

REVIEW OF SOME CALIFORNIA FISHERIES FOR 2004: COASTAL PELAGIC FINFISH, MARKET SQUID, SEA URCHIN, LOBSTER, SPOT AND RIDGEBACK PRAWN, GROUND FISH, HIGHLY MIGRATORY SPECIES, OCEAN SALMON, NEARSHORE LIVE-FISH, PACIFIC HERRING, AND RECREATIONAL

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SUMMARY

In 2004, commercial fisheries landed an estimated 137,329 metric tons (t) of fishes and invertebrates from California ocean waters (fig. 1). This represents an increase in landings of over 9% from the 125,687 t landed in 2003 and a 46% decline from the 252,568 t landed in 2000. Following recent trends, the preliminary ex-vessel economic value of commercial landings in 2004 was \$131 million, a 2% increase from the \$128 million in 2003, and a 25% increase from \$105 million in 2002.

The Pacific sardine fishery was the largest in the state by volume, at over 44,000 t, although the Dungeness crab fishery had the highest ex-vessel value at nearly \$41 million. The ex-vessel value for the sardine fishery was nearly \$4 million, ranking it seventh. Market squid landings were both second in volume, at just over 40,000 t, and ex-vessel value, at nearly \$20 million. Other top-five California landings included Dungeness crab at over 11,000 t, northern anchovy at 6,700 t, and sea urchin at 5,500 t. Besides Dungeness crab and market squid, the top five California landings in terms of ex-vessel value included Chinook salmon at \$17.7 million, sea urchin at \$7.3 million, and California spiny lobster at \$5.8 million.

Landings of California spiny lobster in 2004 were the highest since 1997 at 375 t. The regulatory process making lobster trap permits transferable was started by the California Fish and Game Commission (Commission). Spot prawn landings increased in 2004 by 25% over 2003 landings to 101 t. Only trap gear has been allowed in the fishery since 2003, and a conversion program to allow trawl fishermen into the restricted access trap fishery was instituted. Ridgeback prawn landings in 2004 were at the lowest harvest since 1978 at 28 t.

California's commercial groundfish harvest for 2004 was over 12,000 t, consisting mainly of Pacific whiting, Dover sole, rockfishes, and sablefish. Ex-vessel value of groundfish landings for 2004 was \$13.7 million, a decrease of \$1.1 million from 2003. In addition, the Pacific Fisheries Management Council (PFMC) and NOAA Fisheries removed Pacific whiting from an overfished status and consider the stock to be officially rebuilt.

For highly migratory species (HMS), commercial and recreational landings of albacore decreased 22% and 27%, respectively; commercial yellowfin tuna landings were slightly higher than 2003, whereas recreational landings of yellowfin doubled; and, commercial landings of shark species decreased. Revisions to the HMS fishery management plan were adopted in March 2004 by the PFMC and NOAA Fisheries.

A new program to monitor the recreational catches of marine fishes in California entitled the California Recreational Fisheries Survey (CRFS) was implemented by the California Department of Fish and Game (CDFG) in January 2004. CRFS was created to provide more accurate recreational fisheries information in order to make in-season management decisions and avoid in-season closures.

In 2004, the Commission undertook 22 rule-making actions that address marine and anadromous species. The Commission also adopted the Market Squid Fishery Management Plan which initiates fisheries control rules, a restricted access program, and a seabird closure within the Gulf of the Farallones National Marine Sanctuary for the 2005–06 season. In addition, the Commission instituted a Spot Prawn Conversion Program which allowed several of the previously excluded spot prawn trawl vessels into the restricted access trap fishery.

Coastal Pelagic Finfish

Pacific sardine (*Sardinops sagax*), Pacific mackerel (*Scomber japonicus*), jack mackerel (*Trachurus symmetricus*), and northern anchovy (*Engraulis mordax*) are known as coastal pelagic species (CPS) of finfishes. These species are jointly managed by the PFMC and NOAA Fisheries. During 2004, combined commercial landings of these four species totaled 55,682 t (tab. 1), and the ex-vessel value exceeded \$5.4 million (U.S.). The Pacific sardine fishery is by far the most valuable fishery among these four species.

Pacific Sardine. The Pacific sardine fishery extends from British Columbia, Canada southward into Baja California, México (BCM). Although the bulk of the catch is landed in southern California and Ensenada, BCM, landings in the Pacific Northwest are increasing. The Pacific sardine harvest guideline (HG) for each cal-

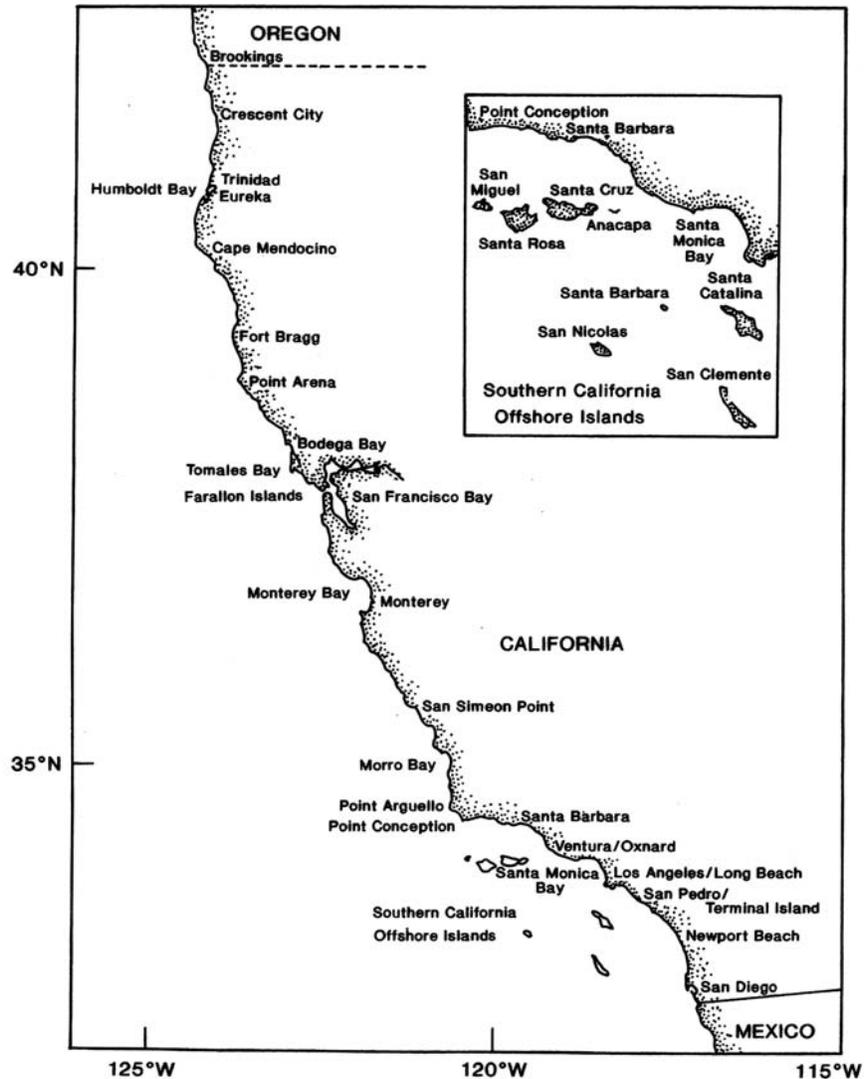


Figure 1. California ports and fishing areas.

endar year is determined from the previous year's stock biomass estimate (≥ 1 -year-old fish on 1 July) in U.S. and Mexican waters. The 1 July 2003 stock biomass estimate for Pacific sardine was 1.1 million t and the recommended U.S. HG for the 2004 season was 122,747 t. The southern sub-area (south of 39°00'00" latitude to the U.S.-Mexican Border) received two-thirds of the HG (81,831 t) and the northern sub-area (north of 39°00'00"N latitude to the U.S.-Canadian Border) received one-third (40,916 t). On 1 September, 80% (54,407 t) of the uncaught HG was reallocated to the southern sub-area, and 20% (13,602 t) was reallocated to the northern sub-area. On 1 December, the total remaining HG was opened coastwide, and by 31 December 2004, 81% (99,526 t) of the HG had been caught coastwide.

The development of a fair and balanced allocation scheme for Pacific sardine fisheries along the North American West Coast continues to be a top priority for the

managing agencies involved. The PFMC is scheduled to adopt a preferred alternative in June 2005, so the new allocation can be in place for the 2006 fishing season.

During 2004, a total of 44,293 t of Pacific sardine, valued at more than \$3.9 million, was landed in California. This represents a 22.6% increase in commercial sardine landings over 2003 (34,292 t). In California, commercial sardine landings averaged 43,235 t over the ten-year period from 1994–2004 (fig. 2). As in previous years, most (88.4%) of California's 2004 catch was landed in the Los Angeles (53.5%; 23,677.1 t) and Monterey (34.9%; 15,443.6 t) port areas (tab. 2). During 2004, a total of 27,841 t of sardine product was exported from California to 25 countries. Most of this product was exported to Japan (11,919 t) and Australia (9,830 t), which represents more than 77% of the total export value of just under \$14.6 million.

Oregon's sardine landings have increased steadily over

TABLE 1
 Landings of Coastal Pelagic Species in California (metric tons)

Year	Pacific sardine	Northern anchovy	Pacific mackerel	Jack mackerel	Pacific herring	Market squid	Total
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
1996	32,553	4,419	10,286	1,985	5,518	80,360	135,121
1997	46,196	5,718	20,615	1,161	11,541	70,257	155,488
1998	41,056	1,457	20,073	970	2,432	2,895	68,646
1999	56,747	5,179	9,527	963	2,207	91,950	164,945
2000	53,586	11,504	21,222	1,135	3,736	118,827	209,144
2001	51,811	19,187	6,924	3,615	2,715	86,203	170,080
2002	58,353	4,643	3,367	1,006	3,339	72,878	143,586
2003	34,292	1,547	3,999	155	1,780	44,965	88,741
2004	44,293	6,793	3,569	1,027	1,596	40,324	99,606

TABLE 2
 Landings of Pacific Sardine and Pacific Mackerel
 at California Port Areas in 2004

Area	Pacific Sardine		Pacific Mackerel	
	Landings t	% Total t	Landings t	% Total t
Eureka	24	0	0	0
San Francisco	370	1	0	0
Monterey	15,444	35	490	14
Santa Barbara	4,734	11	70	2
Los Angeles	23,677	54	3,012	84
San Diego	45	0	0	0
Total	44,293	100	3,572	100

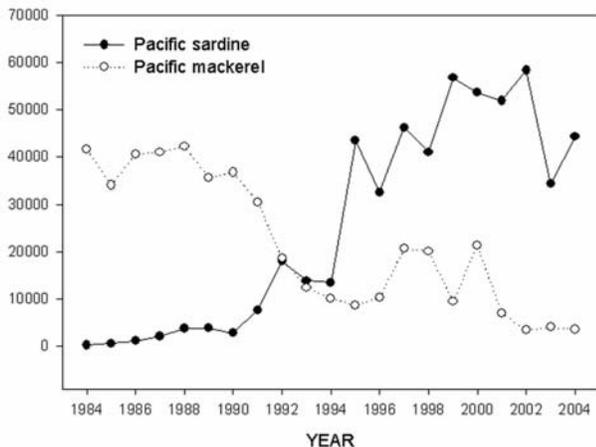


Figure 2. California commercial landings of Pacific sardine (*Sardinops sagax*) and Pacific mackerel (*Scomber japonicus*), 1984–2004.

the past few years (fig. 3). A total of 36,111 t of sardines with an ex-vessel value that exceeded \$4.8 million was landed into Oregon during 2004. This represents a 30% increase over 2003 (25,258 t). In contrast, Washington’s 2004 sardine landings decreased by 25% to 8,934 t in 2004, compared to 11,920 t in 2003 (fig. 3).

Pacific Mackerel. Although Pacific mackerel is occasionally landed in Oregon and Washington, the majority of landings are made in southern California and Ensenada, BCM. The U.S. fishing season for Pacific mackerel runs from 1 July to 30 June. At the beginning of the 2004–05 season (1 July 2004), the biomass was estimated to be 81,383 t and the HG was set at 13,268 t. Because mackerel are often landed incidentally to other CPS, the HG was divided into a directed fishery (9,100 t) with the remaining HG (4,168 t) set-aside for incidental catch (limited to 40% of a mixed load).

California landings of Pacific mackerel have been in decline since the early 1990s (fig. 2). Since 2002, annual landings have averaged 3,645 t. In 2004, 3,569 t of Pacific mackerel were landed in California with an ex-vessel value of \$549,253. Eighty-four percent (3,012 t) was landed in the Los Angeles port areas (tab. 2).

A total of 1,311 t of mackerel product was exported from California to 12 countries worldwide. Most (60%) of this product was exported to Japan. California’s export revenue for mackerel products in 2004 was nearly \$1.3 million.

