

value over the past 20 seasons in San Francisco Bay has been \$7.5 million.

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 2004–05 herring spawning biomass estimate for the San Francisco Bay population was 53,464.9 t, which is 3.2% above the 27-year average (51,825 t). It is the first time since the 1996–97 season that the herring spawning biomass has surpassed the long-term average. The 2004–05 spawning biomass estimate for Tomales Bay was 3,343.9 t, which represents a decrease of 70% from the 2003–04 biomass estimate (10,999 t). The drastic decline in spawning biomass in Tomales Bay may be the result of the 2004–05 El Niño as well as the displacement of herring to other spawning areas. In Humboldt Bay, CDFG conducted spawning ground surveys and monitoring of the herring gillnet fishery for the fifth consecutive season. The 2004–05 spawning biomass estimate for Humboldt Bay was 157.5 t, a decrease of 65.7% from the 2003–04 biomass estimate (459 t). No surveys were conducted in Crescent City Harbor. Based on current otolith readings, the age composition of the 2004–05 San Francisco Bay and Tomales Bay stocks continue to reflect a depressed age structure that has been observed coast wide since the 1997–98 El Niño season. The cause of this phenomenon remains unknown, and may be the result of various ecological factors.

The decline in value of California's herring fisheries in 2005 is due to the inability of the industry to fill the existing catch quotas. However, the long-term decline in value is related to cultural and demographic changes in Japan, the status of Japan's economy, and increased competition from other herring fisheries outside of California. The herring roe product, "kazunoko," remains a popular Japanese New Year's food, but it continues to wane as a traditional holiday gift. The market for herring sac roe in Japan is shifting from a high-end seasonal gift product to a lower-value product available throughout the year and geared toward the casual consumer. California's roe herring fishery faces competition in the Japanese market with products from herring fisheries from the United States, Canada, China, and Russia. The cultural changes in Japan, increased market competition, and the prolonged recession in Japan will keep the ex-vessel price for herring low for the 2005–06 season. Participation in California herring fisheries continues to decline as the price of herring has remained low, and operating costs have increased to make the fishery less profitable. The herring fishing industry has attempted to revive the fishery by seeking regulation changes that would help increase the profitability of the fishery. The key regulation change for the 2005–06 sea-

son was a gillnet minimum mesh size reduction from 2 1/8 inch mesh to 2 inch mesh for the San Francisco Bay herring fishery.

White Seabass

The white seabass (*Atractoscion nobilis*) is the largest member of the Sciaenid family found in California waters. In addition to being a popular gamefish, white seabass is also targeted by a commercial fishery. In 2002, the Commission established a management season for the commercial and recreational fisheries of 1 September to 31 August of the following year. The commercial white seabass fishery landed 132 t in 2005 (fig. 14), a 2% decrease from the 2004 total of 135 t. The Recreational Fisheries Information Network (RecFIN) estimated catch of white seabass in 2005, generated from the CRFS, increased by 11% to 50 t from the previous year's total of 45 t. The RecFIN estimates prior to 2004 are from a different survey and are not directly comparable to the estimates from the CRFS. However, historical trends in the recreational catch of white seabass can be determined from CPFV logbook data (fig. 15). The combined commercial and recreational catch for 2005 was 182 t.

There have been commercial and recreational fisheries for white seabass in California since the 1890s. Historically, commercial landings have fluctuated widely, including the landings of white seabass taken in Mexican waters by California commercial fishermen. Before 1982, the white seabass commercial take in Mexican waters comprised from 1% to over 80% of California's white seabass annual landings. Since then, the Mexican government has prohibited access permits to the U.S. commercial fleet (fig.13).

Beginning in 1994, the use of set and drift gillnets within three nautical miles of the mainland shore from Point Arguello to the U.S.–México border and in waters less than 70 fathoms or within 1 mile (whichever is less) of the Channel Islands was prohibited. In April 2002, the use of gill and trammel nets in depths of 60 fathoms or less was prohibited from Point Reyes to Point Arguello. Despite restrictions, most commercial white seabass landings are still taken with set and drift gillnets. In 2005, set and drift gillnets accounted for 96% of the commercial landings and 98% of commercial white seabass landings were from south of Point Arguello.

The commercial fishery for white seabass is closed between Point Conception and the U.S.–México border from 15 March to 15 June. In 2005, the average ex-vessel value paid by dealers was \$2.59/lb. The total ex-vessel value in 2005 was \$757,269, approximately 25% more than in 2004.

