



Members of the White Abalone Recovery Project and their partners in the White Abalone Recovery Consortium work to bring back the iconic white abalone from the brink of extinction. WARC divers Ben Walker and Shelby Kawana ascend the anchor line to the surface and return to CDFW's research vessel *Garibaldi*.

Story by **Tallulah Winquist**

## Southern California Tale

# Iconic White Abalone Edges Back from Brink of Extinction

**W**hen people think of southern California, they may picture tall stately cliffs of sandstone overlooking long stretches of sandy beaches, and perfect clean waves full of surfers and boogie-boarders. Harvesting abalone for dinner used to be as foundational to a southern California lifestyle as fish tacos and flip-flops are today. A combination of overfishing and disease led to the closure of the entire abalone fishery south of San Francisco by 1998. By 2001, the white abalone was listed as an endangered species because populations continued to decline despite protection from fishing pressure. Population

numbers are so low today that the only option for recovery is through a robust captive breeding and stocking program.

Scientists from the California Department of Fish and Wildlife's White Abalone Recovery Project and their partners in the White Abalone Recovery Consortium (WARC), are working to bring back the iconic white abalone from the brink of extinction. Since 2016, CDFW and partners have been working to actively restore abalone populations through stocking of young captive-reared abalone. Successful stocking is the critical next step to reestablishing self-sustaining wild populations of this culturally and ecologically important mollusk. The early stocking

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studies had aimed to perfect the methods that will be used to restore wild white abalone populations in the future by using red abalone as a test case. Red abalone, a sister species of the white abalone, live in the same deep kelp forest habitats, and their populations in

southern California have also been slow to recover.

Every few months, scientific divers on board the CDFW research vessel *Garibaldi* wrestle into thick neoprene wetsuits and load heavy steel tanks onto their backs so they can check on the stocked abalone. As the divers descend deeper into the kelp forest, they enter the world of the white abalone. Sunlight streams



Scuba diver Armand Barilotti surveys one of the California Department of Fish and Wildlife's red abalone outplant sites off the coast of Southern California. Barilotti works for the Santa Monica Bay Foundation, one of several partner organizations comprising the White Abalone Recovery Consortium. CDFW is a founding partner of the consortium.

Octopus, like the one at right, found hiding in crevasses near a stocking site, are a top abalone predator and therefore pose a threat to newly stocked juvenile red abalone populations. When researchers encounter an octopus, they will catch and relocate it where it's unable to prey on abalone. Below, a rediscovered stocked red abalone was found clinging to the underside of a rock during a one-year post stocking survey.



through the towering giant kelp, briefly illuminating the shiny sides of the small fish taking cover in the kelp blades. Lobsters and octopuses are tucked into the crevices of rocks, and abalone and urchins shelter in the shadows. Many of those abalone are adorned with small brightly-colored numbered tags that identify them as the new additions to the neighborhood. After a few months in the wild, the stocked abalone can show an extensive amount of growth, which speaks to the quality and abundance of resources in their new habitat.

Since restoration stocking began in 2016, the partnership has stocked close to 10,000 red abalone off the coast of Southern California. These studies are helping scientists understand how stocked abalone interact with their new environment in the wild. Researchers are increasing the effectiveness of future abalone restocking work by teasing out the risk factors that abalone face in their new environment. For multiple years after releasing the abalone, divers track the number and the identity of each abalone and assess the ecosystem health and predator abundances at each site. The divers also collect any abalone shells encountered to determine the effects of different predators at each site through time.

Octopuses, lobsters, sea stars and fish are all major predators of the young abalone, and care is taken to introduce the abalone during times of the year when the predators will be least abundant. All the data from these early studies are aimed at lessening the risks that stocked abalone face, and to improve long-term growth and survival. 🐙

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