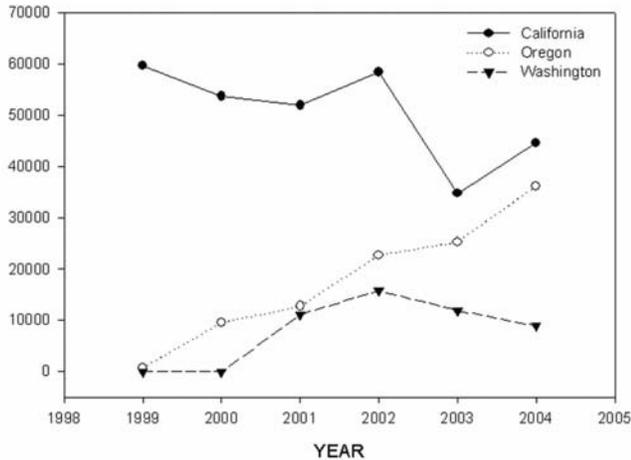


Figure 3. Commercial landings of Pacific sardine (*Sardinops sagax*) in California, Oregon, and Washington, 1999–2004 (PacFIN data).

Since 1999, an average of 219 t of Pacific mackerel has been landed in Oregon, and 107 t was landed during 2004. In Washington, annual landings of mackerel (unspecified species) have averaged 174 t since the year 2000; however, just 22 t were landed during 2004.

Jack Mackerel. Landings of jack mackerel in California were considerably higher in 2004 (1,027 t) than the previous year (155 t); however, they were very similar to 2002 landings (1,006 t). Ex-vessel revenues in 2004 totaled \$246,742, a 78% increase from 2003. In Oregon, landings of jack mackerel totaled 125.8 t with an ex-vessel value of \$17,262. This represents a 41% increase in landings from 2003 and a 93% increase from 2002. There were no reported landings of jack mackerel in Washington during 2004.

Northern Anchovy. Over the past decade, landings of northern anchovy in California have varied widely. This trend continued in 2004, when landings, which totaled 6,793 t, increased by 77% over the previous year (1,547 t). Ex-vessel revenues for northern anchovy totaled \$700,593, making this species the second most valuable CPS finfish in 2004 behind Pacific sardine. In terms of total ex-vessel revenues realized by the four CPS finfish, Pacific sardine represented 72.5%, northern anchovy 13%, Pacific mackerel 10%, and jack mackerel 4.5%.

A total of 53 t of anchovy product valued at \$280,141 was exported from California during 2004. Eighty-five percent of California's anchovy export product was shipped to two countries: China (22 t; \$139,179) and Australia (23 t; \$84,217). In 2004, no northern anchovy was landed in Washington; however, 39.1 t valued at \$3,111 was landed in Oregon.

Krill. Following a request from the National Marine Sanctuaries to prohibit krill fishing in the exclusive economic zone (EEZ) around the three marine sanctuaries off central California, the PFMC will initiate an amend-

ment to the CPS FMP to include krill as a management unit. To facilitate amending the CPS FMP, an alternatives analysis for krill management will be written in the general format of an environmental assessment. Currently, krill fishing is prohibited within the state waters of Washington, Oregon, and California.

INVERTEBRATE FISHERIES

Market Squid

Market squid (*Loligo opalescens*) continued to be one of the largest fisheries in the state. Statewide landings were estimated at 40,324 t, 10% less than 2003 (44,965 t) and 66% less than the record high set in 2000 (118,827 t) (fig. 4). The ex-vessel price ranged from \$150–750/t, with an average of \$450/t. The 2004 ex-vessel value was approximately \$19.9 million, a 22% decrease from 2003 (\$25.4 million).

The fishing permit season for market squid runs from 1 April through 31 March the following year. A northern fishery occurs during the spring and summer and is centered in Monterey Bay. A southern fishery occurs during the fall and winter off the Channel Islands and coastal southern California. During the 2004–05 season (as opposed to the 2004 calendar year), 46,211 t were landed, 15% less than the 2003–04 season (54,636 t) (fig. 5).

The northern fishery catch levels declined to historical levels during the 2004–05 season (fig. 5). Only 6,571 t were landed, a 62% decrease from the 2003/2004 season (17,399 t). Landings began in March and continued through November; however, the majority of landings occurred in May and June. Bad weather, poor squid quality, and concern over fishing pressure in Monterey Bay reduced fishing activity throughout the season. In July and August, water temperatures rose within the bay, further reducing landings. By September, fishing slowed considerably, and vessels began heading to the Channel Islands to participate in the southern fishery.

The southern fishery once again surpassed the northern fishery with 39,640 t landed (86% of the catch) during the 2004–05 season (fig. 5). This was a 6% increase from the 2003–04 season (37,237 t). Landings occurred throughout the season with the bulk of squid caught around the northern Channel Islands. During the late summer months, squid became scarce because of warm water temperatures, so vessels headed north to look for squid along the mainland coast near Point Conception and to participate in the northern fishery. Squid landings slowly increased again in November and remained steady throughout the remainder of the season despite heavy rain storms and overcrowding by vessels at Santa Cruz and Santa Rosa Islands. In March 2005, fishermen found it increasingly difficult to find the large squid

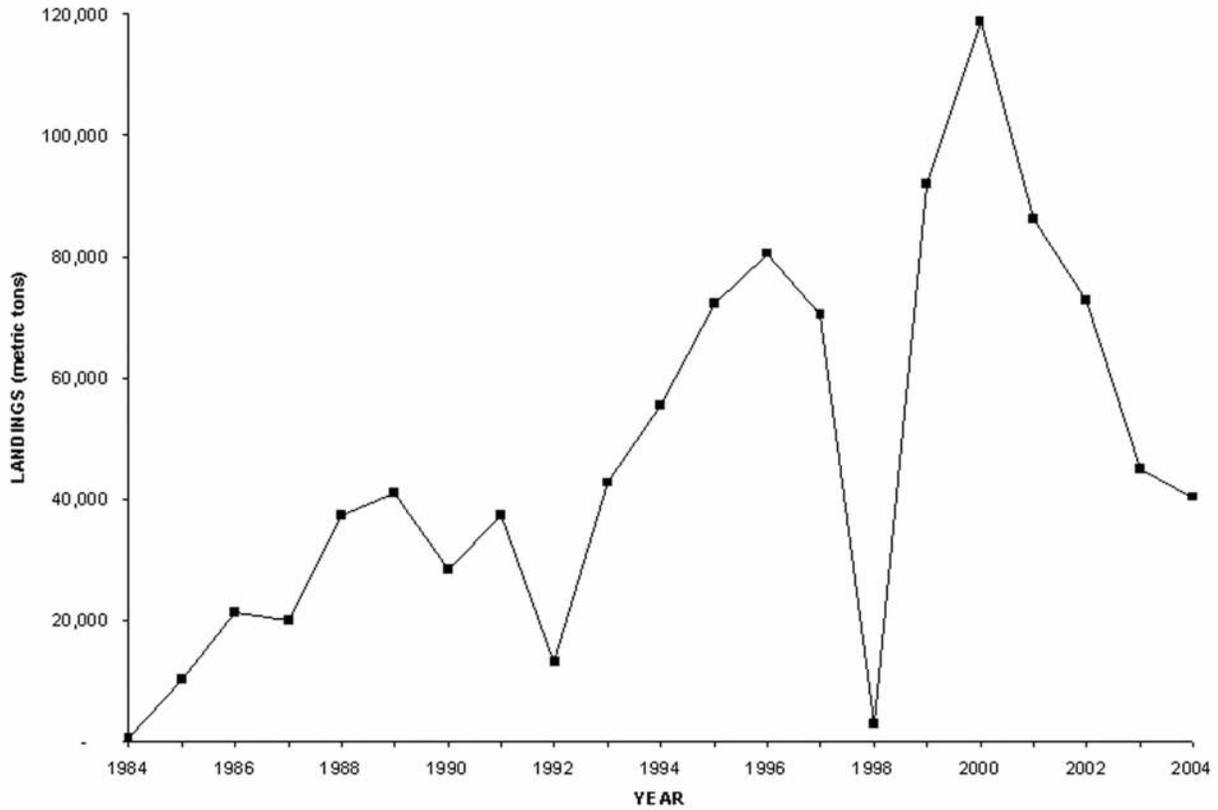


Figure 4. California commercial market squid landings, 1982-2004.

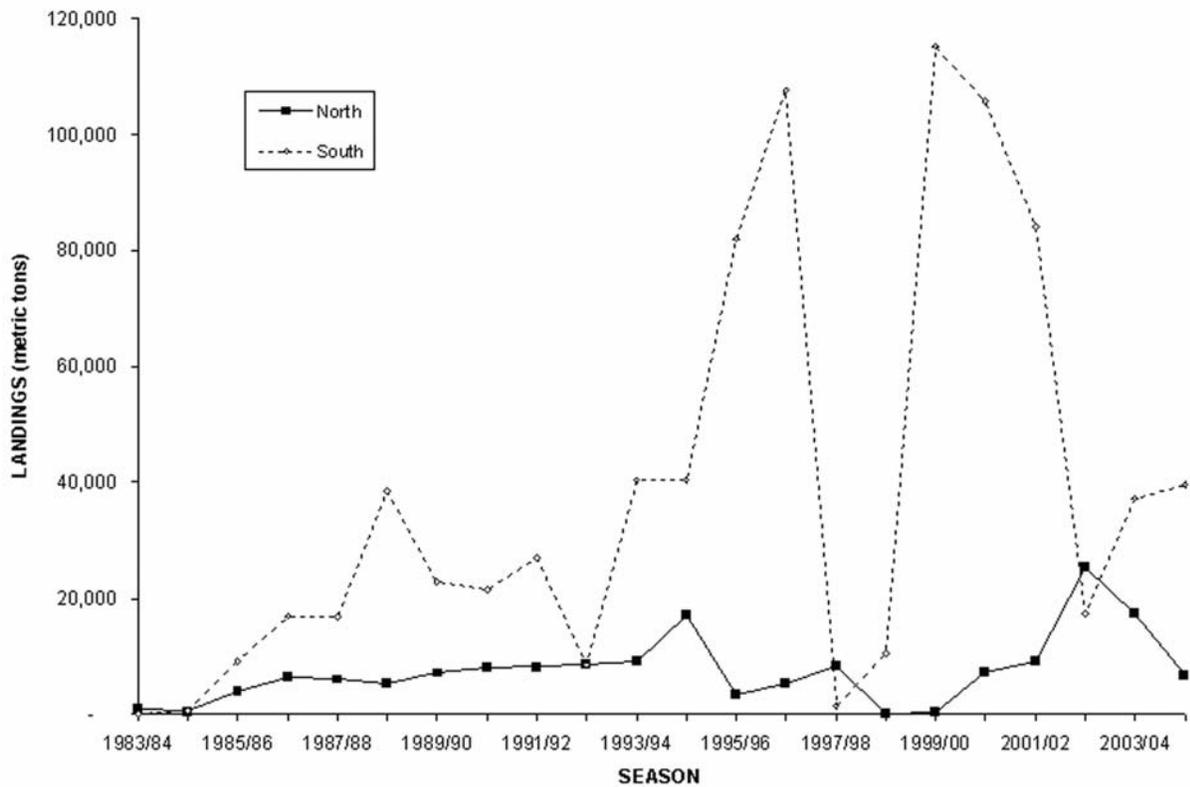


Figure 5. Comparison of market squid landings for northern and southern fisheries by fishing season (1 April-31 March), from the 1982-83 season to 2004-05 season.

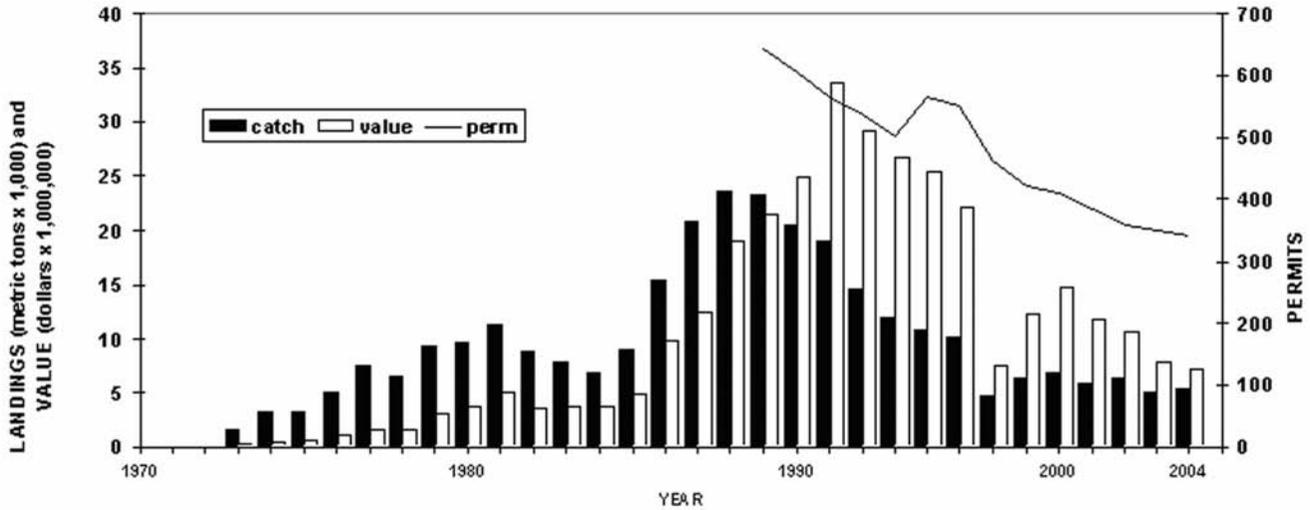


Figure 6. California commercial red sea urchin fishery catch, value, and number of permits, 1971–2004.

avored by the markets, so many switched to targeting Pacific sardine and mackerel or headed north to Moss Landing and Monterey.

