

7. CABEZON

Review of the Fishery

Fishing for cabezon, *Scorpaenichthys marmoratus*, started with the early Native Americans along the central California coast. In one study, cabezon represented five percent of the fish remains taken from exposed rocky coastal archaeological sites. Californians in the modern era did not target cabezon until the late 1930s. By the end of World War II, sportfishing interest in cabezon had increased markedly due to its edibility and relatively large size. Commercial interest in cabezon was generally low until the latter part of the 1900s, but has become a lucrative fishery since the 1990s. It remains so today with consistent market values of over \$5.00 per pound. The importance of the cabezon fishery is reflected in the fact that it is now managed as its own separate harvest group with specific regulations for both sport and commercial fishing.

Private boat fishermen continually take most of the sport-caught cabezon in California. Over the 25-year period, 1981-2006, the average annual catch in number of fish landed for the private boat fishery was 34,300 fish, compared to 20,100 and 5,200 fish for beach/bank and man-made modes of fishing, respectively. The number of cabezon landed by private boaters peaked in 1984 at 55,400 fish statewide and the lowest annual catch for this group was 9,800 fish in 2006.

As game fish, significant numbers of cabezon in shallow, inshore waters makes them a popular target for free divers, in addition to those using scuba. A total of 3,000 cabezon were taken at nearly 150 Central California Council of Diving Clubs' free diving spearfish meets from 1958-2003, making it the eighth most frequently captured species out of 52 species landed. Meet locations ranged from San Luis Obispo County in central California to Mendocino County in northern California.

At present, Commercial Passenger Fishing Vessels (CPFVs) generally do not target cabezon, and only take a small amount of them compared to the total sport catch. Estimates from recreational sampling data show that in recent years the number of cabezon landed from CPFVs have contributed less than 10 percent of the total annual sport catch for this species. With the exception of CPFVs, there is little statewide historical data available for other modes of fishing regarding cabezon take prior to 1980. Starting in 1947, data collected from CPFV logbooks are available that show earlier landings of cabezon have at times been much greater than they have been since the 1980s (Figure 7.1). More restrictive management regulations since 1999 have contributed to this decline (see Management Considerations, below).

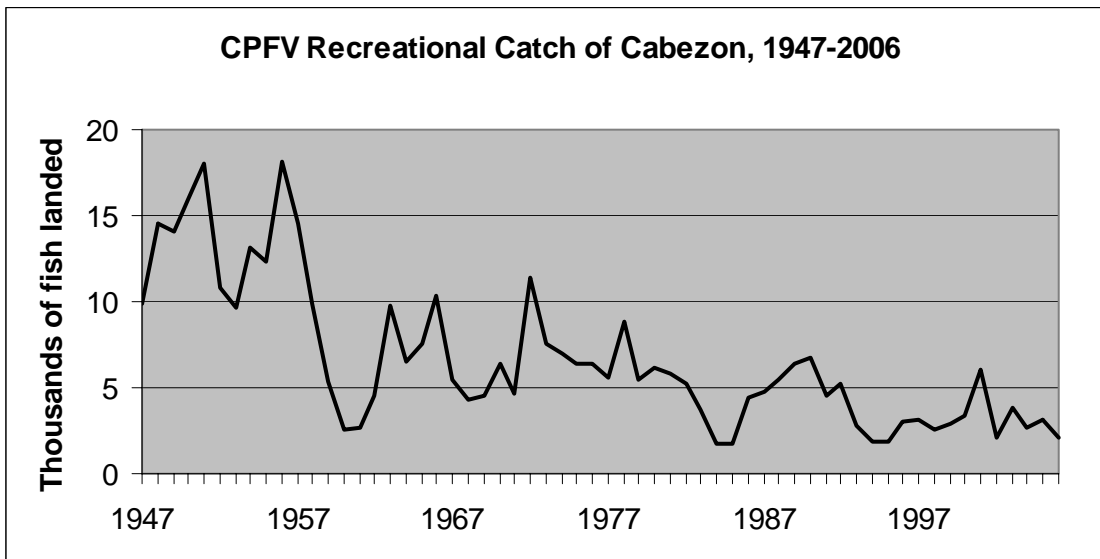


Figure 7.1. Recreational catches of cabezon from Commercial Passenger Fishing Vessels, 1947-2006. Data sources: CPFV logbook data. No data prior to 1947.

