

Black Rockfish

History of the Fishery

Black rockfish (*Sebastes melanops*), also known as black snapper and black bass, are a minor to moderate component of nearshore commercial and recreational fisheries, with increasing importance from the San Francisco area northward. The Eureka area accounts for 80 percent to 90 percent of all commercial landings in the “black rockfish” market category (which may contain other species, most commonly blue rockfish). Annual statewide landings in the 1990s ranged from 189,000 to 277,000 pounds, except in 1993 when only 86,000 pounds were landed. Landings from port areas south of San Francisco have never comprised more than 10 percent of total landings in the market category. In the San Francisco port area, “black rockfish” landings increased fifteen-fold from 1989 to 1992. The majority of black rockfish in commercial fisheries are landed dead but a small portion are now landed live in the recently expanded live fish fishery, primarily from Morro Bay north to Fort Bragg. They are also taken incidentally in the commercial salmon troll fishery. Black rockfish also comprise minor to significant proportions of other market categories, in particular “blue rockfish,” “small rockfish,” and “unspecified rockfish.”

Black rockfish are an important recreational species, particularly in northern California. Long-term monitoring of the recreational skiff fishery in the Eureka/Crescent City area showed them as the most frequently taken species every year in the 1990s; in 1997, for example, black rockfish comprised 58 percent of the observed catch. During the period from 1981 through 1986, the Marine Recreational Fisheries Statistical Survey (MRFSS) showed that in Humboldt and Del Norte Counties (northern California), black rockfish comprised from 15 to 31 percent annually of the estimated total marine recreational catch for all fishing modes combined. South of the Eureka area, black rockfish gradually decrease in importance in the recreational catch and are infrequently observed south of Santa Cruz. They are often among the top 10 species observed annually in commercial passenger fishing



Black Rockfish, *Sebastes melanops*
Credit: DFG

vessel (CPFV) catches from Fort Bragg south to the San Francisco/Princeton area. Black rockfish also are important to divers. In a 1972 survey in northern and central California, black rockfish comprised approximately eight percent of all fish taken by divers, and were primarily taken in northern California.

A six- to seven-fold increase in estimated annual landings of black rockfish in the recreational fishery occurred between 1957 through 1961 and 1979 through 1986, which reflects a substantial increase in fishing effort between the two periods. Since then, estimated total recreational catch has been variable and has not continued to increase steadily. During the 1990s, the annual estimated take of black rockfish in the recreational fishery was fairly similar to that of the commercial fishery.

In 1992, DFG initiated a voluntary catch-and-release program in recreational and commercial fisheries for black rockfish less than 14 inches in total length in response to concerns over the lack of larger fish in sampled recreational catches, particularly in the San Francisco/Half Moon Bay area. The program was unsuccessful in the primary target area (Bodega Bay to Santa Cruz) and was not continued due to two factors: 1) increased recruitment of sub-adult fish to the fishery (*i.e.*, recreational anglers were unwilling to return a substantial portion of their catch to the water); and 2) perceived competition for the same resource from non-cooperative fishermen.

Status of Biological Knowledge

Black rockfish range from Amchitka Island, Alaska to Santa Monica Bay in southern California, but are uncommon south of Santa Cruz. They frequently occur in loose schools ten to twenty feet above shallow (to 120 feet) rocky reefs, but may also be observed as individuals resting on rocky bottom, or schooling in midwater over deeper (to 240 feet) reefs. They may attain a maximum length of 25.5 inches in California, although individuals over 20 inches are rarely observed today. Average size observed in commercial and recreational fisheries now is 14 to 15 inches in northern California and 11 to 13 inches in central California.

Black rockfish have a relatively fast growth rate. First year growth is usually 3.5 to 4.0 inches. Most individuals become available to the fishery by the time they have reached three to four years of age and are approximately 10 to 11.5 inches. They are larger at equal age than blue rockfish; four-to-seven-year old black rockfish may average from 11.5 to 13.8 inches, while blue rockfish range from 10 to 12 inches within that age range. By age five, growth rate of female black rockfish surpasses that of males, and

by age 15, female black rockfish may average 2.4 inches longer than males.

At six years, or about 14 inches, half of all males are sexually mature. At seven to eight years, or about 16 inches, half of all females are sexually mature.