Market squid remains an important international commodity. Squid is used domestically for food and bait and is packed and processed for export. In 2004, approximately 13,580 t of market squid were exported for a value of \$16.9 million. Asian countries were the main export market, with China and Japan taking about 60% of the trade.

In August and December of 2004, the Fish and Game Commission adopted the Market Squid Fishery Management Plan (MSFMP) and its implementing regulations, Sections 53.00–53.03, 149.00–143.00, Title 14, California Code of Regulations (CCR), which went into effect on 28 March 2005. The goals of the MSFMP are to provide a framework that will be responsive to environmental and socioeconomic changes and to ensure long-term resource conservation and sustainability. The tools implemented to accomplish these goals include: 1) setting a seasonal catch limit of 118,000 short tons (107,048 t) to prevent the fishery from over-expanding; 2) maintaining monitoring programs designed to evaluate the effect of the fishery on the resource; 3) continuing weekend closures that provide for periods of uninterrupted spawning; 4) continuing gear regulations regarding light shields and wattage used to attract squid; 5) establishing a restricted access program that includes provisions for initial entry into the fleet, permit types, permit fees, and permit transferability that produces a moderately productive and specialized fleet; and 6) creating a seabird closure restricting the use of attracting lights for commercial purposes in any waters of the Gulf of the Farallones National Marine Sanctuary. Under this framework, the Commission will be able to react quickly to changes in the market squid population

off California without the need for a full plan amendment. It will also provide the Commission specific guidelines for making management decisions. These guidelines will then allow for other management strategies, which would effectively achieve the goals and objectives of the MSFMP and Marine Life Management Act.

Sea Urchin

Statewide landings of red sea urchins (*Strongylocentrotus franciscanus*) in 2004 were estimated at 5.36 t with an ex-vessel value of \$7.1 million (fig. 6). This represents an increase of 6.4% over the previous year. However, northern California landings continued to decline, dropping another 39% compared to 2003, to 0.61 t (11% of the statewide total). Point Arena led northern ports for the second consecutive year, supplanting Fort Bragg as the top northern port during the first 20 years of the fishery.

The 2004 southern California landings increased by 18%, (4.75 t) from 2003. The long-term 1975–2004 average catch for the southern part of the state is 7.53 t. Santa Barbara landed 2.59 t in 2004, a 32% increase over the previous year, making it the number one port in the state with almost half of the state’s landings. However, based on market receipts, effort in Santa Barbara was up by only 16%, indicating that CPUE had increased significantly, by 320 kilograms per receipt, over the previous year. Santa Barbara landings increased as a direct result of the return of the northern Channel Islands as the primary southern California fishing area, after a dip in 2000 and 2001. This recovery also followed the decline of the southern Channel Islands from over 2.36 t caught in 1995 to about 0.32 t in 2004.

Poor market conditions continued to affect the industry, especially in northern California, where premium prices are often lower than those paid in the southern

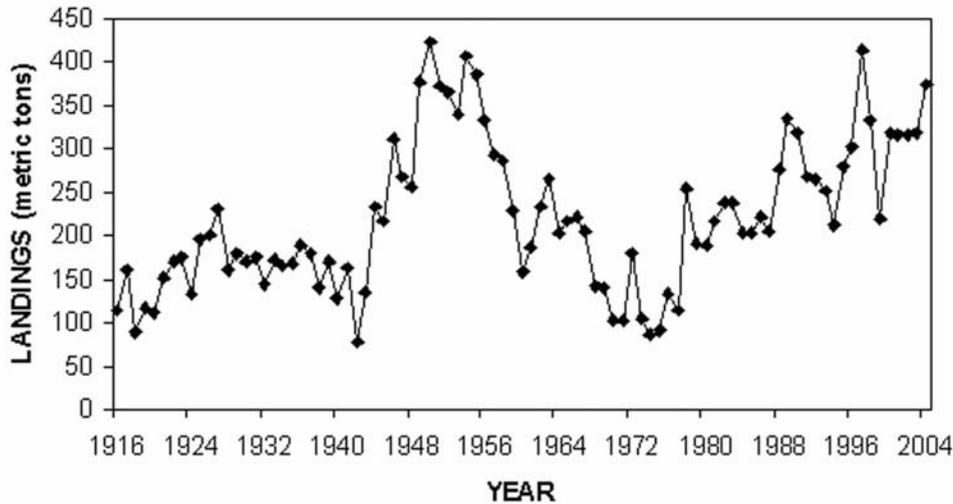


Figure 7. California commercial landings of California spiny lobster, 1916–2004.

part of the state. By the end of 2004, northern California was left with only one major dealer/processor. While some dealers have successfully increased the domestic market share in recent years, in response to weakened Japanese demand, domestic sales have not replaced that lucrative market. Sea urchin ex-vessel prices have been depressed for a number of years, with 24% of the catch selling for \$0.66–\$0.86 per kilogram, 24% selling for \$1.54–\$1.74 per kg, and less than 5% of the catch fetching over \$2.20 per kg. When adjusted for inflation, the 2004 catch yielded about one-half of the 1995 catch on a per-unit basis. Coupled with rising fuel costs, these low prices have combined to lead many divers to cease fishing until the economics improve.

There were 340 sea urchin permits issued in 2004, down by nine from the previous year (fig. 6). The median age of active urchin divers in 2004 was 48 years, with the median years of service at 12. The aging of the sea urchin diver population has been a growing concern of the industry in recent years. The issue of permit transferability is being debated more actively as older divers look to retirement or hope to pass on their permit to younger family members. This is especially true in northern California where market forces and more challenging diving conditions have reduced the working diver pool to only 20 active divers (those landing more than 4.5 t annually).

The Sea Urchin Fishery Advisory Committee (SUFAC) continued to support urchin resource research in 2004 by funding a long-term study of sea urchin larval recruitment by Dr. Stephen Schroeter. Results indicate that since 1990 larval settlement responds to the changes in large-scale oceanographic conditions associated with El Niños, but these responses differ markedly between northern and southern California. In northern California, large settlement events occurred during the relaxation

of upwelling associated with El Niño conditions in 1992, 1993, 1997, and 1998. By contrast, settlement in southern California was lower during El Niño events and increased following the end of the El Niño conditions.

The SUFAC also continued with development of its “barefoot ecologist” program, a collaborative effort between industry divers, scientists, and CDFG to provide a low-cost mechanism whereby urchin divers collect reliable size–frequency and density data on red sea urchin populations using scientifically valid protocols. Problems yet to be resolved with this program include designing an easy-to-use, accurate sea urchin measuring device and a reliable system for measuring habitat area.

California Spiny Lobster

Landings in 2004 for California spiny lobster (*Panulirus interruptus*) totaled 375 t, the highest landings since 1997 (fig. 7). Increases and decreases in landings are not unexpected in a fishery that is strongly influenced by the weather and El Niño and La Niña events. In 2004, landings were almost split evenly between San Diego (37%) and Santa Barbara/Ventura County ports (36%), with Los Angeles/Orange County ports (27%) contributing just over a quarter of the landings. Landings in previous seasons have been highest in San Diego, followed by Santa Barbara/Ventura, and then Los Angeles/Orange Counties. The lobster fishery was valued at \$5.91 million in 2004, up from \$5.02 million in 2003. California ex-vessel prices for spiny lobster consistently range from \$6.50 to \$8.00/lb. The spiny lobster catch is primarily exported to Asian markets, so prices depend on the strength of these overseas markets. In recent years, there has been an effort to develop a domestic market. However, results have been limited because of the common availability of American lobsters (*Homarus americanus*) at a much lower cost.

There has been a commercial fishery for California spiny lobster in southern California since the late 1800s, and commercial landings have been recorded since 1916 (fig. 7). Fishermen use baited traps that are individually set and buoyed to capture lobster alive. There is also a recreational fishery, where both skin and scuba divers are allowed to capture lobster using only their hands. Up to five baited hoop nets may also be used to take lobster recreationally, and this method of take is growing more popular. Commercial and recreational fishermen take lobster in shallow, coastal rocky areas from Point Conception south to the Mexican border and at offshore banks and islands. Lobster season runs from early October through mid-March, and the majority of the landings occur in the first few months of the season.

Since the 1950s, there have been several major regulation changes to better manage the fishery. In 1955, a minimum-size limit of 8.26 cm (3.25 in.) carapace length was established for both recreational and commercial fishers. Since the 1976–77 season, commercial fishermen have been required to use rectangular escape ports (6.05 cm x 29.2 cm) (2.38 in. x 11.5 in.) on traps to decrease the retention of undersized lobster. This management tool, along with warming ocean conditions following the regime shift in 1977, helped reverse the long downward trend in landings from the late 1950s to the 1970s (fig. 3).

A restricted access program for the commercial take of spiny lobster was initiated in the 1996–97 season after a two-year moratorium on permits. Although the number of active participants varies little from season to season, the number of lobster operator permits declines every year. Since 2000, six to nine permits have not been renewed annually. In the prior season (2003–04), a total of 228 permits were renewed, with only 154 actively fishing lobster. Prior to 2003, a small number (three or less) of new permits were issued via a lottery to qualified lobster crewmembers. In February 2003, the Commission repealed the permit lottery and the capacity goal of 225 fishermen. This was done in anticipation of CDFG conducting a formal review of the fishery, which did not take place as planned. Consequently, the industry went back to the Commission in 2004 and requested that it be allowed to move forward on a regulatory change that would allow qualifying lobster permits to be transferred. CDFG and the industry are working together to come up with a transferability program that will not cause a large increase in trap effort.

A logbook for the commercial fishery has been required since 1973. The logbook contains catch and effort information, such as the number of legal-sized lobster taken, the number of small lobsters released, the number, depths, and locations of traps used, and the number of nights the traps were fished. Logbook compliance

has remained high (90% and greater) so CDFG has confidence in the effort estimates derived from the logbooks. The total number of traps pulled in the 2003–04 lobster season was estimated at over 900,000. This number has steadily increased since the 1981–82 season when about 500,000 traps were pulled. Since the number of trap pulls has not been accompanied by a corresponding increase in catch, CDFG wants to adopt a conservative transferability program.

Currently, there are no limits on the amount of lobster commercial fishers can land nor on the number of traps they can use. Fishers set their traps along depth contours in shallow water at the beginning of the season and move them farther from shore (>30.5 m, >100 ft) as the lobsters migrate offshore. This offshore–nearshore migration is stimulated primarily by water temperature. Typically, fishers set 100–300 traps, but those with larger boats or a crewmember may set more.

The bag limit for recreational fishers is seven lobsters a day, down from ten a day in 1971. There are no other limits or reporting requirements, such as punch cards, to track the recreational take of spiny lobster. Department biologists are actively collaborating with Sea Grant and graduate students to develop methods of sampling and assessing the recreational take of lobster.

The commercial lobster industry has shown considerable concern about how the recently established Marine Protected Areas (MPAs) in the Channel Islands National Marine Sanctuary will affect their fishery. Department landings data, however, showed an increased catch of nearly 13% at the Channel Islands in the period after the MPAs were implemented when compared to the five previous seasons. This trend does not indicate that the MPAs are necessarily benefiting fishermen, but it does show that the immediate losses forecasted by the industry did not occur.

In 2003, studies were initiated by students from the Donald Bren School of Environmental Science & Management (University of California Santa Barbara) to develop a long-term monitoring program of the lobster resource in collaboration with stakeholders. Lobster fishers and Bren students are now collecting data together to characterize the lobster resource and its associated commercial fishery inside and out of MPAs. Another long-term goal is to provide assessment data for a fishery management plan for California's spiny lobster.

Spot and Ridgeback Prawn

Preliminary 2004 spot prawn (*Pandalus platycerous*) landings were 101 t, a 25 % increase from 2003 (76 t) (fig. 8). Until 2002, spot prawn were harvested by trawl and trap gear. In 2003, the use of trawl gear for the take of spot prawn was outlawed because of the bycatch of rockfish, particularly bocaccio, an overfished species.

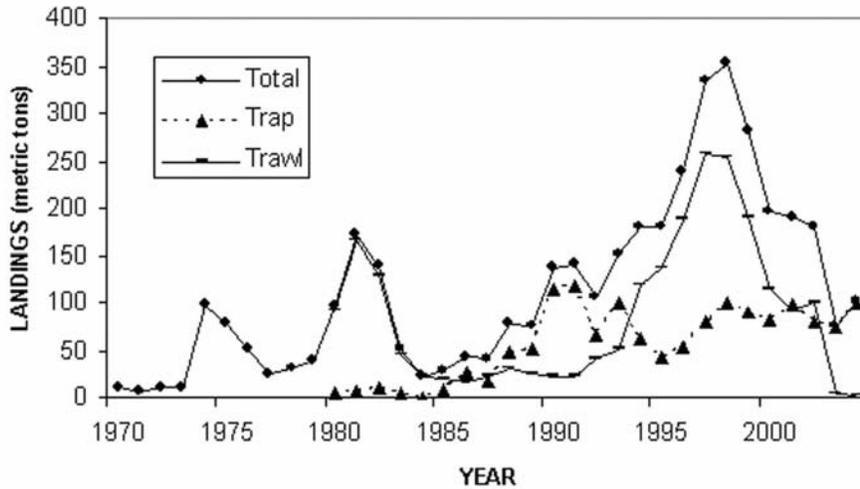


Figure 8. California commercial landings of spot prawn (*Pandalus platyceros*) using trawl and trap gear from 1970–2004.

