

# explore our Puget Sound Beaches

## Information and Resources:

### Beach information numbers:

#### Fish and Shellfish Permits

Contact your local fishing supply store for regulations and to obtain a license.

#### Beach Naturalists

For naturalists' schedules, visit [www.seattleaquarium.org](http://www.seattleaquarium.org); to volunteer, call King County Water and Land Resources at 206.296.8359

#### People for Puget Sound

206.382.7007

### Beach reporting numbers:

#### Toxic Chemical and Oil Spills

Seattle 206.684.7587

Dept. of Ecology 1.800.OILS-911

#### Red Tide Hotline

WA State Dept of Health

1.800.562.5632

Remember, the beach is home to countless marine plants and creatures – do your part to help take care of them and Puget Sound!



The Seattle Aquarium is located on the Seattle waterfront at Pier 59, 1483 Alaskan Way, Seattle, WA 98101.

Learn all about Puget Sound at the Seattle Aquarium. For information or to become a member, visit [www.seattleaquarium.org](http://www.seattleaquarium.org), or call us at 206.386.4300.



Providing Washington families with a smart way to save for college  
1-800 PRICE 529 [www.troweprice.com/collegesavings](http://www.troweprice.com/collegesavings)  
The T. Rowe Price College Savings Plan is sponsored by the Education Trust of Alaska



## SEATTLE AQUARIUM

# explore our Puget Sound Beaches



Your pocket guide

to the wonderful world that exists between high and low tide — and the captivating creatures that live there.

### What is the Puget Sound?

The Sound is actually a long arm of the Pacific Ocean that reaches deep within Washington state. And, just like ocean beaches, the tide changes on Puget Sound beaches four times each day — revealing all kinds of living treasures. The best time to explore is at low tide, when you can find extraordinary sea creatures that live most of their lives underwater.

