

California Barracuda

History of the Fishery

The California barracuda (*Sphyraena argentea*), also known as the Pacific barracuda, has played a significant role in the growth and development of California's commercial and sport fishing industries. Taken primarily off southern California and northern Baja California, Mexico, barracuda figured prominently in the development of the purse seine fishery. Additionally, they have long been a major component of the southern California sport fish catch.

Annual records of commercial barracuda landings date back to 1889, but only nine years of intermittent records exist through 1915, and these are not specific as to catch areas. Commercial landings of barracuda in 1889 were 0.5 million pounds, and by 1915 they were up to 3.6 million pounds. Since 1916, landing records have differentiated barracuda caught in California waters (essentially off southern California) from those caught in waters south of the international border with Mexico (northern Baja California). By 1916, the southern California purse seine fleet consisted of at least seven vessels. Influenced by the economic impetus of World War I, the commercial barracuda fishery grew concurrently with the rapid development of the purse seine fleet.

Attempts to manage the barracuda fishery began in 1915 with a minimum size limit of 18 inches for hook-and-line caught barracuda. Since then, many commercial and sport regulations on gear, seasons, weight, size, and bag limits have been enacted, modified, or repealed. Today, most commercially caught barracuda are taken by gillnets with 3.5-inch mesh, although some are taken by hook-and-line. The minimum size limit is 28 inches. May and June are usually the peak months of commercial fishing activity for barracuda.

Between 1915 and 1970, commercial landings of barracuda harvested from California's nearshore waters averaged 2.1 million pounds annually, despite a gradual decline in landings since 1925. Landings have remained relatively low since 1970, averaging about 113,500 pounds annually. Prior to 1926, California barracuda harvested south of the international border exceeded those catches made in California. Barracuda harvest from Mexican waters remained an integral part of the California fishery until 1969, averaging over one million pounds annually. But over the past 30 years, landings have been insignificant, averaging only 600 pounds annually. The major cause for the decline was the imposition of increasingly restrictive commercial fishing regulations by Mexico which became increasingly restrictive to California fishermen over the years.

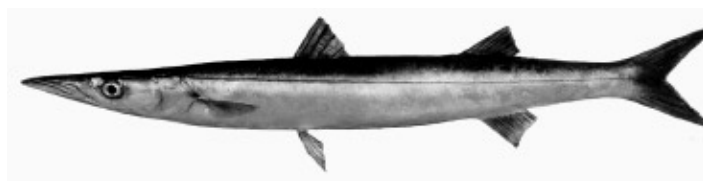
In general, commercial barracuda prices are a function of supply and demand. Historically, the price paid to

fishermen has been low. In 1999, commercial fishermen received an average price of \$0.70 per pound.

The popularity of California barracuda as a game fish goes back to at least the mid-1920s, as is evident from photographs and newspaper accounts. However, the California Department of Fish and Game (DFG) did not begin collecting records of commercial passenger fishing vessel (CPFV) sport fish landings until 1936. Records from 1936 through 1940 reveal that CPFV barracuda landings (in numbers of fish) exceeded those of other sport fishes, and that they often equaled or exceeded commercial landings (in weight) for barracuda taken in California waters. Annual landings for these five years averaged about 630,000 fish. Records were not kept from 1941 through 1946 due to fishing restraints during World War II. As interest in marine sport fishing grew in the post-World War II era, the sport take of barracuda greatly exceeded that of the commercial fleet in California waters. Between 1946 and 1971, CPFV barracuda landings ranged from 87,600 to 1.2 million fish, for an overall annual average of 447,000 fish. In 1971, the current 28-inch minimum size limit for all sport-caught barracuda became effective, causing an 86 percent decline in CPFV barracuda landings from the previous year. Since 1971, CPFV landings of barracuda have been increasing, ranging between 26,300 and 446,000 fish annually.

The Marine Recreational Fisheries Statistics Survey has shown that, on average, 54 percent of the total barracuda catch is from CPFVs, 45 percent is from private and rental boats, and one percent is from shore. In the late 1980s, a DFG study determined that roughly 60 percent of CPFV-caught barracuda are released (almost all of which are less than 28 inches). The study also indicated Los Angeles County accounted for 58 percent of the CPFV barracuda landings.

Sport anglers, especially aboard CPFVs, usually use live anchovies or sardines to fish for barracuda. Anchovies and sardines are also used to chum and hold barracuda schools close to the boat. Metal or plastic artificial lures in a variety of shapes and colors are also popular. Sport-caught barracuda are taken mainly near the surface. Most fishing activity occurs from May through September, when surface water temperatures range between 62° and 70°F.



California Barracuda, *Sphyraena argentea*
Credit: DFG

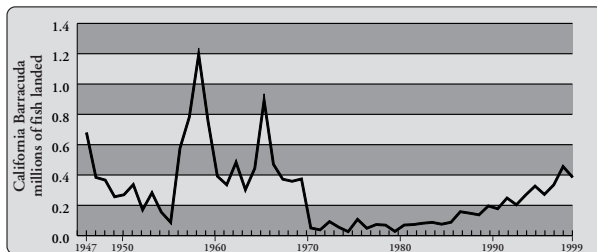
Status of Biological Knowledge

The California barracuda is a nearshore, epipelagic, schooling fish found from Cabo San Lucas, Baja California to Kodiak Island, Alaska. Catch origins indicate the population is centered between San Quentin, Baja California and Point Conception, California. During warm water oceanic events, such as El Niños, a portion of the population may shift northward into central California. Frequently seen at the surface, barracuda have been taken at depths of 120 feet.

