Intertidal Field Guide

CABRILLO NATIONAL MONUMENT

Intertidal Field Guide

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Our Role

Cabrillo Guide

About the Ecosystem

Welcome to one of the world's rarest ecosystems. This vast expanse, where land meets sea, supports a thriving body of marine organisms and algaes 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 cyclically creating a low, high, and middle tidal zone. Each of these zones supports a distinctive community waiting for you to explore. Use this guide to help you in your adventure and discover the organisms that call the intertidal home.

Intertidal Safety Tips

- Remember this area is federally protected; taking of any kind is against the law.
- Only explore in designated areas.
- Be respectful of the critters that live here; avoid disturbing their homes, and only touch gently 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 you can always reach dry land.

Field Guide

WHAT ARE YOU LOOKING AT?

Invertebrates

- Lack a spinal column
- May have exoskeleton

Marine Algae

- Use energy from light to make food
- Provide food for ecosystem

Fish

- Aquatic vertebrates
- Use gills to breathe

Marine Mammals

- Breathe air and have hair
- Give birth to live young

Invertebrates

Invertebrates without Exoskeleton

Invertebrates with Exoskeleton

Invertebrates without Exoskeleton

Aggregating Anemone

Solitary Anemone

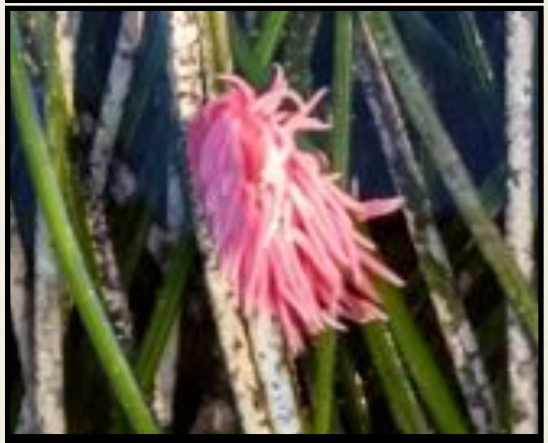
Brooding Anemone

Black Sea Hare

Brown Sea Hare

Dorid Nudibranch

Hermissenda Nudibranch



Hopkins Rose Nudibranch

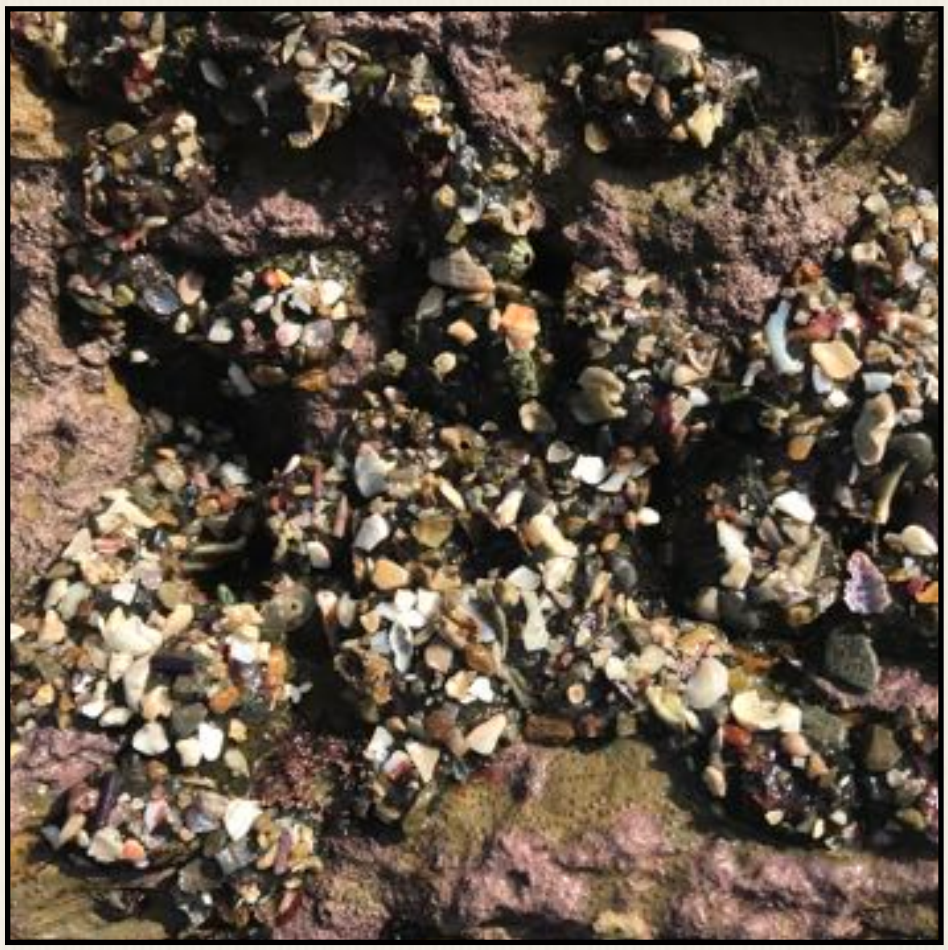
Spanish Shawl Nudibranch

Navanax

Two-Spot Octopus

Aggregating Anemone

Anthopleura elegantissima



Tidal Zone: High to Middle

Description: 5-7cm in diameter when open. Closes during low tide and is covered with shells and sand.