Historically, the vast majority of cabezon in California have been caught by recreational fishermen. However, from 1995 to 2002 commercial landings surpassed recreational take (Figures 7.2a and 7.2b). This sharp increase in commercial landings can be attributed to the advent of the nearshore live-fish fishery in the mid 1980s.

The nearshore live-fish fishery evolved from the demand for specialty foods in Asian restaurants and markets in southern California. Although starting out as an alternative fishery, it quickly expanded into a multimillion dollar industry by the early 1990s. Part of the reason for this boom was the willingness of consumers to pay a much higher price for live fish than dead fish of certain species, particularly plate-sized fish. That premium was passed on to fishermen in the form of higher ex-vessel prices (price per unit of weight paid to fishermen upon landing of catch) for live fish. Accordingly, average unit price per pound for cabezon has increased from \$0.56 in 1991 to \$5.03 in 2006 (Table 7.1), and unit prices have been recorded as high as \$10 to \$12 per pound most recently. Cabezon are one of the top four live-caught species groups in price per pound over the last five years, ranking only behind greenlings, rockfish and flatfish.

Following the recent adoption of more conservative harvest limits, commercial cabezon catch has stabilized at a lower level consistent with the set amount allocated by the state (see Management Considerations, below). In 2006, commercial landings of cabezon totaled 61,900 pounds (28 metric tons) and 87 percent (53,900 pounds) (24.5 metric tons) were brought to market in a live condition.