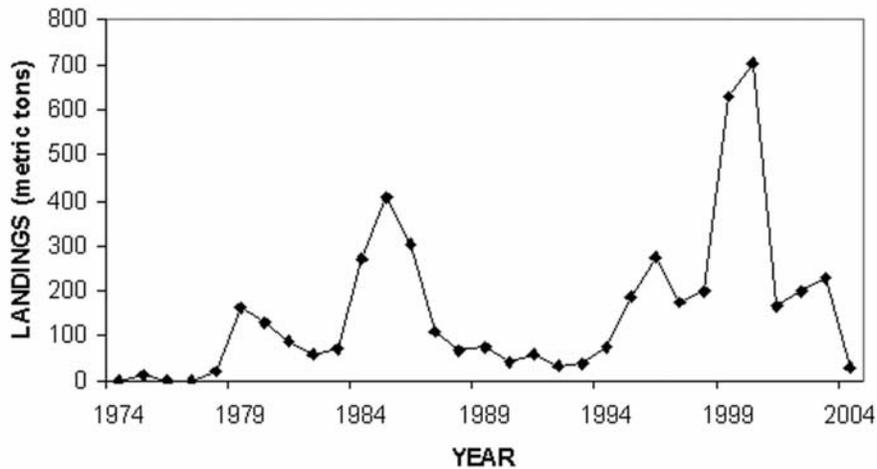


Figure 9. California commercial landings of ridgeback prawn (*Sicyonia ingentis*) from 1974–2004.

Consequently, 2003 spot prawn landings were the lowest since 1987 when trapping was just getting underway in southern California.

Spot prawn are currently caught only with trap gear. The traps are made of wire or plastic mesh of at least 2.22 × 2.22 cm (7/8 × 7/8 in.). The baited traps are fished in strings at depths of 100–167 m (600–1,000 ft.). A two-tiered restricted access trap vessel permit program was initiated in 2002. In 2004, 16 of the 17 Tier 1 trap vessels fished spot prawn from Santa Cruz south to the Mexican border. Tier 1 permittees may use no more than 500 traps unless fishing in state waters north of Pt. Arguello where they are only allowed the use of 300 traps. All three of the Tier 2 vessel permittees also made landings, but are limited to an annual harvest quota of just over 2 t (5,000 lbs.) and may use no more than 150 traps. A 0.023 t (50 lb) allowance of spot prawn while trawling for ridgeback prawn is still legal, but spot prawn

may not be landed as bycatch when trawling for pink shrimp. Eight ridgeback trawl vessels landed 1.4 t of spot prawn in 2004 caught as bycatch.

Almost all spot prawn harvested is sold live, with prices ranging from \$10.00 to \$13.50/individual. Fresh dead spot prawn generally sells for half the price of live. Most trap permittees have invested in live tanks and chillers on their vessels to keep the prawns in top condition for the live market.

The trap fishery in southern California (south of Pt. Arguello) is closed from 1 November to 31 January to protect gravid females. North of Point Arguello, the spot prawn trap season is closed from 1 May to 31 July, an accommodation to prevent serious fishing gear conflicts in the Monterey Bay area.

When the use of trawl gear for the take of spot prawn was prohibited, the Commission directed CDFG to develop a conversion program for the trawl fleet. A

conversion program went into effect at the end of 2004, which allowed the owners of 11 former trawl vessels to purchase Tier 3 spot prawn trap vessel permits. The fee for these permits is \$1,000, and they are non-transferable, whereas the Tier 1 vessel permit fee is \$250, and they were transferable on 1 April 2005. Tier 2 permits are non-transferable and have a fee of \$250.

Ridgeback prawn (*Sicyonia ingentis*) landings totaled 28 t in 2004, the lowest harvest since 1978 (fig. 9) when the fishery was just starting to expand. Ridgeback prawn are only taken with trawl gear, almost entirely in the Santa Barbara Channel. Ridgeback prawns are usually fished in 50–100 m (300–600 ft.) of water. Ninety-seven percent of the landings in the past two years were made in the ports of Santa Barbara and Ventura. Thirty boats landed ridgeback prawn in 2002, 25 in 2003, and only 14 in 2004. The closed season is between 1 June and 30 September, the spawning period for ridgeback shrimp.

In 2003, when ridgeback prawn were more abundant, the average price was only \$1.35/lb. The scarcity of ridgeback prawn in 2004 resulted in an average ex-vessel price of \$2.20/lb. Most of the catch is frozen whole for export and domestic markets.

Ridgeback prawn trawl logs, required since 1986, show that the catch per unit effort (CPUE) in lbs/tow hour varies with the abundance of prawn. CPUE increased from a low of 32 lbs/tow hour in 1992 (34 t harvest) to a high of 213 lbs/tow hour in 1999 (632 t harvest). CPUE averaged 72 lbs/tow hour in the three years prior to 2004, when it dropped to 32 lbs/tow hour. No biomass estimates or maximum sustainable yield calculations exist for ridgeback prawn. However, the landing figures reflect the species' wide fluctuation in availability.

Groundfish

Commercial Fishery Landings. California's commercial groundfish harvest for 2004 was 12,269 t (tab. 3). Total landings increased 16% (1,705 t) from 2003, although they have decreased by 50% (12,403 t) from 1994. The 2004 ex-vessel value for all groundfish was \$13.7 million, a decrease of \$1.1 million, or 7.4%, from 2003 revenues (\$14.8 million).

In 2004, 88% of the groundfish were landed with bottom and mid-water trawl gear, a slight increase over 2003 (85%). Line gear was second at 9%, a slight decrease from 2003 (11%). Trap gear accounted for 2.5% of 2004 landings, while the gill and trammel net remained at less than 1%, a decline from 5% in 1993.

The 2004 groundfish harvest was dominated by Pacific whiting, *Merluccius productus*, (4,742 t), Dover sole, *Microstomus pacificus*, (2,419 t), rockfishes, *Sebastes* spp., (1,758 t), and sablefish, *Anoplopoma fimbria*, (1,429 t) (tab. 3). Dover sole, thornyheads (*Sebastolobus alascanus*

TABLE 3
 California 2004 Commercial
 Groundfish Landings (metric tons)

	2004	2003	% change since 2003	1994	% change since 1994
Flatfishes	3,909	4,767	-18%	6,912	-43%
Dover sole	2,419	3,256	-26%	4,487	-46%
English sole	307	131	134%	460	-33%
Petrale sole	489	380	29%	548	-11%
Rex sole	211	258	-18%	570	-63%
Sanddabs	354	605	-41%	680	-48%
Other flatfishes	129	137	-6%	167	-23%
Rockfishes	1,758	1,984	-11%	10,722	-84%
Thornyheads	550	1,281	-57%	3,316	-83%
Widow	13	5	160%	924	-99%
Chilipepper	65	18	261%	1,847	-96%
Bocaccio	6	1	500%	973	-99%
Canary	1	1	0%	209	-100%
Darkblotched	47	12	292%	292	-84%
Splitnose	161	151	7%	334	-52%
Other rockfishes	915	515	78%	2,827	-68%
Roundfishes	6,423	3,631	77%	6,932	-7%
Lingcod	62	52	19%	564	-89%
Sablefish	1,429	1,629	-12%	2,184	-35%
Pacific whiting	4,742	1,741	172%	3,613	31%
Grenadier	139	163	-15%	529	-74%
Cabezon	49	40	23%	40	23%
Other roundfishes	2	6	-67%	2	0%
Other groundfishes	179	182	-2%	106	69%
Total	12,269	10,564	16%	24,672	-50%

and *S. altivelis*) and sablefish (the DTS complex) landings decreased 29% from 2003, with decreases in all three fisheries, most notably in the thornyhead fishery where landings decreased by 57%. However, chilipepper (*S. goodie*) landings increased 261%. Pacific whiting landings also increased from the previous year, with landings increasing by 172%. Widow rockfish (*S. entomelas*) and lingcod (*Ophiodon elongates*) landings also increased 160% and 19%, respectively. Another large contributor to the groundfish landings was English sole (*Parophrys vetulus*), with a 134% increase. These fisheries were offset, however, by the decreases in the DTS complex—sanddabs, rex sole (*Glyptocephalus zachirus*), and grenadier (*Macrouridae*, sp).

Recreational Fishery Catches. The new recreational sampling program, the California Recreational Fisheries Survey (CRFS), was implemented 1 January 2004. Estimates from this new program indicated that California anglers, regardless of trip type, spent an estimated 4.7 million angler-days fishing and caught about 1,100 t of groundfish (tab. 4). About 233,000 angler-days targeted rockfish and lingcod, resulting in a take of 659 t groundfish or about 60% of the total groundfish from all trips. Another 144 t of groundfish were taken during "other" trips (those trips that did not fall into any of the other trip type categories) and included trips that targeted California scorpionfish (*Scorpaena guttata*) and Pacific sanddab (*Citharichthys sordidus*). In addition,

TABLE 4
 Statewide California Estimates for Examined and Discarded Dead Catch by Weight (metric tons)
 of Groundfish for Specified Trip Type Categories and Groundfish Groups and Estimates of
 Recreational Effort (angler-days) by Trip Type Category

Groundfish Group	Rockfish, Lingcod	Other ¹	Anything	HMS, Coastal Migratory, Bass ²	Salmon	Bay Species, Halibut ³	Miscel- laneous ⁴	Total Trips
Leopard Shark/Spiny Dogfish	0.2	0.1	4.7	8.2	0.2	8	0.1	21.4
Minor Nearshore Rockfish ⁵	318.7	60.8	44.6	25.4	23.4	7.1	0.5	480.6
Rockfish Species of Concern ⁶	42	5.7	22	13.9	0.4	1.9	0	85.9
Other Shelf/Slope Rockfish	196.8	12.5	46.8	35.7	4.8	3.9	0.1	300.6
Lingcod	71.8	22.6	8.4	7.8	9.5	1.7	0.6	122.4
Cabezon/Greenling	26.1	3.9	5.1	5	2.9	0.6	0.3	43.8
Pacific Sanddab, Soles, Thornyheads	3.2	38.6	3.5	1.1	0.6	1	0.1	48
Starry Flounder	0.1	0	0.1	0.1	0.4	1.2	0.1	2
Pacific Whiting, Sablefish	0	0	0	0	0.8	0	0	0.8
Total Estimated Groundfish Catch	659	144.2	135	97.1	43	25.4	1.7	1105.5
Total Angler-Days	233,165	153,761	2,010,261	1,243,872	271,560	403,219	415,161	4,730,999

¹Other trip types include any target species not covered under the specified groups and include targeted California scorpionfish and Pacific sanddab trips.
²The Highly Migratory Species, Coastal Migratory, Bass trip type category includes the tuna/sharks/billfish, yellowtail, white seabass, and bass/barracuda/bonita trip types
³The Bay Species, Halibut trip type category includes the sturgeon, striped bass, and halibut trip types.
⁴The Miscellaneous trip type category includes the croakers, perches, corbina, and smelt trip types.
⁵The Minor Nearshore Rockfish group includes black rockfish.
⁶The Rockfish Species of Concern group includes the following rockfishes: bocaccio, canary, cowcod, widow, and yelloweye.

135 t of groundfish, or 12% of the total from all trips, was taken by anglers that were fishing for any finfish species that was available. Much of the remaining groundfish was taken by anglers targeting highly migratory species, coastal migratory species [yellowtail (*Seriola lalandi*), barracuda (*Sphyrna argentea*), white seabass (*Atractoscion nobilis*), Pacific bonito (*Sarda chiliensis*), basses—kelp bass (*Paralabrax clathratus*), barred sand bass (*P. nebulifer*)—, bay species (sturgeon (*Acipenser* spp.), and striped bass (*Morone saxatilis*)], California halibut (*Paralichthys californicus*), and salmon (*Oncorhynchus* spp.). In particular, the small amount of Pacific whiting was taken during trips targeting salmon while the landings of leopard shark (*Triakis semifasciata*) and starry flounder (*Platichthys stellatus*) were reported from trips targeting bay species and California halibut. In addition, leopard shark was taken during trips that targeted highly migratory and coastal migratory species.

2004 Groundfish Fishery Management Highlights.

In 2004, Pacific whiting was removed from the overfished status. Originally declared overfished in 2002, a new assessment was provided to the PFMC’s Stock Assessment Review (STAR) Panel and Scientific and Statistical Committee (SSC) for review. In 2003, the STAR panel and SSC considered two assessment models, both of which indicated the presence of a strong 1999 year class and that the estimated spawning stock biomass had reached its rebuilding threshold. Following recommendations from both the STAR panel and the SSC, NOAA Fisheries declared the West Coast stock of Pacific whiting as officially rebuilt and thus no longer considered an overfished species. Using these new assess-

ment results, the PFMC set new harvest guidelines with an acceptable biological catch of 514,441 mt for the entire stock.

