8 Giant Sea Bass, *Stereolepis gigas*

Giant sea bass, *Stereolepis gigas*. Photo credit: Edgar Roberts.

History of the Fishery

The giant sea bass, *Stereolepis gigas*, an apex predator of shallow rocky reefs, is the largest resident bony fish found along the California coast and offshore islands. They range from the southern tip of Baja California, Mexico to Humboldt Bay in northern California and in the northern Gulf of California. Aggregations of both sexes are predominantly found south of Point Conception. Giant sea bass are commonly seen by recreational scuba divers in California along La Jolla, Catalina Island, and Anacapa Island. Because the giant sea bass is slow growing, long lived, and aggregates in large groups, it is susceptible to over fishing. In the past, it was not uncommon for nearly entire aggregations to be eliminated by commercial and recreational fisheries.

Commercial fishing for the giant sea bass began in 1870 in southern California, much earlier than the recreational fishery. In 1932 California commercial landings peaked at more than 254,000 pounds (115 metric tons). Mexican commercial landings peaked at 807,750 pounds (367 metric tons) in 1934 and declined to less than 200,000 pounds (91 metric tons) in 1964. Early commercial fishers used hand lines to catch giant sea bass, but as the resource declined, fishing with hand lines became too inefficient and they changed to gill nets. This technique quickly reduced stock numbers, driving the commercial fishery south into Mexican waters. Commercial and recreational fishing for giant sea bass in Mexico continues today with no restrictions.

The recreational fishery for giant sea bass began in 1895, peaking in California in 1964 and in Mexico in 1973. While a few recreational vessels targeted giant sea bass spawning aggregations, most catches were incidental while targeting other species that occupied the same habitat. With both commercial and recreational fishers targeting these aggregations, the species was depleted to the point that in the late 1970s the fishery nearly disappeared in southern California. In 1981 a law was enacted that prohibits both the recreational and commercial take of giant sea bass in California, with the exception that commercial gill net and trammel net fishers could take and sell two fish per trip (FGC §8380, Title 14, CCR, §28.10). Also, a limit was placed on the

amount of giant sea bass that can be taken in Mexican waters and landed in California. These vessels were allowed to land 1000 pounds (450 kilograms) of giant sea bass per trip but only 3000 pounds (1360 kilograms) per year. This law was amended in 1988 to allow only one incidental fish caught in Mexican waters to be landed in California (FGC §8380).

Status of Biological Knowledge

The giant sea bass has been placed in the family Polyprionidae due to its larval similarities with wreckfish. The giant sea bass is a slow growing, long lived species that reaches lengths of more than 7 feet (2.3 meters). The International Game Fish Association all-tackle world record is 563 pound-8 ounce (256 kilograms) fish caught in 1968 off of Anacapa Island, California. There are unconfirmed claims of larger specimens. "The Channels Islands" by Charles F. Holder published in 1910 tells of a giant sea bass taken from the Gulf of California reaching 800 pounds (363 kilograms). However, larger specimens have yet to be confirmed.

Adult giant sea bass occupy rocky habitats near kelp beds, ledges and drop offs at depths of 35 to 130 feet (11 to 40 meters). They may also be found foraging over sandy bottom away from rocky reefs. Juvenile giant sea bass (Figure 8-1) are brick red with irregular rows of black spots on their sides and are found in and near kelp beds and sandy bottom habitats in the depth range of 20 to 70 feet (6 to 21 meters). Adult giant sea bass of both sexes form large aggregations from June through September. Giant sea bass have not been observed spawning in the wild; however, they have been observed spawning in captivity from June through September. This is supported by gonad assessments that also suggest spawning occurs from July through September. Most females mature at 50 to 60 pounds (23 to 27 kilograms) or 7 to 8 years of age, and all females are mature by 100 pounds (45 kilograms) or 11 years of age. Large females are capable of producing an estimated 60 million eggs. After the eggs are deposited and fertilized in the water column they float to the surface, hatching within 36 hours. The developing larvae feed on plankton for their first month before settling on the bottom. It can take 6 years for giant sea bass to reach 30 pounds (14 kilograms), 10 years to reach 100 pounds (45 kilograms), and up to 15 years to reach 150 pounds (68 kilograms).

Figure 8-1. Juvenile giant sea bass. Photo credit: Edgar Roberts.