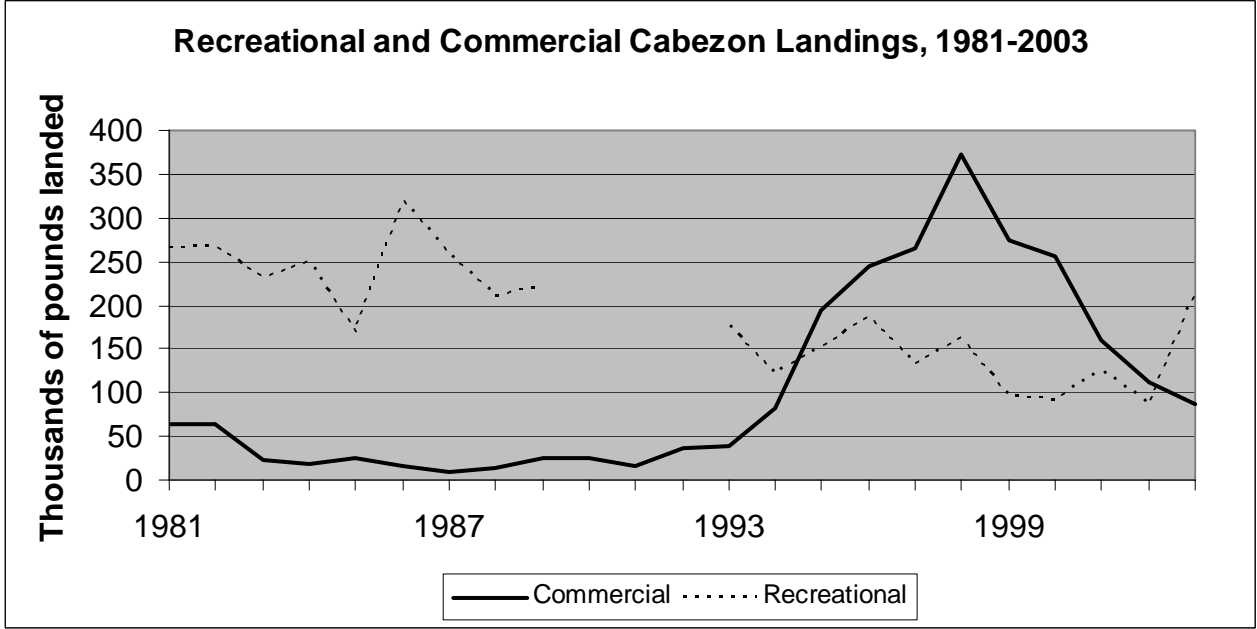


Figure 7.2a. Recreational and commercial landings in pounds for California-caught cabezon 1981-2003. Data sources: MRFSS recreational catch data and DFG commercial landing receipts.

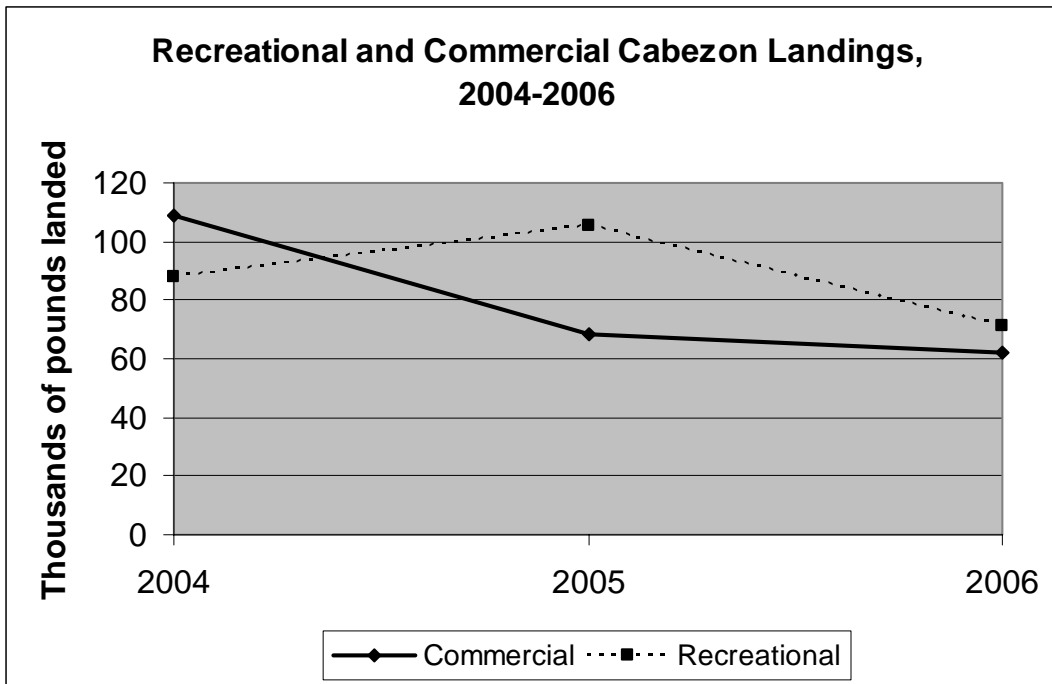


Figure 7.2b. Recreational and commercial landings in pounds for California-caught cabezon 2004-2006. Data source: CRFS recreational catch data and DFG commercial landing receipts.

Fishing revenue from the 2006 commercial harvest of cabezon was about \$343,000 (ex-vessel 2006 dollars). The contribution to total business output for the State from this 2006 commercial harvest is estimated to be \$661,000. Likewise, total employment and wages from cabezon is estimated to be the equivalent of 12 jobs and \$304,000, respectively.

The primary gear types used to land cabezon have been hook-and-line and trap. Since 2003, these two have been the only legal gear types available for commercial take of this species. From 2003 through 2006, approximately 68 percent of cabezon were caught with hook-and-line and 32 percent with trap.