EVERETT

puget sound

hood canal

Richmond Beach

Carkeek Park

Golden Gardens

Discovery Park

SEATTLE

South Alki

Schmitz Overlook

Lincoln Park

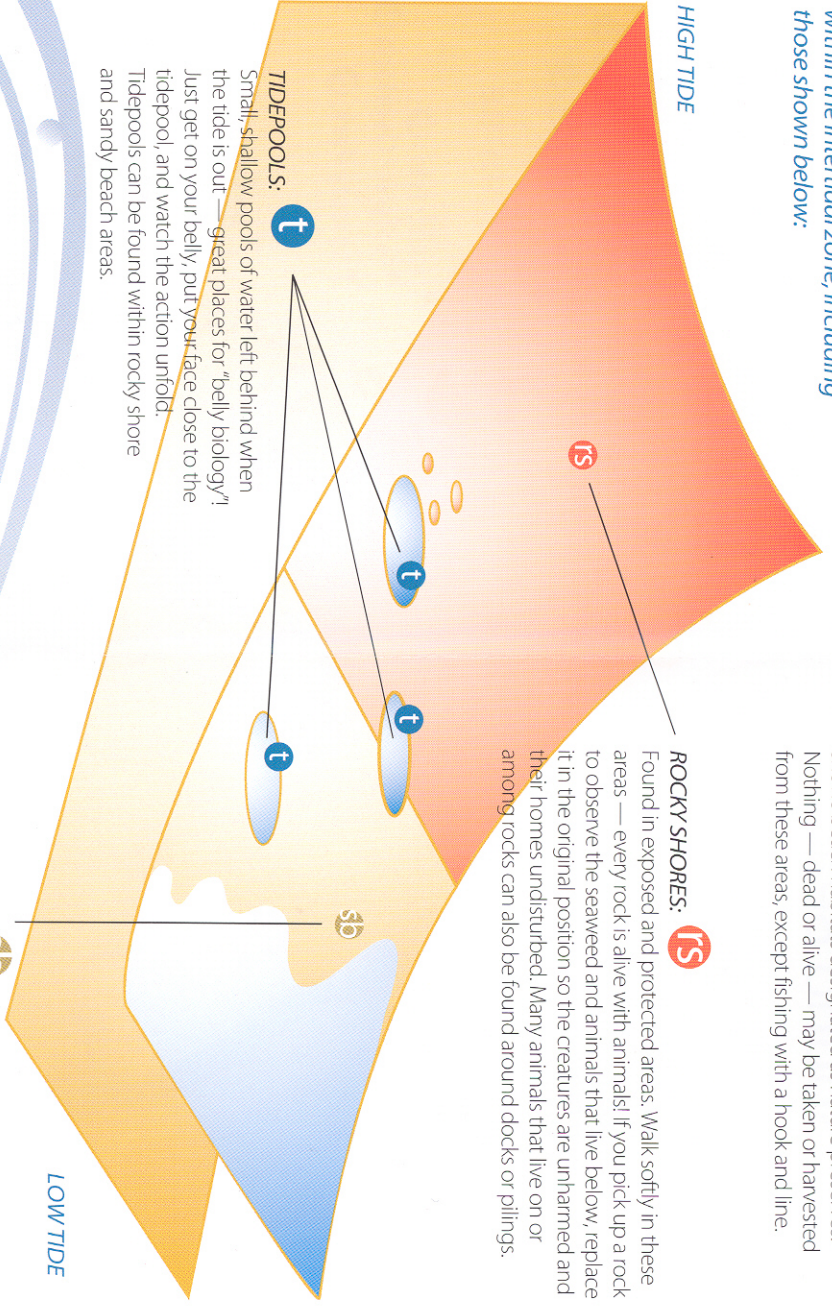
Seahurst

Des Moines



# exploring the Intertidal Zone

Simply put, the intertidal zone is the strip of beach that is submerged in water at high tide and exposed at low tide. The high intertidal area is usually exposed to air and is thus harsh for marine life. The mid-inner intertidal section is covered by water about half of each day and has a greater diversity of marine life. The low tide area is the richest where air exposure is minimal. There are several habitats within the intertidal zone, including those shown below:



### TIDEPOLS:

Small, shallow pools of water left behind when the tide is out — great places for “belly biology”! Just get on your belly, put your face close to the tidepool, and watch the action unfold. Tidepools can be found within rocky shore and sandy beach areas.

### HIGH TIDE

### LOW TIDE

### ROCKY SHORES:

Found in exposed and protected areas. Walk softly in these areas — every rock is alive with animals! If you pick up a rock to observe the seaweed and animals that live below, replace it in the original position so the creatures are unharmed and their homes undisturbed. Many animals that live on or among rocks can also be found around docks or pilings.

### SANDY BEACHES:

Found in both exposed and protected areas. Thousands of animals make their homes on and under the sand. Watch your step to avoid crushing them!

### MUD FLATS:

(Not shown) Found in sheltered areas, such as bays or estuaries. As you walk along a mudflat, notice the many holes created by burrowing clams and worms that live there.

### BE AN INTERTIDAL ECOLOGIST FOR A DAY!

Try taking field notes on the creatures you find in the intertidal zone. Measure a 12" X 12" space in the habitat(s) of your choice and count how many of each creature you find there. Which creatures are most common in which habitats?



### WHAT IS A MARINE PROTECTED AREA?

The Marine Protected Area symbol on our cover map shows beach habitats designated as nature preserves. Nothing — dead or alive — may be taken or harvested from these areas, except fishing with a hook and line.

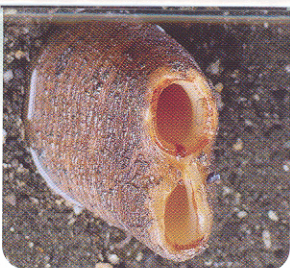
## WHO (and what) LIVES IN THE INTERTIDAL ZONE?



Included in our pocket guide are detailed descriptions to help you identify nearly 50 of the intertidal zone's most interesting residents.

**Explorer's note:** Remember, beach creatures are alive! If you touch them, do so gently. And when you come to the beach, don't take anything away or leave anything (such as litter) behind.