Giant sea bass spawning aggregation site selection is poorly understood. It is thought that young giant sea bass learn aggregation site location from older fish. As a result these aggregation sites are used by generations of giant sea bass. Once a local population is depleted their aggregation site permanently disappears. It is unknown how new aggregation sites are selected. Because giant sea bass will continue to

aggregate in the same location when kelp is absent, it is assumed that kelp is not the attractant for the location of these aggregations. Little is known of the giant sea bass home range and migration patterns. Researchers began studying giant sea bass movement, behavior, and habitat preference in 2000 using acoustic tags and an array of acoustic receivers around the northern Channel Islands and Catalina Island, as well as the mainland coast. Results of this research show that giant sea bass tagged at Anacapa Island were regularly recorded by receivers off Santa Rosa Island in the north and Catalina Island in the south, as well as Point Dume on the mainland, and that adults can travel more than 50 miles (80 kilometers) among the islands and mainland.

The giant sea bass diet has been quantified by stomach analysis and includes anchovies, sardines, squid, white croaker, jack mackerel, Pacific mackerel, California sheephead, ocean whitefish, sand bass, Pacific bonito, midshipman, stingrays, small sharks, cancer crabs, red crabs, spiny lobster and mantis shrimp. Small giant sea bass feed mainly on small inshore species such as anchovies and sardines.

Status of the Population

Incidental landings of giant sea bass in the commercial fishery, from 1998 to 2008, range from 4238 to 8689 pounds (1924 to 3945 kilograms) per calendar year (Figure 8-2). Giant sea bass incidental recreational catch from 1998 to 2008 range from 0 to 1379 fish per calendar year (Figure 8-3 and 8-4).

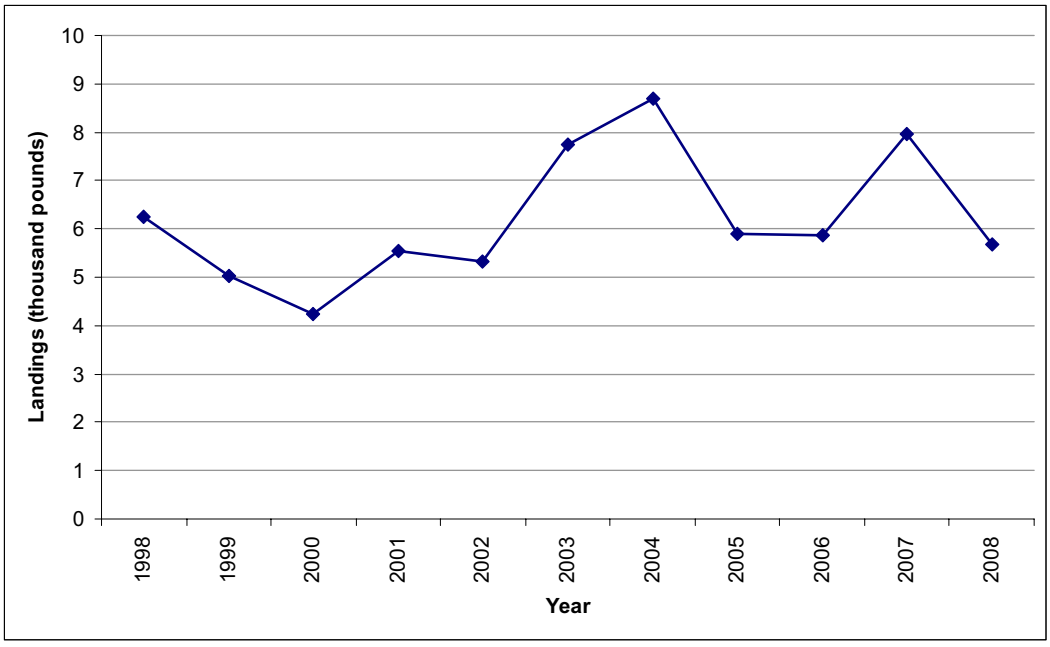

Figure 8-2. Giant sea bass incidental commercial landings, 1998-2008. Data source: CFIS data, all gear types combined.

