12. OCEAN WHITEFISH

Overview of the Fishery

Ocean whitefish, *Caulolatilus princeps*, belongs to the tilefish family, Malacanthidae, and is the only representative of this family found off California except for rare occurrences of Pacific golden-eyed tilefish, *C. affinis*. It is primarily a southern California species, frequently found in association with members of the rockfish family, Scorpaenidae, and California sheephead. Common names for ocean whitefish include blanquillo and pez blanco.

Ocean whitefish are found in loosely aggregated schools near high-relief seafloor structures such as shallow banks, rocky reefs, and kelp beds. They prefer offshore islands to the mainland coast and are abundant at Santa Rosa, Santa Barbara, Santa Catalina, and San Clemente Islands. Otoliths (earbones) of ocean whitefish found in kitchen middens at San Clemente Island indicate that this fish was an important food source for Native Americans.

Presently, peak landings occur during late winter and spring for both recreational and commercial fisheries. Estimated recreational landings have been significantly higher than commercial landings over the last two decades (Figure 12.1, Figure 12.3, Table 12.1, and Table 12.4). The Marine Recreational Fisheries Statistics Survey (MRFSS) estimates recreational catch from all modes of fishing: shore-based, commercial passenger fishing vessels (CPFVs), and private or rental boats. MRFSS catch estimates for 1980 through 1989 and 1993 through 2001 show average recreational landings of approximately 173,000 lb per year for all modes of fishing combined. In contrast, commercial landings from 1980 through 2001 ranged from a low of about 700 lb in 1985 to a high of nearly 51,000 lb in 1994, but have averaged about 11,000 lb per year.

Recreational landings peaked three times during the last two decades: approximately 297,000 lb in 1986, nearly 304,000 lb in 1995, and slightly over 249,000

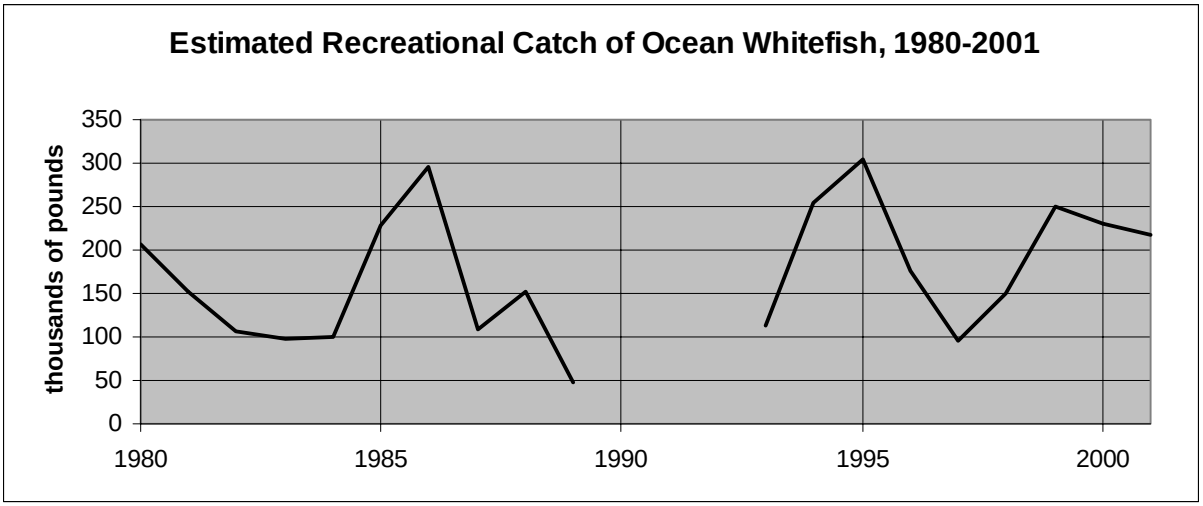

Figure 12.1. Estimated recreational catch (pounds) of ocean whitefish from 1980 to 1989 and 1993 to 2001. Catch estimates do not include fish that were caught and released alive. Data source is the Marine Recreational Fisheries Statistics Survey (MRFSS).

lb in 1999 (Figure 12.1). These peaks follow El Niño events in 1982-1984, 1992, and 1997, and may represent increased reproductive success off California due to warmer El Niño waters.

