Guided adapted from: "Life Between the Tides"
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The Rocky Intertidal

Welcome to one of the world's most unique ecosystems. This vast expanse where land meets sea supports a thriving body of marine organisms and plants all adapted to live under the harsh environmental pressures characteristic of this area. Dictated by the gravitational pull of the moon and sun, the tides predictably flow in and out daily creating a low, high, and middle tidal zone. Each of these zones maintains a unique community waiting for you to explore. Use this pocket guide to help you in your adventure and discover the amazing animals that call the intertidal home.

Mussels (*Mytilus californianus*)

Mussel beds are firmly attached to the rocks by tough strands cemented in place. Shells are tear-shaped and dark blue-black in color. Mussels are commonly 3-5 in. long and open during high tide to filter feed on incoming plankton. Mussel beds are often interspersed with barnacles.

Gooseneck Barnacles (*Pollicipies polymerus*)

Gooseneck barnacles have a fleshy, muscular stalk reaching 4 to 6 in. in length with a calcareous tip. They can be found in clumps interspersed with mussel beds. Once they attach to the rocks as larvae, they do not move their entire lives. Barnacles filter feed when the tide is high using small feather like appendages called cirri to catch plankton.

Sea Lettuce (*Ulva californical*)

Ulva forms dense green, turf-like stands atop rocks in the mid- and low-intertidal. Consists of smooth blades, roughly ¾ of an inch. *Ulva* leaves are edible and quite tasty, fresh or dried.

Dead Man's Fingers (*Codium fragile*)

Codium is a green algae that forms large drooping clumps with cylindrical branches that are spongy in texture. *Codium* is unique in that it only has one large cell wall, the outer skin.

Wireweed (*Sargassum agardhianum*)

This brown algae forms thick stands in the mid- to low- intertidal. Averaging 1-3 ft. long, they have small leafy blades and spherical floats.

Seagrass (*Phyllospadix scouleri*)

Seagrasses are flowering plants that form large clumps in the lower intertidal. Algae that grow on the grasses are called epiphytes and the critters that graze epiphytes are called epifauna.

Coralline algae (*Corallina spp.*)

Corallines are small pink plants with stony segments that branch into a feather pattern. These are perhaps the most abundant of intertidal species in S. California.

Sea Bubble (*Colpomenia sinuosa*)

Colpomenia grows on rocks and other seaweeds in the mid intertidal. They are yellow-brown in color, hollow and bubble-like, and 1-3 in wide.

Owl Limpet (*Lottia gigantea*)

These are the largest of the Pacific Coast true limpets, growing up to 4 in. Most specimens are 2 in. with a lumpy, low profile shell mottled white, brown, and black. They graze on *Ulva* and return to the exact same spot after foraging. Owl limpet is considered a delicacy in Baja California.

Keyhole Limpet (*Megathura crenulata*)

Found on rock surfaces in the low- intertidal, these limpets have a small shell under their fleshy colored mantle ending in a large oval "keyhole". Their mantle can range in color from tan, brown, and black. The keyhole at the apex of their shell is used to both respire and excrete waste.

Kellet's Whelk(*Kelletia kelletii*)

The shell of the Kellet's Whelk is tan to white and can reach up to 6 in. in length. This species is sublittoral (meaning that it lives deeper than the intertidal zone) but can frequently be found in shallow water at low tide. The eggs of the Kellet's Whelk are cream in color and usually found lined up in a single file.

Black Turban Snail (*Tegula funebralis*)

Found in the high and mid- intertidal, *Tegula* often form clusters in crevices or on sides of rocks. They are 1 to 1.5 in. in height and deep purple-black in color. They feed on microscopic algae and seaweeds. Empty *Tegula* shells are also a favorite home for hermit crabs.

Intertidal Safety Tips

- Remember you are entering a federally protected area, taking of any kind is against the law.
- Only explore in designated areas. Please stick to the path and heed trail warnings.
- Be respectful of the critters who live here, avoid disturbing their homes, and only touch with two fingers.
- Waves and algae can make the area extremely slippery. Wear sturdy shoes and step with caution.
- Be aware of the incoming tide. Do not turn your back to the waves and make sure that you can always reach dry land.

NATIONAL PARK SERVICE

Cabrillo National Monument Intertidal Guide

Name: _____

Contact the park for more information:
(http://www.nps.gov/cabr)

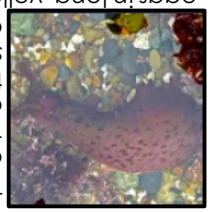
Hermissenda (*Hermissenda crassicornis)*

Hermissenda have an elongate body, up to 2 in. in length, and colored transparent blue, grey, or white. The projections on the top of their body (cerata) are usually orange-ish in color with white tips and contain small stinging cells called nematocysts that they obtain from their food, the sea anemone.

