NOAA FISHERIES SERVICE

Abalone Restoration and Management in Southern California

White abalone.

"Abalone species once supported thriving commercial and recreational fisheries, and are functional components of the giant kelp forest ecosystem of southern California."

Tom Ford, Santa Monica Bay Restoration Commission

Why is Abalone Recovery Important to Southern California?

Abalone was once a thriving commercial and recreational fishery. Currently, recreational fishermen bring an estimated $13 million in revenue to the North Coast of California each year to fish solely for red abalone. Restoring this fishery for other species in California, however, could yield more than $200 million in commercial fishing revenues if operating at the same level as past efforts, and more than $13 million in recreational fishing revenues in southern California.

Abalone also keeps our kelp forests healthy by competing with sea urchins for space and food. In some locations in southern California, this loss of competition has contributed to the decline of kelp forests by 80 percent since the 1950s. Recovery of abalone will help stabilize kelp forests.

What Happened to California Abalone?

In California, five of seven abalone species were commercially and recreationally fished during the 1950s to 1970s. In 1997, the California Department of Fish and Game (CDFG) closed fishing for all abalone in southern California. Overharvesting has been the primary reason for the decline of these species. White and black abalone are currently listed by NOAA Fisheries Service (NOAA) as federally endangered under the Endangered Species Act. Two other abalone species, green and pink, are listed by NOAA as Species of Concern. The remaining species are also experiencing declining populations.

Why Must We Act Quickly to Restore Abalone?

We have a unique opportunity right now to boost abalone populations because of a natural phenomenon called the "Pacific Decadal Oscillation." Every ten years, the Pacific Ocean shifts between warmer and cooler temperatures. The cool water temperatures that we are currently experiencing are ideal for successfully outplanting abalone. Currently, distances between individual males and females are too large to support sufficient reproduction to sustain their populations. If we can increase densities in the right places, we can boost natural reproduction and increase resistance to other threats.

What is NOAA Doing to Restore Abalone in Southern California?

Protections for Abalone Recovery

The closure of abalone fisheries and habitat protections for the two federally endangered species are helping to prevent the further decline of abalone populations throughout California. In 2011, NOAA designated 360 square kilometers of rocky intertidal and subtidal habitat as critical habitat for black abalone in California. A recovery plan for white abalone is complete and is being implemented based on funding availability.

Boosting Abalone Populations

NOAA has taken several steps necessary for successful outplanting of abalone at specific hotspots along the California coast. One step has been to develop methods for the culturing of abalone that yield enough individuals for restoration. NOAA funds are now

Members of Los Angeles Conservation Corps measure cultured green abalone at SEA Lab (Rowena Valderrama, SEA Lab)

being used to culture white and green abalone in preparation for outplanting. NOAA will be testing methods to outplant green abalone in a pilot study along the Palos Verdes coast in 2012. NOAA is also working to develop ways to detect disease in abalone so that we can prevent spreading disease through the restoration process. Investment in genetic testing of wild abalone will help us ensure sufficient genetic diversity for restored areas, which should make those areas more resilient.

"Writing the Book" on Abalone Restoration

In partnership with the CDFG, NOAA has developed a guide to outplanting abalone that has enabled public and private organizations to meet state and federal permit and grant requirements. SEA Lab of Redondo Beach has been culturing green abalone for the last seven years and is now ready to test outplanting under the methods established by this guide.

Public Outreach and Education

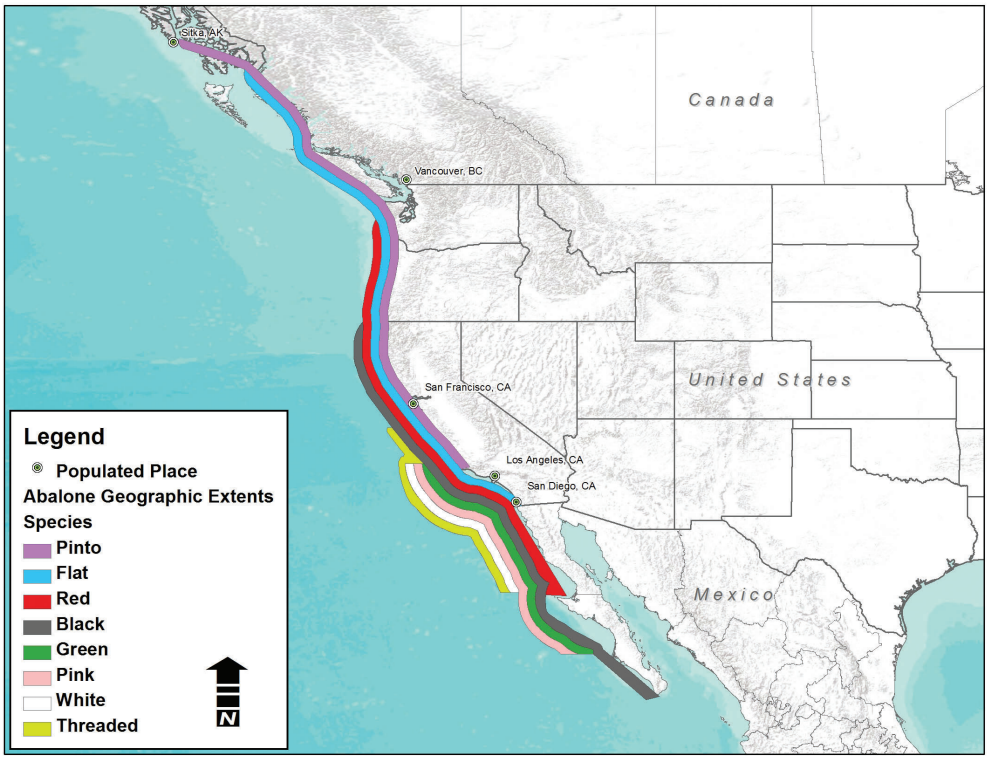
NOAA provided funding and guidance to develop an interactive exhibit at the Aquarium of the Pacific and to support Get Inspired, a local non-profit organization, to develop a classroom abalone culturing program accompanied by a curriculum. Several high school classrooms in Orange County currently culture green abalone that can be used for outplanting.

"While California's abalone are in danger of extinction, their symbolic power appears to surpass even the environmental crises affecting the state's vulnerable coastline."

Les W. Field, Abalone Tales

What are the next steps for Abalone Restoration?

- Outplanting green abalone along six acres in Palos Verdes Shelf by 2013
- Conducting the first ever genetic assessment of green abalone along the southern California coast
- Developing a new technique to test for "Withering Syndrome" disease in green abalone
- Opening a new white abalone culturing facility at the UC Davis Bodega Marine Lab for future outplanting efforts



Colored lines do not indicate depth or abundance of abalone species.