The recreational fishery uses baited hook-and-line gear, and the daily bag limit is 10 ocean whitefish per day, per angler. Ocean whitefish are relatively easy and enjoyable to catch, usually challenging anglers with an exciting fight.

MRFSS data indicate nearly all ocean whitefish are caught from boats, with CPFVs accounting for 66% of the recreational catch on average (Table 12.1 and Table 12.2). CPFV logbooks show an increase in landings since 1960 with a peak of over 144,000 fish in 2000 (Figure 12.2 and Table 12.3). The majority of ocean whitefish taken on CPFVs are caught at the Channel Islands and offshore banks near San Clemente Island. Most of these fish are between 1.5 to 3.5 years of age and are below the minimum size at maturity for both males and females.

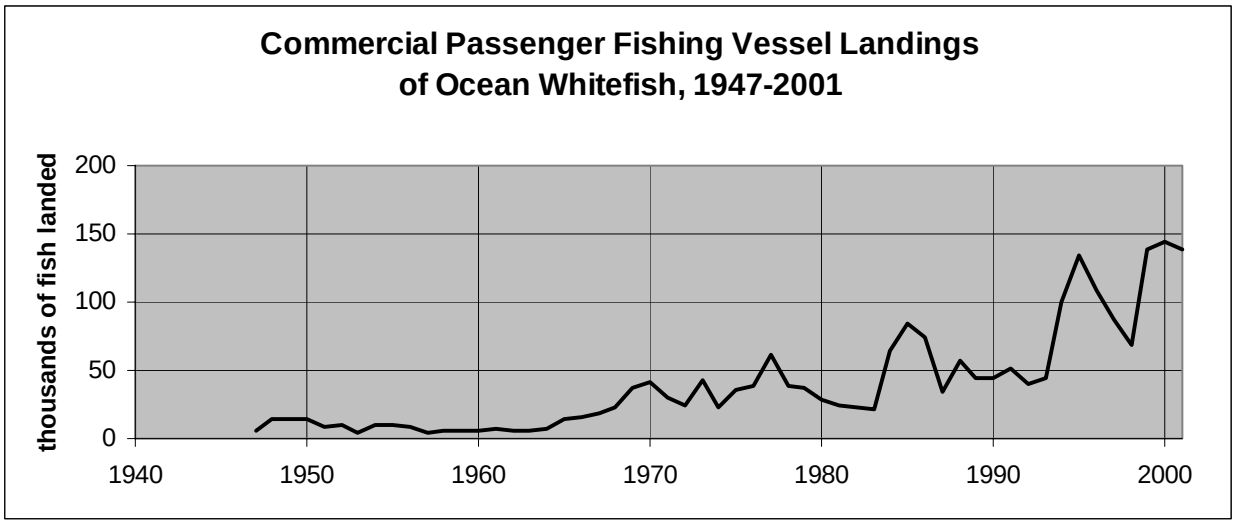

Figure 12.2. Recreational commercial passenger fishing vessel (CPFV) landings (number of fish) as reported on CPFV Logbooks for ocean whitefish from 1947 to 2001. Data sources are California Department of Fish and Game (DFG) Catch Bulletins (1947-1978) and DFG Annual Reports of Statewide Fish Landings by the Commercial Passenger Fishing Vessels (CPFV) Fleet (1979-2001).

The texture and flavor of ocean whitefish is superb. The commercial catch is sold in fresh fish markets and makes excellent sashimi, comparable in flavor and texture to any of the most esteemed white-fleshed fish used for this purpose. In Japan, species of tilefish similar to ocean whitefish command premium prices in the fresh fish market. Off California, however, some ocean whitefish have an unpredictable bitterness which has made it a less profitable and less desirable species for commercial fishermen. The unpleasant taste remains regardless of the method used to clean, freeze, or cook them. The bitterness may be related to the fish's diet since the condition is apparently restricted to fish caught in and around kelp beds or shallow water.

