

Giant Sea Bass

History of the Fishery

Because giant sea bass (*Stereolepis gigas*) grow slowly and mature at a relatively old age, they are susceptible to overfishing. As a consequence, they have suffered a serious decline in numbers. Commercial landings from U.S. waters peaked in 1932 near 200,000 pounds before declining. Mexican waters were more productive (peaking at over 800,000 pounds in 1932) and did not permanently sink below 200,000 pounds until 1964. A few hook-and-line fishermen targeted giant sea bass, but they were also caught incidentally by gillnets set for halibut and white seabass.

Recreational landings, reported in numbers of fish rather than pounds, show a similar trend of peaking and permanently declining. The peak in California landings occurred in 1963 while Mexican landings peaked in 1973. That these recreational fisheries peaked after the commercial fishery is due to the later development of the recreational fishery rather than a reflection of the giant sea bass population. A few boats developed a special recreational fishery targeting spawning aggregations during the summer months. Trips made in July to certain reefs between Point Abreojos and Magdalena Bay, Baja California, consistently produced 70 to 100 giant sea bass. One trip produced 255 in three days. Once these aggregations were exploited the fishery disappeared with the fish.

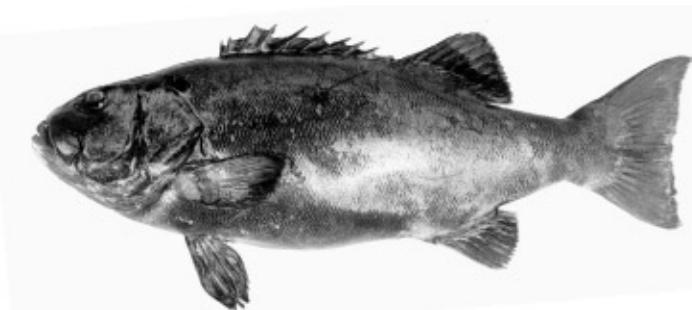
In 1981, a law was passed that prohibited the take of giant sea bass for any purpose, with the exception that commercial fishermen could retain and sell two fish per trip if caught incidentally in a gillnet or trammel net. This law also limited the amount of giant sea bass that could be taken in Mexican waters and landed in California. A vessel could land up to 1,000 pounds of Mexican giant sea bass per trip but could not land more than 3,000 pounds in a calendar year. The law was amended in 1988, reducing the incidental take to one fish in California waters. Although this law may have prevented commercial fishermen from selling giant sea bass in California, it did not prohibit fishing over habitats occupied by this species and probably did little to reduce the incidental mortality of giant sea bass, as giant sea bass that were entangled in the nets were discarded at sea. The 1981 rule changes were more effective in protecting giant sea bass in Mexico, since large landings had been historically made by hook-and-line fishermen targeting grouper, cabrilla, and giant sea bass off the Pacific coast of Baja California. The banning of inshore gillnets displaced the California fishery from the majority of areas inhabited by giant sea bass; it is reasonable to assume that this closure significantly reduced the incidental mortality of giant sea bass in California.

Status of Biological Knowledge

Although this species is most frequently referred to as black seabass in California, the American Fisheries Society has designated the common name as giant sea bass. Black seabass is an unrelated Atlantic coast species. Giant sea bass were originally assigned to the grouper family, Serranidae, but later placed in a new family, Percichthyidae. Although family placement has still not been resolved, similarities between larvae of wreckfishes and giant sea bass seem to support placement in the family Polypoprionidae.

Small juveniles are bright orange with large black spots. As they grow they lose the orange coloration and take on a bronzy purple color. The spots slowly fade as the fish gets larger and darker, with large adults appearing solid black to gray with a white underside. Giant sea bass are capable of rapid and dramatic color changes. Large fish retain the ability to display large black spots, can take on a bicolor appearance (light below, dark above), white mottling, jet-black or light gray. As implied by the name, the most dramatic feature of giant sea bass is their large size. The International Game Fish Association world record for this species is 563.5 pounds, caught at Anacapa Island in 1968. Giant sea bass reach lengths in excess of seven feet, and are nearly as big around as they are long.

