

UC SANTA BARBARA

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## **Rockfish Populations Declining Say Researchers**

Rockfish populations off the Southern and Central California coast have severely declined in recent years, according to marine biologists from the University of California, Santa Barbara.

A study headed by biologist Milton Love of the Marine Science Institute at UC Santa Barbara is using several techniques to examine the status of economically important bottom fishes offshore in California. The study is part of a cooperative research project being conducted with the U.S. Geological Survey's Biological Resources Division.

While the numbers of many rockfish species have declined precipitously, one in particular -- bocaccio -- might be listed as an endangered species if it were a land animal since the populations of bocaccio have dropped down to 8 to 10 percent of their 1960 numbers, explained Love.

Rockfishes, which encompass approximately 70 species in California, have formed major fisheries -- both recreational and commercial -- in California waters since the 19th century, according to Love.

Love's research included over 50 dives using the two-person submarine Delta. He surveyed extensive rock outcrops in waters between 100 and 1,200 feet deep and found that many of the areas, even those over 100 miles from shore, harbored very

few large rockfishes.

"The direct observations we made from the Delta were particularly unsettling," said Love. "It is strange to travel over acres of excellent rockfish habitat, including rock outcrops with large crevices and caves, and see almost no large fishes."

Love also analyzed rockfish data compiled by coastal electrical power generating stations which corroborated his submarine research. The results have been published in the recent volume 96 of the 1998 Fishery Bulletin, a publication of the National Oceanic and Atmospheric Administration of the U.S. Department of Commerce.

He explained that these results are particularly useful because they are based on unbiased samples of water taken in by the power plants. The data spanned 17 years (from 1977-1993) and comprised a minimum of several surveys per month.

Love said that the decline of rockfish is a relatively long term phenomenon that has been occurring for decades, but has increased since the late 1970s.

Love's findings are supported by similar studies (of the central California Coast) being conducted by Mary Yoklavich of the National Marine Fisheries Service. "With the exception of small, isolated rock outcrops that likely serve as natural refuges for these fishes in deep water, we too have found very few large aggregations of these important fishes," said Yoklavich.

Love and Yoklavich note that many of these areas contain swarms of small rockfishes, perhaps because the larger rockfishes that feed on the small fishes are gone. "For example, we surveyed over a mile of rocky reef at Lausen Knoll near Newport Beach in Southern California and found only three fishes larger than about 15 inches," said Love. "In the past this was a major fishing ground for large rockfishes, but now they are essentially gone."

The researchers point to overfishing and poor survival of larval rockfish as the reasons for the decline. The rockfish larvae are not surviving because plankton, their food supply, has declined due to the warming of the ocean. "Basically the (rockfish) larvae are starving to death," said Love. "They never survive the larval stage."

Both Love and Yoklavich voiced concern that the numbers of adult rockfishes of some species may have reached levels so low that recovery of the populations may be quite difficult. They said this demonstrates the need to set aside areas where fishing is not allowed to help conserve and maintain these populations.

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