

Nearshore Rockfishes (Genus *Sebastes*)

Thirteen fishes of the genus *Sebastes* (rockfish) are included in the State's list of nearshore species defined in Title 50, Code of Federal Regulations, Parts 600 and 660 as Nearshore Rockfish. These are: black, black-and-yellow, blue, brown, calico, China, copper, gopher, grass, kelp, olive, and quillback rockfishes, and treefish.

Black Rockfish (*Sebastes melanops*)

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. Black rockfish are a component of both commercial and recreational fisheries, with increasing importance from San Francisco northward. Data from the 1981-1986 Marine Recreational Fishery Statistics Survey (MRFSS) survey showed a 23 percent decline in the average weight of black rockfish taken compared with fish taken between 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. 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; 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 catch 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 maybe partially related to strong 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.

Black-and-Yellow Rockfish (*Sebastes chrysomelas*)

Status of the Population:

While there have been several studies of local abundance for black-and-yellow rockfish, there is no comprehensive assessment of their population.

Blue Rockfish (*Sebastes mystinus*)

Status of the Population:

The blue rockfish is one of the most important recreational species in California (Leet et al. 2002). It is usually the more frequently caught rockfish north of Point Conception for anglers fishing from CPFVs and skiffs, is also important to divers, and is occasionally caught by shore anglers. Only a small portion of blue rockfish are from commercial landings, however, they have become a minor component of the live fish fishery (Leet et al. 2002) Although no fishery-independent population estimates have ever been made of blue rockfish stocks, it appears that they have withstood considerable fishing pressure over the last four decades and continue to be healthy north of Point Conception. However, there is evidence of a decline in blue rockfish stocks off southern California since the 1970s.

There is a well-documented difference in the population structure between northern and central California stocks. Northern stocks are generally characterized by a wider size range of adults, a higher proportion of adults greater than 15 inches and a correspondingly greater mean length, less variability in annual recruitment, and most likely a higher growth rate. These attributes are likely a result of a combination of greater fishing pressure and a greater influence of anomalous oceanic conditions such as El Niño events in central California. Greater variability in annual recruitment results in occasional strong year classes that cause strong length-frequency modes in the population; this occurred four times in recreational fishery samples obtained from 1959 to 1983 in central California. It is believed that the last exceptionally strong year class of blue rockfish in central California occurred in 1988, which is cause for concern. However, a relatively strong year class also was observed in 1999. In 1993, when the majority of the 1988 year class had become available to recreational anglers, mean lengths in the sampled catch declined substantially in central California. For example, mean length of blue rockfish sampled from Monterey area CPFVs declined from 11.9 inches in 1992 to 11.0 inches in 1993. In heavily fished and well-sampled populations of rockfish, changes in annual mean length from one year to the next are commonly less than 0.5 inches. The total number of blue rockfish caught in recreational fisheries increased substantially from the late 1950s to the mid-1980s, concurrent with increased effort. However in the past 15 years recreational fishing effort has been variable but has not shown a consistent increase; the recreational catch of blue rockfish has shown the same pattern. However, increased commercial fishing in the nearshore area during the same period has put additional stress on blue rockfish populations.

Brown Rockfish (*Sebastes auriculatus*),

Status of the Population:

While there have been studies of local abundance in certain coastal areas and within bays, the population size and structure of this species has not been comprehensively assessed. Evidence of stress on brown rockfish stocks in California exists, however, and some relative changes in the population have been identified. Commercial and recreational catches have steadily increased during the last 40 years, while the average length and weight of brown rockfish in landings have declined. When recreational statistics collected during the last 20 years were compared to results from a 1958 through 1961 recreational survey, brown rockfish showed a 49 percent decrease in average weight per fish over 30 years. Mean length of brown rockfish obtained from CPFVs and private recreational boats in northern California declined by 18 percent and 21 percent, respectively, over 40 years. In southern California, mean length in the CPFV catches declined by 31 percent during the same period. In relation to the length at which 50 percent of males and females are mature, recreational landings data indicate that from 1958 to 1961 most brown rockfish taken had reached sexual maturity. By the 1980s, however, few fish taken from shore or from bays, and about half taken from private recreational boats were sexually mature. Lengths of brown rockfish sampled from commercial landings during the last decade also reflect that half of the fish were at or below the size at which 50 percent of the population is sexually mature, and few larger adult fish were being landed compared to historic values. The decline in size of fish in these fisheries does not seem to be associated with incoming year classes, but instead with a depletion of larger adults due to fishing pressure. Although nearly half of the fish landed statewide are adults that can replenish the population, there are now few large adults above the length of the median-sized fish recorded in the 1958 through 1961 survey (Leet et al. 2002). The brown rockfish has been identified as a species vulnerable to severe localized depletions in other geographic areas; in Washington State, the Puget Sound stock of brown rockfish was recommended for listing as a threatened species in 1999 (Leet et al. 2002).