Commercial landings of ocean whitefish peaked in 1926 with just over 368,000 lb landed (Figure 12.3 and Table 12.4). Commercial landings have not approached this level since, which may reflect low consumer demand rather than availability. A slight increase occurred in the 1940s, probably associated with the increased demand for all

fish during World War II. Landings at that time peaked at approximately 101,000 lb, followed by a significant decline. Annual commercial landings from 1950 through 2001 have remained low, averaging about 7,400 lb and only exceeding 50,000 lb once in 1994.

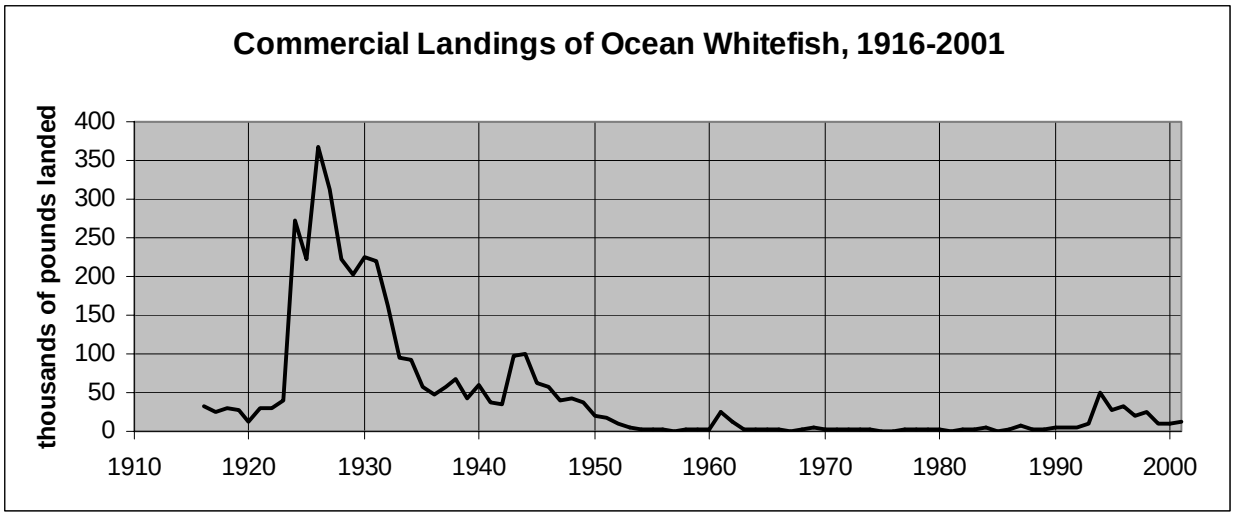

Figure 12.3. Annual commercial landings (pounds) of ocean whitefish from 1916 to 2001. Data sources are the California Department of Fish and Game (DFG) Catch Bulletins (1916-1949, 1951-1974, 1978), Draft Program Environmental Document Ocean Sportfishing Regulations, September 2001 (1950, 1975-1977, 1979-1983) and the DFG commercial landing receipt database (1984-2001).

The primary commercial gear used to take ocean whitefish is hook-and-line gear. Smaller quantities are taken incidentally with set longline, fish traps, and entangling nets (such as set gill nets).

The commercial premium live-fish fishery, which emerged in the late 1980s and early 1990s, has a high incidental catch rate for ocean whitefish in southern California. Although this hook-and-line fishery targets nearshore rockfish species, cabezon, and California sheephead, ocean whitefish are often unintentionally hooked. Increased consumer demand for quality fresh fish products and high market prices for nearshore species has caused increased fishing pressure in the nearshore, and coincidentally, higher landings of ocean whitefish. Live nearshore rockfish, cabezon and California sheephead commanded higher prices than live ocean whitefish, which are considered less desirable.

The first live ocean whitefish landing in the California Department of Fish and Game (DFG) commercial records occurred in 1993. The average price paid for live ocean whitefish from 1993 to 2001 was $1.72 per lb, $0.43 more per lb than the price paid for dead ocean whitefish landed during the same time period. Live landings peaked in 1998 at about 10,300 lb, which represented 43% of the commercial landings for that year. The following year, 71% of the catch was landed live; however, total landings for 1999 were approximately half of those in 1998. In 2000 and 2001, the average price per lb was the same for dead as for live ocean whitefish. The proportion of the catch landed live decreased to 59% in 2000 (5,300 lb) and down to 48% in 2001 (5,900 lb).

