

Copper Rockfish

History of the Fishery

The copper rockfish (*Sebastes caurinus*) is a highly variable species in terms of coloration, and due to this characteristic it has been known by several names, depending to some degree upon locality. These include copper rockfish, whitebelly rockfish, gopher, white gopher, and bolina (this name is most commonly applied to the brown rockfish). Copper rockfish is most widely used and is the recommended vernacular name. Historically, copper rockfish was considered a common nearshore species.

Over the past 20 years, copper rockfish have become a less frequent component of the nearshore environment. Commercially, copper rockfish are landed in a number of market categories including copper rockfish as well as red, bolina, and gopher rockfish groups. It is sold as fillets by the market names rockfish or red rockfish and often whole as red rockcod; it is considered an excellent food fish. Copper rockfish is one of the species taken in the live-fish fishery. They have been an important component of the recreational catch in both skiff and commercial passenger fishing vessel fisheries, especially off central and northern California. Due to its relatively large size, known to reach 22.9 inches in length, copper rockfish has been considered one of the premium species in the recreational angler's catch and a prime target for the sport diver.

Status of Biological Knowledge

The copper rockfish was one of the first species of rockfishes to be described from the Pacific Coast, having been scientifically named in 1845 by John Richardson from Sitka, Alaska. For many years, the copper and whitebelly rockfish were considered as separate species but morphological and biochemical analyses in the 1980s have shown these two nominal forms to be conspecific, a highly variable-colored but genetically unique species. The copper rockfish is broadly distributed geographically, known from the Gulf of Alaska to off central Baja California, Mexico. It also has a broad bathymetric distribution, known to occur from the shallow subtidal to 600 feet.

As with all rockfishes, coppers are viviparous and highly fecund. A 13.4-inch female is capable of producing 215,000 ova and an 18.5-inch fish of producing 640,000 ova. The largest individuals may well produce over one million larvae. The larvae are released during winter months (Jan.-March). Young-of-the-year copper rockfish are pelagic and recruit into the nearshore environment at about 0.8 to 1.0 inch during April and May off central California. The newly recruited copper rockfish initially associate with canopy-forming kelps such as *Macrocystis*, *Cystoseira*, and *Nereocystis*. After several months, and at about 1.6 inches, the juveniles settle to the bottom on

rocky reef as well as sandy areas and are referred to as benthic juveniles. Copper rockfish in the early juvenile stage are morphologically similar to two closely related species, gopher rockfish and black-and-yellow rockfish, and the three species at this life stage are extremely difficult to distinguish. Upon settling, color patterns and morphological characteristics develop and the three species become separable.

Copper rockfish are an important component of the nearshore rocky reef system and are frequently encountered by scuba divers in this environment. Submersible observations of the biotic community off the Big Sur coast revealed copper rockfish between depths of 70 and 325 feet. The majority of sightings were of individual (solitary) fish occurring over rocky reef or boulder fields and most frequently in areas of high relief. Occasionally, an individual was observed over sand. Coppers are considered epibenthic, normally occurring slightly above the substrate.

Tagging studies indicate that copper rockfish, for the most part, show little movement once they have settled to the bottom. Movement of up to one mile has been noted but the majority of tagged and recaptured copper rockfish are from the locality where they were originally taken. This life history characteristic makes species with high site fidelity susceptible to local depletion. In areas close to fishing ports and higher rates of utilization, fewer and smaller copper rockfish are caught.

Copper rockfish reach sexual maturity at about 11.6 inches total length (TL) for females and 14.6 inches TL for males. This is at about five years of age for females and seven years for males. Size and age for copper rockfish from off central California for the first five years are as follows: age zero, 3.6 inches TL; age one, 3.7 to 5.9 inches TL; age two, 4.2 to 9.4 inches TL; age three, 7.0 to 11.5 inches TL, and age four, 8.9 to 13.2 inches TL. There appears to be no significant difference in the growth rates between sexes.



Copper Rockfish, (*Sebastes caurinus*) and a sea anemone
Credit: CA Sea Grant Extension Program

Off central California, copper rockfish have been aged to 28 years for a 22.1-inch individual. Copper rockfish from Puget Sound have been aged to 34 years.

Copper rockfish feed on a wide variety of prey items. Crustaceans form a major part of their diet; these include *Cancer* crabs, kelp crabs, and shrimps. Squid of the genus *Loligo* and octopuses are also important food items. Fishes, which include young-of-the-year rockfishes, cusk-eels, eelpouts, and sculpins are important forage for larger individuals. Juvenile copper rockfish feed primarily on planktonic crustaceans.

Hybridization of copper rockfish with brown rockfish has been suspected in Puget Sound, but this has not been noted from anywhere else within their range.

Status of the Population

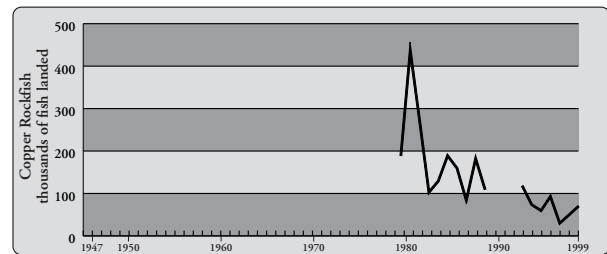
There has been no stock assessment of this species in California. However, there is compelling evidence that copper rockfish populations have severely declined in many areas and large individuals are noticeably less common than in past decades. Due to their solitary nature, high habitat specificity, and the size they can enter the fishery (as juveniles), the copper rockfish is a prime candidate for local depletion.

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Recreational Catch 1947-1999, Copper Rockfish

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

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