Despite the conspicuous size and protected status of giant sea bass, there are no published scientific studies to provide details of the biology and habits of this creature. In the eastern Pacific, giant sea bass range from Humboldt Bay to the tip of Baja California, and occur in the northern half of the Gulf of California. Some authors have stated that this species is also found along the coast of northern Japan and the Sea of Japan, but this may be a case of mistaken identity. Within California it is rarely found north of Point Conception. Adult giant sea bass seem to prefer the edges of nearshore rocky reefs. These reefs are relatively shallow (35 to 130 feet) and often support thriving kelp beds. Although the kelp may disappear due to a strong El Niño or overgrazing by sea urchins, giant sea bass remain at the reef. At certain times of the year,

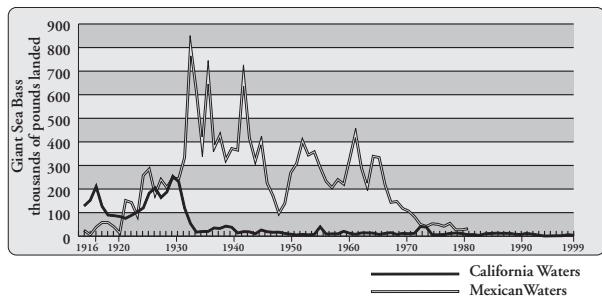
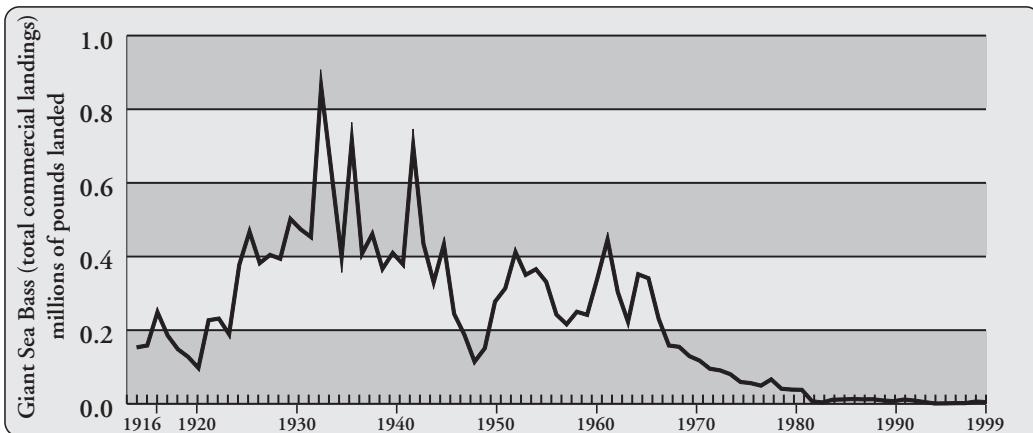


Giant Sea Bass, *Stereolepis gigas*
Credit: DFG

Giant Sea Bass

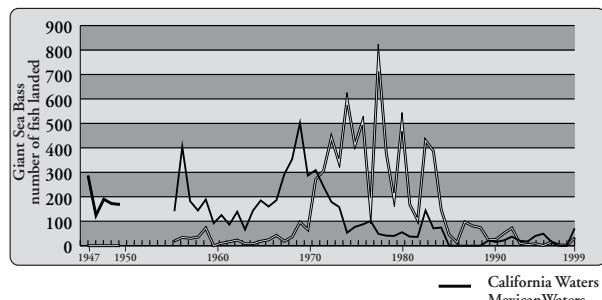
Commercial Landings 1916-1999, Giant Sea Bass

Data reflects catch from both California and Mexican waters landed in California. Data source: DFG Catch Bulletins and commercial landing receipts.



Commercial Landings by Location 1916-1999, Giant Sea Bass

Landings separated by location of catch. All landings were recorded at California ports.
Data Source: DFG Catch Bulletins and commercial landing receipts.



Recreational Catch 1947-1999, Giant Seabass

Data derived from commercial passenger fishing vessel (party boat); Recreational catch as reported by CPVF logbooks, logbooks not reported prior to 1936; no data available for 1941-1946; data separated by location of catch. Catch Data was not available for 1999.

adults can be found well away from the reef foraging for squid over a sandy bottom.

The orange juvenile phase has been reported among drifting kelp scattered over the bottom in 20 to 35 feet of water, over the soft muddy bottom outside of the Long Beach breakwater, and over flat sandy bottom in Santa Monica Bay. Larger juveniles up to 31 pounds have been

found over flat sandy bottom and are sometimes caught over deep ridges (230-265 feet) off the coast of Del Mar by anglers targeting rockfish.

Given their depressed population and protected status, it is unlikely an aging study of giant sea bass will be completed in the near future. Although aging data are sparse, it is safe to say these fish grow slowly and live a long time. Estimated growth-rates are six years to reach 30 pounds, 10 years to reach 100 pounds, and 15 years to reach 150 pounds.

