

Divers Are Restoring California's Kelp Forests

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When it's healthy, kelp grows like a forest on the ocean floor. (Photo: NatalieJean/Shutterstock)

[Devereaux Bell](#)

Many people around the world like to eat urchin. The Japanese, as well as most Americans, know it as uni.

René Rojas grew up eating urchin in Chile, where it's part of the culture (they like to eat it [raw, with lemon](#) juice and oil). Now he's an urchin diver in Santa Monica Bay, that chunk of the Pacific that straddles greater Los Angeles. But these days he doesn't just dive for the treasured red urchins so prized by foodies. Instead, he's on a mission to root out their purple cousins — golf ball-sized creatures that have taken over the waters off Palos Verdes.



Purple sea urchins live in the eastern side of the Pacific Ocean along the coast from Mexico to Canada. (Photo: RelentlessImages/Shutterstock)

In the last several years, purple urchins have exploded 60-fold in California and devoured massive amounts of kelp forests due to warmer waters. "It would be like one of those beautiful deciduous forests turned into a desert," Gretchen Hofmann, a professor of marine ecology at the University of California, Santa Barbara told [The New York Times](#). "But in the matter of five years."

In that amount of time, kelp forests have declined by 93 percent in northern California. Purple urchins are notorious for competing with red urchins for kelp. In turn, the population of red urchins has dropped drastically.

This has been tough on the area's fishing industry, which supplies red urchins to much of the sushi-loving world. It's been even tougher on the area's aquatic wildlife.

Los Angeles itself has boomed from 100,000 people to well north of 10 million in just over a century. During that time, [much of the city's waste runoff](#) made its way into Santa Monica Bay, killing off three-quarters of the kelp forest that forms the basis of its ecosystem. With the kelp have gone the red urchins.

Not that kelp's decline and the purple urchin explosion are solely the fault of shore pollution. Overfishing, erosion and three El Nino cycles since 1998 haven't helped. Kelp likes cold, nutrient-rich water. Each El Nino, when it comes, brings warm tropical water, low in nutrient value. In winter the cycles bring storms that literally rip the kelp from its holdfasts.

Kelp's long list of enemies

Kelp is amazing stuff. When healthy and bountiful, Rojas says, it's dogged enough to clamber "all the way to the surface." Its egg-noodle leaves, pulled upward by air-filled sacs, grow along a stalk, kind of like corn — and, when healthy they reach a similar density. "The kelp, it really is like a forest," Rojas affirms, with a canopy at the top that once held a slate of sea creatures, some 700 species long.

Many of these animals have gone. The urchin's main predators — sea otters, spiny lobsters, California sheephead — are hard to find these days. You'd think that would mean more red urchins, but when the predators moved out, the purple urchins moved in, seizing and occupying a whole habitat. What was once a thick kelp-covered seabed studded with red urchins, is now antiseptic white rock, studded only with plum-colored purpura.

To fix this bleak scene, Californians took action in 2013. After years of research and planning, [The Bay Foundation](#) — a nonprofit currently heading a group of environmentalists, fishermen, researchers and local aquariums — began implementing a five-year plan to rebuild the kelp forest. This, they hope, will bring back the red urchins, along with other departed creatures.

In July 2013, under ecologist Tom Ford, then director of marine programs and now the foundation's executive director, The Bay Foundation's divers [began culling purple urchins](#) from more than 150 acres of coastal waters.

Where the divers come in



Diver Rene Rojas heads to the ocean to dig up invasive purple urchins. (Photo: Heather Burdick/The Bay Foundation)

On clear mornings, Rojas motors out to a set destination, sometimes an hour's trek away. There he works on a few square meters at a time, digging purple urchins from the seabed with a climbing hammer. The goal is to reduce the number of purple urchins from 40 per meter to just two.

Parts of the bay have gotten so bad that, when he arrives to work a new plot, Rojas finds hardly anything but purple urchins and bare rock. Everything else has been crowded out. The "urchin barrens," as they're called, truly are barren. "All around the floor is white," he says, and the purple urchins are the only things alive and growing. But in a short few weeks, and where once there was only white, there is a hint of brown. That's the kelp spores coming back, say Rojas.

Then, in a few months, the floor will be very brown with mostly healthy red urchins. In such places, the bay is once again ripe to explode with flora and fauna. And since the kelp here can grow up to a foot a day, real progress is being made toward restoration — 13 acres have been rehabilitated so far.

Ford's team gets the credit for this progress, especially the few divers like Rojas who cull urchins directly for the foundation. But the larger Southern California fishing community has played a role as well, giving the project a healthy momentum.

Ford and his team have worked to include the industries that live off the bay's bounty. Ford dug clams while studying biology at the University of Rhode Island, and genuinely understands the needs and mindset of the sea's small businessmen. There's "a huge incentive for the fishing community" in restoring the bay, he says. In fact, at stake for them is nothing less than the future of California's most valuable fishing export.

The economics of the situation mean, quite simply, that the people on shore need the urchins (and thus the kelp) as much as the creatures in the sea do — an ideal union for ecological action. In the end, this little project in Santa Monica Bay is helping prove an essential point for environmental advancement the world over: when needs are shared and interests align, good things can happen.

Editor's note: This article has been updated since it was originally published in September 2014.