Early in 2004, the PFMC adopted rebuilding plans for bocaccio (*S. paucispinis*), cowcod (*S. levis*), widow and yelloweye (*S. ruberrimus*) rockfishes under the Pacific Coast Groundfish Fishery Management Plan Amendment 16–3. It also mandated the use of the Cowcod Conservation Areas (CCA) as a primary cowcod rebuilding strategy. Finally, the PFMC asked the SSC to revise the Terms of Reference used to evaluate rebuilding plans for overfished groundfish stocks.

At the June 2004 PFMC meeting, NOAA Fisheries reported successful implementation of the Vessel Monitoring System (VMS) program and the associated telephone declaration system for those vessels with federal limited-entry groundfish permits. Nearly 300 VMS units are now in operation.

During 2004, NOAA Fisheries and the PFMC worked on developing an environmental impact statement (EIS) that proposed amending the Pacific Coast Groundfish FMP (FMP) to address essential fish habitat (EFH) for groundfish. A major management tool that the PFMC also considered in 2004, and continues to consider in 2005, is the creation of a dedicated access privilege [or individual quota (IQ)] system for the Pacific Coast groundfish limited-entry trawl fishery. A trawl IQ program would change harvest management in the trawl fishery from a cumulative two-month trip limit system to an individual annual quota system.

In-season Adjustments. In-season changes to the commercial and recreational management specifications

TABLE 5
 California Commercial Landings (metric tons) and Ex-vessel Values of Highly Migratory Species in 2004 and 2003

	Landings (t)			Ex-vessel Value (US\$)		
	2004	2003	% change from 2003	2004	2003	% change from 2003
Tunas						
Albacore	1,350	1,720	-22	2,449,097	2,609,146	-6
Yellowfin	478	465	3	447,496	449,708	<-1
Skipjack	304	349	-13	109,199	159,938	-32
Bluefin	37	36	3	53,487	74,552	-28
Bigeye	21	34	-38	147,696	262,766	-44
Billfishes						
Swordfish	817	1,472	-44	4,824,694	7,850,629	-39
Striped Marlin ^a	—	—	—	—	—	—
Roundfish						
Dorado	1	6	-83	5,638	8,200	-31
Sharks						
Common Thresher	67	177	-62	195,417	486,856	-60
Bigeye Thresher	3	3	0	4,139	3,782	9
Pelagic Thresher	1	2	-50	2,500	2,814	-11
Shortfin Mako	37	48	-23	97,071	115,504	-16
Blue ^b	—	—	—	—	—	—
Total	3,116	4,321	-28	8,336,430	12,023,890	-31

^aCommercial landings are prohibited in California.

^bReported landings less than 50 kilograms.

were implemented throughout 2004, as in past years, and are highlighted by the following:

Commercial Fishery

- A revised trawl bycatch model updated with a new year of at-sea observations and a new primary sablefish fixed-gear bycatch model were adopted for use in management decision making for in-season adjustments in 2004.
- In the spring, the PFMC recommended increased trip limits for Dover sole, thornyheads, and sablefish (the DTS complex) and petrale sole, arrowtooth flounder (*Atheresthes stomias*), and other flatfishes based on the updated trawl bycatch model projections. However, in the summer, the PFMC recommended adjusting cumulative limits for the DTS complex and petrale sole because landings were tracking ahead of projections.
- The PFMC's Groundfish Management Team identified the Cordell Bank as an area of particularly high catch of canary rockfish (*Sebastes pinniger*), an overfished rockfish species, and the PFMC and CDFG adopted closure of Cordell Bank to commercial and recreational fishing.
- The PFMC recommended adjusting regulatory requirements on trawl gear use to provide more opportunities to harvest target species with minimal effects to overfished species.
- During the summer, changes in landings allowances of incidental catches in the limited-entry trawl- and limited-entry fixed-gear fisheries were made for the remainder of the year.

- Darkblotched rockfish (*S. crameri*), as well as the deep-water slope species, and canary rockfish trip limits were increased, but later in the year, the PFMC recommended moving the trawl Rockfish Conservation Area (RCA) boundaries seaward to bring the total mortality of darkblotched rockfish close to zero. This latter action was taken due to higher-than-expected catches of darkblotched rockfish.

Recreational Fishery

- Various more restrictive in-season adjustments were also recommended in April 2004 to achieve PFMC harvest objectives for lingcod and canary rockfish.
- Upon Commission recommendation, the PFMC recommended that NOAA Fisheries change recreational bag limits for the rockfish/cabazon/greenlings complex north of 40°10'N latitude (near Cape Mendocino) to match regulations south of 40°10'N latitude.
- A closure of the Cordell Bank was implemented in the final rule for 2004 groundfish fisheries.
- The PFMC recommended in March 2005 that the Commission adopt an increase in the lingcod minimum-size limit from 24 inches to 30 inches and a reduction of the bag limit from two fish to one fish.

Highly Migratory Species

Albacore. Albacore (*Thunnus alalunga*) is the leading highly migratory species (HMS) caught in both commercial and recreational fisheries in California (Tabs. 5, 6). In 2004, commercial landings totaled 1,350 t, down 22% from 2003 (1,720 t). Ex-vessel revenues also decreased 6% (\$2.4 million) from 2003 (\$2.6 million);

TABLE 6
**California Recreational Commercial Passenger
 Fishing Vessel Landings (number of fish) of Highly
 Migratory Species in 2004 and 2003**

	Landings (number of fish)		
	2004	2003	% change from 2003
Tunas			
Albacore	181,620	249,651	-27
Yellowfin	62,189	29,947	108
Skipjack	4,324	32,249	-87
Bluefin	3,356	22,334	-85
Bigeye	434	60	86
Billfishes			
Swordfish	2	2	0
Striped marlin	4	4	0
Roundfish			
Dorado	7,731	3,211	141
Sharks			
Common thresher	18	26	-31
Bigeye thresher	1	0	100
Pelegic thresher	1	3	-67
Shortfin mako	301	113	166
Blue	6	47	-87
Total	259,988	337,647	-23

however, the average price per ton increased 16% from \$1,249 in 2003 to \$1,493 in 2004. Almost all (99%) of the albacore landed in California was landed using surface hook-and-line gears; some incidental take occurred in gillnets and purse seine gears. Exports of fresh frozen albacore from California went to Ecuador and Spain for canning. This decline in landings doesn't necessarily reflect a decline in the albacore population. Commercial albacore landings have varied dramatically over the last decade, ranging from 5,585 t in 1999 to 833 t in 1995, significantly lower than the highs in the 1950s and 1960s when landings were routinely over 27,000 t. This decline is attributed to a shift in fishing effort by the California-based fleet into waters off Oregon and Washington where albacore have been more available. Commercial landings of albacore in Oregon and Washington in 2004 were 4,807 t and 6,157 t, respectively.

Commercial Passenger Fishing Vessel (CPFV) logbook data indicate that recreational anglers landed 181,620 albacore, down 27% from 2003 (249,651) and down 42% from the record high of 312,776 in 2002. Eighty-nine percent of the reported catch occurred south of the U.S.-México border. According to CRFS data, the average weight per fish in 2004 was 7.1 kg, resulting in an estimated total landed weight of 1,290 t.

Stock status of albacore is reviewed at one to two year intervals by the North Pacific Albacore Workshop (members: United States, Japan, Canada, and Taiwan). Presently, the stock is healthy and not overfished, although stock and catches are increasing throughout the north Pacific.

No quotas are being contemplated, and no regional harvest guidelines are recommended at this time.

Yellowfin Tuna. Commercial landings of yellowfin (*Thunnus albacares*) totaled 478 t, up 3% from 2003 (465 t). The ex-vessel revenues decreased 1% (\$447,496) from 2003 (\$449,708). The average price-per-ton also decreased 3% from \$796 in 2003 to \$770 in 2004. California's coastal purse seine fleet caught 99% of the yellowfin landed in California. Exports of fresh frozen yellowfin tuna from California went mainly to México for processing. The annual landing trend has been declining since 1974, when more than 111,600 t of yellowfin was landed in California. The decline in commercial landings can be attributed to the relocation of large cannery operations overseas. Currently there are no canneries operating in California.

CPFV logbook data indicate the recreational anglers landed 62,189 yellowfin, twice the 29,947 fish reported in 2003. The increase in the CPFV landings can be attributed to an abundance of small yellowfin (<600 mm fork length) in coastal waters in the late summer and early fall. However, the 2004 catch is significantly lower than the high of 116,000 fish in 1983. While CPFVs from San Pedro to San Diego recorded catches of yellowfin, 87% of the 2004 catch was harvested south of the U.S.-México border. According to CRFS data, the average weight per fish in 2004 was 3.8 kg, resulting in an estimated total landed weight of 236 t.

The yellowfin stock appears to be below, but near, maximum sustainable yield (MSY), with fishing mortality higher than that recommended by the HMS FMP. The Inter-American Tropical Tuna Commission (IATTC) conducts stock assessments annually, and the recommended quota is usually between 250,000 and 300,000 t for the Eastern Pacific Ocean (EPO). In view of the small share (about 1%) of the total yellowfin catch made by West Coast fishers, and the productivity of the stock, no regional harvest guidelines were recommended at this time.

Skipjack Tuna. Commercial landings of skipjack (*Katsuwonus pelamis*) totaled 304 t, down 13% from 2003 (349 t). The ex-vessel revenues decreased 32% (\$109,199) from 2003 (\$159,938), and the average price per ton decreased by 22% from \$459 in 2003 to \$359 in 2004. Purse seine vessels caught 99% of the skipjack landed in California. Exports of fresh frozen skipjack went to México and Spain for processing and canning. Skipjack landings have declined over the past 24 years following the high of 78,926 t in 1980. The decline in commercial landings in California is attributed to the relocation of large cannery operations to overseas locations and the reflagging of U.S. vessels. Currently, there are no canneries operating in California. Almost all commercial skipjack landings in California are caught south of the U.S.-México border.

CPFV logbook data indicates recreational anglers landed 4,324 fish, down 87% from 2003 (32,249 fish). According to CRFS data, the average weight per fish in 2004 was 2.8 kg, resulting in an estimated total landed weight of 12 t. The decrease in landings can be attributed to a shift of skipjack from southern California's coastal waters in 2003 to waters beyond reach of the local CPFV fleet in 2004.

The eastern Pacific skipjack stock is assessed annually by the IATTC and appears to be very productive. No upper limit to the catch is evident, and no MSY has been established. In view of the small share (about 3%) of total catch made by West Coast fishers, and the productivity of the stock, no regional harvest guidelines were recommended.

Bluefin Tuna. Commercial landings of bluefin (*Thunnus thynnus*) totaled 37 t, up 3% from 2003 (36 t). The ex-vessel revenues decreased 28% (\$53,487) from 2003 (\$74,552); however, the average price per ton increased 63% from \$1,708 in 2003 to \$2,776 in 2004. Purse seine vessels operating in the Southern California Bight (SCB) caught 75% of the bluefin landed in California, and the drift gillnet fleet accounted for 25% of the reported landings. Exports of fresh frozen bluefin tuna from California went to Japan. Historically, landings peaked at more than 17,000 t in 1966. Since then, landings have been variable but declining due to a decrease in the availability of bluefin in the EPO and a decrease in the number of boats which direct their effort at them.

CPFV logbooks data indicate that recreational anglers landed 3,356 bluefin, down 85% from 22,334 fish landed in 2003. According to CRFS data, the average weight per fish in 2004 was 8.8 kg, resulting in an estimated total landed weight of 21 t. Of the bluefin landed by CPFV passengers, 86% was caught south of the U.S.-México border.

The IATTC reviews the status of the northern bluefin tuna stock occasionally. Evidence of overfishing or persisting decline in the stock is lacking. West Coast fishers account for about 10% of the total catch of the stock, harvesting mainly juveniles that migrate irregularly to the eastern Pacific. In view of the limited effect West Coast fisheries have on the spawning stock and the lack of international agreement on the need to control fishing mortality, no regional harvest guidelines were recommended.

Bigeye Tuna. Commercial landings of bigeye tuna (*Thunnus obesus*) totaled 21 t, down 38% from 34 t landed in 2003. The ex-vessel revenues also decreased 28% (\$147,696) from 2003 (\$262,766). Overall, bigeye commanded the highest average price per ton of all tunas landed in California; however, the average price per ton dropped 7% from \$6,341 in 2003 to \$5,902 in 2004.

The offshore longline fishery landed 100% of the bigeye in California. Exports of fresh frozen bigeye from California went to Canada.

CPFV logbook data indicate that recreational anglers landed 434 bigeye tuna, a seven-fold increase from 60 fish landed in 2003. Bigeye caught south of the U.S.-México border accounted for 89% of the landed fish. There is no CRFS estimate for an average weight in 2004.

In June of 2004, NOAA Fisheries declared bigeye tuna in the western and central Pacific overfished. By November, NOAA Fisheries implemented a final rule to close the U.S. longline fishery for bigeye when the landings reached 150 t. The fishery closed 13 December 2004.

Billfishes

Swordfish. Commercial landings of swordfish (*Xiphias gladius*) totaled 817 t, down 44% from 1,472 t landed in 2003. The ex-vessel revenues also decreased 39% (\$4.8 million) from 2003 (\$7.9 million); however, the average price per ton increased 11% from \$4,388 in 2003 to \$4,859 in 2004. Most swordfish landed in California support domestic seafood restaurant businesses. In the late 1970s, the swordfish fishery transformed from primarily a harpoon fishery to a drift-net fishery, and landings soared to a historical high of 2,357 t by 1985. Since then, annual landings have averaged more than 1,400 t.

