three live individuals were found. There is concern that populations of this species have been reduced to levels that would make its continued existence questionable.

Withering syndrome (WS) continues to affect black abalone. It has been detected in central California populations as far north as Cayucos, San Luis Obispo County. Nevertheless, a few large (old) individuals still remain at many locations in the Channel Islands, and there are signs of newly recruited black abalone. These may be significant indications of a WS-resistant strain of black abalone. These abalone would be important in any natural or human-enhanced resource recovery.

DUNGENESS CRAB

California Dungeness crab (*Cancer magister*) landings during 1994–95 totaled 5,931 MT, an increase of 3,179

MT from 1993–94, and well above the ten-year average of 4,153 MT.

In northern California, crab season opened on December 1, 1994, after a price settlement of \$1.40 per pound. A fleet of 385 vessels landed approximately 4,519 MT at Crescent City, Trinidad, Eureka, and Fort Bragg. Crescent City accounted for 2,556 MT, followed by Eureka (1,029 MT), Trinidad (494 MT), and Fort Bragg (440 MT).

San Francisco–area Dungeness crab fishing opened on November 8, 1994, but a price dispute delayed production until November 27, when a price of \$1.50 per pound was agreed upon. Total crab landings increased by 1,059 MT from the previous season to a total of 1,304 MT. Crab fishermen landed 595 MT at Bodega Bay and 709 MT at ports in San Francisco Bay. Monterey and Morro Bay contributed 108 MT to total landings.

Significant legislation affected the Dungeness crab fishery; Assembly Bill 3337, signed by Governor Wilson in September 1994, became effective on April 1, 1995. This bill required that vessel permits be issued for commercial Dungeness crab, and established criteria for issuing those permits. The bill also provided for transfer of permits under specified conditions, convened a Dungeness crab review panel to review applications for vessel permits and permit transfers, and permitted the CDFG director to delay opening the Dungeness crab season if such a delay were recommended by the California Seafood Council. Provisions regarding the issuance of Dungeness crab vessel permits and permit transfers were amended in 1995. Additional legislation excluded the Dungeness crab fishery from jurisdiction of the California Seafood Council, and CDFG authorized a quality testing program before the opening of the Dungeness crab season north of Sonoma County.

The CDFG director appointed four Dungeness crab review panel members, who processed over 300 applications for vessel permits and permit transfers. A total of 671 Dungeness crab vessel permits were finally issued for 1995–96.

SPOT PRAWN

Preliminary 1995 spot prawn (*Pandalus platyceros*) landings totaled 176 MT, an 11% decrease from the 198 MT landed in 1994 (figure 2). Approximately 134 MT of spot prawn were harvested by trawl, while 42 MT were taken with trap gear. Eighty-four percent of the combined trawl/trap spot prawn catch was landed and sold live, thereby commanding significantly higher ex-vessel prices. Ex-vessel prices ranged from \$4.50 to \$12.25/lb live and between \$2.50 and \$3.50/lb dead. The average ex-vessel price for all spot prawn landed in 1995 was \$6.25/lb, up about 50 cents from 1994.

Fifty-one percent of the 1995 spot prawn trawl catch

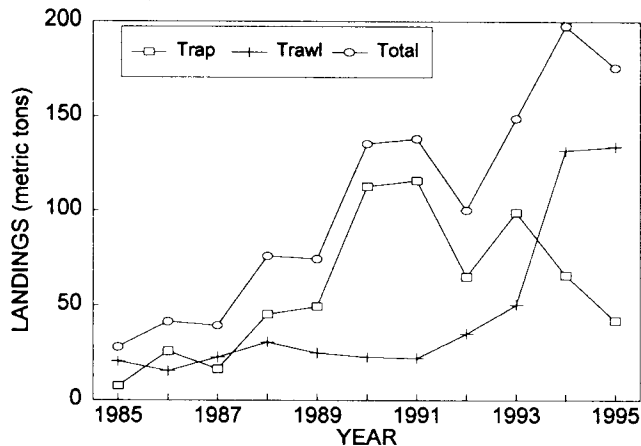


Figure 2. California spot prawn landings, 1985-95.

was taken in Santa Barbara Channel, while trawls conducted between Point Piedras Blancas (San Luis Obispo County) and Point Conception (Santa Barbara County) provided 45% of the spot prawn landings. Unlike previous years, there was little trawl activity along Monterey's coast. Only 4 trawl vessels made landings from this area, as compared to 15 vessels in 1994.

