

Identification Key for Common Intertidal Sea Stars of Puget Sound

How to use this key

1. Start at 1a.
2. Count the arms on the sea star you wish to identify.
3. Identify the appropriate statement in that pair and follow the prompt.
4. Repeat this process of identifying correct statements and following the prompt until your animal is identified.
5. Click on the name to find out more information on the species.

Start Here- Click either statement 1a or 1b below.

1a. Animal has five arms

[Go to 4](#)

OR

1b. Animal has more than five arms

[Go to 2](#)

2a. Animal has six arms

[Leptasterias hexactis, Six Arm Sea Star](#)

OR

2b. Animal has more than six arms

[Go to 3](#)

3a. Animal has 9 or 10 arms, smooth "skin"

[Solaster stimpsoni, Striped Sun Star](#)

OR

3b. Animal has more than 10 arms, spiny "skin"

[Pycnopodia helianthoides, Sunflower Star](#)

4a. Animal has short arms (R/r less than 3) [*See Notes](#)

[Go to 5](#)

OR

4b. Animal large or shaped otherwise

[Go to 7](#)

5a. Prominent spines along the margin of arms

[Hippasteria phrygiana, Spiny Red Star](#)

OR

5b. Smooth along margins of the arms

[Go to 6](#)

6a. Animal bright orange or red

[*Mediaster aequalis*, Vermilion Star](#)

OR

6b. Animal grayish, soft, leathery

[*Dermasterias imbricata*, Leather Star](#)

7a. Arms smooth, red on top, yellow beneath

[*Henricia leviuscula*, Blood Star](#)

OR

7b. Arms spiny

Go to 8

8a. Long arms ($R/r = 5$ to 8) *[See Notes](#)

[*Evasterias troschelii*, Mottled Sea Star](#)

OR

8b. Short arms ($R/r = 3$ to 4.5) *[See Notes](#)

Go to 9

9a. Color generally pink, animal can be up to two feet across

[*Pisaster brevispinus*, Short-Spined Sea Star](#)

OR

9b. Color purple, brown or orange

[*Pisaster ochraceus*, Purple Sea Star](#)

Notes

* Two measurements need to be made in order to determine the relative length of the arms of a sea star. A sea star is made up of arms and a central area to which they are attached called the disk. Since a sea star has radial symmetry, their dimensions are referred to radii.

"**R**" is the length of the arm as measured from the center of the animal to the tip of the arm.

"**r**" is the radius of the disk and is measured from the center to a notch between the arms.

R divided by **r** (**R/r**) is the relative length of the arm.

For instance: Distance from center of the disk to the tip of the arm is 10" and the distance from the center to the notch between the arms is 2 1/2", then: $R/r = 10/2.5 = 4$

Sea star species

Dermasterias imbricata, Leather Star



This sea star is feels smooth and slimy and smells like garlic. It is a medium sized sea star up to a foot in diameter but has relatively short arms (**R/r = 2.4 to 2.9** *[See Notes](#)). It is usually mottled with reddish brown to orange blotches outlined with grey. It is usually found in the sub tidal area on rocks. It feeds primarily on sea cucumbers.

Evasterias troschelii, Mottled Sea Star



The mottling on this sea star is fairly distinctive. It might be confused with the purple sea star (*Pisaster ochraceus*) but the mottled has a greater arm to disk ratio ($R/r = 5$ to 7.5 *[See Notes](#)). That ratio for the purple sea star ranges from 2.7 to 4. Usually mottled green, red, brown or orange with white spines. Usually on rocks and cobble but is also found on sand. It feeds on clams, jingle shells, barnacles, chitons, sea squirts and snails. Usually has a commensal scale worm.

Henricia leviuscula, Blood Star



The long arms, ($R/r = 3 \text{ to } 7$ *[See Notes](#)) brilliant red coloration on top and bright yellow below serve to identify this animal. This animal is found in shallow water on rocky substrates. It is thought to feed on plankton and possibly on encrusting sponges.

Hippasteria phrygiana, Spiny Red Star



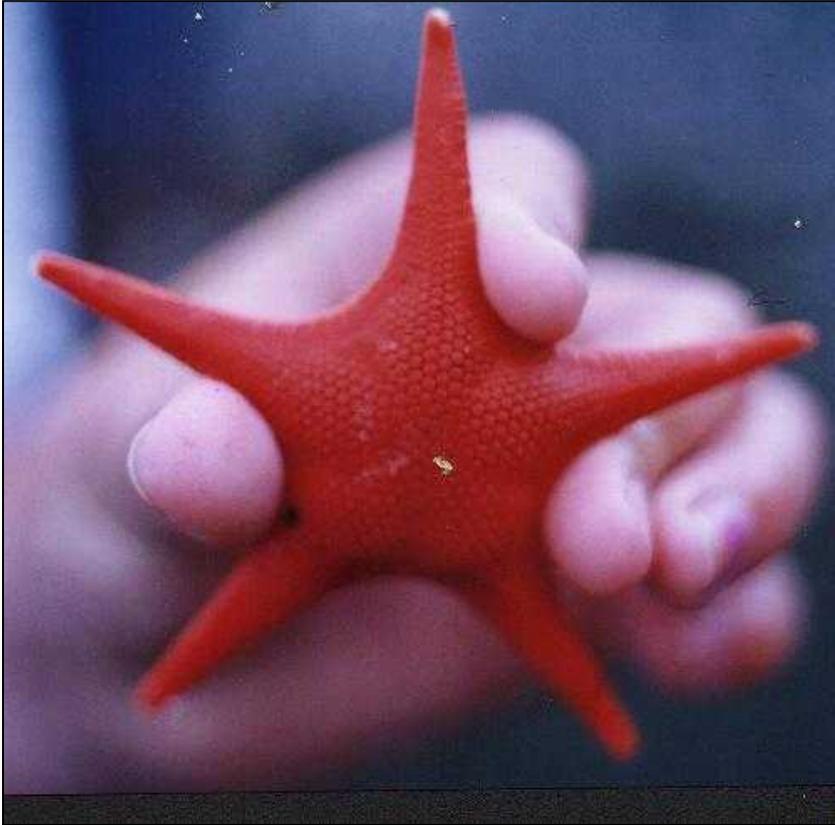
Its spiny surface, vermilion color and short arms ($R/r = 1.7$ to 2.6 *[See Notes](#)) cannot be confused with any other star in this region. It is usually subtidal but can sometimes be found on the beach. It can be up to a foot in diameter. The spiny red sea star feeds primarily on the orange sea pen and the white plume anemone, sea squirts, sand worms and eggs of sea slugs.