Distribution: Alaska to Baja California

Interesting Facts: To reproduce, individual anemones divide and separate into two new anemones of the same sex.

Solitary Anemone

Anthopleura sola

Tidal Zone: Low to Subtidal

Description: A 7-10 cm disc rimmed with tentacles; usually light green with stripes extending from the center.

Distribution: Alaska to Panama

Interesting Facts: The stinging cells, or nematocysts, in their tentacles are used to capture food.

Brooding Anemone

Eplactis Prolifera

Tidal Zone: Low

Description: Orange, red, or brown 2 cm disc.

Distribution: Alaska to Southern California

Interesting Facts: Eggs are fertilized within the body of the adult, then released out of its mouth.

Black Sea Hare

Aplysia vaccaria

Tidal Zone: Low to Subtidal

Description: Dark purple to black sea slug that grows up to 76 cm long.

Distribution: Southern California to Baja California

Interesting Facts: Unlike the California Sea Hare, this species does not ink. Instead, its primary defense is camouflage. This is the largest of all sea slugs.

Brown Sea Hare

Aplysia californica

Tidal Zone: Low

Description: Rusty brown to red sea slug with dark streaks or spots. 12 cm - 15 cm long.

Distribution: Northern California to Baja California

Interesting Facts: Gets its coloration from the red algae it eats. This species will ink like an octopus when disturbed.

Dorid Nudibranch

Diaulula sandiegensis

Tidal Zone: Middle to Low

Description: Small, tan-bodied sea slug with dark brown or black rings on its back. Up to 7.6 cm long and 5 cm wide.

Distribution: Pacific Coast from Northern Japan to Baja California

Interesting Facts: Feeds on sponges found on the undersides of rocks.

Hermissenda Nudibranch

Hermissenda crassicornis

Tidal Zone: Low

Description: Small, 5 cm long sea slug with transparent gray, white, or blue body. The tentacle-like cerata on its back can be red, orange, green, brown, or black.

Distribution: Alaska to Baja California

Interesting Facts: The tips of the cerata contain stinging cells, or nematocysts.

Hopkins Rose Nudibranch

Hopkinsia rosacea

Tidal Zone: Low

Description: Small sea slug, 2.5 cm in length, with a red body and pink fleshy appendagescovering the body.

Distribution: Oregon to Baja California

Interesting Facts: This sea slug derives its color from the rose-colored bryozoan, or small encrusting invertebrate, it feeds on.

Spanish Shawl Nudibranch

Flabellina Iodinea

Tidal Zone: Low to Subtidal

Description: A small sea slug about 8 cm long with a bright purple body and orange tentacle-like cerata on its back. The ear-like rhinophores are a deep red color.

Distribution: British Columbia to Baja California

Interesting Facts: This nudibranch can flatten its body and swim by bending back and forth to propel itself through the water

Navanax

Navanax inermis

Tidal Zone: Low to Subtidal

Description: A 7-10 cm long sea slug that is black with a series of orange, yellow, and blue dashes, spots, and stripes.

Distribution: Northern California to Baja California

Interesting Facts: This species of sea slug is carnivorous and feeds on soft-bodied snails. Will also expel a yellow ink when threatened.

Two-Spot Octopus

Octopus bimaculoides

Tidal Zone: Low to Subtidal

Description: The body can be from 5-20 cm in length with arms three-times the length of the body. Has two dark spots ringed with blue below the eyes, hence its name.

Distribution: Central California to Baja California

Interesting Facts: Masters of camouflage, octopuses can change the color and texture of their skin. They will also release a dark black ink when threatened.