Status of Biological Knowledge

Ocean whitefish have elongated bodies covered with small scales, and relatively thick, fleshy lips. Overall coloration is yellowish-brown above and lighter below. The dorsal fin is continuous, beginning above the pectoral fin and ending near the broad, yellow tail. Right after capture, their coloration also includes a central light-blue band running the length of the dorsal and anal fins. The long, pointed, pectoral fins are bluish with a yellow streak near the center. This bright coloration fades as the fish dies.

The geographic range for ocean whitefish is from Vancouver Island, British Columbia, Canada to Peru, including the Galapagos Islands and the Gulf of California. It is most abundant south of Point Conception (Santa Barbara County) and occurrences north of Monterey (Monterey County) are rare.

Ocean whitefish prefer offshore rocky reefs and banks, which are abundant around the Channel Islands. They are found periodically in kelp beds, although they have no apparent relationship with giant kelp. Adults can be found from 4 to15 ft above the bottom anywhere from the shallow subtidal area to 450 ft, but are commonly caught at depths of 90 to 200 ft.

Ocean whitefish have relatively small mouths, and accordingly feed upon small organisms including crabs (such as the pelagic red crab) and other crustaceans, shrimps, euphausiids, small octopuses, squid, and various small fishes, especially anchovy and lanternfish. Pelagic juvenile ocean whitefish have been found in the stomachs of albacore, and adult ocean whitefish are preyed upon by giant sea bass, sharks, and other large fishes.

The maximum life span of ocean whitefish is thought to be about 13 years with a maximum length of 40 in. Maximum weight is thought to be about 12 lb; however, fish exceeding 10 lb are rarely seen. In one study, the oldest of several hundred ocean whitefish sampled was 13 years old, weighing 7.5 lb and measuring 25.5 in. Females are believed to mature slightly earlier than males. A 1980 study examining 485 ocean whitefish found that females seemed mature at 3 to 4 years (16 to 19 in. total length) whereas males appeared mature at 4 to 5 years (19 to 22 in. total length). No significant difference in growth rates has been found between the sexes.

Little is known about spawning and recruitment of ocean whitefish in California waters; however, a number of studies in California and Mexico have indicated that the spawning period is lengthy. A 1994 study examining developmental stages of gonads, conducted in the Bay of La Paz, Mexico, concluded that ocean whitefish spawn annually with a prolonged spawning period from November through March, with females spawning at least twice, possibly three times, during that period. Ocean whitefish eggs presumably drift with ocean currents. Plankton surveys have found that larval distributions of ocean whitefish are centered around Punta Eugenia in central Baja California, Mexico, and surveys have not found larvae off southern California.

Specific details about the northward migration of ocean whitefish remain unknown, particularly with respect to timing, age, and size of individuals. It is also not known if these same individuals return south to spawn again. Ocean current systems seem to play a critical role in the range of distribution and magnitude of ocean whitefish populations off California. One possibility is that northward currents may carry eggs, larvae, and juvenile fish long distances from their origin, perhaps providing an influx of

individuals to colonize cooler, northern waters. The reproductive success of ocean whitefish is likely inhibited in a cold water environment, which could explain observed variations in abundance off California. Indeed, abundance appears to increase following El Niño events.

Status of the Population

The current population level is unknown for ocean whitefish. It is thought that the fish off southern California are derived from the spawning population off central and southern Baja California, Mexico.

Management Considerations

No minimum size limit is required for ocean whitefish and any gear may be used to catch them. A large portion of recreationally caught ocean whitefish is immature. Recently, a size limit was considered as a management option; however, it is unclear whether this type of regulation would contribute to the reproductive success of fish caught in California waters. There is no direct evidence that ocean whitefish can successfully reproduce off California, and undersized fish may not survive once released because of problems readjusting buoyancy.