During 1995, southern California spot prawn trawlers accounted for 88% of total catch. Southern California trap fishermen continued to fish around the Channel Islands and along submarine canyons (Redondo, Newport, and La Jolla Canyons). Traps were also fished at Tanner and Cortez Banks but were not productive. In northern California, fishermen continued to set traps at Monterey and Carmel Canyons.

In 1995, the Fish and Game Commission modified existing regulations for spot prawn trawl fishing, and adopted regulations for the spot prawn trap fishery, which was previously unregulated. Impetus for these regulations was a reduction of catch per unit of effort (CPUE) in both prawn fisheries despite increases in statewide landings. Trawl fishery CPUE has declined at a rate of about 11% per year since 1989. For trap fishing, CPUE has declined at a higher rate, averaging about 21% per year since 1988.

Changed regulations for trawl fishing expanded area closures to include all waters south of Point Arguello for November 1 to January 15. Before this change, spot prawn trawlers could not fish between Point Arguello and Point Dume from November 1 to January 31. A time/area closure was also initiated in the trap fishery. Trap closures covered the same territory as trawl closure but ran from January 16 to March 31. In addition, spot prawn trap fishermen were limited to 500 traps each, and a mesh size restriction of 2.5 by 2.5 cm was implemented. The Commission also provided for continued use of the commonly used Fathomplus trap until a trap retention study has been completed.

SEA CUCUMBER

Sea cucumber landings statewide were 267.6 MT in 1995, a decrease of 26 MT since 1994. The catch was composed of 75.2 MT of warty sea cucumber (*Parastichopus parvimensis*) and 192.4 MT of California or giant red sea cucumber (*P. californicus*). Commercial trawlers in southern California harvested giant red sea cucumbers, while divers harvested warty cucumbers by hand. Most sea cucumbers were landed at Terminal Island, Ventura, and Santa Barbara Harbors. The main fishing grounds for giant red sea cucumbers were Santa Barbara Channel and Santa Catalina Channel at depths of 30 to 90 fathoms. A small quantity of giant red sea cucumber (2 MT) was taken by divers off central California. Warty sea cucumbers were harvested as far south as San Diego, but most harvesting occurred in waters off four northern Channel Islands at 6 and 10 fathoms.

The average price for both warty and giant red sea cucumbers was \$0.70/lb. and ranged from \$0.20 to \$1.00/lb. The two-tier price structure seen in past years, with a higher price paid for diver-harvested warty sea cucumber, no longer seemed to be employed by dealers. Most of the sea cucumber landings were dried and exported to Hong Kong and Taiwan. The end product, called *trepang*, sold for \$4.00 to \$13.00/lb. A small portion of total landings was distributed and sold within the United States.

California's sea cucumber fishery began near Los Angeles around 1978, and averaged under 45 MT annually until 1982, when a trawl fishery developed near Santa Barbara. During the next eight years, annual landings increased gradually (figure 3). An influx of trawlers, predominately out of the Los Angeles port area, greatly expanded fishing effort and catch in 1991. From 1991 through 1995, sea cucumber landings exceeded 260 MT (figure 3). Since 1992-93, sea cucumber fishing has been a limited-entry fishery based on previous minimum sea

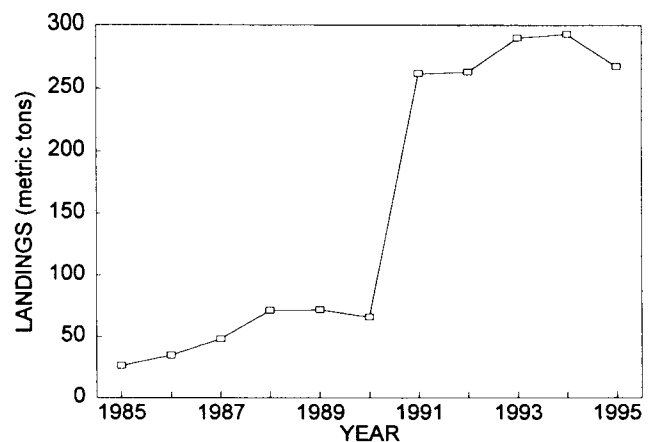


Figure 3. California sea cucumber landings, 1985-95.

cucumber landings of 50 pounds. There were 115 sea cucumber permittees in 1995. Landing receipt data indicate that 79 permittees on 28 trawlers and 39 dive boats actively participated during 1995.