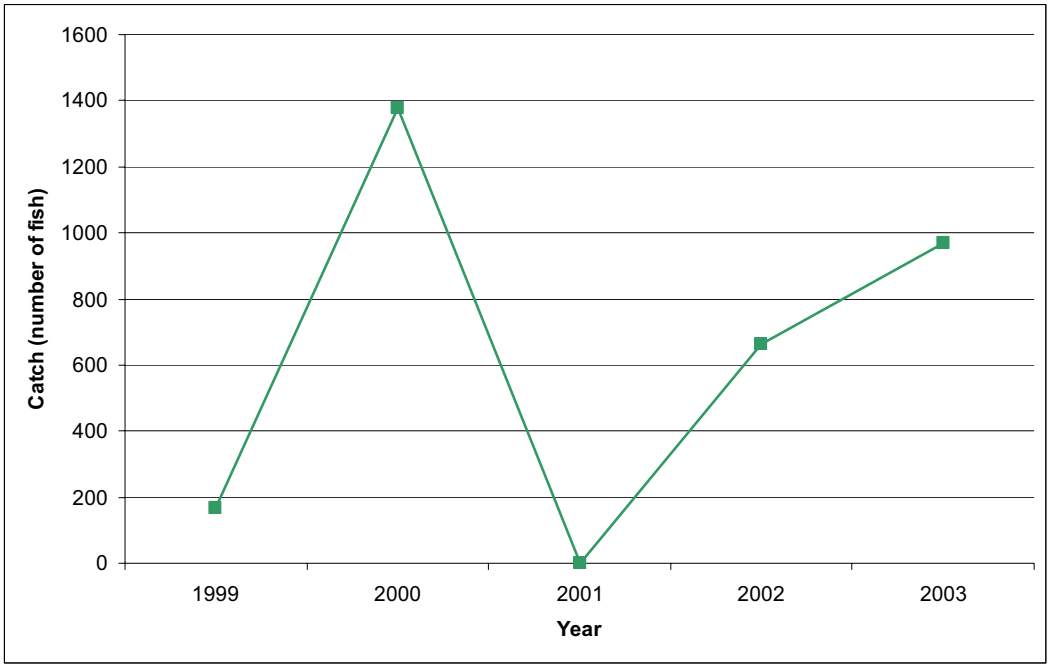

Figure 8-3. Giant sea bass incidental recreational catch, 1998-2003. Data source: MRFSS data, all fishing modes and gear types combined.

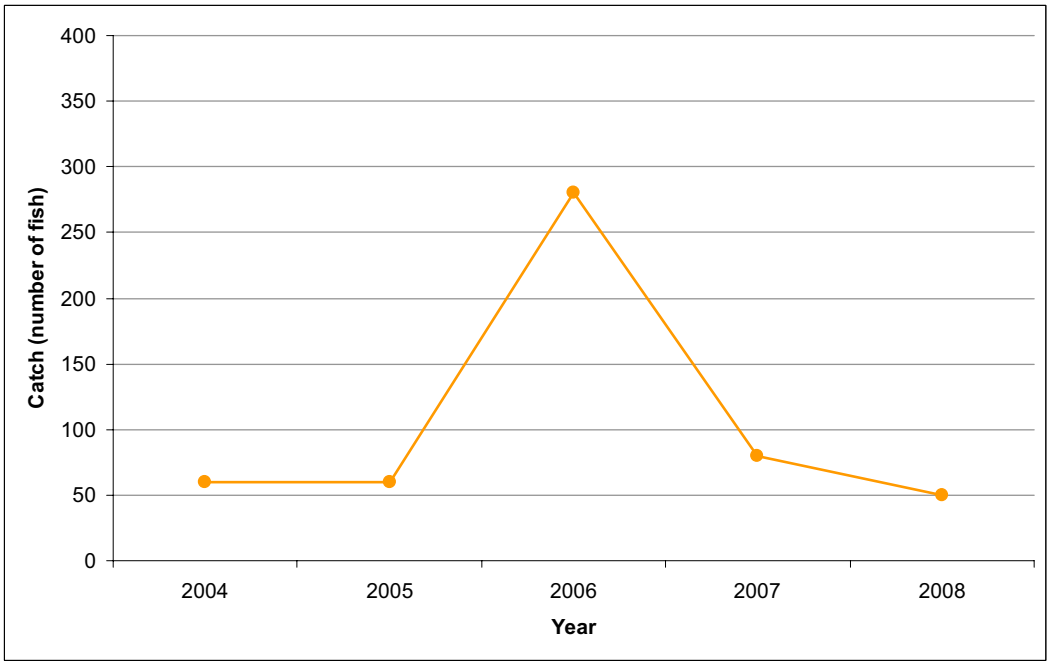

Figure 8-4. Giant sea bass incidental recreational catch, 2004-2008. Data source: CRFS data, all fishing modes and gear types combined.