Status of Biological Knowledge

The cabezon is the largest member of the cottid family and the only species of this family large and accessible enough to produce a viable fishery. In Spanish, *cabezon* means big-headed or stubborn and, proportionally, the massive head is definitely the largest feature of this fish. The species name, *marmoratus*, refers to the marbled or mottled appearance of the body which can be reddish, greenish, or bronze. Generally, the belly is a pale turquoise or white, and there are no scales on the body. Anecdotal evidence from fish kept in aquaria suggests that cabezon have the ability to change color to match their surroundings. There is also some evidence that coloration may be used to determine sex at some life stages.

Cabezon range from Point Abreojos, Baja California to Sitka, Alaska and are common from Washington to southern California. Preferred cabezon habitat is hard bottom substrate, often in crevices or areas of high relief. Although the reported maximum depth for cabezon is 300 feet (91 meters), the majority of recreational and commercial catch occurs in waters less than 120 feet (37 meters). Adult fish frequent subtidal areas with rocky reefs, often in kelp beds, and also occur around breakwaters, jetties, oil platforms and other man-made structures.

In California, spawning occurs in late fall and early winter, peaking in January and February. Females deposit eggs in recesses on exposed rock where they adhere to each other forming a nest. Fertilization is thought to be external and evidence suggests cabezon spawn multiple times in a season. A large female that measures 30-inches (76-centimeters) and weighs 23-pounds (10-kilograms) can produce approximately 152,000 eggs. Nests can be 18-inches (46-centimeters) in length, 2- to 4-inches (5- to 10-centimeters) thick and vary in color from pale green to red. Males guard the nest until eggs are hatched. After hatching, the young of the year spend 3 to 4 months as pelagic larvae and juveniles. Pelagic juveniles are silvery in coloration and are commonly found underneath drifting kelp mats. Settlement occurs when juveniles reach a length of approximately 1.5-inches (4-centimeters) at which time they recruit into tide pools. Fish leave the intertidal zone before maturing but may revisit tide pools during high tides to forage as adults.

There have been several reports on the toxicity of cabezon roe. In the 1950s, the well-known ichthyologist Carl Hubbs published a personal account of eating

cabezon roe. As part of an ongoing search for another caviar, Hubbs and his wife consumed the roe and flesh of a cabezon for dinner. Four hours later they "...awoke in misery...and were violently ill throughout the rest of the night." Laboratory evidence indicates that the roe is lethal to mice, rats, and guinea pigs. Anecdotal information on egg masses exposed at low tide suggests they are not preyed upon by natural predators such as raccoons, mink, or birds. Observations of captive cabezon have documented a female eating her own eggs with no resulting ill effects.

Length at maturity from one California study showed that 50 percent of females and males were mature at about 13-inches (33-centimeters; 2.3 years of age) and at about 12-inches (31-centimeters; 1.8 years of age), respectively. All fish larger than 18-inches (46-centimeters) and older than 7 years of age were found to be mature, regardless of sex. Females attain a larger size and grow slower than males. Cabezon can reach a maximum length of 39-inches (1-meter) and weigh as much as 25 pounds (11-kilograms), although average total length for sport-caught fish is 16-inches (41-centimeters) and 2.3 pounds (1-kilogram). Results of current research suggest that cabezon have a greater longevity than previously thought. Based on the maximum reported size of 39-inches (1-meter), it is probable that they could attain ages of 20 years or more.

Cabezon can be aptly described as "lie-in-wait" predators. Their mottled coloration enables them to blend in with their surroundings as they lie motionless waiting for their next meal. With large, robust pectoral fins set low on the body and a powerful tail, they quickly lunge after unwary prey, engulfing it in their large mouth. Their diet consists mainly of crustaceans, although large and small cabezon have different diets. Adult fish eat crabs, small lobsters, mollusks (abalone, squid, octopus), small fish (including rockfishes), and fish eggs. In preying on abalone, cabezon have a unique ability to pry smaller animals off of rocks, consume the meat and spit out the shell when done. Small juveniles consume amphipods, shrimp, crabs, and other small crustaceans. Juveniles are eaten by rockfishes and larger cabezon, as well as by lingcod, *Ophiodon elongatus*, and other sculpins. Large cabezon may be preyed upon by harbor seals, *Phoca vitulina richardsi*, or California sea lions, *Zalophus californianus*.