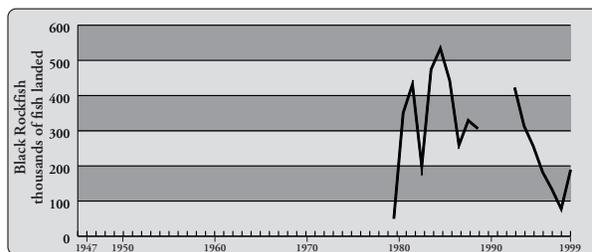
As with all members of the genus *Sebastes*, fertilization and development of embryos takes place within the female's body. Black rockfish mating generally occurs between September and November. Females store the sperm until their eggs mature in December or January, at which time the eggs are fertilized by the stored sperm. The larvae develop within thirty days, at which time black eyespots become visible to the naked eye. The eyed larvae are released into the water from late January to May, peaking in February off of California.

Larvae may remain in the ocean's surface waters for three to six months where they are dispersed by currents, advection, and upwelling. They begin to reappear as young-of-the-year (YOY) in shallow, nearshore waters by May, but the major recruitment event usually occurs from July to August. YOY black rockfish generally recruit to the shallower portions of kelp beds (15- to 40-foot depth) as well as semi-protected sandy areas of the coast. As newly settled YOY (approximately 1.5 inches) they most closely resemble yellowtail rockfish YOY. As they grow, YOY black rockfish more closely resemble YOY blue rockfish in pigmentation but lack the mottling on the sides, which are a uniform tan to light brown. As juveniles and adults, black rockfish are frequently mistaken for blue rockfish. The best characteristics that separate black from blue rockfish are a wide, unmottled, light blue-gray area along the lateral line, a relatively large mouth, the shape of the anal fin, and black speckling in the dorsal fin.

Although black rockfish may occur with blue rockfish, particularly in central and northern California, they are not considered to be competitors because their diets share little in common. Juvenile and adult black rockfish primarily consume crab megalopae, amphipods, isopods, and other fishes, including YOY rockfishes.

Major predation occurs on all rockfishes from the moment of larval release throughout the first year by a variety of fishes and invertebrates, as well as marine birds. Larger black rockfish are preyed upon by lingcod and marine mammals such as sea lions.

Black rockfish are commonly associated with other nearshore fish species, particularly other rockfishes. A statistical technique, cluster analysis, was used to partition CPFV catch data from 1987 to 1992 in the Monterey area based on the frequency of occurrence of species in the sampled catch. Interestingly, no other schooling rockfish was closely associated statistically with black rockfish, but three benthic species (gopher, China, and brown rock-



Recreational Catch 1947-1999, Black Rockfish

Data Source: RecFin data base for all gear types; data not available for 1990-1992

fishes) showed an affinity to the same habitat and depth range as black rockfish. It is commonly known among fishermen that black rockfish in central California are characterized by localized areas of relatively high abundance in the nearshore area.

The DFG has conducted limited tagging studies on juvenile and adult black rockfishes. Between 1978 and 1985, 89 black rockfish were tagged in central California. Four tags were returned from fish which had been at liberty from 18 to 552 days; all fish were recaptured in the same areas where they were released.

Status of the Population

Although no fishery-independent population estimates have ever been made of black rockfish stocks in California, substantial information exists on relative abundance and length frequency from fishery-dependent surveys. Data from the 1981-1986 MRFSS survey showed a 23 percent decline in the average weight of black rockfish taken compared with fish harvested from 1958 through 1961.

Onboard observations from CPFVs in the San Francisco area documented a significant change in the length frequency of the sampled catch from 1989 to 1990. During that period, the occurrence of larger adult black rockfish (greater than 15 inches) declined precipitously. This occurred during a time when nearshore commercial hook-and-line fishing effort and landings were expanding, as mentioned previously. Mean length in the sampled catch from the San Francisco area declined from 14.3 inches in 1988-1989 to 12.1 inches in 1990-1991, and has ranged from 11.4 to 12.6 inches annually from 1993 to 1998. This is well below the average length at 50 percent sexual maturity. Since 1993, all other CPFV port areas from Fort Bragg south to Morro Bay have yielded similar low mean lengths.

Results from commercial fishery sampling are consistent with the above. For example, 296 black rockfish sampled from the Morro Bay area commercial nearshore fishery from 1993 to 1997 averaged 12.2 inches. Coincident with

these observed declines in mean length were increased harvest rates (catch per angler hour) observed in the CPFV fishery in central California, particularly from 1994 to 1997. Thus, the observed decline in mean length is partially related to stronger recruitment, and, in spite of increased fishing effort on black rockfish in recent decades, localized populations of adults still must be present in California to provide this recruitment.

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