Sea cucumbers have a short life span, low age at maturity, sporadic recruitment, and high natural mortality. Species with these characteristics can be vulnerable to overfishing, but it is expected that southern California populations of warty and giant red sea cucumber can sustain current harvest levels, given the effort-limiting permit restrictions. In central and northern California, giant red sea cucumber is currently caught by a small number of individuals who landed 2.6% of diver-harvested sea cucumbers in 1995.

SEA URCHIN

California's red sea urchin (*Strongylocentrotus franciscanus*) landings peaked at 23,577 MT in 1988. Since then, catches and CPUE have trended downward at different rates in northern and southern California, with 9,991 MT landed statewide in 1995 (figure 4). West coast sea urchin catches and CPUE from British Columbia to Baja California have generally declined during the last half-decade following a period of rapid fishery expansion. The 1995 northern California catch fell by 18% from 1994, while southern California dropped by only 3%, the smallest decline since 1990. Fishing effort in southern California shifted from the northern Channel Islands south to San Clemente Island. Landings in Santa Barbara declined by 38% in 1995, and increased by 91% at Los Angeles area ports, which largely service the southern Channel Islands.

Low average ex-vessel prices and declining harvestable stocks were significant factors driving northern California divers south in 1995 (table 4). Bodega Bay prices fell by an average of 13% from 1994, the sharpest decline

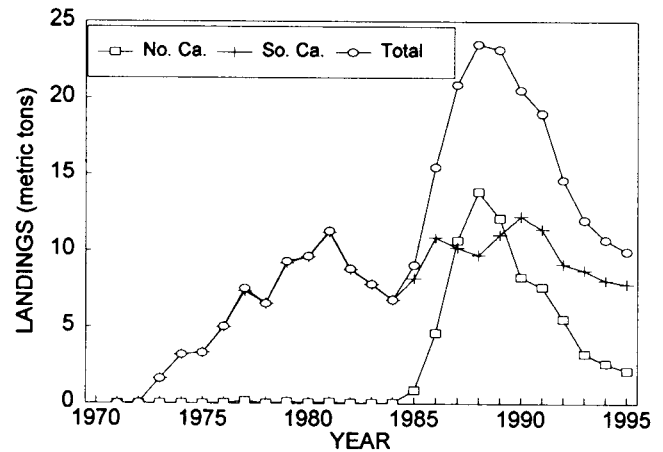


Figure 4. California sea urchin landings, 1970–95.

in northern California. Despite the drop in catch and value from 1994, \$22.2 million ex-vessel made red sea urchin the single most valuable species landed in California, surpassing market squid.

Sea urchin permittees peaked at 915 in the 1987–88 permit year, falling to 576 by 1994. In 1994, 41 northern California permittees out of 207 who fished landed 50% of the 2,630 MT total catch. In southern California, 50% of the 8,063 MT harvested was caught by 104 out of the 450 who fished that region. In 1995 CPUE (kg/diver-hour) ranged from a low of 122 at Bodega Bay and Fort Bragg to 145 kg/hr at Albion. This represents a continued leveling off of CPUE that began in 1993 in northern California. Southern California CPUE ranged from 49 kg/hr in coastal Los Angeles to a high of 155 kg/hr at San Nicolas Island. The relatively minor purple sea urchin fishery represented only 0.4% of the total sea urchin catch (37 MT), split evenly between northern and southern California.

