

Swarm of sea urchins wreaks destruction on US West Coast

October 24 2019, by Gillian Flaccus and Terence Chea



In Oct. 16, 2019 photo, a purple sea urchin sits in a touch tank at the Marine Hatfield Science Center in Newport, Ore. Tens of millions of voracious purple sea urchins that have already chomped their way through towering underwater kelp forests in California are now spreading north to Oregon, sending the delicate marine ecosystem off the shore into such disarray that other critical species are starving to death. A recent count found 350 million purple sea urchins on one reef in Oregon alone, a more than 10,000% increase since 2014 and in northern California, 90% of the giant kelp forests have been devoured by

the urchins, perhaps never to return. (AP Photo/Gillian Flaccus)

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A recent count found 350 million purple sea urchins on one Oregon reef alone—more than a 10,000% increase since 2014. And in Northern California, 90% of the giant bull kelp forests have been devoured by the urchins, perhaps never to return.

Vast "urchin barrens"—stretches of denuded seafloor dotted with nothing but hundreds of the spiny orbs—have spread to coastal Oregon, where kelp forests were once so thick it was impossible to navigate some areas by boat.

The underwater annihilation is killing off important fisheries for red abalone and red sea urchins and creating such havoc that scientists in California are partnering with a private business to collect the over-abundant purple urchins and "ranch" them in a controlled environment for ultimate sale to a global seafood market.

"We're in uncharted territory," said Scott Groth, a shellfish scientist with the Oregon Department of Fish and Wildlife. "You can't just go out and smash them. There's too many. I don't know what we can do."

The explosion of purple sea urchins is the latest symptom of a Pacific Northwest marine ecosystem that's out of whack.



This Sept. 26, 2019 photo shows coastal waters off Greenwood State Beach where The Nature Conservancy is mapping and monitoring one of Mendocino County's last remaining bull kelp forests near Elk, Calif. Tens of millions of voracious purple sea urchins that have already chomped their way through towering underwater kelp forests in California are now spreading north to Oregon, sending the delicate marine ecosystem off the shore into such disarray that other critical species are starving to death. A recent count found 350 million purple sea urchins on one reef in Oregon alone, a more than 10,000% increase since 2014 and in northern California, 90% of the giant kelp forests have been devoured by the urchins, perhaps never to return. (AP Photo/Terry Chea)

Kelp has been struggling because of warmer-than-usual waters in the Pacific Ocean. And, in 2013, a mysterious disease began wiping out tens

of millions of starfish, including a species called the sunflower sea star that is the only real predator of the ultra-hardy purple urchin. Around the same time, the purple urchins had two excellent breeding years—and with no predators, those gametes grew up and are now eating everything in sight.

"You can imagine all of these small urchins growing up, each one of them looking for food, desperate for food. They're literally starving out there," said Steven Rumrill, lead shellfish expert at Oregon's wildlife agency. "I've seen some big-scale fluctuations in the populations of sea stars and urchins, but never on this magnitude."

Scientists are not yet sure if climate change is responsible for the sea urchin explosion, but they suspect it plays a role in the cascade of events that allowed the purple urchins to boom. And kelp, already under siege from warming waters, is not as resilient as it once was, said Norah Eddy, an associate director at the Nature Conservancy California's oceans program.



In this Oct. 16, 2019 photo, Steven Rumrill, lead shellfish expert with the Oregon Department of Fish and Wildlife, places his hand next to shells of red sea urchins at various stages of development to show a size comparison at the Marine Hatfield Science Center in Newport, Ore. Tens of millions of voracious purple sea urchins that have already chomped their way through towering underwater kelp forests in California are now spreading north to Oregon, sending the delicate marine ecosystem off the shore into such disarray that other critical species are starving to death. A recent count found 350 million purple sea urchins on one reef in Oregon alone, a more than 10,000% increase since 2014 and in northern California, 90% of the giant kelp forests have been devoured by the urchins, perhaps never to return. (AP Photo/Gillian Flaccus)

"We're going to see climate change as a big driver of changes in kelp forest as we move forward, and we are already seeing that," said Eddy,

who is leading an effort to use drones to map and monitor Northern California's last remaining kelp forests.

The devastation is also economic: Until now, red abalone and red sea urchins, a larger and meatier species of urchin, supported a thriving commercial fishery in both states. But 96% of red abalone have disappeared from California's northern coast as the number of purple sea urchins increased six fold, according to a study released this week by the University of California, Davis.

Last year, California closed its red abalone fishery, which poured an estimated \$44 million into the coastal economy per year, and Oregon suspended permits for its 300 abalone divers for three years. The commercial harvest of red sea urchins in California and Oregon also has taken a massive hit.