Invertebrates with Exoskeleton

Sea Stars

Crustaceans

Shelled Invertebrates

Other

Sea Stars

Banded Brittle

Bat Star

Ochre Sea Star

Knobby Sea Star

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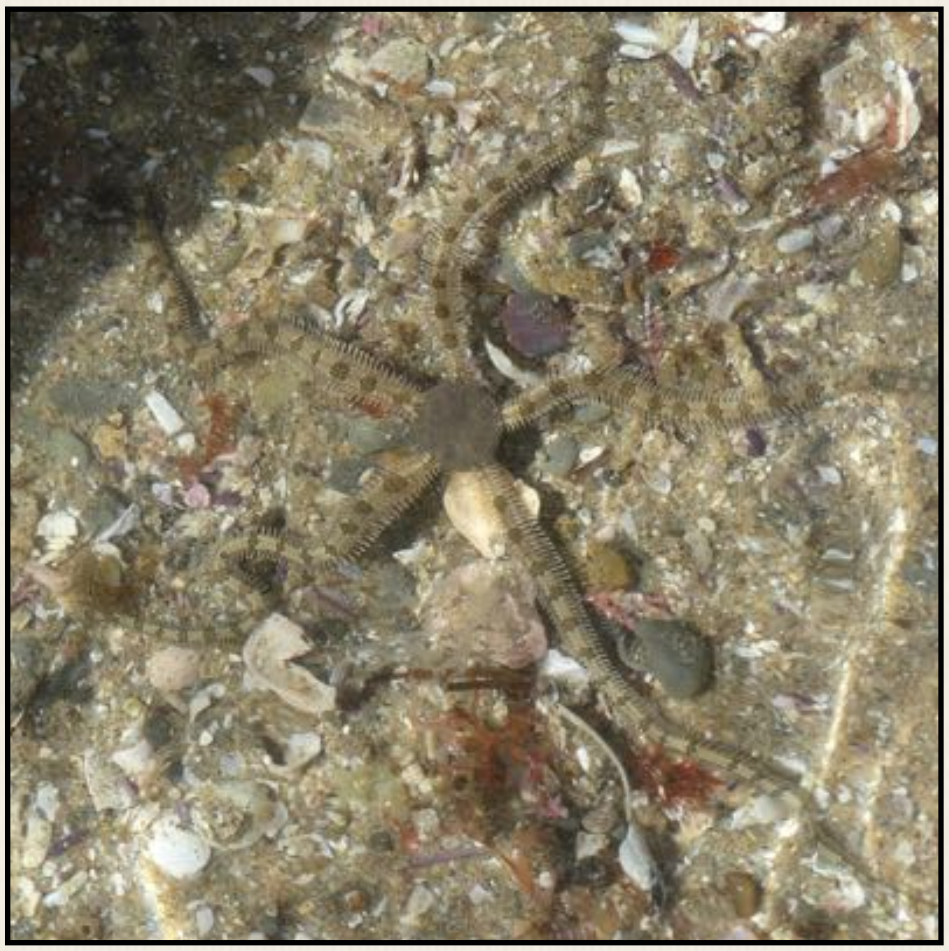
Banded Brittle Star

Ophionereis annulata



Tidal Zone: Middle

Description: Small, round, brown body with five 10-12 cm long gray legs marked with brown bands.

Distribution: Southern California to Panama

Interesting Facts: Arms will easily break off when disturbed, but will regrow.

Bat Star

Patiria miniata

Tidal Zone: Low to Subtidal

Description: Averaging 7.5 cm in diameter with five triangular shaped legs. Usually orange in color.

Distribution: Alaska to Baja California

Interesting Facts: This species is omnivorous (eats both algaes and animals).

Ochre Sea Star

Pisaster ochraceus

Tidal Zone: Low to Subtidal

Description: Diameter of 45 cm - 50 cm. They range in color from yellow, orange, brown, red, or purple.

Distribution: Alaska to Baja California

Interesting Facts: Once one of the most prolific sea stars on the West Coast, this species was recently decimated by Sea Star Wasting Disease.

Knobby Sea Star

Pisaster giganteus

Tidal Zone: Low to Subtidal

Description: A tan or brown base with blunt blue spines tipped with purple, pink, or white. Usually about 36 cm - 48 cm in diameter.

Distribution: British Columbia to Baja California

Interesting Facts: Sea Stars eat their prey by expelling their stomach and digesting prey externally.

Crustaceans

Blue-Legged Hermit Crab

Globose Kelp Crab

Rock Crab

Striped Shore Crab

Spiny Lobster

Blue-Legged Hermit Crab

Pagurus samuelis

Tidal Zone: High to Middle

Description: Shells about 2.5 cm in height with bright blue color bands on their legs.

Distribution: British Columbia to Baja California

Interesting Facts: They favor empty Black Turban Snail shells and feed on the remains of animals and algae material.

Globose Kelp Crab

Taliepus nuttalli

Tidal Zone: Low to Subtidal

Description: Purple to reddish brown, 10 cm body with an overall diameter of 30 cm including the legs.

Distribution: Central California to Baja California

Interesting Facts: Feed on large kelp species, such as Giant Kelp and Feather Boa Kelp.

Rock Crab

Cancer productus

Tidal Zone: Low to Subtidal

Description: Red to brown oval crab 12 cm wide with large mouth pieces that point forward. Adults have a fringe of hair on lower body surface and legs.