TABLE 4
 Preliminary California Commercial Red Sea Urchin Landings, 1995

Port	Landings (MT)	Percentage of catch	Value	\$/kg
Crescent City	34.2	.3	\$64,789	1.89
Fort Bragg	574.7	5.8	\$1,151,550	2.00
Albion	433.5	4.3	\$858,822	1.98
Point Arena	727.4	7.3	\$1,471,690	2.02
Bodega Bay	340.3	3.4	\$597,043	1.75
Other N. Calif.	54.4	.5	—	—
N. Calif. subtotal	2,164.5	21.7	\$4,255,722	—
Santa Barbara	2,252.7	22.6	\$5,232,803	2.32
Oxnard-Ventura	2,396.7	24.0	\$5,549,597	2.32
Los Angeles	2,517.4	25.2	\$5,380,950	2.14
San Diego	659.4	6.6	\$1,828,690	2.77
S. Calif. subtotal	7,826.1	78.3	\$17,991,978	—
Grand totals	9,990.6	—	\$22,247,700	—

SWORDFISH AND SHARKS

Swordfish (*Xiphias gladius*) landings were 788 MT in 1995, 32% less than in 1994 (table 5). During the past decade, drift gill net fishing accounted for the majority of total landings. This year, 65% of landings were taken with drift gill nets, up from last year's 45%, as longline landings decreased from 45% to 24%. Although 22 vessels used longline gear outside the U.S. Exclusive Economic Zone (EEZ) and landed swordfish in southern California ports in 1995, only 4 were based out of California by year's end. As usual, harpoon landings constituted 8% of total catch. Sixty-one percent of total swordfish catch was landed in southern California ports.

Gear type affected swordfish ex-vessel prices in 1995. Typically, fishermen landing drift gill net-caught swordfish received \$3.00 to \$5.00 per pound, whereas longline-caught fish commanded only \$2.00 to \$4.00 per pound. Fishermen landing harpoon-caught swordfish received the highest prices: \$4.00 to \$6.00 per pound.

Landings of common thresher shark (*Alopias vulpinus*) declined 20% to 155 MT in 1995, which continues the decade-long declining trend in landings. Thresher sharks are taken primarily with drift gill nets (80%), followed by set gill nets (12%) and assorted other gears (8%). Eighty-six percent of total landings continue to be made in southern California, with San Diego the top port (39%). Ex-vessel prices varied from \$1.00 to \$2.00 per pound.

Shortfin mako shark (*Isurus oxyrinchus*) landings in 1995 were 65 MT (table 5), a decrease of 26%. Eighty-one percent of total catch was landed in southern California ports, at ex-vessel prices between \$0.50 and \$1.50 per pound. Mako sharks are caught primarily by drift gill net (76%), with 8% landed by longline vessels operating outside the EEZ, hook and line gear accounting for approximately 7%, and 9% landed incidentally in other fisheries.

TABLE 5
 Landings of Swordfish and
 Selected Shark Species (Metric Tons)

	Swordfish	Common thresher shark	Shortfin mako shark
1985	2,362	700	103
1986	1,749	276	215
1987	1,246	239	274
1988	1,129	250	222
1989	1,296	295	177
1990	851	210	262
1991	711	344	151
1992	1,068	179	97
1993	1,218	162	84
1994	1,165	194	88
1995*	788	155	65

*Preliminary

TABLE 6
 Preliminary California Commercial Halibut Landings, 1995

Port	Catch (MT)	Percentage of catch	Value
Eureka	4.35	1.25	\$21,299
Bodega Bay	6.69	1.93	\$33,203
San Francisco	145.02	41.77	\$821,660
Monterey	35.29	10.17	\$182,071
Morro Bay	23.29	6.71	\$147,894
Santa Barbara	70.04	20.17	\$500,269
Los Angeles	49.00	14.12	\$353,281
San Diego	13.48	3.88	\$106,108
Totals	347.17		\$2,165,784

CALIFORNIA HALIBUT

Commercial landings of California halibut (*Paralichthys californicus*) rebounded to approximately 347 MT in 1995 (table 6), a 49.5% increase over the 232 MT landed in 1994 (figure 5). Increased landings in 1995 also marked an end to downward landing trends since 1991. The Marine Resource Protection Act of 1990 (Proposition 132), which restricts gill netting in California waters (out to three miles) south of Point Arguello, has most likely contributed to the lowered landings seen in recent years.