In this undated photo, provided by Scott Groth, Groth, a diver, holds a sunflower sea star in waters off the Oregon coast near Port Orford, Ore., before the invasion of purple sea urchins. The sunflower sea star is the primary predator of the purple sea urchin and urchin numbers exploded when a mysterious wasting disease killed off millions of the sea stars beginning in 2013. Tens of millions of voracious purple sea urchins that have already chomped their way through towering underwater kelp forests in California are now spreading north to Oregon, sending the delicate marine ecosystem off the shore into such disarray that other critical species are starving to death. (Scott Groth via AP)

"That's a huge economic loss for our small coastal communities," said Cynthia Catton, a research associate with the University of California, Davis Bodega Marine Lab. "In California, there were 30,000 to 40,000 participants in (the abalone) fishery every year for decades, and for the first time ever that fishery had to close."

And while the purple urchins have eaten themselves into starvation as well, unlike other kelp-dependent creatures, the species can go into a dormant state, stop reproducing and live for years with no food.

That means the only way to restore the kelp is to remove or destroy the purple urchins. Scientists estimate that in Oregon alone, it would take 15 to 20 years to remove all 100 million pounds (45 million kilograms) of purple urchins recently surveyed on just one large reef.



This Sept. 26, 2019 photo shows an aerial view of one of the last remaining kelp forests near Elk, Calif., on the Mendocino County coast, which has lost more than 90 percent of its bull kelp in less than a decade. Tens of millions of voracious purple sea urchins that have already chomped their way through towering underwater kelp forests in California are now spreading north to Oregon, sending the delicate marine ecosystem off the shore into such disarray that other critical species are starving to death. (AP Photo/Terry Chea)

While urchins are in starvation mode, the edible part—known as roe—shrivels, making them commercially worthless.

Against this backdrop, conservationists, commercial urchin harvesters, scientists and private interests are coming together with an unusual plan: Pay underemployed red sea urchin divers to collect the shriveled, but

living, purple sea urchins and transfer them to carefully tended urchin "ranches" to be fattened up for sale to seafood markets around the world.

One company, Urchinomics, is already working on urchin ranching projects in Japan, Canada and California and sees a future where the overwhelming demand for wild urchin roe is replaced by a taste for human-raised purple urchins collected from the seafloor, allowing kelp forests to rebound.

"We're turning an ecological problem into an ecological opportunity and an economic opportunity," said Brian Takeda, the Urchinomics CEO. "It's the first time we've ever had an economic incentive to get these destructive urchins out of the water."