The International Union for the Conservation of Nature and Natural Resources (IUCN) has designated the giant sea bass as a critically endangered species on the IUCN Red List. The population of the giant sea bass in California continues to be well below historic levels. In 1990, Proposition 132 was passed outlawing the use of gill nets

and trammel nets within state waters [within 3 nautical miles (5.6 kilometers) from the mainland, 1 nautical mile (1.8 kilometers) from islands] off southern California beginning in 1994 (FGC §8610.2). The gill net closure displaced the California fishery from the majority of giant sea bass habitat, significantly reducing the incidental catch mortality of giant sea bass in California waters.

The establishment of Marine Protected Areas (MPAs) in locations of giant sea bass aggregations may eliminate catch and release mortality of these enormous reef fish. One study shows a local population of 100 individuals without juvenile recruitment will have 29 individuals after 25 years with natural mortality rate of 6 percent. Adding a 5 percent catch and release mortality will leave only 10 fish after 25 years and 20 percent could cause local extinction in 16 years.

Anecdotal information suggests there has been a gradual increase in giant sea bass numbers over the past few years. Incidental observations by scuba divers have seen an increase in giant sea bass numbers at popular dive locations off La Jolla and at Anacapa and Catalina Islands over the past few years. Scuba surveys conducted by the Van Tuna Research Group, Occidental College, along Palos Verdes Point, beginning in 1974, observed giant sea bass for the first time in 2002 and again in 2003-2004 (Figure 8-5). The Ocean Resources Enhancement and Hatchery Program's (OREHP) gill net monitoring program found a significant increase in giant sea bass catch-per-unit-effort (CPUE) from 1995 to 2004 (Figure 8-6). No scientific research has been conducted on giant sea bass population trends. To date there is still relatively little known of this apex predatory fish.

Hopefully, with the closure of the giant sea bass fishery, elimination of gill nets from the state waters of southern California in 1994, and the implementation of the MPAs within the species home range, the giant sea bass population will rebound after having been severely depleted.