San Francisco led California in halibut landings, with 42% of total catch by weight, followed by Santa Barbara (20%), and Los Angeles (14%). All ports in California experienced an increase in halibut landings over 1994. Trawl gear was the most effective fishing method, landing 50% of the total catch (174 MT), followed by set gill net (25%; 86 MT) and hook and line (22%; 77 MT).

Ports landing mostly with trawl gear include Eureka (68%), San Francisco (62%), Morro Bay (77%), and Los Angeles (56%). Set longline gear contributed the highest percentage by weight for Monterey (50%), Santa Barbara (59%), and San Diego (95%). Only Bodega Bay landings were primarily from hook and line (98%).

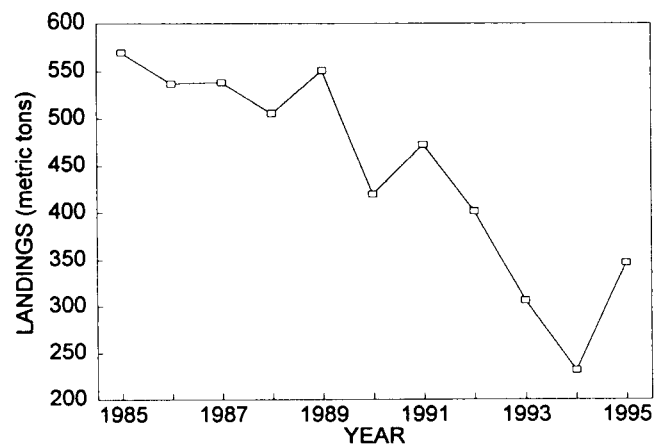


Figure 5. California halibut landings, 1985-95.

Statewide, the ex-vessel price for halibut ranged from \$0.80 to \$5.50 per pound, with an average of \$2.84. Ports south of Monterey averaged \$1.00 more per pound for halibut than ports to the north, probably because of a more developed live-fish market in southern California. The total value for halibut landings in California for 1995 was approximately \$2.17 million.

OCEAN SALMON

In 1995, PFMC again enacted restrictive commercial and recreational ocean salmon regulations in California to (1) protect endangered chinook (*Oncorhynchus tshawytscha*) stocks—Sacramento River winter chinook and Snake River fall chinook, (2) ensure fall chinook spawner escapement goals for Klamath, Sacramento, and Oregon coastal rivers, and (3) protect depressed coho (*Oncorhynchus kisutch*) stocks coastwide.

In California, commercial fishing for ocean salmon was allowed only south of Horse Mountain, with various time and area closures enacted during 1995 (May 1–September 30). A minimum size limit of 26 inches remained in effect. More than 2,741 MT (6 million lbs; 629,300 fish) of dressed chinook were landed by commercial trollers, who fished approximately 21,600 days during 1995. Ex-vessel prices for dressed salmon averaged \$1.76 per pound, and total ex-vessel value exceeded \$10.6 million. Commercial fishing for coho salmon was not allowed during 1995.

Recreational fishing regulations in California were similar to those in 1994, with various time and area closures enacted during 1995 (February 18–November 12). Coho salmon could not be retained after April 30, 1995. In Klamath Management Zone (KMZ; Horse Mountain, California, to Humbug Mountain, Oregon) quotas were also enacted. Statewide, recreational landings more than doubled over the previous year as sport anglers landed a record 397,200 chinook during 378,500 angler trips (CPUE: 1.05 fish/angler). Most salmon were caught south of KMZ, where sport anglers landed 383,600 chinook during 353,800 angler trips on commercial passenger fishing vessels and private skiffs. Anglers were limited to two salmon per day, with a minimum size limit of 20 inches total length.

TABLE 7
 Preliminary 1995 Landings of Live Fish (Metric Tons)

	Southern California	Northern California
Rockfishes	126	47
California sheephead	88	0
Cabezon	78	4
California halibut	51	2
Lingcod	14	16
All others	20	3
Total	377	72

In KMZ, three separate seasons were enacted: (1) May 17–July 8, or 10,600 chinook quota, Wednesday through Saturday fishing only, one salmon per day; (2) August 16–31, or 900 total chinook quota, Wednesday through Saturday fishing only, one salmon per day; and (3) September 1–9, no quota, open 7 days a week, one salmon per day, no more than 6 salmon in 7 consecutive days. A 20-inch size limit was in effect during all three seasons. In the California portion of KMZ, anglers landed 13,800 chinook during 24,700 angler trips made primarily on private skiffs.