Calico Rockfish (*Sebastes dallii*)

Status of the Population:

There are currently no estimates of abundance for calico rockfish in California. There were more calico rockfish landed annually by sport anglers in the 1980s than in the 1990s, which may have reflected the abundance of that species during two strong El Niño events that occurred in the 1980s. Whether the reduced calico rockfish catch during the 1990s was a result of changing oceanic conditions or was due to actual depletion of calico rockfish stocks by sport and commercial fisheries is not known. Because of the relatively small size of adult calico rockfish, they are not usually targeted by either sport or commercial fishermen. Calico rockfish appear as bycatch in prawn trawls and other nearshore fisheries in southern California and are caught

by sport anglers on CPFVs and private boats when they are fishing for other, larger benthic species.

China Rockfish (*Sebastes nebulosus*)

Status of the Population:

While there have been several studies of local abundance for China rockfish, there is no comprehensive assessment of their population.

Copper Rockfish (*Sebastes caurinus*)

Status of the Population:

Over the past 20 years, copper rockfish have become a less frequent component in the nearshore environment (Leet et al. 2001). There has been no stock assessment of copper rockfish in California (Leet et al. 2001). However, there is compelling evidence that copper rockfish populations have severely declined in many areas and large individuals are noticeably less common than in past decades. Department research cruise data and diving observations have noted fewer copper rockfish and smaller average sizes in areas where they were previously abundant. Fishery dependent data show significant decreases in recreational catch between the periods of 1958 to 1961 and 1981 to 1986 (Karpov et al. 1995). Catches in spearfishing competitions have similarly declined, with fewer fish landed and smaller average sizes. Due to their solitary nature, high habitat specificity, and the size (juveniles) at which they can enter the fishery, the copper rockfish is a prime candidate for local depletion (Leet et al. 2001).

Gopher Rockfish (*Sebastes carnatus*)

Status of the Population:

While there have been several studies of local abundance for gopher rockfish, there is no comprehensive assessment of their population.

Grass Rockfish (*Sebastes rastrelliger*)

Status of the Population:

While there have been several studies of local abundance for grass rockfish, there is no comprehensive assessment of their population.

Kelp Rockfish (*Sebastes atrovirens*)

Status of the Population:

While there have been several studies of local abundance for kelp rockfish, there is no comprehensive assessment of their population.

Olive Rockfish (*Sebastes serranoides*)

Status of the Population:

Historically, olive rockfish have been common in the recreational fishery as far north as Fort Bragg and were particularly important from central California to the northern Channel Islands (Leet et al. 2001). As late as the 1980s, olive rockfish were a very important recreational species throughout much of southern California. However, a combination of overfishing and poor recruitment brought about by changes in oceanographic conditions led to a steep decline (83 percent) in southern CPFV catches between 1980 and 1996 (Leet et al. 2001). There has been no stock assessment of this species. However, there is clear evidence that olive rockfish have declined in abundance south of Point Conception (Leet et al. 2001) and most likely also off central California.

Quillback Rockfish (*Sebastes maliger*)

Status of the Population:

While no stock assessment has been done for quillback rockfish in California, length-frequency data exist on their occurrence in the recreational fishery in northern and central California, as well as in the commercial fishery from the same region (Leet et al. 2001). Between the late 1980s and mid-1990s, quillback rockfish experienced increased take by the commercial fishery as the market demand for premium, live fish increased, yet no significant trend was noted in the average size of fish. Fishing pressure has relaxed somewhat in recent years because of restrictions placed on the fishery. Concern over sustainability of the commercial and recreational nearshore fishery has made this species of particular interest to fishery managers (Leet et al. 2001).

Treefish (*Sebastes serriceps*)

Status of the Population:

While there have been several studies of local abundance for black-and-yellow rockfish, there is no comprehensive assessment of their population.