### Clams & Oysters



**Pacific Geoduck**    
A giant clam, with a neck that may exceed 3'.



**At home/Size:** 3-5 feet under the sand/ Shell, up to 8", weight, up to 20 pounds  
**Look For:** The geoduck's neck, poking an inch or so out of the sand at low tide.  
**Fast Fact:** These huge creatures can have a lifespan of up to 150 years.  
**!** Trying to 'catch' a geoduck by pulling on its neck may kill the clam.



**Giant Pacific (or Japanese) Oyster**   
A large, non-native oyster with a grey/white fluted shell.

**At home/Size:** On firm or rocky beaches, attached to rocks or each other/Up to 12"  
**Look For:** Purple or black colorations, which indicate new growth.  
**Fast Fact:** These oysters often house irregular, dull pearls.



**Pacific Littleneck Clam**  

A common bivalve with an oval shell that is light brown to grey, often with an irregular brown pattern.  
**At home/Size:** On sand or gravel beaches, to a depth of about 4"/Up to 3"  
**Look For:** Short "teeth" on the inside edge of the shell.  
**Fast Fact:** Tiny pea crabs sometimes live within this clam.



## Clams & Oysters



### Japanese Littleneck Clam m sb

A common, non-native clam with an oval shell that is light brown to grey, often with streaks of brown.

**At home/Size:** On sand or gravel beaches, to a depth of about 4"/Up to 3"

**Look For:** A smooth inside edge on the shell; purple or yellow coloration inside.

**Fast Fact:** These clams were introduced to our area less than 100 years ago.



### Heart Cockle sb m

A cockle with an oval shell that is prominently ribbed; light to dark brown in color.

**At home/Size:** Sand or mud beaches, on or near the surface/Up to 5 1/2"

**Look For:** The mottled color of a young cockle.

**Fast Fact:** The cockle uses its long foot like a pole vault to push away from its predators.



### Blue Mussel rs

A bivalve with a smooth, wedge-shaped shell that is blue, black, tan or brown.

**At home/Size:** In sheltered areas, attached to hard surfaces/Up to 4 1/2", but usually much smaller.

**Look For:** The very strong byssal threads, which attach the mussel to its home.

**Fast Fact:** Mussels feed on plankton and pump up to three gallons of seawater per hour through their gills.

## Rock Dwellers



### Rough Piddock

A bivalve with grey to brown wedge-shaped shells that are divided into three separate sections.

**At home/Size:** Buried in soft rocks, mud or hard clay/Up to 3"

**Look For:** The piddock's siphon peeking out from its burrow in a rock.

**Fast Fact:** Piddocks can burrow up to 20" deep into soft rock.

## Rock Dwellers



### Acorn Barnacle rs

A shrimp-like animal housed in a hard shell.

**At home/Size:** Attached to rocks, docks and other hard surfaces/Up to 3/4" in diameter.

**Look For:** Acorn barnacles feeding underwater, using their legs (called cirri) to sweep up plankton.

**Fast Fact:** Acorn barnacles live most of their lives standing on their heads, attached to hard surfaces by an exceptionally powerful glue.



### Thatched Barnacle rs

Larger barnacles with homes resembling thatched huts.

**At home/Size:** Attached to rocks, docks and other hard surfaces/Up to 1 1/2" in diameter.

**Look For:** Downward-pointing spines covering shell plates.

**Fast Fact:** The thatched barnacle's sharp spines are thought to discourage predators.



### Mossy Chiton rs

An oval, flattened mollusk with 8 overlapping shells (called valves), bound together by a leathery girdle.

**At home/Size:** On rocks or in tidepools/Up to 2 3/4" with stiff bristles around the perimeter.

**Look For:** The valves of dead chitons, called butterfly shells, washed up on the shore.

**Fast Fact:** Chitons slowly cruise around rocks looking for algae to eat.



### Hairy Chiton rs

Commonly seen with mossy chitons, this mollusk has soft bristles.

**At home/Size:** On rocks or in tidepools/Up to 3"

**Look For:** A small notch at the rear of the animal (usually).

**Fast Fact:** Chitons use an internal compass to navigate at night.



## Rock Dwellers



### Keyhole Limpet **RS**

A common mollusk with a single, volcano-shaped shell.