LIVE-FISH FISHERY

The 1995 statewide landings for live fish were estimated at 449 MT, 10% more than in 1994 (table 7). Fifty-four different fish species were landed live and had an ex-vessel value of over \$3 million. Landings may be underestimated because some fish buyers failed to properly code landings as live fish.

Live-fish fishing began in 1988 mainly to supply the California Asian community. Live fish are now sold to both local and overseas markets. What began as small trapping and hook and line operations has now become a complex, multimillion-dollar fishery using many gear types, targeting a multitude of species, and delivering fish in a variety of ways. For this market, fishes must be visually attractive and able to withstand the rigors of capture and transportation. Optimum individual weights ranged between one and three pounds, a suitable single-entrée size at Asian restaurants. Ex-vessel prices ranged from \$2.00 to \$7.00 per pound. Larger fish were also sold live, but at considerably reduced prices (except for California halibut). Prices fluctuated with market demand, fish size, fish condition, and weather conditions. Hook and line gear was used to capture 63% of the live fish landed statewide; trap gear landed 23%.

Live-fish landings in southern California (Morro Bay

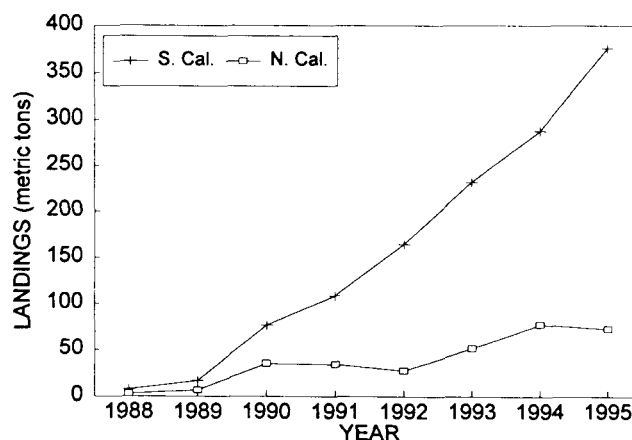


Figure 6. California live-fish landings, 1988–95.

southward) totaled 377 MT, 16% more than in 1994 (figure 6). Target species for all gear types included California sheephead (*Semicossyphus pulcher*), California halibut (*Paralichthys californicus*), California scorpionfish (*Scorpaena guttata*), cabezon (*Scorpaenichthys marmoratus*), lingcod (*Ophiodon elongatus*), and grass (*S. rastrelliger*) and gopher (*S. carnatus*) rockfishes. Most of this year's catch was taken with hook and line (57%) and trap (27%) gear. Trapping accounted for 76% of all live California sheephead taken. Traps used for finfish were originally constructed like lobster traps, but variations flourished as this fishery continued to develop. Fishing pressure for high-value nearshore species intensified as hook and line vessels heavily targeted cabezon and gopher and grass rockfishes. Catches of these fish increased dramatically from 1994: 216% for cabezon, 79% for gopher rockfish, and 56% for grass rockfish. Live California halibut were caught with line, net, and trawl gear, primarily from the ports of Santa Barbara and Morro Bay. Halibut was kept alive to ensure optimum freshness, then bled, iced, and quickly shipped overseas. Two-thirds of all live landings were delivered to Morro Bay and Santa Barbara/Ventura.

Live-fish landings in northern California (north of Morro Bay) totaled 72 MT, 13% less than in 1994 (figure 6). Most landings (94%) were made by hook and line vessels using vertical, horizontal, and troll longlines to harvest rockfish along nearshore rocky reefs and offshore banks. Principal finfishes caught were gopher, china (*S. nebulosus*), and copper (*S. caurinus*) rockfishes. Although finfish traps are not authorized for use in state waters from Pigeon Point (San Mateo County) to southern Mendocino County, fishermen are now exploring trapping options outside the EEZ. Fort Bragg has a rudi-

mentary trap fishery for sablefish and cabezon. White croaker was specifically targeted in San Francisco Bay for the first time this year.

