

UC SANTA BARBARA

THE *Current*

October 19, 1999

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Search and Support for the Rare White Abalone is on; Sex Must Occur with Close Neighbors

A single white abalone female named Abigail, kept alive in a tank at the University of California, Santa Barbara, is the only one of her kind in captivity -- and she needs a male sexual partner.

White abalone have been nearly decimated since they were overfished in the last two decades, so scientists at UC Santa Barbara are beginning a captive breeding program similar to those that have been used to replenish imperiled species on land.

The mollusks reproduce by broadcasting their eggs and sperm into the seawater, and for fertilization to occur, the spawners need to be within three feet of a member of the opposite sex to effectively reproduce. "No neighbors means that the remaining animals are effectively sterile," said Kevin Lafferty, assistant professor of marine biology at UC Santa Barbara, and marine ecologist for the U.S. Geological Survey (USGS).

Unfortunately, overfishing has left the few remaining pockets of white abalone too far apart from each other to reproduce effectively. Since abalone are slow-moving creatures confined to a small area for their entire life, they need help in getting reestablished.

A multi-agency consortium to restore the white abalone had success last weekend when divers located a healthy bed of reproducing white abalones, located in the Tanner Banks, about 50 miles away from San Clemente Island. Until now most of the few remaining animals that have been located in the wild were too far apart from each other to reproduce.

The fishery for white abalone was closed in 1996. In 1997, the National Marine Fisheries Service made the abalone a candidate species for federal listing under the Endangered Species Act. Thus, the white abalone could become the first marine invertebrate to be granted that level of protection.

"People thought it was impossible to take such a fecund animal -- a single female can produce 10 million eggs in a season -- and drive it to extinction through fishing," said Gary Davis, a senior scientist at the Channel Islands National Park.

Unfortunately, the basic husbandry for culturing white abalone is not known, according to Daniel E. Morse, professor of biology at UC Santa Barbara and chair of the Marine Biotechnology Lab. A long-time leader in developing husbandry technology for abalones, Morse will try to crack the white abalone's fertility cycle and learn how to effectively propagate juveniles.

"Although techniques already exist that work well for other abalone species, the challenge is to adapt them to the food and environmental idiosyncrasies of white abalones," said Morse. Funding for this work is provided by a National Oceanographic and Atmospheric Administration (NOAA) grant.

Abalones themselves have been a favored food of Californians for a long time: the tasty-fleshed marine snails have been found in the earliest Indian middens of some 10,000 years ago.

The white abalone is a deep-water species found between 80 and 200 feet on rocky reefs from Point Conception in California to Punta Abreojos in Baja California, Mexico. Highly prized for their tender white meat, they often brought a 20 percent higher price than red abalone, the primary mainstay of the abalone fishery. During the 1970s, however, an intense commercial and recreational fishery for white abalone developed, quickly peaked and then crashed.

In one example, diving surveys have shown that of more than 25 acres of white abalone habitat at depths of 100 to 200 feet at the California Channel Islands

revealed no new populations of white abalone, and only 12 large individuals. Researchers found hundreds of empty shells, a few from recently dead individuals, but most shells were old and disintegrating, testimony to once abundant populations, which in the 1970s numbered 1,000 to 5,000 per acre.

This month a group of university, government and private biologists, in a two-person submersible, began to cruise the ocean floor in search of the rare marine snail. In all the team will make over 50 dives.

Researchers are now using research submersibles which had never been used to search for such animals as difficult to see as abalone. The submersibles, though, provide a clear, close view of abalone habitat, access to large areas, and longer hours for observation. In addition the submersible's continuous video and tracking systems provide excellent records of surveyed areas and environmental conditions.

For more information on the search for white abalone and the research consortium, check the following website: <http://www.usgs.gov/newsroom/article.asp?ID=1214>

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