Status of the Population

The most recent California stock assessment on cabezon was completed in 2005. For this assessment cabezon were treated as different northern and southern California substocks based on differences in total removals, ecology, and current management needs. Point Conception was used as the delineation line between the two substocks. Reproductive output (mature female biomass) of the cabezon resource off northern California was estimated to be about 40 percent of the unfished stock, indicating a healthy population. Southern California's stock was estimated to be at about 28 percent of the unfished level. California's Nearshore Fishery Management Plan defines a groundfish species to be overfished if its

reproductive output falls below 30 percent of its unfished stock. For this reason, the southern substock's status is of concern to managers, although the stock size is projected to increase due to good recruitment indicators.

Management Considerations

The cabezon became a federally designated groundfish in 1982 when the Pacific Fisheries Management Council (PFMC) adopted the Pacific Coast Groundfish Fishery Management Plan. Since then it has been managed under the joint jurisdiction of the state and the federal government. Prior to 1982, this species was managed by the California Department of Fish and Game (CDFG) through regulations adopted by the state legislature and the California Fish and Game Commission (FGC).

Since the late 1990s, considerable federal pressure developed to rebuild "overfished"¹ species and subsequent management actions designed to avoid these species shifted fishing effort into nearshore areas putting additional pressure on shallow species such as cabezon. At the same time, state and federal management took a more precautionary approach for unassessed, "data poor" species lowering harvest limits. In addition, the popularity of the commercial live-fish fishery increased dramatically in the 1990s resulting in even greater pressure on nearshore stocks.

California's Marine Life Management Act (MLMA) of 1998 was adopted in response to the need to take a more precautionary approach to management that prioritized resource sustainability, and to address the rapid development of the live-fish fishery. This important piece of legislation made the possession of a commercial nearshore permit mandatory and delegated finfish management authority to the FGC. Minimum commercial size limits for nearshore species including cabezon were enacted². The MLMA also required that the FGC adopt a Fisheries Management Plan (NFMP) for nearshore finfish.

In 2000, under these new guidelines, the FGC adopted a precautionary approach for nearshore stocks with no assessment including cabezon which called for harvest limits to be set at 50 percent of historic landings.

Nineteen nearshore species including the cabezon are managed under provisions outlined in the NFMP, which was adopted by the FGC in 2002. The NFMP also mandated a precautionary management approach for stocks without quantifiable assessments so harvest limits continued to be set at 50 percent of historic landings until better information was available. In conjunction with the NFMP adoption, the FGC adopted a restricted access program which reduced the number

¹ "Overfished" is a formal federal or state designation used when the status of an assessed stock is determined to be at a critically low level; several important California groundfish species share this designation including bocaccio, canary, cowcod, widow and yelloweye rockfishes and previously, lingcod.

² In 2001 the commercial size limit for cabezon was increased from 14 to 15 inches.

of nearshore permittees regionally, limited approved gears to trap and hook-and-line, and provided for minimal bycatch in other fisheries.