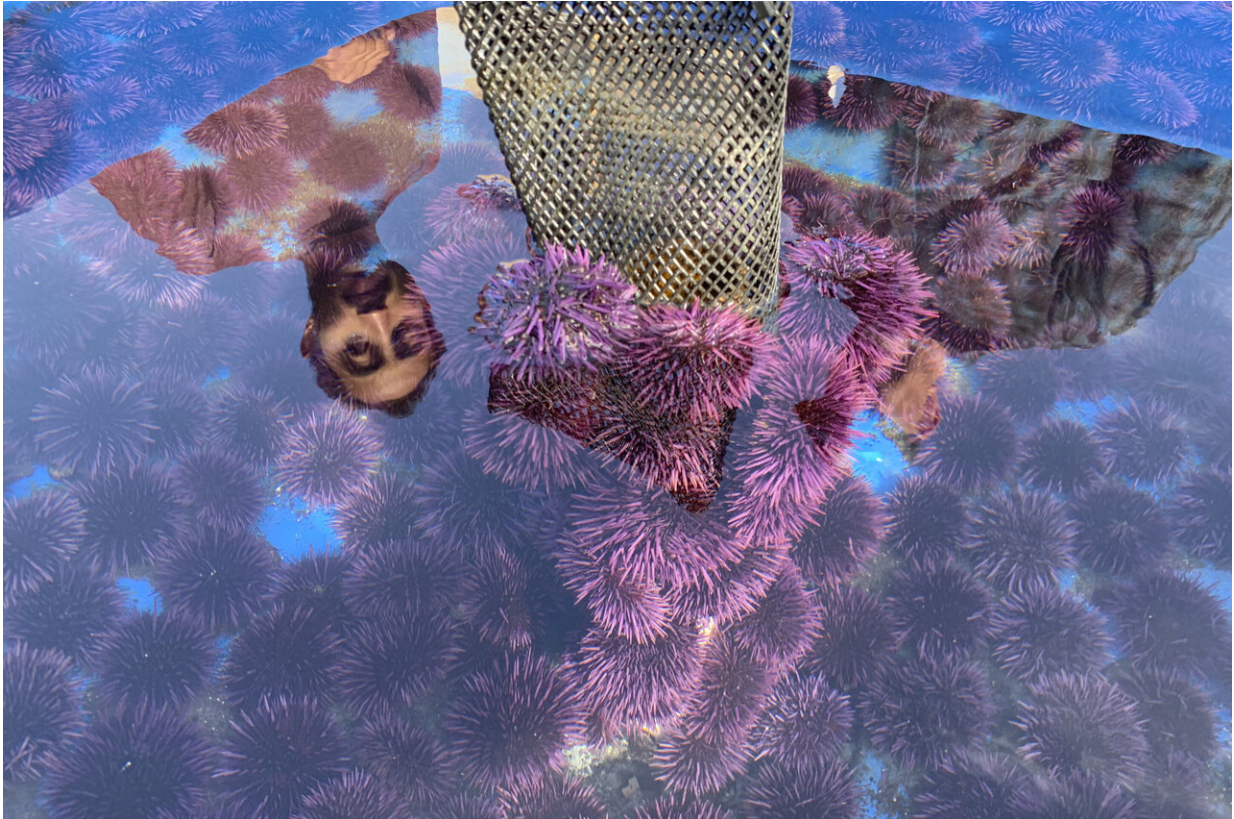


In this May 20, 2019 photo, roe, or uni, is seen inside a purple urchin that was harvested off the Mendocino County Coast and fed for several weeks at the Bodega Marine Lab in Bodega Bay, Calif. The urchins are being "ranched" as part of a pilot project to remove purple urchins from the ocean floor, feed and restore them to health, then sell them as premium seafood. Tens of millions of voracious purple sea urchins that have already chomped their way through towering underwater kelp forests in California are now spreading north to Oregon, sending the delicate marine ecosystem off the shore into such disarray that other critical species are starving to death. (AP Photo/Terry Chea)



In this May 20, 2019 photo, a purple urchin is held at Bodega Marine Lab, which is running a pilot project to remove purple urchins from the ocean floor, feed and restore them to health, then sell them as premium seafood in Bodega Bay, Calif. Tens of millions of voracious purple sea urchins that have already chomped their way through towering underwater kelp forests in California are

now spreading north to Oregon, sending the delicate marine ecosystem off the shore into such disarray that other critical species are starving to death. (AP Photo/Terry Chea)



In this May 20, 2019 photo, a container at the Bodega Marine Lab in Bodega Bay, Calif. holds hundreds of live purple urchins harvested from the Mendocino County coast where they have been decimating kelp forests. Tens of millions of voracious purple sea urchins that have already chomped their way through towering underwater kelp forests in California are now spreading north to Oregon, sending the delicate marine ecosystem off the shore into such disarray that other critical species are starving to death. (AP Photo/Terry Chea)



In this 2018 photo, provided by Scott Groth, a destroyed kelp forest filled with an explosion of purple sea urchins is seen off the Oregon coast near Port Orford, Ore. Tens of millions of voracious purple sea urchins that have already chomped their way through towering underwater kelp forests in California are now spreading north to Oregon, sending the delicate marine ecosystem off the shore into such disarray that other critical species are starving to death. A recent count found 350 million purple sea urchins on one reef in Oregon alone, a more than 10,000% increase since 2014 and in northern California, 90% of the giant kelp forests have been devoured by the urchins, perhaps never to return. (Scott Groth via AP)



In this May 20, 2019 photo, Karl Menard checks of purple urchins that were harvested off the Mendocino County Coast and fed in troughs for several weeks at the Bodega Marine Lab in Bodega Bay, Calif. Tens of millions of voracious purple sea urchins that have already chomped their way through towering underwater kelp forests in California are spreading north to Oregon, sending the delicate marine ecosystem off the shore into such disarray that other critical species are starving to death. Now, a coalition of scientists, ecologists and private business interests is trying to harvest the unwanted purple sea urchins and transfer them to sea urchin "ranches." The urchins are fattened up at the ranches for sale to a global seafood market. (AP Photo/Terry Chea)

In Oregon, red urchin divers are a tiny artisanal collective, but they are also exploring ways to try to turn the glut of destructive purple urchins to their advantage. Oregon's urchin fishery had a boom year last year, when

red urchins were scarce in California but before their purple cousins had spread north. Now, they too are hurting.

Rumrill, the shellfish expert from Oregon, supports efforts to harvest excess urchins but strikes a less optimistic note when it comes to saving the kelp.

"That's a promising technique. But we shouldn't fool ourselves into thinking that we're going to solve this large-scale ecological problem, this literal perfect storm of events, by eating our way out," he said. "It's just too big a problem."

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