Spawning has never been observed in nature, but gonad examinations suggest that it occurs between July and September. Male fish have been observed to be mature at 40 pounds, and females at 50 to 60 pounds. Anecdotal information suggests that giant sea bass aggregate at specific locations and times to spawn. Because of the large size of this species, females are capable of producing enormous numbers of eggs. The ovaries of a 320-pound specimen contained an estimated 60 million eggs. Fertile, hydrated giant sea bass eggs are relatively large for a marine species, measuring about 0.06 inch in diameter. The eggs float to the surface and hatch in about 24 to 36 hours. The larvae drift and feed in the plankton for about a month before settling to the bottom and beginning their lives as juveniles. Giant sea bass have spawned in captivity several times, most recently at the Long Beach Aquarium of the Pacific where a single pair spawned in two successive years, nearly weekly beginning in June and ending in August or September.

Examinations of fish caught in Mexico indicate that the principal prey items are sting rays, skates, lobster, crabs, various flatfish, small sharks, mantis shrimp and an occasional kelpbass or barred sandbass. Earlier analyses found blacksmith, ocean whitefish, red crab, sargo, sheepshead, octopus and squid. Giant sea bass are not built for speed, and the majority of their prey consists of organisms that

live on the bottom. The vacuum produced when the huge mouth is rapidly opened draws such organisms into their mouth. Giant sea bass themselves are eaten by a variety of fishes and marine mammals when they are small. In addition to humans, large sharks prey on adults.

Except for the short period of time they spend as planktonic larvae, giant sea bass live in close association with the bottom. This way of life may become a problem for this species. The sediments along the coast of southern California carry high loads of toxins. In fact, an area off the Palos Verdes peninsula is thought to contain higher levels of DDE (a breakdown product of DDT) than anywhere else in the world's oceans. PCB is another pollutant that is prevalent along the coast of southern California. Many forms of invertebrates live in these sediments, ingesting the pollutants along with the organic material they feed on to survive. These organisms occupy very low trophic levels, and the toxins are passed up the food chain in increasing concentrations. Long-lived, top level predators accumulate the highest levels of toxins. Giant sea bass caught in southern California have been found to have high body burdens of DDE and PCB. Fish collected 200 miles south of the Mexican border were found to be free of toxins. Thus, California populations of giant sea bass may suffer from more than just overfishing. These two toxins have been found to affect reproduction in other species of fish, as well as in amphibians, reptiles, and birds.

It is presumed that giant sea bass migrate to specific sites to spawn. This was almost certainly the case prior to the exploitation of the spawning aggregations, but it is not known how far individuals traveled to participate in the aggregation, or whether these migrations take place today. The process of site selection for spawning aggregations is not well understood, but experimental manipulation of small aggregating reef species suggests that once a site is selected young fish learn its location from older fish. In this way, the same traditional spawning aggregation sites are used by subsequent generations of fish. Once the learning cycle has been broken it is not known how a new (or the same) spawning aggregation may form. The population may have to reach a particular density before the process of forming annual spawning aggregations becomes a possibility. Giant sea bass have been found in groups year round at a few locations in southern California. Although anglers that come across these areas and hook several giant sea bass in one day may be led to believe that this species is thriving, giant sea bass remain absent from the vast majority of our coast. It is likely that the fish are gregarious, and after heavy exploitation, the population has collapsed to a very few focal points where they can be found in healthy numbers.

Status of the Population

The California population of giant sea bass is well below historical highs. Anecdotal information suggests that numbers may be beginning to rebound under current measures. No hard data exist that provide actual or relative numbers of giant sea bass.

Management Considerations

See the Management Considerations Appendix A for further information.

Michael L. Domeier

Pfleger Institute of Environmental Science

References

- Domeier, Michael L. and Patrick L. Colin. 1997. Tropical reef fish spawning aggregations: defined and reviewed. Bull. Mar. Sci. 60 (3):698-726.
- Eschmeyer, W.N., E.S. Herald, and H. Hammann. 1983. A field guide to Pacific Coast fishes of North America. Houghton Mifflin Company. Boston, MA. 336 p.
- Shane, M. A., W. Watson, and H. G. Moser. 1996. Polyprionidae: giant sea basses and wreckfishes. Pages 873-875 In: H. G. Moser (ed.), The early stages of fishes in the California Current Region. Coop. Fish. Invest. Atlas No. 33. Allen Press Inc., Lawrence, KS. Calif.