

# Other Nearshore Rockfishes

## History of the Fishery

Historically, many of the nearshore rockfishes have been taken primarily by recreational anglers fishing from boats, the shore, or by diving. Kelp rockfish (*Sebastes atrovirens*), gopher rockfish (*Sebastes carnatus*), black-and-yellow rockfish (*Sebastes chrysomelas*), China rockfish (*Sebastes nebulosus*), grass rockfish (*Sebastes rastrelliger*), and treefish (*Sebastes serriceps*) have been minor components of recreational and commercial fisheries. Gopher rockfish is the only species of these six that comprised a significant proportion of recreational landings and was common enough in commercial landings to have a market category prior to 1994. Gopher rockfish have comprised up to 13 percent annually of commercial passenger fishing vessel (CPFV) observed landings from the Morro Bay area. A review of the marine recreational fishery statistics survey (MRFSS) catch data from 1980 to 1999 indicated recreational catches of grass rockfish, China rockfish, gopher rockfish and kelp rockfish have declined since the late 1980s and landings of treefish were higher from 1993 to 1999 than 1980 to 1989. While the MRFSS provides catch information for shore and vessel-based angling, divers are not represented. The "private/rental boat" method contributed the highest proportion of the gopher rockfish recreational catch for all of California. China rockfish have accounted for up to three percent of CPFV observed catches from San Francisco north. Both China rockfish and gopher rockfish are most frequently observed in CPFV and private boat catches. Grass rockfish, kelp rockfish, black-and-yellow rockfish and treefish are more frequently caught by anglers fishing from private boats than by anglers fishing from CPFVs or from shore.

Development of the live/premium fishery in the late 1980s resulted in increasing commercial catches of many species occupying the nearshore environment in and around kelp beds, including these six rockfishes. Live fish are taken primarily by line gear and pot and trap gear, but other gear types are used. The fishery serves mainly Asian American markets that demand top quality (live) fish. Fishermen receive premium prices for their catches ranging from \$2 to \$10 per pound, compared to \$1.50 per pound or less previously. Grass rockfish command the highest prices up to \$4.84 average price per pound in 1998. With the exception of treefish, these nearshore rockfish species are caught primarily north of Point Conception.

Historically, commercial landings have been recorded by both specific (gopher rockfish) or nonspecific (gopher group) market categories and until 1994 there were no specific market categories for any of these nearshore species except gopher rockfish. Annual total landings by spe-

cies are difficult to determine due to the inexact nature of recording landings. Market categories are often comprised of multiple species; for example, sampled market categories from the Morro Bay area from 1993 to 1998 revealed a wide range of placement of the six species in both group and single species categories. Gopher and grass rockfish appeared most frequently in nine other market categories than their own. The most common classification error seemed to occur between gopher and black-and-yellow rockfishes with 34.4 percent of the black-and-yellow market category being made up of gopher rockfish. The gopher group contained up to 61 percent gopher rockfish. While species misidentification does occur, fish are often grouped by price rather than by species complicating specific landing estimates. Based on DFG CMAS-TER summaries of reported landings, landings of gopher and grass rockfishes and the gopher group peaked at 31,255 pounds (\$35,740 value) in 1994, 109,003 pounds (\$506,670) in 1995, and 221,018 pounds (\$521,163) in 1996, respectively.

The live fish market demand is mainly for fish in the one to two pound size range, and up to four pounds for grass rockfish. For gopher, black-and-yellow, grass, and China rockfishes, this size range is above the size of sexual maturity, although in the development of the fishery all fish were kept regardless of size. Due to concerns over the harvest of immature fish, legislation passed in late 1998, the Marine Life Management Act, implemented minimum commercial size limits on grass, gopher, kelp, black-and-yellow, and China rockfishes. The new size limits are 12 inches for grass and China rockfishes, and 10 inches for gopher, kelp, and black-and-yellow rockfishes. The shallow, nearshore nature of this fishery renders it very weather dependent. Poor weather, combined with lower overall allowable catches, implementation of minimum size limits, and a lack of a market north of Bodega Bay resulted in reduced catches from 1997 to 1999.