**At home/Size:** On rocky beaches from the low intertidal to subtidal/Shell width to 2 3/4"

**Look For:** A hole in the top of the shell – this is unique in limpets.

**Fast Fact:** Unlike most limpets, the keyhole is primarily a carnivore, eating encrusting animals.



### Mask Limpet **RS**

This limpet's oval shell features a very off-center and pointed peak.

**At home/Size:** Among cracks and crevices of the high intertidal/Shell width to 1 1/2"

**Look For:** Faint brown and white stripes on the mask limpet's shell.

**Fast Fact:** Every year, a 1" mask limpet is estimated to need 75 square inches of space on rocks to locate enough algae to survive.



### Shield Limpet **RS**

One of the most conical limpets with an oval shell nearly as high as it is wide.

**At home/Size:** On rocks in the low intertidal to subtidal/Shell width to 2 1/8"

**Look For:** Brown and white stripes radiating from the shield limpet's center.

**Fast Fact:** This limpet may be found living on other organisms such as large brown seaweeds and mussels.



### Plate Limpet **RS**

Our flattest and most rounded limpet.

**At home/Size:** On rocks from the low intertidal to subtidal/Shell width to 2"

**Look For:** Blotches radiating from the center of the plate limpet's shell.

**Fast Fact:** Look close – the plate limpet might have green seaweed or small barnacles on its shell.

## Rock Dwellers



### Isopods **RS**

Small, flat, elongated crustaceans with seven pairs of legs.

**At home/Size:** Under rocks, in mussel beds, or on seaweeds/Up to 1 3/8"

**Look For:** Isopods swimming across tidepools at night.

**Fast Fact:** Isopods can assume many colors to help them blend in with their backgrounds.

## Snails



### Moonsnail **SB**

One of the largest intertidal snails, with an enormous foot protruding from the opening of its shell.

**At home/Size:** On the sand, burrowing for clams to eat/Up to 5 1/2"

**Look For:** The moonsnails' distinctive sandy egg collar, which looks like the bottom of a toilet plunger, commonly found in spring and summer.

**Fast Fact:** A moonsnail's egg collar can contain up to half a million eggs.



### Periwinkles **RS**

Tiny, spiral-shelled snails found in eelgrass, seaweed, or on rocky shores.

**At home/Size:** On rocks and barnacles/Up to 5/8"

**Look For:** A variety of shell colors on this versatile little creature.

**Fast Fact:** Some scientists believe that land snails evolved from periwinkles.



### Frilled Dog Whelk **RS**

A snail with a shell that may be solid or striped in varying colors, including brown, grey, black, or orange.

**At home/Size:** On rocky beaches/Up to 2"

**Look For:** Masses of dog whelk eggs that look like thousands of yellow rice grains, attached to the undersides of rocks.

**Fast Fact:** Instead of drilling holes into its prey like other snails, the dog whelk probes between and around their shells with its tongue-like proboscis.



## Crabs



### Shore Crab **rs** **m** **sb**

Crustaceans with 10 legs (2 of which are claws) and a hard upper shell (called a carapace).

**At home/Size:** Under rocks/Carapace width to 2 1/4", depending on species

**Look For:** A shore crab's tiny eyes and antennae at the front of its shell.

**Fast Fact:** As a shore crab grows, it discards its old shell and replaces it with a new, larger one. Sometimes crabs eat their old shells to recycle the calcium.



### Kelp Crab **rs** **m** **sb**

One of several "spider" crabs found in Puget Sound.

**At home/Size:** In kelp beds or on pilings/Carapace width to 3 1/2"

**Look For:** Large adult kelp crabs on dock pilings and sandy beaches.

**Fast Fact:** Kelp crabs' extremely sharp legs allow them to climb up kelp beds.



### Dungeness Crab **m** **sb**

A commercially important, red-brown to purple crab.

**At home/Size:** Low intertidal to subtidal in sandy and eelgrass habitats/Width to 9"

**Look For:** Empty crab shells (molts) of Dungeness and red rock crabs on beaches.

**Fast Fact:** Female Dungeness crabs may lay up to 2.5 million eggs per year.



### Red Rock Crab **rs**

A brick-red cousin to the more popular Dungeness crab.