In 1995, legislation created a limited-entry program, which included numbers of traps, trap construction requirements, and incidental catch restrictions. Two Senate bills were also passed to reduce nearshore fishing pressure by limiting hooks used per vessel and to establish weekend closures in designated areas.

RECREATIONAL FISHERY

Northern California

In northern and central California, commercial passenger fishing vessel (CPFV) anglers fish for rockfishes (*Sebastes* spp.), salmon (*Oncorhynchus* spp.), lingcod (*Ophiodon elongatus*), and other nearshore species in ocean waters, and for striped bass (*Morone saxatilis*) and white sturgeon (*Acipenser transmontanus*) in estuarine waters. California halibut (*Paralichthys californicus*) are taken along the coast, but most catch comes from San Francisco Bay. Recreational fishing for coho, or silver, salmon (*Oncorhynchus kisutch*), was closed after April 30, 1995, as it had been in 1994.

Total catch decreased by 12% from reported landings for 1994 (table 8). Twelve primary species or species groups taken in central and northern California, in decreasing proportion, were rockfishes, king salmon, lingcod, California halibut, chub mackerel, striped bass, unspecified flatfishes, cabezon, jack mackerel, unspecified sharks, leopard sharks, and sturgeon. The first four groups made up 98.6% of the total catch. Rockfishes dominated

TABLE 8
 Central-Northern California CPFV Landings (Number of Fish) in 1995 and 1994

Species/species group	1995	1994	1995 rank	Percent change
Rockfishes, unspecified	767,313	924,743	1	-17
King salmon	124,489	98,131	2	+27
Lingcod	25,719	25,156	3	+2
California halibut	13,664	4,134	4	+231
Pacific mackerel	3,419	3,433	5	0
Striped bass	3,102	2,247	6	+38
Flatfishes, unspecified	3,099	5,304	7	-42
Cabezon	1,041	1,217	8	-14
Jack mackerel	765	478	9	+60
Shark, unspecified	613	923	10	-34
Leopard shark	468	1,040	11	-55
Fishes, unspecified	348	1,981	12	-82
Sturgeon, unspecified	281	155	13	+81
White croaker	168	317	14	-47
Albacore	135	171	15	-21
All others	135	296	—	—
Totals:				
Number of fish	944,759	1,069,726		-12
Number of anglers	173,093	166,396		+4
Number of reporting CPFVs	121	123		-2

TABLE 9
 Southern California CPFV Landings (Number of Fish) in 1995 and 1994

Species/species group	1995 landings		1994 landings		Percent change
	Number	Rank	Number	Rank	
Rockfishes, unspecified	407,678	1	470,549	1	-13
Barred sand bass	350,539	2	286,444	3	+22
California barracuda	326,792	3	268,202	5	+22
Pacific mackerel	267,731	4	333,222	2	-20
Kelp bass	231,687	5	276,086	4	-16
Ocean whitefish	133,655	6	100,420	7	+33
Spotted scorpionfish	94,398	7	90,665	8	+4
Yellowfin tuna	87,347	8	46,831	10	+87
Halfmoon	54,656	9	49,219	9	+11
Skipjack tuna	43,043	10	15,327	13	+181
Pacific bonito	39,995	11	106,280	6	-62
Yellowtail	29,445	12	19,882	12	+48
California sheephead	23,735	13	19,947	11	+19
White croaker	16,916	14	5,725	15	+196
Bluefin tuna	14,646	15	2,309	22	+534
Salmon (Chinook)	9,201	16	3	23	—
Wahoo	5,733	17	4,051	20	+42
California halibut	5,681	18	3,415	21	+66
Jack mackerel	5,330	19	5,425	16	-2
Dolphinfish	5,022	20	5,318	17	-6
Lingcod	4,823	21	5,935	14	-19
Flatfishes, unspecified	4,664	22	4,471	19	+4
White seabass	4,264	23	2,518	22	+69
Blacksmith	3,150	24	5,100	18	-38
All others	17,632	—	7,117	—	—
Totals:					
Number of fish	2,187,763		2,134,461		
Number of anglers	455,545		415,673		
Number of reporting CPFVs	205		155		

CPFV catches in 1995, accounting for 81% of the total catch. In 1995, catch of rockfishes was 17% less than that in 1994, primarily because of an increased salmon catch, up 21% from 1994. During periods of good salmon fishing, recreational anglers shift effort from rockfishes to salmon. The total number of anglers increased by 4% over 1994, primarily because of excellent salmon availability.