Several of these species are also important in non-consumptive uses. Colorful, accessible, or both, treefish and



Gopher Rockfish, *Sebastes carnatus*  
Credit: DFG

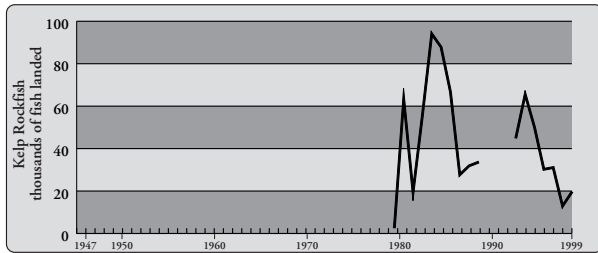
kelp, black-and-yellow, gopher, and China rockfishes are frequently observed and photographed by divers. In addition, individuals are taken for the aquarium trade.

### Status of Biological Knowledge

**K**elp, black-and-yellow, gopher, and grass rockfishes are relatively well studied, while treefish and China rockfish are, to differing degrees, less well-known. Most of these species occupy restricted ranges of geography or habitat. The treefish is most common in depths of less than 100 feet or so on rocky reefs, and is restricted largely to the region south of Point Conception. Kelp, black-and-yellow, and gopher rockfishes are not abundant north of Sonoma County (or farther south, for kelp rockfish),

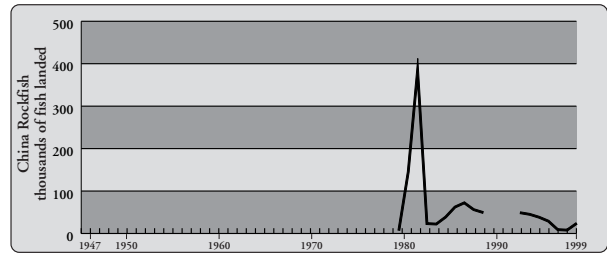
and range south to the region of Point Eugenia, Baja California. Each has a restricted habitat, with kelp rockfish occurring almost exclusively in kelp forests, black-and-yellow rockfish occurring in high-relief rocky bottom at depths shallower than about 60 feet, and gopher rockfish occurring on rocky reefs from 40 feet to perhaps 150 feet. The geographical range of the grass rockfish extends throughout California and into southern Oregon, but its habitat is restricted to rocky areas shallower than about 20 feet.

The China rockfish is abundant into Washington, British Columbia, and southeastern Alaska, declining in abundance south into California. It is quite rare south of Point Conception, and seems to inhabit progressively deeper water in the southern part of its range. The ranges for some of these species have changed in the last 15 to



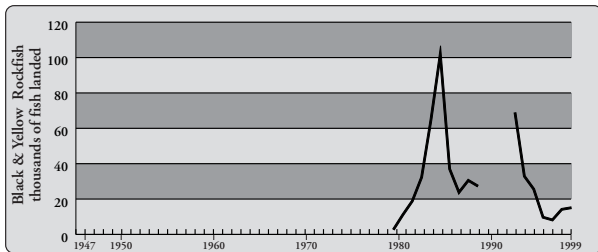
**Recreational Catch 1947-1999, Kelp Rockfish**

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



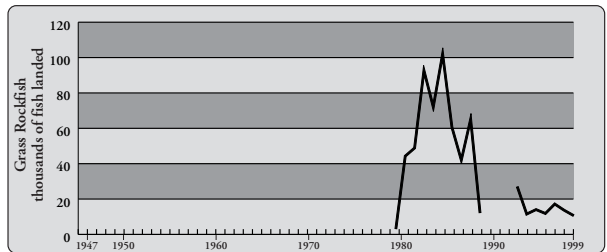
**Recreational Catch 1947-1999, China Rockfish**

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



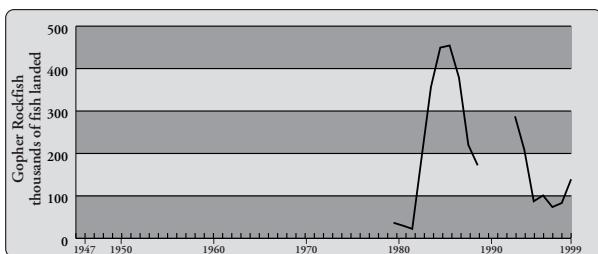
**Recreational Catch 1947-1999, Black & Yellow Rockfish**