Growth in length is most rapid during the first year of life. Barracuda reach a total length of 14 inches at one year. At two years, they have grown to 20 inches and weigh about one pound. However, the maximum growth by weight of nearly one pound per year is achieved by four- and five-year-old fish. The minimum size limit of 28 inches, approximately a three-pound fish, is near the average size for a four-year-old. At this age, females are about 0.75 inches larger than males, and the difference increases to about 2.5 inches in fish over six years old. The oldest fish aged was an 11-year-old measuring 41 inches and weighing about nine pounds. Larger and presumably older fish include the state angling record of 15 pounds 15 ounces and a 17-pound fish caught off Carpenteria in 1958 that measured 46.5 inches.

California barracuda produce pelagic eggs and larvae. Fertilization takes place externally as the sexes simultaneously release their gametes. At two years, almost all males and 75 percent of females are sexually mature. All are mature at three years of age. Full sexual maturity occurs in males at a length of 20 inches and in females at 22 inches. In a single spawning, a two-year-old female may produce 50,000 eggs, increasing to about 400,000 by age six. Individuals may spawn more than once during a spawning season. Off southern California, spawning takes place from April to September, peaking in June.

Feeding habits of California barracuda are not well documented, but some potential prey species can be mentioned. During pelagic schooling movements, barracuda may feed on other open water schooling fishes such as



Recreational Catch 1947-1999, California Barracuda

CPFV = commercial passenger fishing vessel (party boat); Recreational catch as reported by CPFV logbooks, logbooks not reported prior to 1947.

northern anchovy, Pacific sardine, Pacific mackerel, jack mackerel, and Pacific saury. In association with kelp beds or shallow water habitats, they may feed on topsmelt and California grunion. Opportunistic feeding on market squid made vulnerable during their spawning activity is likely.

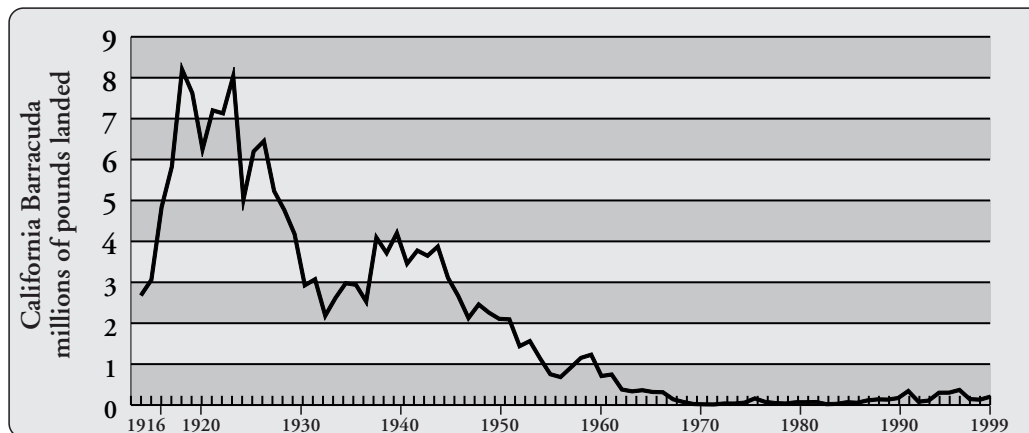
Previous references to the predators that feed on California barracuda have listed sea lions, seals, porpoises, and giant sea bass. Analyses of the gut contents and scat from marine mammals have failed to discover barracuda remains. Observations of California sea lions and harbor seals opportunistically feeding on barracuda injured or entrapped by fishing gear are common, but these animals more typically feed on the same size prey as adult barracuda. Giant sea bass are more likely predators on juveniles and adult barracuda.

California barracuda have an inshore distribution during their early life history. Fish a few inches long are observed in protected bays and marinas. Larger young-of-the-year fish school below the canopy of semi-protected kelp-bed habitats. Older juveniles and adults form large schools that disperse widely in the open-water environment.

Movements of California barracuda have been studied by tagging. Fish tagged during May 1959 at locations off northern Baja California and off southern California were recovered at intermixed locations, indicating a single population. Movements of up to 100 miles north and south occurred during the summer, but a portion of the recoveries were at the release sites. However, a general migration pattern that was distinctly northward during the summer and less distinctly southward during the fall was indicated. Movements are presumably a response to sea temperature, and warm overwintering temperatures off southern California reduce the southward return. High catch success during spring and summer off southern California has been correlated with warm sea temperatures the preceding winter.

Status of the Population

The status of the California barracuda population is unknown, because data concerning catch, fishing effort, and age composition are scarce. Barracuda catches off California are variable for many reasons, one of which is that barracuda are migratory with a preference for warmer waters. During an El Niño event, when warmer than normal water masses move up the coast, barracuda are caught far north of their normal range and in greater than average numbers off southern California, suggesting a higher population level. This was apparent during the 1957-1959 El Niño event, one of the most intense on record. However, during the similarly intense 1982-1983 and 1997-1998 El Niño events, barracuda catches did not



**Commercial Landings
1916-1999,
California Barracuda**
Data Source: DFG Catch
Bulletins and commercial
landing receipts.

increase appreciably. Assuming fishing effort and the percentage of the population migrating northward were similar, the difference suggests that the barracuda population was depressed during the latter El Niño periods. Since the late 1980s, catches have increased but remain well below those reported prior to 1970. This is due to the fact sport anglers may no longer keep short barracuda as they were allowed to do prior to 1971. Only during one three-year period, 1958 though 1960, has the number of barracuda off southern California been estimated by the DFG. Estimates ranged from 1.6 to 2.9 million fish.

Because of uncontrollable factors such as migration, water temperature, and Mexico's management policies, the DFG's management policies for this species probably have a limited effect on its population level. Nevertheless, the regulations are intended to reduce the likelihood of overfishing this valuable resource.

Management Considerations

See the Management Considerations Appendix A for further information.

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