**At home/Size:** In gravel and rocky habitats, low intertidal to subtidal/Carapace width to 8"

**Look For:** The black-tipped claws that distinguish red rock crabs from Dungeness crabs.

**Fast Fact:** Red rock crab pinchers are 20 times more powerful than those of Dungeness crabs.

## Crabs



### Hermit Crab **rs** **m** **sb**

A small crab that uses snail shells as its home.

**At home/Size:** Tidepools/Up to 1 1/2"

**Look For:** Tiny legs protruding from the opening of the hermit crab's shell.

**Fast Fact:** When a hermit crab outgrows its shell, it simply looks for a larger one to move into and sometimes battles another crab for possession.

**!** Pulling a hermit crab from its shell home is fatal to the crab.

## Shrimp



### Shrimp **rs** **sb**

Small arthropods with jointed legs, two pairs of antennae, many body segments and exterior skeletons.

**At home/Size:** In sand, mud or tidepools; on rocky beaches/Up to 3", depending on type

**Look For:** Volcano-shaped mounds created by shrimp burrowing in the wet sand or mud.

**Fast Fact:** Some species of shrimp are male when they're young and become female in adulthood.

## Sea Slugs



### Sea Lemon **rs** **m** **sb**

One of the many shell-less sea snails (nudibranchs) with plume-like gills on top.

**At home/Size:** On rocky and cobble beaches/Usually to 4" long

**Look For:** Egg masses that resemble curled white ribbons on rocks in spring and summer.

**Fast Fact:** The color of this and other brightly colored slugs serves as a warning to potential predators of toxins in their bodies.



### Shaggy Mouse **rs** **m** **sb**

A shaggy, brownish to grayish sea slug that resembles a wet mouse.

**At home/Size:** On rocky and cobble beaches/Up to 2 3/4"

**Look For:** Egg masses that resemble soft white noodles on rocks.

**Fast Fact:** The shaggy mouse feeds on sea anemones and is apparently unaffected by their sting.



## Spiny Skinned



### Purple Sea Star **rs**

An abundant, spiny-skinned animal with chunky arms radiating from a central disk and tube feet for locomotion.

**At home/Size:** Rocky habitats/Diameter to 14"

**Look For:** Five arms (usually) and three colors – purple, orange or brown.

**Fast Fact:** Like all sea stars, the purple sea star can regenerate its arms but the loss – perhaps from rough handling – can reduce its ability to defend itself and secure food.

! Sea stars can be damaged if picked up.



### Mottled Star **rs sb**

Long, narrow arms distinguish this species from the purple star.

**At home/Size:** Rocky or sandy habitats/Diameter to 16"

**Look For:** Five arms (usually) and three colors – orange, brown or blue-grey.

**Fast Fact:** This common star is found in more protected areas – it's not fond of heavy surf locations like the purple star.

! Sea stars can be damaged if picked up.



### Sunflower Star **rs sb**

This aptly named sea star resembles a sunflower.

**At home/Size:** Soft bottoms and rocky habitats/Up to 39" wide; our largest sea star

**Look For:** The many colors of this enormous sea star include yellow, orange, brown, pink, red or purple.

**Fast Fact:** A full-sized sunflower star may have 15,000 tube feet, allowing for movement of perhaps 10' in a minute – a world-record for sea stars!

! Sea stars can be damaged if picked up.

### Red Sea Cucumber **rs sb**

An elongated, soft animal with a mouth at one end and tube feet running along the bottom.

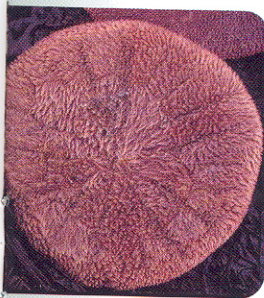
**At home/Size:** On or between rocks/Average 6" in length

**Look For:** Sea cucumber tentacles peeking out from under rocks.

**Fast Fact:** Sea cucumbers will blow some of their guts out if frightened.



## Spiny Skinned



### Sand Dollar **sb**

A round, flat sea urchin relative that is dark brown or purple when living; skeletons of dead specimens are grey or white.