Hopkins Rose (*Hopkinsia rosacea)*

Rosy nudibranchs are unmistakable with their vibrant red and pink coloration. Their body is approximately 1 in. long and they can often be found in seagrass or on rocks in low pools. The branchial plumes from which they breath and rhinophores from which they smell are often covered by long distinctive projections called papillae.

Sea Hare (*Aplysia californica)*



These soft-bodied sea slugs can have a reddish brown to greenish grey skin coloration. Sea hare's feed mostly on red seaweeds, giving them this coloration. They lay their eggs in long, yellow, spaghetti-like mats. Like octopus, the sea hare will produce a thick cloud of ink when disturbed to distract would be predators.

Doríd Nudibranch (*Diaulula sandiegensis)*

Diaulula have distinct brown or black rings on the top of their elliptical shaped body. They get to be up to 3 in. long and 2 in. wide. The surface of their skin is velvety in texture due to the calcareous spicules embedded in their skin. These spicules are obtained from the sponges they eat and used to defend against predators.

Two-spot Octopus (*Octopus*

Found in holes or crevices, octopus are secretive creatures. They have a sack-like body roughly 2-8 in. in size with 8 sucker bearing arms about three times the length of their body. They are radially able to change their skin color and texture to match their surroundings using small pigment cells called chromatophores.

Moray Eel (*Gymnothorax mordax)*

Moray eels are often light to dark brown or greenish in color and can be found in holes or crevices. They can reach as long as 5 ft. and up to 14 lbs. They often eat small fish, octopus, and crustaceans. These eels have two sets of jaws and extremely sharp teeth. Be careful when sticking your hands in holes where a moray might mistake your finger for a delicious fish.

Conspicuous Chiton (*Stenoplax conspicua)*

These are the largest of the Southern California chitons attaining a length of nearly 4 in. They have an elongated body covered on top by scales or plaques. These chitons are nocturnal and avoid sunlight by hiding under rocks in smooth sandy areas.

Sand-castle Worms (*Phragmatopoma californica)*

A cream colored worm with lavender tentacles and black bristles. This worm is a tube builder and is almost always found in a colony that forms a honeycomb design. Though the worm itself is only 2 in. long, they cement together tiny grains of sand and shells to create reefs as big as 6 ft.

Shore Crab (*Pachygrapsus crassipes)*

Shore crabs are commonly found in crevices in the mid- to high intertidal. The have a small, square-shaped body roughly 2 in. wide and are green or red in coloration. They will move quickly sideways to avoid predators but will "battle" when threatened. They consume plant material and other forms of detritus.

Spiny Lobster (*Panulirus interruptus)*

Though larger lobsters are found mostly offshore, juvenile lobsters can sometimes be found in the seagrass beds of the intertidal. Lobsters are nocturnal and feed on urchins or other animal remains. Due to their commercial importance, they are illegal to take under a certain size and without a permit.

Knobby Sea Star (*Pisaster giganteus)*

Knobby sea stars can be found in the lower intertidal stuck firmly to rocks with their suction cup tube feet. They are distinguished by the bright blue circles around their knobby spines. Sea stars feed on urchins by covering them with their long arms, pushing their stomachs out of their bodies, and digesting the animal externally.

Banded Brittle Star (*Ophionereis annulata)*

Brittle stars belong to a different group than the sea stars. Their primary difference is that they have brittle segmented arms that allow them more mobility that their sea star cousins. Brittle stars are often found under boulders or in kelp holdfasts as they do not like being in the sunlight.

Globose Kelp Crab (*Taliepus nuttalli)*

Globose Kelp Crabs are deep purple to reddish brown in color and can reach nearly 1 ft. in size. Though they can be found swept into the intertidal, these crabs normally live In the kelp forest adjacent to the tidepools. You will often find them crawling around and eating the Giant Kelp, *Macrocystis pyrifera*.

Sea Urchin (*Strongylocentrotus purpuratus)*

Purple sea urchins range between 2 and 4 in. in diameter. Along with their spines, they have small tube feet that help them move around or stick to rocks. They are voracious predators and feed frequently on Giant Kelp. When the urchin's predators are removed from an ecosystem, they can run rampant and form urchin barrens.

Bat Star(*Patiria miniata)*

Bat stars come in a multitude of colors of red, orange, brown, and many more. Unlike other sea stars they have web like structures between their five arms. Bat stars in the tidepools are mostly small, ranging from 1 to 3 in. in diameter and found on the underside of rocks or in sandy areas.

Anemone (*Anthopleura zola)*

The solitary sea anemone is the largest of the S. California anemones. They can reach a diameter of up to 10 in., but are often 3 to 5 in. and are light green in color. Their coloration comes from the symbiotic algae that live in them. Anemone catch their prey using stinging cells called nematocysts.