Much of the ocean whitefish catch comes from the Channel Islands. The new marine protected areas (MPAs) at the Channel Islands may affect the overall take of ocean whitefish. However, it is unknown if these MPAs will have an effect on ocean whitefish populations since ocean whitefish off California are not thought to contribute to the overall reproductive success of the population.

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Further Reading

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Table 12.1. Estimated catch (pounds) by recreational anglers of ocean whitefish by fishing mode, 1980-2001

Year	Man-made structures	Beach and bank	Shore	Commercial passenger fishing vessels (CPFV)	Private or rental boats	Total
1980	350	3,799	------	87,353	115,093	206,595
1981	------	------	------	96,616	55,160	151,776
1982	------	------	------	65,044	42,277	107,320
1983	------	------	------	76,187	20,932	97,118
1984	------	------	------	48,252	51,316	99,567
1985	------	------	------	184,853	43,728	228,581
1986	------	------	------	262,236	34,410	296,646
1987	------	------	------	62,099	46,044	108,143
1988	------	------	149	75,887	75,989	152,025
1989	------	------	------	39,405	9,334	48,739
1990	------	------	------	------	------	------
1991	------	------	------	------	------	------
1992	------	------	------	------	------	------
1993	------	------	------	90,991	21,260	112,251
1994	------	------	------	150,830	104,122	254,952
1995	------	256	------	233,727	69,682	303,665
1996	111	------	------	127,423	49,425	176,960
1997	------	------	------	62,810	32,731	95,540
1998	742	------	------	91,676	58,168	150,586
1999	------	------	------	205,301	43,904	249,205
2000	------	------	------	140,810	90,377	231,187
2001	------	------	------	97,939	120,087	218,026

------ Estimates not available.

1. Data source: the Marine Recreational Fisheries Statistics Survey (MRFSS); data obtained from the Pacific States Marine Fisheries Commission website.
2. No estimates are available from 1990 through 1992 or for January and February of 1995. Estimates for 2001 are preliminary. Northern California CPFVs were not fully sampled because of refusals.
3. Catch estimates do not include fish that were caught and released alive; they only include fish that were harvested.
4. From 1986 to 1989, individual catch estimates were not made for the man-made structures mode or the beach and bank mode. Instead, a single estimate was made for these shore modes.

Table 12.2. Estimated catch (number of fish) by recreational anglers of ocean whitefish by fishing mode, 1980-2001

Year	Man-made structures	Beach and bank	Shore	Commercial passenger fishing vessels (CPFV)	Private or rental boats	Total
1980	817	1,914	------	37,607	78,329	118,667
1981	------	------	------	35,248	22,158	57,406
1982	------	------	------	62,725	14,377	77,102
1983	161	------	------	36,293	16,115	52,569
1984	------	------	------	65,976	27,843	93,819
1985	------	------	------	243,053	44,514	287,566
1986	------	------	------	231,762	31,561	263,323
1987	------	------	------	85,191	39,636	124,828
1988	------	------	226	89,656	84,158	174,040
1989	------	------	------	34,592	8,413	43,006
1990	------	------	------	------	------	------
1991	------	------	------	------	------	------
1992	------	------	------	------	------	------
1993	------	------	------	48,001	19,741	67,742
1994	------	------	------	207,747	84,406	292,153
1995	------	241	------	260,234	74,034	334,510
1996	202	------	------	139,940	37,368	177,510
1997	------	------	------	63,028	27,542	90,570
1998	641	------	------	73,142	43,043	116,826
1999	------	------	------	174,139	38,240	212,379
2000	------	------	------	120,920	73,040	193,960
2001	------	------	------	95,109	104,205	199,315

------ Estimates not available.

1. Data source: the Marine Recreational Fisheries Statistics Survey (MRFSS); data obtained from the Pacific States Marine Fisheries Commission website.
2. No estimates are available from 1990 through 1992 or for January and February of 1995. Estimates for 2001 are preliminary. Northern California CPFVs were not fully sampled because of refusals.
3. Catch estimates do not include fish that were caught and released alive; they only include fish that were harvested.
4. From 1986 to 1989, individual catch estimates were not made for the man-made structures mode or the beach and bank mode. Instead, a single estimate was made for these shore modes.