Nearshore Rockfish

Current Regulations

Nearshore rockfish are a complex of 13 species of rockfish subject to both federal and state laws and regulations. These species are managed pursuant to the Federal Pacific Coast Groundfish Fishery Management Plan (Groundfish Plan) adopted by the Pacific Fishery Management Council (PFMC) and under laws and regulations adopted by the California Legislature and Commission. Council management and regulation of nearshore rockfish includes an annual harvest guideline for the entire minor nearshore rockfish complex that is allocated between recreational and commercial fishery sectors, and two-month cumulative catch limits for segments of the commercial fishery. California has enacted laws [Marine Life Management Act (Chap. 1052, Stats. 1998) and Nearshore Fishery Management Act (Chap. 1053, Stats. 1998)] and Commission regulations to protect the juveniles of some nearshore rockfish, and to develop more comprehensive and sustainable management of these and other important nearshore fishes. Foremost in these efforts is the development of a Nearshore Fishery Management Plan (Nearshore FMP). The Nearshore FMP along with implementing regulations has been submitted to the Commission for their review and consideration, with final adoption and certification expected in October 2002.

Commercial Fishery: The commercial fishery for nearshore rockfish is regulated using a combination of minimum sizes, reporting requirements, season and area restrictions, and catch limits as follows:

- Commercial fishermen must possess a “nearshore fishery” permit to take ten species of nearshore fishes, including five species of nearshore rockfish (black- and-yellow, China, copper, gopher, grass, and kelp).
- The minimum commercial size limit for black-and-yellow, gopher, and kelp rockfishes is 10 inches total length, and for China and grass rockfishes is 12 inches total length.
- Regulation changes adopted in June 2002 by the Council prohibit fishing for minor nearshore rockfish outside 20 fathoms south of 40 degrees, 10 minutes North Latitude, near Cape Mendocino, Humboldt County.
- Fishing for nearshore rockfish is authorized in waters less than 20 fathoms south of 40 degrees, 10 minutes North Latitude.
- Two-month cumulative catch limits exist on minor nearshore rockfish between Cape Mendocino and Point Conception, Santa Barbara County, and between Point Conception and the U.S.-Mexico border.

- Nearshore rockfish for which there are size limits must be measured immediately on being brought aboard and released immediately if not in compliance with the size limit.
- Nearshore rockfish must be sorted by species prior to weighing and the weight reported separately on the Department receipt.

Recreational Fishery: The recreational fishery for nearshore rockfish is regulated principally with a bag limit, hook limit, and area and season closures as follows:

- The bag limit for rockfish is ten rockfish per day in combination of species (includes nearshore, shelf, and slope species).
- Not more than two hooks and one line may be used when sport fishing for rockfish.
- Rockfish fillets must have the entire skin attached; and brown skinned rockfish fillets must be a minimum of six and one-half inches in length, and bocaccio fillets must be a minimum of five inches in length.
- Regulation changes adopted in June 2002 by the Council prohibit fishing for rockfish, including nearshore rockfishes, outside 20 fathoms south of 40 degrees, 10 minutes North Latitude, near Cape Mendocino, Humboldt County.
- Fishing for rockfish, including nearshore rockfish, is closed in waters less than 20 fathoms deep during November and December 2002 south of Cape Mendocino as a result of Council action taken in 2001. A seasonal closure on take of rockfish, including nearshore rockfish, between Point Conception and 40 degrees 10 minutes North Latitude is in effect from March through April
- During rockfish closures specific to waters 20 fathoms or greater, fishing and possession of rockfish is authorized in waters less than 20 fathoms in depth along the mainland coast and around offshore islands and rocks (excluding reefs and banks) (including nearshore rockfish, but not more than two shelf rockfish other than bocaccio, canary, cowcod, and yelloweye rockfish).

How MPAs May Help:

Nearshore rockfishes appear to be excellent candidates for enhancement of populations using an MPA management approach. In addition to being highly residential and moderate to long-lived, they are extremely fecund (with older, larger individuals producing the majority of sperm and eggs) and generally have a lengthy larval life stage. Marine protected areas would protect critical spawning stock biomass and potentially ensure a continual recruitment supply to fished areas via larval dispersal. A system of MPAs would allow scientists and resource managers to compare habitats and ecological communities in fished and unfished areas and determine if observed changes are caused by human activity or environmental change. To gain the fullest range of potential expected benefits, the network of MPAs would need to encompass a representative portion of a species habitat.

As noted in the introduction, examples of beneficial effects of MPAs on rockfish size, population structure, and reproductive potential exist (Palsson 1998; Palsson and Pacunski 1995; Paddack 1996). These examples specifically show that within MPAs rockfish reach larger sizes and have significantly higher potential for producing larvae. Based on the larval behavior, this production has a definite potential to influence areas outside MPAs.