**At home/Size:** Sandy areas with standing water/Up to 4" across, depending on type

**Look For:** Tiny gills extending through the flower-shaped pattern on the top.

**Fast Fact:** The "wings of a dove" found inside dead sand dollars are actually their teeth.

! Sand dollars may not survive if turned upside down.

## Fishes



### Tidepool Sculpin **rs sb**

A small, slender fish in brown, green or reddish shades with five irregular stripes across the top of its back.

**At home/Size:** In tidepools and under rocks/Up to 3 1/2"

**Look For:** Tidepool sculpins in a variety of colors — they can change them to match their surroundings.

**Fast Fact:** If displaced from their homes, the tidepool sculpin's sense of smell may guide them back to their tidepools.



### Gunnel **rs sb**

Eel-like fishes in variable solid or patterned colors.

**At home/Size:** Under seaweed, rocks or eelgrass; in tidepools/Up to 18"

**Look For:** Finger-length gunnels hiding under rocks.

**Fast Fact:** Gunnels have reduced scales on their bodies which allows them to breathe through their wet skin.



### Prickleback **rs sb**

Another group of eel-like fishes.

**At home/Size:** Under seaweed, rocks or eelgrass; in tidepools/Length to 20"

**Look For:** Dorsal (top) fins that are more prickly than gunnels.

**Fast Fact:** Some prickleback species have bizarre, fleshy cirri or crests on their heads.

! If you touch a tidepool fish, you may damage its delicate slime layer.



## Fishes



### Northern Clingfish **rs**

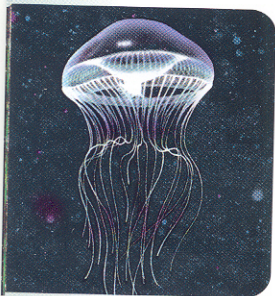
A fish with a brownish, tadpole-like body tapering to the tail.

**At home/Size:** Under rocks from low intertidal to subtidal/Length to 6 1/2"

**Look For:** A suction disk on the clingfish's underside, formed by its lower fins.

**Fast Fact:** Clingfish attach to the underside of rocks for protection, but occasionally they fall prey to their own kind – as they are cannibalistic.

## Jellies



### Water Jelly

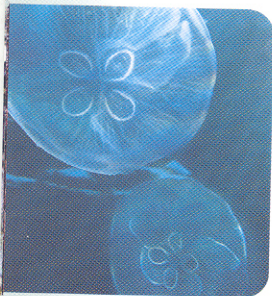
A transparent, bell-shaped jelly with long trailing tentacles.

**At home/Size:** In open water and close to shore/Up to 3" in diameter

**Look For:** Luminous water jellies visible in the dark water at night.

**Fast Fact:** Water jellies sometimes eat other jelly species, including their own.

! Even the most gentle touch can harm a jelly.



### Moon Jelly

A translucent, bell-shaped jelly with four horseshoe-shaped reproductive organs (called gonads) and many short, trailing tentacles.

**At home/Size:** Floating near the surface/Up to 16" wide

**Look For:** Moon jellies stranded on the beach (but don't touch them!).

**Fast Fact:** When the sun is out moon jellies may use it to migrate.

! Even the most gentle touch can harm a jelly.



### Fried Egg Jelly

One of our largest jellies, resembling a huge fried egg.

**At home/Size:** Floating on the surface/Up to 24" in diameter with tentacles to 20' long

**Look For:** Yellowish/orange coloration in the center, similar to the yolk of a fried egg.

**Fast Fact:** Caution! This is one of the few jellies with a toxin strong enough to hurt humans.

## Worms



### Calcareous Tube Worm **rs m sb**

Earthworm relatives whose bodies are made up of visible rings.

**At home/Size:** In mud or muddy sand; on, under or attached to rocks; in mussel beds/From less than 1" to 12", depending on type

**Look For:** The white shells of tube worms on the sides of large rocks.

**Fast Fact:** There are over 9,000 species of segmented worms; most of them are marine dwellers.

## Sea Anemones



### Aggregating Anemone **rs sb**

This upside-down jellyfish cousin resembles a flower.

