



FHL Sea Stars

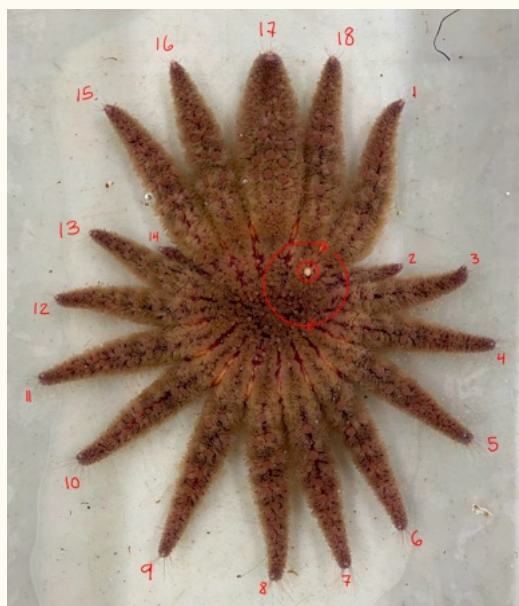
SEASONAL NEWSLETTER



Wait... you can identify individuals?

Madreporite

The key to re-identifying a star is to make sure you are looking at it in the same orientation. But how? Luckily there is one asymmetric structure on most stars and all sunflower stars: the **madreporite** (the off white dot circled in red at right). It is a sieve-like plate, a filter for water coming into a sea star's water-vascular system. Look at the closeup of a different star's more yellow madreporite below. The star's little white **spines** surrounding it make up a unique pattern which can be super helpful in identifying individuals - as long as you can see the madreporite!



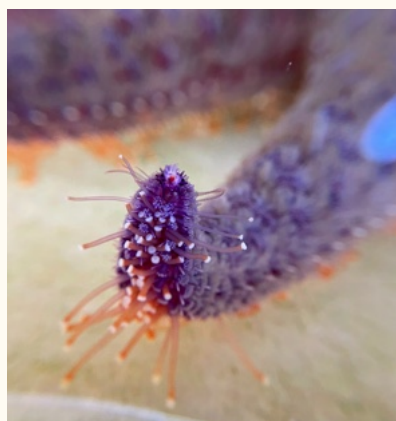
Arms

Using the **madreporite**, we can orient the star like a clock. So starting from the madreporite and going clockwise, we count the arms on an individual star, both the ones we can see from their upper side ('apparent arm number') and newly-sprouting ones only visible from below (giving the true arm number). We keep detailed records of both numbers: if we are trying to identify a star out in the field, we are not going to be flipping it over! We also classify the size of smaller arms (*such*

as arm 2 at above left) as they grow in. If we next look at this star in a month, arm 2 will be longer! We also take note of any distinguishing characteristics of their arms. Look for example at arm 12 - that's a fat arm (we call "phat") getting ready to split down the middle into two arms! Yes they sometimes do this!!

Coloration

Each star has a certain overall color, but it's thankfully always more complicated than that. Some have distinct **stripes** down their arms (*see above*), some have bright orange **tube feet** on their underside (*see below right*) which in this star contrasts their purple topside. The lighter **arm tips** of one might distinguish them from the purple of others. The fuzzy **papulae** (their 'lungs'!) can vary from transparent to green. The **rosettes** (*see below right*) show a variety of colors. For each of the stars that are in our care, we have detailed notes on all these details, tracking them as they grow, and assisting in getting to know each individual.



Rosettes are elevated structures containing many tiny pincers (pedicellariae) surrounding some spines. See how the upper star's rosettes are bright orange and the lower one's are purple? Very useful for individual ID!

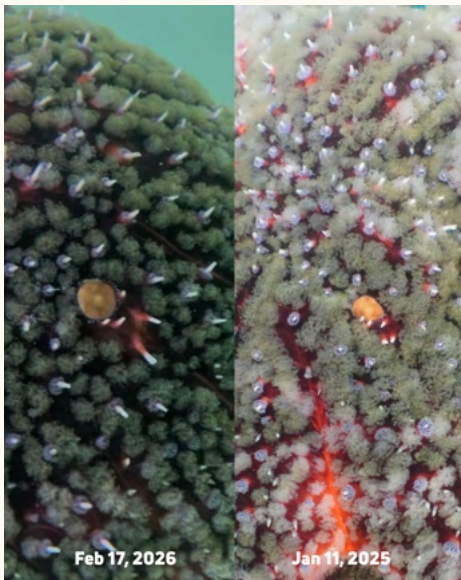
Ursa Minor

Last sighted at the FHL dock!

When our lab was founded in 2019, we collected wild sunflower stars as broodstock from multiple locations around San Juan Island in order to begin our restoration breeding program. We named one of these O.G. stars Ursa Minor; he was initially collected from below the dock at our very own Friday Harbor Labs. Ursa parented and subsequently grand-parented many of the stars we have in lab today. In October 2023 we released him back off the FHL docks, and over the years we and others keep seeing him. We have been able to confirm, from many such sightings, that this is indeed Ursa --

that is, as long as the photos we get have the madreporite showing (*see page 1*)!

This February we happened to be down at the dock around low tide, and spotted a star we thought was Ursa Minor but needed to get up close to see the madreporite to get our confirmation.



We hopped on a paddleboard and maneuvered over to the star, and used a Divevolk Underwater phone case (kindly gifted to us by Tony Newlin!) to grab a shot of the madreporite. See the proof at left. We were able to confirm that it was indeed Ursa Minor, and over the past few months he has been seen just about every week! Hooray for Ursa!



Team Spotlight: Julia Knopf



Julia grew up in the Bay Area of California before relocating to Washington to attend UW. She spent time at Friday Harbor Labs taking courses in Spring and Summer of 2024, including attaining her AAUS Scientific Diver Certification. During this time she was introduced to the work of the FHL Seastar Lab. Shortly after graduating with her BSc in marine biology and oceanography, she joined the team as a full time paid Research Assistant. Julia is also one of our research divers who make our releases and monitoring possible. We are so lucky to have Julia!

Stars for the Sea

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