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Starfish Are Still Dying, But Here's Reason for Hope

The massacre of sea stars along the West Coast continues, although the pace has slowed because so many already have died.

By **Jane J. Lee**, National Geographic

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It's been three years since millions of sea stars from Alaska to Canada and down to Baja, Mexico started wasting away into gooey white mounds. And although the destruction wrought by this disease shows no signs of stopping, the pace of the die-off has slowed.

That's partly because so many sea stars have already died, says Ben Miner, a marine biologist at Western Washington University in Bellingham. Some areas have seen up to a 90 percent decline in their populations. (Read about why millions of sea stars

are 'melting' away.)

Scientists identified the likely culprit last year: A pathogen known as a densovirus, part of the same parvovirus group that can cause gastrointestinal problems in unvaccinated dogs. So they've shifted their efforts to monitoring sea star populations and investigating why this disease—probably caused by a very common ocean virus—is now rampaging through 19 species of sea stars.

Cornell University microbiologist Ian Hewson, who helped narrow down the viral suspects, is looking at the densovirus' genetic code to see what might have changed over time. He's hoping to find a clue as to what's triggered the virus to become so harmful.

Hewson also plans to conduct laboratory experiments to study in detail how the wasting disease progresses through an individual starfish after it's infected. And he'd like to figure out how the virus is transmitted and whether it affects the babies and juveniles.

Altered Communities

Other experts have shifted to monitoring sea star populations and the communities they leave behind. "We're more focused on assessing the consequences and looking at signs of recovery," says Pete Raimondi, a marine ecologist at the University of California, Santa Cruz.

In some of the locations hit early on with this wasting disease, Raimondi and colleagues are already starting to see a shift in the animal community. In tidepools, where there used to be a mix of organisms including sea stars, scientists are now seeing mussels dominating.

Why? Sea stars eat mussels, Raimondi says. So if you take away a predator, the prey will thrive.

In central California's subtidal zone, scientists are starting to see "huge numbers of sea urchins," says Raimondi. It's a little unexpected, he adds, and they're not sure whether the urchin increase is connected to the sea star die-off or not. (Read about how some urchins are also wasting away.)

But because the urchin population is booming off of central California, Raimondi and colleagues also are starting to see the loss of their food: kelp. That's worrisome because kelp forests house a menagerie of organisms that depend on it for shelter, protection, and food.

Forecasters are predicting a very strong El Niño this winter, which usually brings big storms to this parched state. Those storms can knock down kelp stands, so these underwater forests could really get hammered this year. (Read about what a strong El Niño could mean for the Pacific.)

Farther up the coast in the Pacific Northwest, sea stars have either gotten smaller in body size, or they are big, with few in the

mid-size range, says Drew Harvell, a marine ecologist at Cornell University.

A Million Reasons For Hope

Miner and colleagues do still see the occasional adult sea star during their surveys off Washington State. And because one adult can produce hundreds if not thousands of larvae, it's possible the remaining individuals could repopulate devastated areas, he says.

"If a population is doing well in one location, it has the potential to produce millions of offspring, which can be dispersed widely," Miner explains.

This is part of the reason why Miner, Harvell, and Raimondi don't expect to see local extinctions of sea star species in the near future.

In fact, 2014 was the biggest year for sea star babies Raimondi has ever seen for California's tidepools since he began monitoring sites in 1992.

It will take a couple of years to know for sure whether these young sea stars will contribute to a recovery of populations along North America's west coast. But "it gives us some hope," Raimondi says.

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