Recreational anglers fishing from private vessels occasionally catch swordfish in southern California, but catch estimates are indeterminate due to a low number of sampler contacts with fishers. CPFV logbook data indicate only two fish landed in 2004 and 2003, indicating this mode of fishing is an insignificant component of the fishery.

Striped Marlin. The HMS FMP prohibits the commercial take or sale of striped marlin (*Tetrapturus audax*) to provide for and maximize recreational fishing opportunities. Marlin is caught as bycatch in the drift gillnet fishery for swordfish, resulting in regulatory discard.

Recreational anglers fishing from private vessels catch the majority of the marlin in southern California, but catch estimates are indeterminate due to a low number of sampler contacts with fishers. CPFV logbook data indicate only four fish landed in 2004 and 2003, suggesting that this mode of fishing is an insignificant component of the fishery.

Roundfish

Dorado (Dolphinfish). Commercial landings of dorado (*Coryphaena hippurus*) totaled 1 t, a decrease from 6 t landed in 2003. The ex-vessel revenues also decreased 31% (\$5,638) from 2003 (\$8,200); however, the price per ton increased three-fold from \$1,131 in 2003 to \$4,185 in 2004. High-seas longline vessels land the majority (62%) of dorado, followed by hook-and-line

(32%) and troll (6%) gears. Historically, dorado landings have been a relatively small component of the HMS management unit, and they vary from year to year, primarily depending on cyclic intrusions of warm water into the SCB. Dorado landings support local seafood restaurants in southern California when available to the commercial fleet.

CPFV logbook data indicate that recreational anglers landed 7,731 dorado, a two-fold increase from 3,211 fish landed in 2003. There is no CRFS estimate for an average catch weight in 2004. Dorado caught south of the U.S.-México border accounted for 91% of the landings.

Sharks

Common Thresher. Commercial landings of common thresher (*Alopias vulpinus*) totaled 67 t, down 62% from 177 t landed in 2003. The ex-vessel revenues also decreased 60% (\$195,417) from 2003 (\$486,856); however, the average price per ton increased 6% from \$2,266 in 2003 to \$2,400 in 2004. The common thresher is the leading shark landed in California where it is harvested primarily by drift gillnets (58%), followed by set gillnets (39%), and other assorted gears (3%) throughout the year. The thresher shark fishery emerged with the development of the drift gillnet fishery in the mid 1970s and supports the domestic seafood restaurant industry. Bigeye and pelagic threshers are also landed in California, but are a relatively minor component of the fishery. Because basic population dynamic parameters for these shark species are unknown, they are managed with a precautionary harvest guideline of 340 t.

CPFV logbooks data indicate that recreational anglers landed 18 common threshers, down from 26 fish landed in 2003. Recreational anglers fishing from private vessels in the SCB commonly catch thresher sharks, but catch estimates are indeterminate due to a low number of sampler contacts with fishers.

Shortfin Mako. Commercial landings of shortfin mako (*Isurus oxyrinchus*) totaled 37 t, down 23% from 48 t landed in 2003. The ex-vessel revenues also decreased 16% (\$97,071) from 2003 (\$115,504); however, the average price per ton increased 10% from \$1,976 in 2003 to \$2,168 in 2004. Mako is the second-most-common shark landed in California, where it is harvested by the drift-gillnet (42%) fishery targeting swordfish, followed by set-gillnet (38%), hook-and-line (11%), set longline (5%), and assorted gears. Landings occur throughout the year with the highest monthly landing weights occurring May through September. Because basic population dynamic parameters for this species of shark are unknown, it is managed with a precautionary harvest guideline of 150 t.

CPFV logbook data indicate that recreational anglers landed 301 makos, up almost three-fold from 113 fish

landed in 2003. Recreational anglers fishing from private vessels in the SCB commonly catch makos, but catch estimates are indeterminate due to a low number of sampler contacts with fishers.

Blue Shark. Commercial landings of blue shark (*Prionace glauca*) totaled 13 kg in 2004, a decrease from 49 kg in 2003. Over the past decade, landings have been minimal, averaging 5 t annually. Despite the low landings, this species is caught as bycatch in the drift-gillnet fishery and pelagic-longline fishery and discarded at sea. Survival rates of discarded blue sharks are unknown.

CPFV logbook data indicate that recreational anglers landed six sharks in 2004, down from 47 sharks in 2003. This species is not the target of the CPFV fleet.

2004 HMS Fishery Management Highlights. The PFMC and NOAA Fisheries completed the Highly Migratory Species Fishery Management Plan (HMS FMP) in March of 2004. The plan provides a management framework for HMS harvested within the EEZ and adjacent high-seas waters off the contiguous West Coast states. Adoption of the HMS FMP provided for implementation of new management and conservation tools, consolidation of existing state and federal tools, and international agreements for HMS. The new conservation and management tools include harvest control rules for common thresher and shortfin mako sharks, definition of prohibited and protected species, establishment of incidental HMS catch allowances, requirements for a new federal HMS vessel permit, requirements for logbook reporting and submissions, requirements for carrying fishery observers, and a summary of mandatory time and area closures.

Commercial fishing gears authorized for the harvest of HMS include: harpoons, surface hook-and-line gears, purse seines, drift gillnets, and longlines. Pelagic longline gear is prohibited inside the West Coast EEZ as is shallow-set longline gear in the adjacent high-seas areas to avoid gear interactions with endangered sea turtles and sea birds. Recreational gears authorized for harvest of HMS are hook-and-line, rod-and-reel, and spear.

There are two turtle conservation areas on the West Coast with seasonal drift gillnet restrictions. The Pacific Leatherback Conservation Area (PLCA), the largest of two conservation areas, spans the Eastern Pacific Ocean (EPO) north of Point Conception, California (34°27'N) to Oregon (45°N) and west to 129°W. Drift-gillnet fishing is prohibited annually within the PLCA from 15 August to 15 November. Another conservation area implemented to protect Pacific loggerhead turtles from drift-gillnet gear during a forecasted or occurring El Niño event is located south of Point Conception, California and west of 120°W from 1 January through 31 January and from 15 August through 31 August.

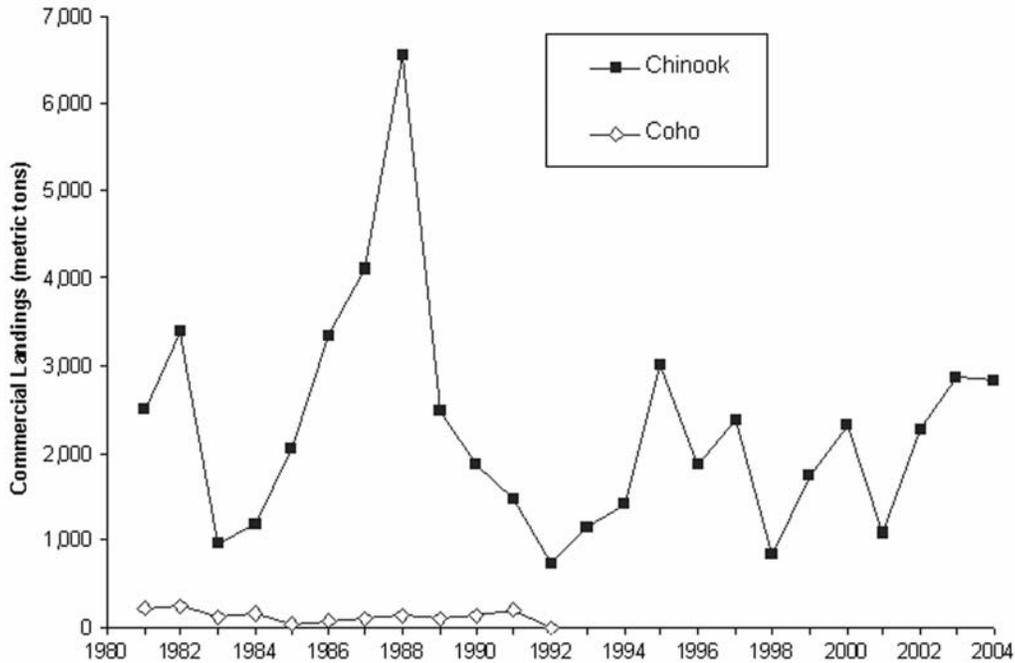


Figure 10. California commercial ocean salmon landings, 1981–2004.

Under the HMS FMP, stock status of tunas is determined by estimating the abundance (biomass) of the stock throughout its range and comparing the estimate of abundance with the adopted acceptable level of abundance. West Coast fisheries harvest a small fraction of the total catch taken by all nations in the north Pacific. Tuna catch by U.S. vessels based on the West Coast, as a percentage of the total catch for the stock, ranges from less than 1% for bigeye tuna to about 16% for albacore. In most cases, effective conservation of tunas requires international action.

Ocean Salmon

Commercial ocean salmon landings in 2004 were similar to 2003 landings. Approximately 500,800 dressed Chinook salmon (*Oncorhynchus tshawytscha*) were landed, weighing 2,824 metric tons in approximately 21,600 boat days (fig. 10). The value to the commercial fishing fleet was over \$17.9 million with an average price of \$2.87 per pound. Landings occurred primarily in the San Francisco and Fort Bragg port areas when open. This is partially due to a slight northern shift in the distribution of Chinook salmon, as well as an increase in the number of days open to fishing in Fort Bragg compared to the past few years. The 2004 ocean salmon seasons were slightly more restrictive than the 2003 seasons.

The recreational landings were more than double the 2003 landings. Landings totaled 220,200 Chinook salmon for 215,700 angler days (fig. 11). The average catch per angler day was 1.02 Chinook. There was a limit of two

fish per angler in all California management areas. The take of coho salmon (*Oncorhynchus kisutch*) has been prohibited in the recreational fishery since 1996. In the California portion of the Klamath Management Zone (KMZ) (Horse Mountain to the California–Oregon border), 22,800 Chinook salmon were landed in 25,500 angler days with a minimum size of 20 inches total length (TL). South of Horse Mountain the size limit was 24 inches TL until 30 April and 20 inches TL for the remainder of the season. Barbless “circle” hooks were required when fishing by any means other than trolling north of Point Conception.

The 2004 ocean salmon regulations adopted by the PFMC were designed to do the following:

- provide commercial and recreational seasons south of Point Arena that were substantially the same as the 2000 and 2001 seasons in terms of timing and duration;
- allow an exploitation rate (marine and freshwater combined) of no more than 15% for Oregon coast natural coho;
- provide for at least 35,000 naturally spawning adult Klamath River fall Chinook with a minimum adult natural spawner escapement rate of 33%;
- meet the Klamath River fall Chinook allocation objectives of 50% (31,100 fish) of the allowable adult harvest for tribal subsistence and 50% for commercial fisheries, at least 15% (4,700 fish) of the non-tribal harvest for the Klamath River recreational fishery, and 14.1% (3,700 fish) of the ocean harvest for the KMZ (Horse Mountain, California to Humbug Mountain, Oregon) recreational fishery;

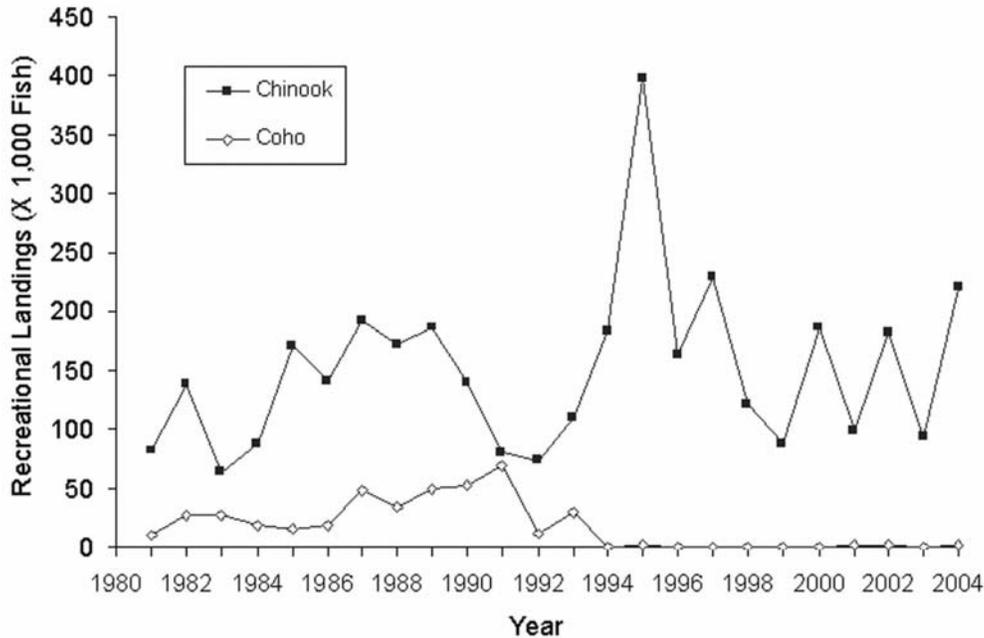


Figure 11. California recreational landings of ocean salmon, 1981–2004.

