Disease nearly wiped out sea stars on California's Central Coast. Is the population recovering?

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Crouching low among rocky tidepools nearly completely covered with sharp-shelled mussels, California State Parks interpretive manager

Robyn Chase gave out a sharp cry.

"I found one!" she yelled excitedly over to another State Parks interpreter accompanying her on a visit to Estero Bluffs State Park just north of Cayucos on Dec. 22.

Chase pointed to a huge, dinner plate-sized purple ochre sea star nestled inconspicuously in a small pool of water.

"Oh, he's eating well," she said, noting how the sea star was surrounded by the jet-black mussels, its preferred meal.

The ochre sea star was the first of roughly 15 sea stars found that day by Chase and her small team. It took more than an hour to locate the colorful echinoderms within the expansive tidepools at Estero Bluffs.

State Parks hosted a total of four sea star search parties at tidepool locations along San Luis Obispo County's coast the week of Dec. 19—including two in Montaña de Oro State Park near Los Osos and another at Hearst San Simeon State Park.

Members of the public joined State Parks interpreters as they scrounged the rocky shores for the colorful sea stars. Some snapped photos and sent them to iNaturalist, a community science social network used by scientists as a helpful database of biodiversity around the world.

At Corallina Cove in Montaña de Oro, interpreters and community members found about 14 sea stars on Dec. 20, while at Hazard Reef just up the shore, they found 144 after scouring the entire tidepool area on Dec. 21.

While the State Parks interpreters were excited to stumble upon those caches of sea stars, they expressed concerns about the state of the local

population.

"It's honestly very different now," Chase said.

Sea star population devastated by disease

Sea stars across the West Coast have struggled since 2013 to recover from sea star wasting syndrome, which causes the invertebrates to deteriorate and lose limbs before dying.

Before 2013, scientists could count more than 50 ochre sea stars at the Estero Bluffs in an area no bigger than three semi trucks stacked next to each other. Scientists could count more than 100 in a similarly small spot at Hazard Cove within the tidepool area

Over the past decade, wasting syndrome has nearly wiped out five-armed ochre sea stars in the state and devastated their leggier cousins, sunflower sea stars.

Sunflower sea stars are now considered regionally extinct in California, although a few persist along the Pacific Northwest and Alaskan shorelines.

Scientists are still struggling to find answers to the devastation caused by the mysterious disease.

Melissa Douglas, an intertidal associate research specialist at UC Santa Cruz, has worked with a team of scientists to monitor the sea stars along the West Coast.

Their data, gathered over more than two decades across dozens of tidepool sites along the coast, have all shown essentially the same pattern: abundant populations of sea stars that plummet to near-

extinction after the sea star wasting syndrome took hold.

"This is coming up on 10 years, so this is the biggest event of sea star wasting we've ever seen," Douglas said.

Douglas said it's still difficult to determine what exactly caused the disease to take such a vicious hold on the sea stars—but a few theories floating around surmise that ocean heatwaves and greater amounts of organic material in tidepools had some impact.

Douglas's research—through the Multi-Agency Rocky Intertidal Network, or MARINe, for short—is focused on monitoring the population of sea stars and the impacts of their demise.

Unfortunately, her research has found that the ochre and sunflower sea stars simply haven't been able to repopulate.

The population of ochre sea stars along the Central Coast appears to have pretty much flatlined since the 2013 sea star wasting syndrome event, according to MARINe's data.

"I don't want to say there's no hope, but it's not looking very good," Douglas said. "They're definitely not headed to recovery right now."

Why sea stars are important marine species

Sea stars are considered keystone species. In other words, without them, ecosystems are thrown out of balance and species diversity can change drastically.

Along the Central Coast, that is particularly obvious in the mussel population along the rocky shores. The surge in the mussel population could shove other intertidal species out, such as algae, barnacles, limpets,

sponges and sea slugs, Douglas said.

Sunflower sea stars were also vitally important to keeping sea urchin populations in check.

Without sunflower sea stars, the urchins have completely mowed down kelp forests in some areas, Douglas said.

Kelp forests provide important feeding grounds and shelter for various marine species, including sea otters, fish and birds, according to the National Oceanic and Atmospheric Administration.

Community can help with sea star research

Keeping tabs on the sea stars to learn how their population continues to evolve is vitally important, Douglas said, and the community can help.

Dennis Krueger recently retired from owning Kayak Horizons in Morro Bay but still loves paddling in the Morro Bay estuary.

About once a month, Krueger paddles out to the T Pier in the bay to look for sea stars, count and measure them. He sends the data to Douglas and the team at MARINe.

"I just thought, 'Well, heck, I'm out on the bay all the time and I'd love to help in any way I can,'" Krueger said. "Now I'm gathering data for people to make big decisions with."

Over the 23 years he's lived in Morro Bay, Krueger said he's noticed a change in the sea star population. The species' struggle has become more apparent since he started sending data to MARINe about four years ago, he said.

"I used to be able to see 15 to 20 sea stars when I'd take the kids out to paddle," he said. "We're now seeing fewer and it's becoming more common to not see any at all."

Sending data to MARINe is "pretty easy," said Krueger, who underwent simple training from scientists on how to properly identify and measure the sea stars.

Anyone interested in doing similar monitoring work can contact the MARINe team at seastarwasting.org.

But even without training, community members can contribute to monitoring the sea star population along the Central Coast, Douglas said.

"If there's a good low tide and you can head out to the tidepools to search for sea stars," she said. "Don't forget a camera."

How to submit sea star observations

Find a sea star while exploring the San Luis Obispo County shoreline?

Simply snap a picture and either send it to the MARINe team at marinedb.ucsc.edu/ssd/public/observation-log/create or submit it to iNaturalist. You'll want to know the GPS coordinates of where you found the sea star and what kind of sea star it is.

iNaturalist has a good guide on its website at inaturalist.org/guides/7857.

Your observation might just help scientists better determine how the sea star population is faring against sea star wasting syndrome in your area.

"If there's any silver lining out of all of this, it's been really heartwarming to see how many people are interested in sea stars and

becoming involved in the research," Douglas said.