The recreational fishery for white seabass occurs almost entirely south of Point Arguello. In 2005, 98%

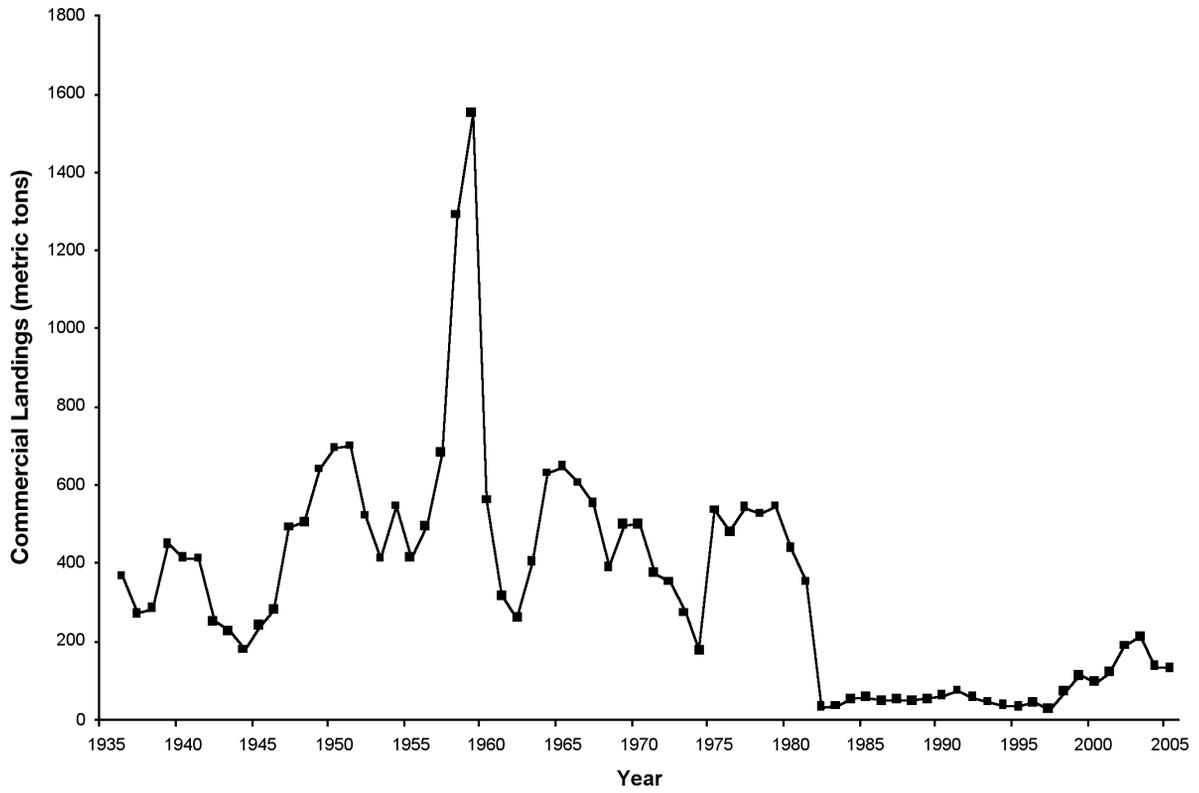


Figure 14. California commercial landings of white seabass (*Atractoscion nobilis*) in metric tons, 1936–2005.