**At home/Size:** Attached to rocks, docks and other hard surfaces/Usually 2" in diameter

**Look For:** Bright pink tentacles on the aggregating anemone's green body.

**Fast Fact:** These anemones can clone and form masses – aggregations – on the rocks.

! It's OK to touch an anemone's tentacles, but please be very gentle.



### Moonglow Anemone **rs sb**

A common anemone often seen burrowing in the sand.

**At home/Size:** Attached to rocks, docks and in the sand/Usually 2"

**Look For:** Distinctive white bands on the moonglow anemone's tentacles (these are absent in the look-alike aggregating anemone).

**Fast Fact:** At night, if you're lucky, you might see the tentacles glow.

! It's OK to touch an anemone's tentacles, but please be very gentle.



### Mottled Anemone **rs sb**

An anemone with a green, green and red or solid red column.

**At home/Size:** Attached to rocks, docks and other hard surfaces/Usually 4" in diameter

**Look For:** Column color that varies widely, from green, to green and red, to solid red.

**Fast Fact:** This anemone has been reported to live to 80 years in captivity.

! It's OK to touch an anemone's tentacles, but please be very gentle.



## Seaweed



### Rockweed **rs**

A brownish green seaweed that stands upright and features flattened stems with several branches.

**At home/Size:** On top of rocks/3"-7" tall

**Look For:** Rockweed found in the high to low intertidal on a rocky beach.

**Fast Fact:** Rockweed can lose 90% of its water and still survive.



### Sea Lettuce **rs**

A slippery, grass-green seaweed with ruffled edges.

**At home/Size:** On rocks or floating on mudflats/Up to 7" long

**Look For:** Green water in a tidepool, indicating that sea lettuce has released reproductive cells there.

**Fast Fact:** Sea lettuce is edible and used in foods such as sushi, soup and stew.



### Sugar Kelp **rs**

One of several large brown algae common to the shore area.

**At home/Size:** Rocky habitats from the low intertidal to subtidal/Blades to 11' long and 7" wide

**Look For:** Two rows of wrinkled patches running the length of the blade.

**Fast Fact:** The name is taken from a form of sugar found within this kelp.



### Bull Kelp **rs**

Our largest seaweed, bull kelp forms rich beds in Puget Sound during the summer.

**At home/Size:** Rocky habitats from low intertidal to subtidal/Length to 65'

**Look For:** Softball-sized floaters and massive holdfasts, resembling roots, attached to a rock.

**Fast Fact:** This is Washington's fastest-growing native vegetation – its growth exceeds 6" per day in optimum summer-time conditions.

## Seaweed



### Nori **rs**

A seaweed with very thin, brownish-purple blades.

**At home/Size:** Most common in low to high intertidal rocky habitats/Length to 2'

**Look For:** Nori's iridescent blades – they show up best in good light.

**Fast Fact:** This seaweed is farmed and sold for use in sushi.



### Turkish Towel **rs**

Thick purplish-red blades characterize this species.

**At home/Size:** Low intertidal to subtidal in rocky habitats/Length to 20"

**Look For:** Distinctive rubbery bumps covering the blades.

**Fast Fact:** Turkish towel is sometimes commercially harvested for carrageenan, a thickening agent found in many products, including ice cream and toothpaste.



### Sargassum **rs**

Long, stringy, yellowish-brown growth identifies this seaweed.

**At home/Size:** Low intertidal to subtidal in protected rocky habitats/Length to 6 1/2"

**Look For:** Tiny floats attached to sargassum's many branching blades.

**Fast Fact:** Sargassum was introduced from Japan in the early 1900s and competes for space with native vegetation.

## Plant



### Eelgrass **n sb**

A bright green, bladelike plant with one or more veins running along its length.

**At home/Size:** Rooted in mud or sand in sheltered waters/Up to 4'

**Look For:** Other small creatures using the eelgrass as their home.

**Fast Fact:** Eelgrass beds are important nurseries for young fish and invertebrates.