- limit the ocean harvest rate for age-4 Klamath River fall Chinook to no more than 16% to protect California coastal Chinook;
- provide for the escapement of 122,000 to 180,000 hatchery and natural adult Sacramento River fall Chinook; and
- prohibit the retention of coho salmon in California to protect central California coast coho.

For more complete information, see PFMC’s Web site, <www.pcouncil.org>, where you will find the report “Review of the 2004 Ocean Salmon Fisheries,” which was compiled by the PFMC Salmon Technical Team and PFMC staff.

Nearshore Live-Fish

Preliminary summaries of 2004 data indicated that commercial landings of California nearshore finfish totaled 247 t. Of that, 199 t were recorded as live landings and 48 t as dead landings. The ex-vessel value of total landings for 2004 was \$2.2 million, of which \$1.9 million was paid for live fish (fig. 12). Compared to 2003, this represents a 7% increase in total nearshore landings and a 10% increase in value. Live landings decreased by 2% compared to 2003, and there was no change in the total ex-vessel value. The proportion of live landings in the nearshore fishery declined to 81% compared to 87% in 2003 (fig. 13).

Management of the Fishery. The nearshore fishery, as defined in Section 1.90, Title 14 of the CCR, includes a select group of finfish: cabezon (*Scorpaenichthys marmoratus*), California scorpionfish (*Scorpaena guttata*), California sheephead (*Semicossyphus pulcher*), kelp and

rock greenlings (*Hexagrammos decagrammus* and *H. lagocephalus*), monkeyface eel (*Cebidichthys violaceus*), and the following rockfishes (*Sebastes* spp.): black (*S. melanops*), black-and-yellow (*S. chrysomelas*), blue (*S. mystinus*), brown (*S. auriculatus*), calico (*S. dallii*), China (*S. nebulosus*), copper (*S. caurinus*), gopher (*S. carnatus*), grass (*S. rastrelliger*), kelp (*S. atrovirens*), olive (*S. serranoides*), quillback (*S. maliger*), and treefish (*S. serripes*). The 19 species are primarily found in association with kelp beds or rocky reefs in waters less than 20 fathoms. Most are territorial, slow-growing, and long-lived, making them vulnerable to overfishing even at low exploitation rates. These species are commonly captured in the nearshore live-fish fishery, and they are managed by the state under the Nearshore Fishery Management Plan (NFMP). All except California sheephead, monkeyface eel, and rock greenling are also included in the PFMC fishery management plan for Pacific coast groundfish.

History and Fishing Operations. The nearshore live-fish fishery began in the mid-1980s. Initially, the fishery supplied live fish for the California Asian community. The live-fish market has since expanded and now supplies markets nationally and, in some cases, internationally. Before the market for live fish developed, the wholesale value (ex-vessel value) for rockfishes, cabezon, California sheephead, and greenlings was low. An increase in consumer demand for a premium quality product caused landings of live fish to increase. Because the ex-vessel price for live fish is usually higher than the price for dead fish, the overall value of the fishery increased dramatically. In 1989, cabezon was primarily landed dead and the average ex-vessel price was less than

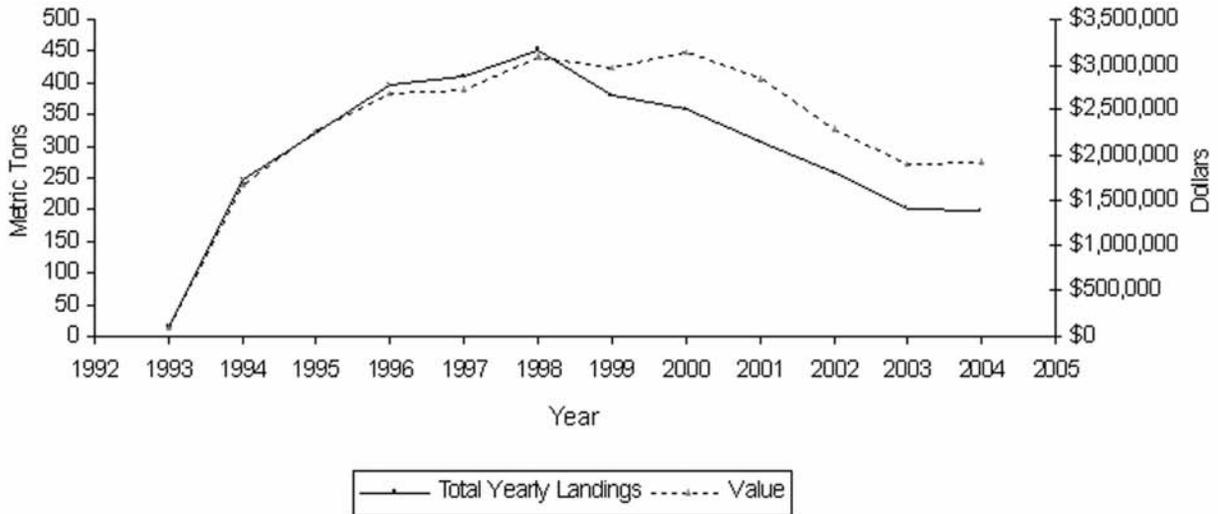


Figure 12. California nearshore live-fish landings and ex-vessel value, 1993–2004.

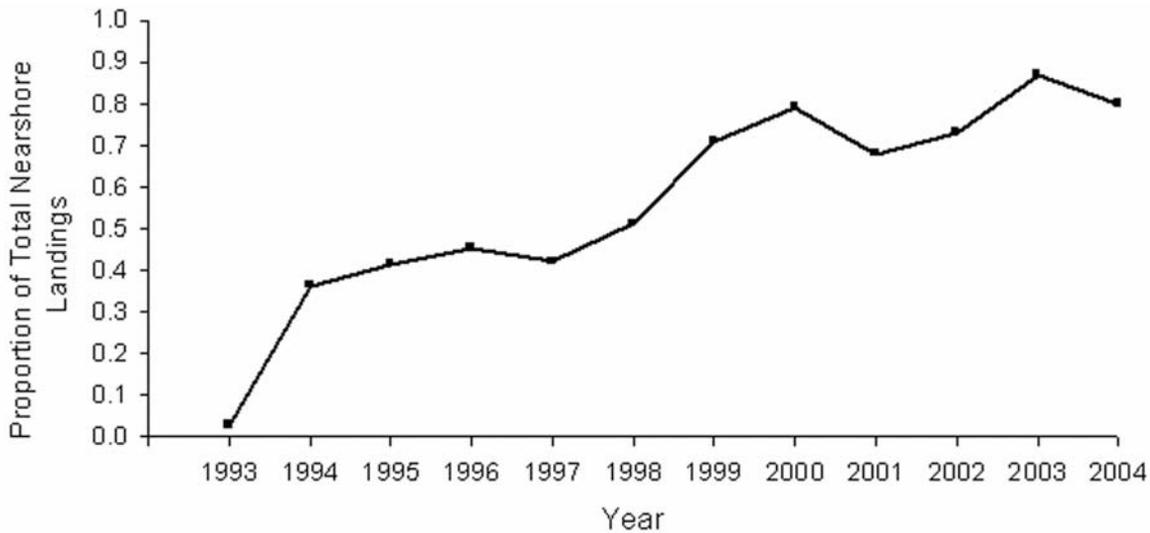


Figure 13. Proportion of fish landed live in the nearshore fishery, 1993–2004.

50 cents per pound. In 2004, the average ex-vessel price for dead cabezon was \$2.40 per pound while the live cabezon price was \$4.74 per pound (down slightly from \$4.81 in 2003). Prices vary widely depending on port region, species, size, season, and marketability of fish. In 2004, ex-vessel prices for live landings of the 19 nearshore species ranged as high as \$10.50 per pound.

Primary gear types used to capture nearshore fish include various hook-and-line methods and trap gear. Hook-and-line gear includes rod-and-reel, vertical longlines, horizontal longlines, and weighted “stick gear.” Vessels using hook-and-line gear are limited to 150 hooks per vessel and not more than 15 hooks per line. In addition, no more than 50 finfish traps may be used in state waters along the mainland shore. Most hook-and-line and trap vessels range from 20–40 feet in length

and are capable of operating in shallow water close to shore. The fishery is generally short-range, and operators deliver live fish to market or to dockside holding bins daily when weather allows. California scorpionfish is also taken live using hook-and-line gears and as by-catch in the trawl fishery.

Nearshore Landings Information. Landing receipts are the primary source of information for quantifying commercial catch and landings in the nearshore fishery. By law, commercial fish buyers must complete a landing receipt at the time fish are received, purchased, or transferred. Information such as aggregate species weight, price paid, gear used, and condition (e.g., live) must be provided. Considerable effort is spent reviewing and editing landing receipts to ensure information such as species, species’ weights, and condition code, is accurately re-

ported. When condition information is missing, it can often be determined by examining the ex-vessel price: a substantially higher price usually indicates a live landing.

Landings information, especially in the 1980s and 1990s was sometimes reported by market category rather than by species. This provided limited information on the species composition of the catch. In recent years, regulations mandating that dealers record landing weights by species for some of the 19 nearshore finfishes has reduced the widespread use of group market categories. Nevertheless, market categories on which this review is based likely contain several different species similar in appearance or market value. For example, the “group gopher” market category often includes gopher, brown, black-and-yellow, grass, kelp, copper, China, and quillback rockfishes. For consistency with previous reports, landings information for market categories is provided in this report.

Data used for this report are preliminary, and live-fish landing weights provided in this review should be interpreted as conservative estimates of the actual live-fish landings in 2004. It should also be noted that condition (live or dead) of fish landed was not required to be reported on landing receipts until 1993; therefore, prior years were not considered in this review. Statewide for 2004, 81% of nearshore fish were reported to be landed live (fig. 13); this is down slightly from the 87% reported in 2003.

Regional Landings. Prices and dominant landings varied by management region, ports within a region, and season. Below is a regional summary for 2004.

North Coast Region (Oregon border to Cape Mendocino; Port Complexes of Crescent City and Eureka): Landings in the North Coast Region totaled 73 t, or 30% of nearshore fish landings statewide, with a preliminary ex-vessel value of \$0.30 million. Of the total, 73% were landed live. Approximately 27% of the state’s live fish were landed in the North Coast Region for a value of \$0.24 million. In this region, live landings were dominated by the black rockfish market category (46 t), followed by the cabezon (2 t), and quillback rockfish (1 t) categories. The black rockfish category accounted for 64% of the North Coast Region’s landings of live fish and 23% of statewide live landings, as well as 10% of the value of all statewide live landings. Almost 100% of the live fish landings in this region were taken by hook-and-line gear.

North-Central Coast Region (Cape Mendocino to Point Año Nuevo; Port Complexes of Fort Bragg, Bodega Bay, and San Francisco): North-Central Coast Region landings totaled 35 t or 14% of nearshore fish landings statewide with an ex-vessel value of \$0.36 million. Sixty-six percent of the total was landed live. The North-Central Region landed approximately 12% of the state’s live fish

with a value of \$0.25 million. The top three market categories landed live were cabezon (10 t), gopher rockfish (4 t), and black-and-yellow rockfish (3 t). These three market categories accounted for 44%, 19%, and 11% of the North-Central Coast Region’s landings of live fish, respectively. Hook-and-line gear was used to take 86% of live cabezon landings. Finfish traps are allowed only in certain parts of the North-Central Coast Region. This region had the lowest proportion of live landings.

South-Central Coast Region (Point Año Nuevo to Point Conception; Port Complexes of Monterey and Morro Bay): South-Central Coast Region landings totaled 87.5 t or 32% of nearshore fish landings statewide with an ex-vessel value of \$1.06 million. Of these 87.5 tons, 79 t (90%) were landed live—the highest proportion of any region. Approximately 40% of the state’s live fish were landed in this region for a value of \$1.02 million. Live landings were dominated by cabezon (29 t) and brown rockfish (22 t), accounting for 65% of the South-Central Coast Region’s landings of live fish, followed by grass (10 t), gopher (9 t), and black-and-yellow (6 t) rockfish market categories.

South Coast Region (Point Conception to México border; Port Complexes of Santa Barbara, Los Angeles, and San Diego): South Coast Region landings totaled 52 t or 21% of nearshore fish landings statewide with an ex-vessel value of \$0.48 million. Forty-four tons were landed live, representing 84% of the regional total. About 22% of the state’s live fish were landed in the South Coast Region for a value of \$0.43 million. In 2004, live landings of California sheephead dominated the landings (32 t), followed by cabezon (5 t), grass rockfish (2 t), and California scorpionfish (2 t). All together, these categories accounted for 94% of the South Coast Region’s landings of live fish. Eighty-six percent of the sheephead landings were taken using trap gear.

Recent Trends in the Fishery. Preliminary data for 2004 indicate that landings of live fish leveled off following a decline from a peak in 1998 (453 t landed). Beginning in 1999 and 2000, changes in federal and state regulations, which limited landings, accounted for much of the observed decline. In addition, the 2004 total value of the fishery also leveled off (fig. 12) compared to the previous year.

Total nearshore landings increased slightly from 2003 to 2004, although there was a small decrease in the number of nearshore permittees. An increase in the 2004 black rockfish optimal yield (OYs) was accompanied by increases in trip limits for certain species. Increased trip limits may have provided an economic incentive for certain permittees who would otherwise not have fished. Conversely, the California sheephead TAC decreased in 2004, providing less opportunity for that species in the southern region. Nearshore effort and landings contin-

ued to be tied to low federal trip limits and depth restrictions designed to protect overfished species such as bocaccio, canary and yelloweye rockfishes, and lingcod.

