



Oregon Sea Grant Extension
Sustainable Tourism &
Outdoor Recreation Program

Interpretative Fact Sheet

Purple Sea Urchin (*Strongylocentrotus purpuratus*)



The following short article is from the [Oregon Coast 101 Species](#) collection used by the Guide and Outfitter Recognized Professional (GORP) training program. These articles are intended to provide interesting facts you can share with your clientele and add value to your services.

An Interpretive Fact Sheet has been written about each species. We are currently uploading these blogs and creating the links.

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Purple Sea Urchin (*Strongylocentrotus purpuratus*)

 tourism.oregonstate.edu/purple-sea-urchin-strongylocentrotus-purpuratus/

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Invasion of the Purple sea urchin



Purple sea urchin (Image courtesy of Laura Francis, NOAA)

In 2013, millions of starfish were wiped out by a mysterious disease. Populations of the sunflower sea star were also devastated.

Why is this important? The sunflower sea star is the only real predator for the Purple sea urchin other than humans.

*It is almost like one of those 'z' science fiction movies.
There's a monster with no head, wiping out precious resources,
that seemingly lives forever, and eats its own kind.
It could have been a story about the Purple sea urchin.*

Where found

The Purple sea urchin lives on the Pacific coastline and is found from Alaska to Cedros Island, Mexico. They inhabit rocky low intertidal and nearshore subtidal communities.

In an intertidal zone, the urchin will camouflage or decorate itself with algae, rocks, and shells. Scientists suggest that this behavior might help protect the urchin from ultraviolet rays, from drying out, or perhaps being eaten.

They like areas of strong wave action and churning aerated waters which may also provide some camouflage and protection. Surprisingly, they are found in depths of up to 525 feet.

A disguise or just dressing up?

In the intertidal zone, a purple sea urchin will decorate itself with shells, rocks and pieces of algae. Scientists think this behavior protects the urchin from drying out, getting eaten by gulls or being damaged by the sun's ultraviolet rays.

They live solitary lives, often in crevices, just waiting for a bit of kelp to drift by.

Subtidal urchins live together in hordes that can take down a giant kelp forest (as recently reported in California), especially when predator populations get out of sync. Eventually, a kelp forest becomes totally barren.

Predators

Purple sea urchins are a favorite food of Sea otters. When the number of Sea otters declined, there was a remarkable jump in urchin population in California.

How to tell if a Sea Otter has been preying on the Purple sea urchin? Its mouth and teeth are totally purple, like a lipstick gone bad.

Sea stars also prey on Purple sea urchins. As the sea star creeps near the urchin, the urchin moves its spines and lets the sea star get really close.

The Purple sea urchin patiently waits as the star closes in. Then launches a surprise attack with pincers chomping on the sea star's tube feet. Most sea stars back off about this time.

The Sunflower sea star does not. When one of these stars get close, the urchin seems to panic, waving its spines and pincers, and attempting a retreat.

Physical aspects

*Urchins don't move very fast. It's feet are tiny.
If it is not fast enough, the Sunflower sea star will
swallow the urchin whole, spines and all.*

Small tubular suction devices extending from the spines help the urchin move. The tube feet are muscles that protrude from the spines.

The feet can attach to rocks or coral and move the urchin across the sea floor. The tubular feet help the urchin breathe and are used more often than gills for gas exchange.

The mouth (located on the underside) has five toothlike plates. The teeth and spines are used to dig holes or depressions for the urchin to hid in. They can even drill through steel pilings by flaking away rust.

Spine-amazing

The spines help move food around to the mouth and support the feet. The spines will pierce human skin and cause minor problems.

If this happens to you, douse with vinegar. Vinegar will quickly dissolve the spine. Do not pull it out...it never entirely comes out...

The round body holds the spines and can measure up to four inches in diameter. Generally, adults are bright purple.

Juveniles may be pale green with some purple tinges. Eggs, or roe, are orange and are considered a delicacy.

Look ma – No Head?

*The Purple sea urchin does not have a head structure.
But, it seems to have a head for business.*

Sea urchins are big business and a high-valued fishery in California. In 2000, 20 million pounds were harvested and sold to Japanese markets. Sea urchin harvesting has become one of the highest valued fisheries in California, bringing \$80 million in export value per year.

The idea of 'urchin ranching' is popping up projects in Japan, Canada and California. Divers could transfer wild and starving urchins to on-land tanks where they could be fattened up for sale. The numbers available in the wild are astronomical.

The possibilities are endless almost like the life span of these critters. Most of the urchins have long lives, like 70 or more years. The potential for creating a sustainable aquaculture fishery along the Pacific coast is immense.

This story turns totally weird when comparing human and urchin DNA. Using the strictest measure, the purple sea urchin and humans share 7,700 genes.

That explains the purple spikey hair perfectly don't you think? A story for a different day.

More urchin anyone?

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