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



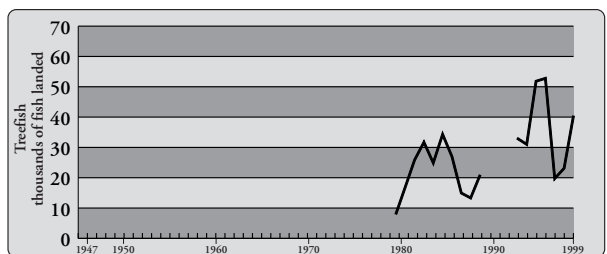
**Recreational Catch 1947-1999, Grass Rockfish**

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



**Recreational Catch 1947-1999, Gopher Rockfish**

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



**Recreational Catch 1947-1999, Treefish**

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

20 years. Black-and-yellow rockfish and kelp rockfish abundance have declined since the early 1970s in the northern Channel Islands, and probably throughout the Southern California Bight. Little has been documented on northward range expansion for these species, and nothing has been documented regarding changes in the ranges of gopher, China, and grass rockfishes. The treefish seems to be more abundant now in the Monterey area than in the 1980s. These changes in distribution seem to be related to ocean warming that began in 1977.

Five of the six species are relatively small for rockfish. The grass rockfish, at about 20-22 inches, reaches the largest size of the six species. The largest individuals of the other five species rarely exceed 15-17 inches; among the five, the China rockfish reaches slightly larger sizes than the others, followed in rough order by treefish, kelp rockfish, gopher, and black-and-yellow rockfishes. Treefish have not been aged, but at least one study of age and growth has been conducted on kelp, black-and-yellow, gopher, grass, and China rockfishes. The greatest ages recorded in each of these five species are between 20 and 26 years. However, because the largest individuals observed in each species have typically not been aged and because aging to date has been based largely on readings of whole otoliths, greater maximum ages may be possible. Different studies have produced different estimates of age at first maturity, perhaps because of differences in goals and methodology. In the five species that have been aged, many studies suggest that first maturity occurs in the range of three to four years, although one study indicates later maturity.

Treefish and kelp, black-and-yellow, gopher, and China rockfishes appear to reproduce once per breeding season. Grass rockfish may reproduce only once per season, but some contradictory data exist. There are no data on spawning seasonality in treefish, but the other five species appear to spawn in winter through spring. Grass rockfish seem to reproduce the earliest, giving birth primarily in December through February (except for an observation in August), China rockfish reproduce slightly later, black-and-yellow and gopher rockfishes slightly later still (spawning through early spring), and kelp rockfish the latest, spawning through May and June.

The adult movement of most of these species may be even more restricted than other rockfishes. Individual black-and-yellow, gopher, and kelp rockfishes have been shown to inhabit restricted home ranges, and it is likely grass rockfish, China rockfish, and treefish share this behavior. Aggressive behavior has been observed in all except grass rockfish (for which observations are limited), and gopher rockfish and black-and-yellow rockfish are definitely territorial. However, some evidence from artificial reefs sug-

gests that typically sedentary individuals may occasionally wander indeterminate distances, on the order of tens of meters, from their home ranges.

Available data suggest that diets of juvenile fish of all six species include primarily crustacean zooplanktors such as barnacle cyprids. Overall adult diets are more varied. Crustaceans and small fish are common diet items for adult fish of all six species. Kelp rockfish also eat cephalopods, gastropods, polychaetes, and tunicates. Cephalopods and gastropods are consumed by gopher rockfish as well, along with ophiuroids (brittle stars) and polychaetes. Black-and-yellow rockfish and China rockfish also consume ophiuroids. A variety of mollusks are consumed by China rockfish including cephalopods, gastropods, chitons, and nudibranchs. Small fish consumed by these rockfishes include juvenile rockfish (mainly blue rockfish), sculpins, juvenile surfperch, kelpfishes, and plainfin midshipman. Information on diet of treefish is limited.

## Status of the Populations

While there have been several studies of local abundance in some of these species (particularly black-and-yellow, gopher, and kelp rockfishes), there is no comprehensive assessment of their populations. Each species is probably subject to local depression in abundance and average size where diving, skiff fishing, party boat activity, or commercial fishing is concentrated. The low fecundity, restricted habitats, and limited movements of these species make them vulnerable to local fishing pressure. Statewide, the limited geographic ranges and restricted habitats of these species suggest that they have small populations in comparison to more widespread species that have traditionally been the targets of commercial fishing. These species have limited depth distributions so that all of the spawning population is vulnerable to fishing and few natural refugia probably exist. Because good recruitment years are infrequent there is the danger of removing too many spawners even with limited fishing pressure.

## Management Considerations

See the Management Considerations Appendix A for further information.

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