Beginning in 2004, the harvest limit for cabezon has been based on assessment results and stock status. An overview of California Fish and Game Commission regulations for cabezon in 2006 were as follows:

- The total allowable catch (TAC) for cabezon in 2006, as well as in 2005, was 152,100 pounds (69 metric tons), of which the commercial fishery was allocated 59,300 pounds (27 metric tons) and the recreational fishery was allocated 92,800 pounds (42 metric tons).
- In past years, the commercial cabezon fishery closed early due to the projected catch exceeding its allocation. To avoid this, a mid-season reduction in commercial trip-limit amounts was adopted for September through October 2006. The change reduced the 2-month allotment from 900 pounds (0.4 metric tons) to 200 pounds (.09 metric tons) total take per permittee, and allowed the commercial cabezon fishery to remain open through the end of the year.
- Recreational bottomfishing seasons and/or depth restrictions were relaxed to some extent for all regions of California in 2006, allowing for increased fishing opportunity. There was no change in the 1-fish bag limit and 15-inch (38-centimeter) minimum size limit for cabezon for sport anglers.
- The total combined catch for sport and commercial fisheries in 2006 was estimated to be 87 percent of the TAC. In 2005 that combined total was estimated at 114 percent, exceeding the state TAC.

The most important data needs according to the stock assessment are: an accurate accounting of removals, especially from the recreational and live-fish fisheries, and a fishery-independent survey of cabezon population abundance. Both the recreational and commercial live-fish fishery take have traditionally been challenging to monitor. The sheer size and dispersed nature of recreational fishing in California makes it difficult to sample. The difficulty in monitoring the commercial live-fish fishery stems from the small and mobile nature of the landings, with fish often being transported directly to restaurants. Live-caught fish are also harder to handle if encountered by samplers and often fishermen are wary of having their premium catch examined, fearing reduced quality and trauma from being handled. To offset these difficulties, recent changes in the way the recreational fishery is monitored are designed to improve total sport take estimates, and greater enforcement of required commercial landings reporting will help reduce unreported catch. Ongoing fishery-independent research being undertaken in Morro Bay will provide managers with better information related to local and regional cabezon population demographics and abundance, especially if these efforts are expanded to other areas of California's coast. Study results have the potential to aid in future

stock assessments by providing estimates of catch, fishing effort, catch-per-unit effort, mortality, population size, fish movement, and site fidelity, among other data.

Real-time monitoring of commercial landings could be used to reduce lag time between when catch is actually landed and when the data from the landing is available to managers electronically. Lag time is currently around 6 weeks, making it difficult to actively track the cabezon catch as it comes in, or know at any time during the season what portion of the TAC has been landed. Any reduction in this time lag would help keep catches closer to the TAC at the end of the year.

California has considered the adoption of a slot size limit for cabezon in the past, and it is a management tool that may be considered again should the stock status change.

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Further Reading

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Table 7.1. Annual California commercial landings of cabezon in pounds, with ex-vessel value and average price per pound (lb) for years 1981-2006.

Year	Pounds	Ex-vessel Value	Avg. price/lb	Year	Pounds	Ex-vessel Value	Avg. price/lb
1981	64,400	\$10,221	\$0.17	1994	82,900	\$273,589	\$3.05
1982	63,800	\$10,038	\$0.18	1995	193,800	\$665,633	\$3.07
1983	23,600	\$3,889	\$0.20	1996	245,200	\$837,835	\$3.18
1984	18,700	\$2,534	\$0.24	1997	264,900	\$847,259	\$2.99
1985	25,900	\$5,685	\$0.28	1998	372,800	\$1,224,134	\$2.94
1986	16,200	\$3,716	\$0.30	1999	274,700	\$1,007,441	\$3.41
1987	8,800	\$2,658	\$0.36	2000	255,900	\$1,126,355	\$3.95
1988	12,700	\$5,423	\$0.40	2001	159,400	\$716,663	\$4.12
1989	25,000	\$7,600	\$0.42	2002	110,900	\$483,897	\$4.07
1990	26,000	\$9,209	\$0.40	2003	87,500	\$415,605	\$4.21
1991	16,300	\$13,436	\$0.57	2004	109,100	\$504,139	\$4.19
1992	36,600	\$50,847	\$1.79	2005	68,200	\$341,814	\$4.65
1993	39,300	\$123,273	\$2.92	2006	62,300	\$343,181	\$5.08