Nearshore Fishery Management Plan Implementation.

The Nearshore Fishery Management Plan (NFMP), adopted in 2002, is a framework plan that identifies a management strategy for many of the nearshore species targeted by the nearshore live-fish fishery. Five management approaches (Fishery Control Rule, Regional Management, Allocation, Marine Protected Areas, and Restricted Access) form the basis for integrated management strategies that, over time, will meet the goals and objectives of the Marine Life Management Act (MLMA) and provide for sustainable nearshore stocks and fisheries. Since the NFMP was adopted, management has improved and will continue to do so as we implement these approaches and our knowledge base increases.

- *Use of the NFMP Fishery Control Rule:* The NFMP relies on an information-based harvest strategy that uses an increasing level of knowledge to establish harvest limits; it is more conservative than the current control rule for federal groundfish utilized by the PFMC. As more information becomes available, for example through formal stock assessments and improved essential fishery information, harvest limits can be modified. For example, catch limits may be adjusted based on estimates of existing stock relative to unfished levels rather than based on a portion of recent landings. Assessment scientists used this fishery control rule formula in 2003 to calculate harvest limits for cabezon and black rockfish, which were adopted by state and federal regulatory agencies in 2004.
- *The Restricted Access Program:* A full restricted access program was implemented for the shallow nearshore species (cabezon, California sheephead, greenlings, California scorpionfish, and black-and-yellow, China, gopher, grass, and kelp rockfishes) in 2003. Nearshore Fishery Permit (NFP) holders now have regional permits that only allow them to use hook-and-line gears. A regional gear endorsement also allows the use of trap gear. A total of 216 NFPs were issued in 2003, and a total of 202 permits were issued in 2004, resulting in an annual attrition rate of about seven percent.

A nontransferable Deeper Nearshore Species Fishery Permit (DNSFP) was first required in 2003 to take black, blue, brown, calico, copper, olive, quillback, and treefish rockfishes. There were 286 permittees in 2003 and 246 permittees in 2004, resulting in an attrition rate of nine percent.

- *Regional Management:* Regional management of the nearshore fishery depends on the ability to monitor both recreational and commercial landings by geographic area. Previously, only the commercial sector of the fishery could be monitored on a regional basis.

The new California Recreational Fishery Sampling program was implemented in 2004, making regional recreational estimates possible. This new level of precision is expected to further efforts to develop region-based management for the nearshore fishery.

- *Marine Protected Areas:* Implementation efforts have been directed toward evaluating the available information on appropriate habitat for the NFMP species in and around Marine Protected Areas (MPAs), with an emphasis on southern California species. This effort will help determine the adequacy of utilizing existing MPAs as reference reserves for NFMP species. It may eventually provide time series data on nearshore fish abundance resulting from monitoring both inside and outside reserves.

Pacific Herring

California's Pacific herring (*Clupea pallasii*) fisheries had mixed success in 2004. Statewide landings for the 2003–04 sac roe season (December 2003–March 2004) totaled 1,651 t, a decrease of 16% from the 2002–03 landings of 1,975 t, with permittees in all fishing areas not reaching their quotas. The San Francisco gill net fleet, composed of three platoons (418 active permits), landed 1,397 t, 23.7% under the 1,833 t quota. The Tomales Bay fishery (36 permits) landed a total of 253.7 t of the 453.6 t quota. No fishing effort took place in Crescent City (three permits) with a 27.2 ton quota, and Humboldt Bay landings (four permits) totaled only 0.53 tons, far below the 54.4 ton quota for that fishery. Annual sac roe landings January to December 2004 decreased from 1,780 t to 1,596 t, down 10.3% from the previous year (tab. 1).

Catch value in the herring sac roe fishery is based on roe recovery rates. Ex-vessel prices for herring with 10% roe recovery averaged an estimated \$500 per short ton for gill-net landings, with an additional \$50 paid for each percentage point above 10%. This is the third consecutive season that the ex-vessel price per ton has been well below the 10-year average of \$873, reflecting the continuing volatility of the Japanese economy. The statewide ex-vessel value of the sac roe fishery fell to \$879,500 in 2004, the lowest value for this fishery in 10 years at only 15.7% of the average value per year for the previous nine seasons (\$5.6 million). Since the 1997–98 season, the San Francisco Bay herring eggs-on-kelp fishery landings have been below average. Landings totaled 5.7 t, which was only 16.1% of the 35.3 t quota and an 88.7% decrease from last season's landings of 53.3 t. The total estimated value of the 2003–04 eggs-on-kelp harvest was approximately \$43,712 based on an average ex-vessel price of \$3.50/lb. Under favorable market conditions, the price paid for herring eggs-on-kelp may vary with the product's grade, with grade 1 receiving approximately \$10/lb, and grade 5 bringing \$3–4/lb.

CDFG conducted research surveys in three bays to estimate the spawning biomass of each herring stock. Spawn deposition survey estimates were used to assess San Francisco, Tomales Bay, and Humboldt Bay populations.

The 2003–04 herring spawning biomass estimate for the San Francisco Bay population was 31,207 t, which is 25.4% below the 30-year average (41,845 t). There was no herring spawning biomass estimate for the 2002–03 season. The age composition of the 2003–04 San Francisco Bay population, based on current otolith readings, reflects a continued depressed age structure that has been observed since the 1997–98 El Niño season. The 2003–04 spawning biomass estimate for Tomales Bay was 10,999 t, which represents an increase of 176.6% over the 2002–03 biomass estimate (3,975 t). This estimate is the largest since the re-opening of the Tomales Bay herring sac roe fishery in the 1992–93 season and the second largest recorded since the CDFG first initiated annual population assessments in Tomales Bay during the 1972–73 season. In Humboldt Bay, CDFG conducted spawning ground surveys and monitoring of the herring gill net fishery for the fourth consecutive season. The 2003–04 spawning biomass estimate for Humboldt Bay was 459 t, an increase of 199.4% over the 2002–03 biomass estimate (153 t). No surveys were conducted in Crescent City Harbor.

The herring roe product, “kazunoko,” remains an integral part of traditional Japanese New Year’s festivities. However, changes in the Japanese culture and economy have also resulted in changes to the sac roe market. Industry observers expect demand for kazunoko to wane as younger Japanese become more westernized. Ex-vessel prices are expected to remain low with concern for the Japanese economy, and herring buyers will proceed cautiously by offering similarly low prices in the 2003–04 season.

Recreational Fishery

Recreational ocean fishing in California takes place from piers, shorelines, private vessels, and CPFVs across more than 1,100 miles of coastline. To more efficiently monitor the catch of over 1 million saltwater sport anglers and divers, the CDFG implemented the CRFS program in January 2004.

The CRFS is a new method for estimating total marine recreational finfish catch and effort in California. The program is a coordinated sampling survey designed to gather catch and effort data from anglers in all modes of marine recreational finfish fishing. This survey incorporates and updates the sampling methodologies of the National Marine Fisheries Services’ Marine Recreational Fisheries Statistics Survey (MRFSS) and the CDFG’s Ocean Salmon Project. The CRFS program includes many changes and improvements over previous surveys,

such as high-frequency, on-site sampling, on-site estimates of private boat effort, emphasis on species of concern, and use of an angler license database to estimate effort when it cannot be estimated directly from field sampling.

The CRFS was created in response to the concerns of fishery managers and constituents over using MRFSS to make in-season management decisions. The primary goal of CRFS is to provide fishery managers with more accurate and timely marine recreational fishery-based data in order to make necessary adjustments and avoid in-season closures. In 2004, there were several in-season adjustments made to recreational groundfish regulations. On 1 March, recreational groundfish was closed on the Cordell Bank (off Marin county) to reduce incidental take of canary rockfish. On 1 April, the daily bag limit on lingcod went from two fish to one fish per day, and the size limit increased from 24 to 30 inches. On 16 May, fishing for black rockfish was closed in state waters north of 40°10'N latitude.

The CRFS sampling effort in 2004 increased substantially from MRFSS sampling effort in 2003. The number of recorded fish lengths went up 109% (88,665) from 2003 (42,462), while the total number of fish counted went up 250% (220,567) from 2003 (63,019). The number of anglers interviewed increased by 276% (126,814) from 2003 (33,748), and the number of assignments completed rose by 117% (4,097) from 2003 (1,888). Additionally, the number of CRFS samplers working in the field doubled from 26 in 2003, to 52 in 2004.

The CRFS tabulates catch and effort estimates by year, month, coastal district, trip target type, marine area, and fishing mode. The four types of fishing modes are man-made (piers and jetties), beaches and banks, party and charter boats, and private or rental boats. All recreational finfish catch and effort in California can be categorized into one of these modes. In 2004, the CRFS estimated over 4.4 million individual recreational fishing trips occurred in California waters (tab. 7). The large majority of sportfishing trips (2.7 million) were in man-made mode and most of those trips were on public piers. Public piers serve as the most affordable and convenient sportfishing platform for anglers in California. Traditionally popular target species on public piers include Pacific bonito, Pacific mackerel, Pacific sardine, California halibut, rockfish, California corbina (*Menticirrhus undulatus*), and embiotocids (perches). During warm water events, jumbo squid (*Dosidicus gigas*) can be caught in large numbers off piers, as well as by boat anglers, but in 2004 they weren’t a significant part of the recreational catch in either mode. The CRFS does not produce estimates of jumbo squid, but samplers do observe catch and dorsal mantle length data.

The top-ten species landed in 2004 (CRFS estimates in metric tons) by recreational anglers and divers from

TABLE 7
 Estimate of Individual Fishing Trips Made
 by Fishing Mode in 2004

Mode	Number of fishing trips
Man-made	2,742,000
Beach bank	302,000
Party/Charter vessels	711,000
Private vessels	659,000
Total	4,414,000

TABLE 8
 Estimated Recreational Landings (metric tons)
 by Fishing Mode in 2004*

Common Name	Total	Man Made	Beach/ Bank	Party/ Charter Boat	Private/ Rental Boat
Barred sandbass	791	4	3	417	368
Pacific barracuda	502	17	—	423	62
Yellowtail	380	—	—	176	204
Pacific bonito	359	201	12	100	47
Pacific mackerel	329	243	1	20	64
Kelp bass	328	2	6	216	104
Vermilion rockfish	212	0	3	140	69
California halibut	185	16	—	36	134
Albacore	181	—	—	27	154
Blue rockfish	160	0	8	110	42
Lingcod	122	2	12	43	66
Black rockfish	106	1	4	28	74
Barred surfperch	86	13	73	0	0
Jacksmelt	69	64	5	0	1
Pacific sardine	67	66	—	0	0
Bocaccio	61	—	—	54	7
Olive rockfish	55	0	2	44	9
Striped bass	52	6	1	9	35
Bat ray	49	40	6	0	3
Pacific sanddabs	43	1	0	26	16
Totals	4,137	676	136	1,868	1,458

*CRFS does not include estimates of chinook salmon.

all modes combined were barred sandbass, California barracuda, yellowtail, Pacific bonito, Pacific mackerel, kelp bass, vermilion rockfish (*Sebastes miniatus*), California halibut, albacore, and blue rockfish (tab. 8). With the exception of Pacific mackerel and Pacific bonito, the majority of the top-ten species landed were taken by party/charter or private/rental boats.

Barred sandbass, California barracuda, and yellowtail were staples of the fleet south of Point Conception. These species are a common part of the catch in southern California throughout the year, but effort and catch greatly increases in the summer months. 2004 saw the return of Pacific bonito as a significant part of the sport catch in southern California. Pacific bonito were a substantial part of the catch in all fishing modes from spring through the remainder of the year. Catch peaked in the summer when Pacific bonito were the most abundant species landed on public piers. While albacore made the

top-ten species landed in California waters in 2004, California anglers landed the majority of albacore in Mexican waters.

Southern California vessels frequently target species in waters south of the border. Fish caught in Mexican waters and landed in California ports do not count toward state or federal quotas (if a quota exists for a species). While the CRFS technicians do sample these trips, the CRFS estimates don't include catch that is harvested outside of state waters and then landed in California ports.

The number of trips by private vessels and CPFVs into Mexican waters has been increasing in recent years due to both excellent albacore fishing and restrictions on groundfish species. The size of the long-range CPFV fleet in San Diego has also been increasing. The long-range fleet specializes in five to 21 day trips south of the border to target species such as wahoo (*Acanthocybium solanderi*), dolphinfish, yellowfin tuna, yellowtail, and albacore.

In addition to the CRFS, the CDFG collects and maintains a database derived from mandatory logbook information supplied by CPFVs. Much of our historical and current knowledge of CPFV recreational fishing in California is based on the logbook data. The CPFV logbook data are also used to validate CRFS party/charter boat estimates.

The estimates from the MRFSS program are not directly comparable to the CRFS program. Most of the survey methodologies from the CRFS program are significantly different from those of the MRFSS program. Two programs must be calibrated so that the long time series of recreational data can be used with these new data. The CDFG, along with the Pacific States Marine Fisheries Commission Recreational Fisheries Information Network statistical committee, will undertake the task during the coming months.

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