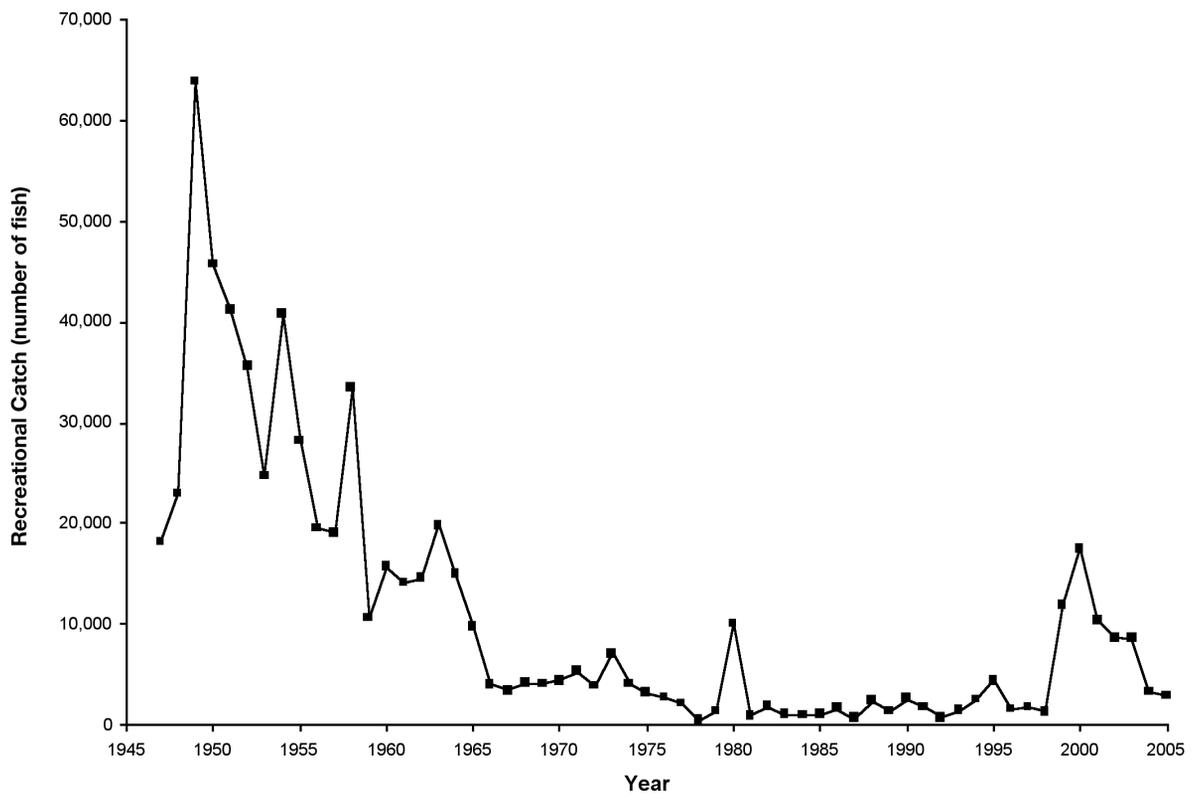


Figure 15. California recreational catch (in numbers of fish) of white seabass (*Atractoscion nobilis*) from CPFVs, 1947–2005.

of the catch occurred south of Point Arguello. The majority of the recreational take occurs between March and September. White seabass have a minimum size limit of 28 inches (710 mm), and the daily bag limit is three fish, except from 15 March through 15 June when the daily bag limit is one fish. Most fish are caught by hook-and-line anglers onboard CPFVs and private boats. However, during the 2004–05 season, an estimated 27% of the total number of fish caught was taken by shore anglers.

In 1983, the California Legislature (Legislature) established the Ocean Resources Enhancement and Hatchery Program (OREHP) managed by CDFG. The program researches artificial propagation, rearing, and stocking methods of marine fish species caught in southern California waters whose populations have declined, adversely affecting to commercial or recreational fishing. Initially, OREHP focused on California halibut and white seabass. But in response to funding constraints, white seabass has been OREHP's primary species for research and production since 1986. In 1995, the building of the OREHP hatchery in Carlsbad, California was completed. The hatchery, located next to Agua Hedionda Lagoon, produces juvenile white seabass that are grown to 150–200 mm before being placed in grow-out facilities. Currently there are 14 grow-out facilities located in bays and marinas from Santa Barbara to San Diego, including Santa Catalina Island. Volunteers raise the fish until they reach 200–300 mm and then release them at or near the grow-out site. In 2004, approximately 270,000 hatchery-produced white seabass were released, the highest total to date. In 2005, OREHP released 100,911 white seabass. Since 1986, 1.1 million white seabass, each implanted with a coded wire tag (CWT), have been released from OREHP facilities.

To evaluate the effectiveness of the program in enhancing stocks of white seabass, OREHP conducts a gillnet survey designed to capture 1 to 4 year old juvenile white seabass at 19 coastal and embayment sites from Santa Barbara to San Diego, including Santa Catalina Island. Initially, the survey focused on determining the distribution of young fish, but switched in the second

half of 1996 to look at recruitment of one-year-old fish and recovery of tagged fish. OREHP also conducts surveys of adult fish taken in the commercial and recreational fisheries to detect CWTs indicating fish produced by the hatchery. In 2005, CWTs were recovered from 14 adult white seabass.

To manage the state's commercial and recreational fisheries for white seabass, the Commission adopted a White Seabass Fishery Management Plan (WSFMP) in 1996. However, regulations to implement the plan were not adopted by the Commission at that time. When the Legislature enacted the Marine Life Management Act (MLMA) in 1998, it granted broader authority to the Commission to manage certain commercial and recreational fisheries, including white seabass. The Legislature also declared that the WSFMP would remain in effect until amended and brought into compliance with the MLMA. The CDFG revised the WSFMP in accordance with the MLMA and submitted it to the Commission, which adopted it on 4 April 2002. To implement the WSFMP, the Commission adopted regulations to establish a fishing season, harvest control rules, an annual review of the resource, and the White Seabass Scientific and Constituent Advisory Panel.

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