

Saving the Sea Stars: Oregon Coast Aquarium develops treatment plan

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Oregon Coast Aquarium (OCAq) staff have developed a treatment plan for Sea Star Wasting Syndrome (SSWS), a deadly set of symptoms that have decimated sea star populations.

Sea Star Wasting Syndrome caused a mass die off of sea stars along the Pacific Coast in 2013 and 2014. Near- unidentifiable gelatinous bulks, the remnants of stars having fallen to wasting, littered the seafloor. One of Oregon's keystone species, the sunflower sea star (*Pycnopodia helianthoides*), was decimated, and is now listed as critically endangered.

There is no known cure for SSWS, but thanks to the efforts of OCAq staff, there is now an effective treatment. Over the last two years, OCAq Aquarist Tiffany Rudek worked to develop a reliable method of treating ill, injured, or stressed sea stars. For many of the stars under her care, the treatment was the difference between life and death.

Rudek partnered closely with supervisor and OCAq Sea Jelly Specialist Evonne Mochon Collura to refine the treatment and submit the formal plan, which may now be accessed online. In sharing their treatment plan, other researchers may repeat the protocol to prevent wasting in their collections.

The method involves supporting the star's immune system, as opposed to treating myriad bacterial factors, and is applicable to physical injuries as well as wasting symptoms.

When stars show symptoms at OCAq, such as skin lesions and twisted limbs, they are taken to a quarantine area for Rudek's treatment. The stars are placed into a cold water holding area and a buffer containing

specific trace elements is applied. They are given an invertebrate-specific probiotic to prevent harmful bacteria growth and secondary infection, and undergo medicated baths to remove opportunistic parasites and fungus.

This is all completed and repeated with the goal of creating a low stress environment for the stars, and an unwelcoming environment for harmful bacteria and parasites.

So far, this method has proven successful with 17 sea stars of varying species, including the Aquarium's three sunflower sea stars.

"Tiffany's thinking is out-of-the-box, and that's exactly what we needed," Mochon Collur said. "She had the tenacity and creativity to develop the method until it worked, and now we have over two dozen stars saved, and counting."

Rudek and Mochon Collura will continue trialing the method and collaborating with other labs and sea star working groups. While the trial is in its early stages, and the sample size is relatively low, Aquarium staff are optimistic with these very promising results.

Rudek said she is looking forward to the impact the treatment may have in other facilities.

"We opted to share this method, because not sharing didn't feel right," she said. "There are sea stars dying rapidly, and what we've developed is working—there's a chance it could help so many people and so many stars."