Eighty-six percent of total rockfish catch came from port areas from Port San Luis north to Bodega Bay. Lingcod constituted 3% of the total catch, slightly higher than in 1994. There was increased recruitment of juvenile lingcod in 1994 and 1995, and CPUE increased from previous years. Declines in total catch were observed for four other species or species groups including flatfishes (down 42%), cabezon (down 14%), sharks (down 34%), and leopard sharks (down 55%), while catches of jack mackerel increased 38% in 1995.

Landings of California halibut, sturgeon, and striped bass increased from 1994 levels, and were almost exclusively from San Francisco Bay. Halibut catch increased 70% from 1994, and increases in other groups may have been related to a higher influx of Sacramento-San Joaquin Delta runoff than in previous years.

Southern California

Southern California's large marine recreational fishery includes private recreational boat, beach-and-bank, pier, and CPFV modes. CPFV accounts for approximately 40% of California's marine recreational landings. In southern California and Baja California waters, traditional CPFV target species include California barracuda (*Sphyrnaea argentea*), barred sand bass (*Paralabrax nebulifer*), bluefin tuna (*Thunnus thynnus*), Pacific bonito (*Sarda chiliensis*), halfmoon (*Medialuna californiensis*), California halibut (*Paralichthys californicus*), kelp bass (*Paralabrax clathratus*), Pacific mackerel (*Scomber japonicus*), rockfishes (*Sebastes* spp.), spotted scorpionfish (*Scorpaena guttata*), California sheephead (*Semicossyphus pulcher*), skipjack tuna (*Euthynnus pelamis*), wahoo (*Acanthocybium solanderi*), ocean whitefish (*Caulolatilus princeps*), white seabass (*Atractoscion nobilis*), yellowfin tuna (*Thunnus alalunga*), and yellowtail (*Seriola lalandi*).

In 1995, 2,187,763 fish were landed by CPFV anglers south of Point Conception (table 9). Southern California catch represented 70% of the 3,132,522 fish landed statewide. Reported CPFV landings increased 2.5% in southern California, while decreasing 2% statewide. Angler participation on CPFVs increased both statewide

(8%) and in southern California (10%) in 1995. Approximately 455,545 CPFV anglers fished off southern California, representing 73% of statewide total anglers (628,638) for 1995.

The top ten ranking species made up 91% of total landings by CPFV anglers in southern California (table 9). Rockfishes as a group continued to dominate CPFV landings in southern California and statewide in 1995, but southern California landings decreased by 13%. Barred sand bass landings increased 22%, moving this species from third to second rank of importance in 1995. Barracuda (up 22%) continued a decade-long increase, moving from fifth to third rank. Pacific mackerel decreased in relative importance from rank two to four, with landings down 20%. Kelp bass (down 16%) dropped from position four to five. Ocean whitefish, primarily targeted on rockfish trips, increased by 33% and moved up in importance to rank six. Spotted scorpionfish landings showed little change, but moved from rank eight to seven due to relative decreases of other species. Yellowfin tuna landings were up 87% in 1995, moving this popular species from tenth to eighth place. Halfmoon landings increased 11%, remaining in ninth position. Skipjack tuna jumped from position thirteen to ten, with a 181% increase in landings. Pacific bonito (down 62%) dropped out of the top ten in 1995, moving from rank six to eleven.

Marked changes in landings were observed for a number of other popular sport fish species in 1995 (table 9). Increased landings were reported for several other south-

ern species, including bluefin tuna (up 534%), yellowtail (up 48%), wahoo (up 42%), and white seabass (up 69%). California halibut landings increased 156% statewide and 66% in southern California. Southern California CPFV anglers benefited from chinook salmon, with most of 9,201 salmon landed near Santa Barbara and Ventura, but landings were reported as far south as San Diego. Approximately 1,047 albacore (*Thunnus alalunga*) were landed in southern California, most of which were caught off Santa Barbara in September.

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Note: This review is available online at

<http://www-mlrg.ucsd.edu/calcofi.html>.