Leptasterias hexactis, Six Arm Sea Star



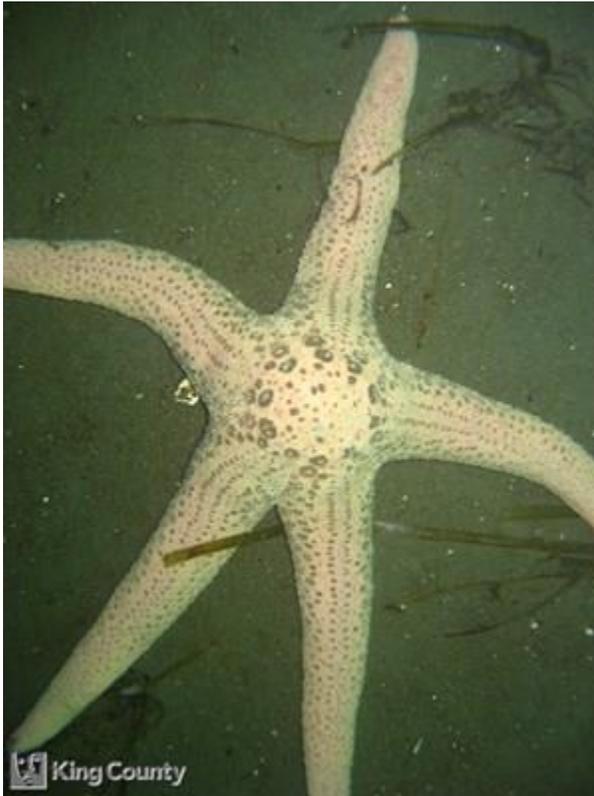
This animal is usually between 2 and three inches in diameter making it one of the smallest sea stars found in the central and south Puget Sound. The relative length of the arms is somewhat short ($R/r = 2.8$ to 5.0 *[See Notes](#)). While it resembles a juvenile [Mottled](#) or [Purple sea star](#), the bands on the arms help identify the Six arm Sea star.

Mediaster aequalis, Vermilion Star



Even though this bright-red sea star can be as much as eight inches in diameter, it has relatively short arms ($R/r = 2.4$ to 3.0 *[See Notes](#)). It can be found on almost any substrate, but it seems to prefer gravel and sand. It eats encrusting sponges, sea pens, loose algae on sand and flesh from dead animals. This sea star seemed to "bloom" near Point Robinson on Vashon Island in 1996.

Pisaster brevispinus, Short-Spined Sea Star



This animal prefers relatively shallow water and a sand/mud bottom where it feeds on clams. The Short-Spined Sea Star can grow to be more than 2 feet across with arms more than 3 inches thick. It is similar in appearance to the [Purple Sea star](#) but it has somewhat longer arms ($R/r = 2.8$ to 5.0 *[See Notes](#)) and the [Purple Sea star](#) is **never** pink. The Short Spined Pisaster has been sighted at Burton Acres on Vashon Island during low tide events.

Pisaster ochraceus, Purple Sea Star



The Purple Sea star is a medium size animal found on rocky shores where it feeds primarily on barnacles. Its arms are relatively short ($R/r = 2.7$ to 4.1 *[See Notes](#)). Although its common name implies that it is most often purple, it is as likely to be some shade of orange or brown but **never** pink. The arrangement of spines on the topside forms a netlike pattern. Some years, numbers of this species seems to "bloom" to the extent that large boulders show large white patches where the they have consumed the barnacles leaving just the cement that held their shells to the rock. These animals also eat mussels.

Pycnopodia helianthoides, Sunflower Star



This soft bodied sea star can be 80 cm in diameter -- the largest found in this region. The arms are relatively short ($R/r = 2.5$ to 3.5 *[See Notes](#)). It can move across the bottom at 160 cm/minute (more than 5 feet), which makes it the fastest as well. It feeds on whatever it can catch including hermit crabs, sea cucumbers, clams, urchins, sand dollars and bait.

Solaster stimpsoni, Striped Sun Star



The purple or blue stripe down each arm distinguish this ten-armed sea star. It can be very pale yellow to completely blue on its smooth surface. The arms are moderately long (**R/r = 2.3 to 4.4** *[See Notes](#)). This animal is usually found on cobbled beaches but can be found on sand. It is a carnivore which feeds primarily on sea cucumbers.