Table 12.3. Recreational commercial passenger fishing vessel (CPFV) landings (number of fish) as reported on CPFV Logbooks for ocean whitefish, 1947-2001

Year	Number of fish	Year	Number of fish	Year	Number of fish	Year	Number of fish
1947	5,160	**1961**	6,647	**1975**	35,165	**1989**	44,777
1948	14,124	**1962**	6,157	**1976**	38,363	**1990**	44,789
1949	14,576	**1963**	6,231	**1977**	61,058	**1991**	51,605
1950	14,925	**1964**	6,949	**1978**	38,006	**1992**	40,702
1951	8,828	**1965**	13,810	**1979**	36,957	**1993**	44,355
1952	10,003	**1966**	15,587	**1980**	28,810	**1994**	100,599
1953	4,963	**1967**	18,184	**1981**	24,378	**1995**	133,666
1954	9,952	**1968**	22,155	**1982**	22,604	**1996**	108,370
1955	9,508	**1969**	36,474	**1983**	22,095	**1997**	87,655
1956	7,951	**1970**	40,990	**1984**	64,241	**1998**	69,266
1957	4,389	**1971**	29,800	**1985**	84,441	**1999**	139,285
1958	6,143	**1972**	24,632	**1986**	73,919	**2000**	144,060
1959	5,608	**1973**	42,362	**1987**	34,967	**2001**	138,011
1960	5,850	**1974**	23,301	**1988**	56,884		

------ Landings data not available.

1. Data sources: DFG Catch Bulletins (1947-1978) and DFG Annual Reports of Statewide Fish Landings by the Commercial Passenger Fishing Vessels (CPFV) Fleet (1979-2001).
2. Logbooks have been required for southern California, including fish taken in Mexican waters and landed in California, for the entire time period reported here. Logbooks were required for central and northern California from 1957 to present.
3. The data are number of fish reported on logbooks submitted to DFG.

Table 12.4. Commercial landings (pounds) of ocean whitefish, 1916-2001

Year	Pounds	Year	Pounds	Year	Pounds	Year	Pounds	Year	Pounds
1916	32,196	**1933**	95,053	**1950**	20,626	**1967**	1,059	**1984**	5,627
1917	25,976	**1934**	93,191	**1951**	18,198	**1968**	2,647	**1985**	722
1918	31,014	**1935**	57,771	**1952**	8,808	**1969**	4,490	**1986**	2,657
1919	28,016	**1936**	46,603	**1953**	5,839	**1970**	1,778	**1987**	7,036
1920	13,711	**1937**	57,198	**1954**	3,634	**1971**	3,706	**1988**	3,095
1921	29,439	**1938**	68,012	**1955**	2,312	**1972**	2,569	**1989**	3,174
1922	30,270	**1939**	43,688	**1956**	1,820	**1973**	1,584	**1990**	6,067
1923	39,908	**1940**	59,606	**1957**	834	**1974**	2,359	**1991**	5,014
1924	273,077	**1941**	36,970	**1958**	1,902	**1975**	975	**1992**	5,886
1925	222,112	**1942**	35,986	**1959**	1,319	**1976**	1,040	**1993**	10,380
1926	368,064	**1943**	97,434	**1960**	3,518	**1977**	1,651	**1994**	50,746
1927	313,102	**1944**	100,801	**1961**	25,191	**1978**	2,371	**1995**	27,807
1928	222,192	**1945**	61,988	**1962**	12,002	**1979**	2,278	**1996**	31,465
1929	201,725	**1946**	57,271	**1963**	3,254	**1980**	1,620	**1997**	21,232
1930	225,102	**1947**	40,946	**1964**	1,771	**1981**	885	**1998**	23,857
1931	221,200	**1948**	41,840	**1965**	1,982	**1982**	1,391	**1999**	11,168
1932	162,027	**1949**	37,821	**1966**	2,709	**1983**	1,974	**2000**	8,816
								2001	12,346

Data sources are the California Department of Fish and Game (DFG) Catch Bulletins (1916-1949, 1951-1974, 1978), Draft Program Environmental Document Ocean Sportfishing Regulations, September 2001 (1950, 1975-1977, 1979-1983) and the DFG commercial landing receipt database (1984-2001).