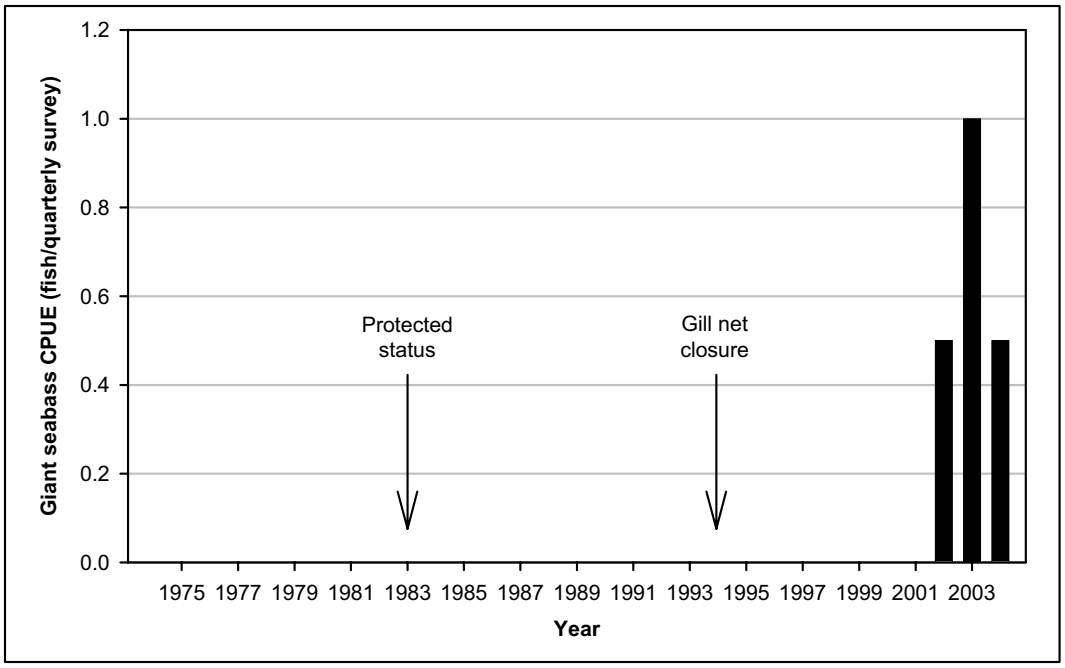

Figure 8-5. Giant sea bass catch-per-unit-effort (CPUE) from quarterly scuba survey, Palos Verdes Point, CA, 1974-2004. Data source: Daniel J. Pondella II, Department of Biology, Occidental College.

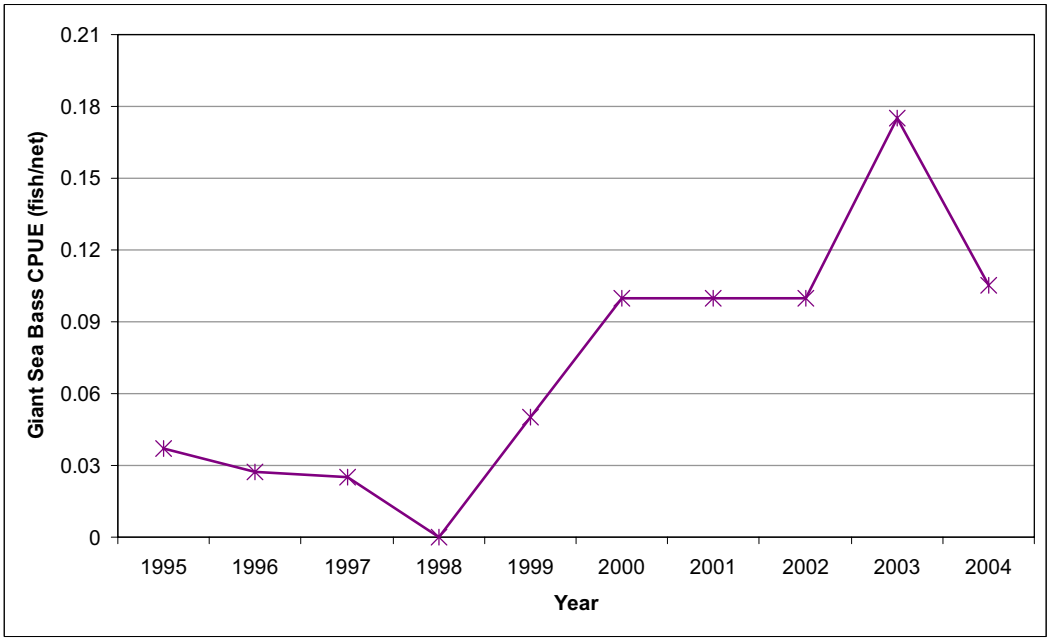

Figure 8-6. Giant sea bass catch-per-unit-effort (CPUE), 1995-2004, from OREHP gill net sampling program. Data source: Daniel J. Pondella II, Department of Biology, Occidental College.

Management Considerations

Current management practices should remain in place. The most important management for protecting the giant sea bass is establishing and maintaining full protection of their aggregation sites to eliminate incidental catch and release mortality.

Donald S. Baldwin
California Department of Fish and Game
DBaldwin@dfg.ca.gov

Aimee Keiser
Pacific States Marine Fisheries Commission

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Giant sea bass incidental commercial landings, 1998-2008.

Year	Pounds	Year	Pounds
1998	6,238	**2004**	8,689
1999	5,018	**2005**	5,889
2000	4,238	**2006**	5,877
2001	5,530	**2007**	7,952
2002	5,324	**2008**	5,685
2003	7,752		

Data source: CFIS data, all gear types combined.

Giant sea bass incidental recreational catch, 1998-2003.	
Year	**Number of fish**
1998	0
1999	166
2000	1,379
2001	0
2002	662
2003	968

Data source: MRFSS data, all fishing modes and gear types combined.

Giant sea bass incidental recreational catch, 2004-2008.	
Year	**Number of fish**
2004	60
2005	60
2006	280
2007	80
2008	50

Data source: CRFS data, all fishing modes and gear types combined.