Distribution: Oregon to Baja California

Interesting Facts: This species is known to feed on hermit crabs.

Striped Shore Crab

Pachygrapsus crassipes

Tidal Zone: High to Middle

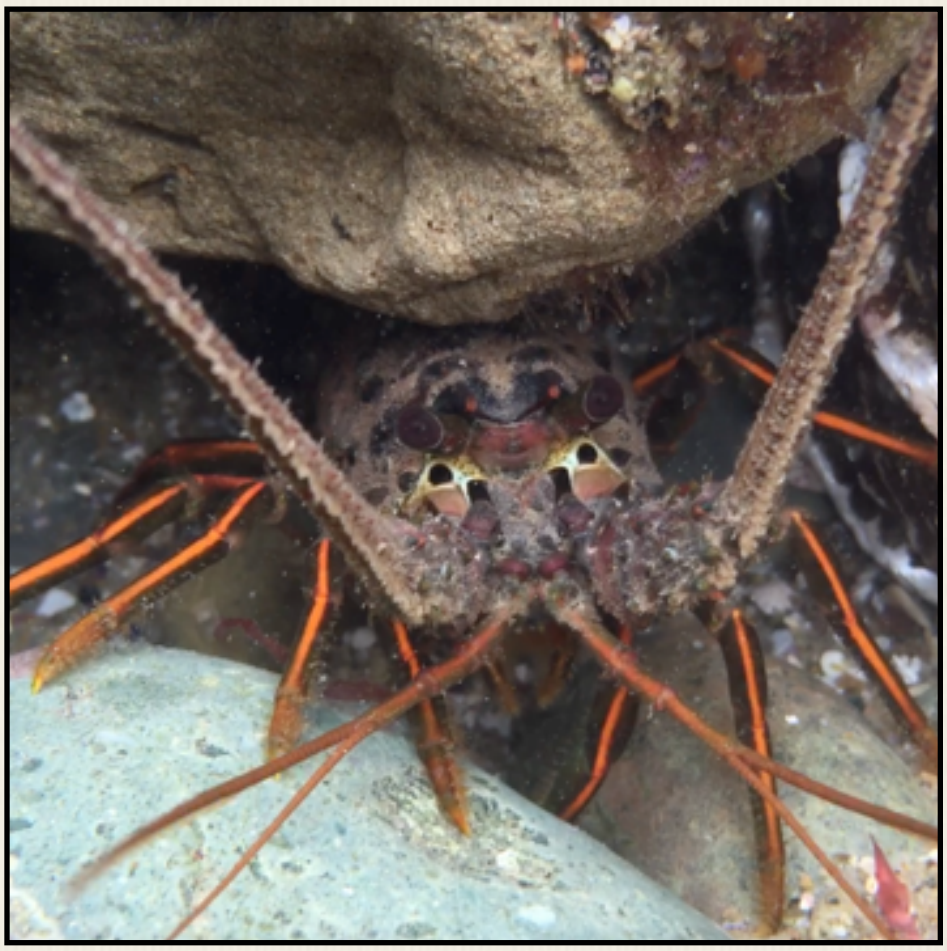
Description: This crab can grow up to 5 cm wide and has a square-shaped body in shades of red, purple, or green with lateral stripes.

Distribution: Oregon to Baja California

Interesting Facts: They are scavengers, but can also prey upon snails, limpets, and hermit crabs.

Spiny Lobster

Panulirus interruptus



Tidal Zone: Low to Subtidal

Description: Those found in the tidepools are usually juveniles averaging about 30 cm in length. Brick red in color with orange stripe down the legs.

Distribution: Southern California to Mexico

Interesting Facts: Lacking claws, like their east coast relatives, these lobsters have spines on their bodies and sharp tail segments for protection.

Shelled Invertebrates

Barnacles

Thatched Barnacle

Gooseneck Barnacles

Chiton

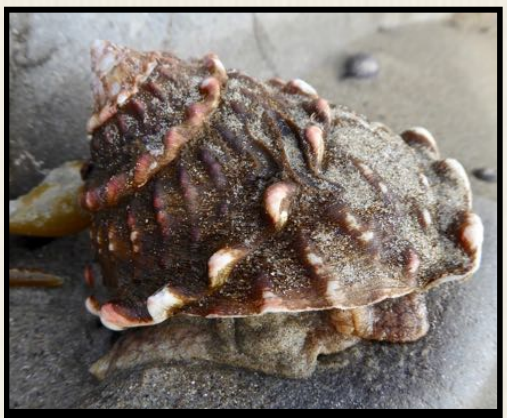
Black Turban Snail

Blue-Legged Hermit Crab

Gray Periwinkle

Chestnut Cowry

Kellet's Whelk


Wavy Turban Snail

Keyhole Limpet

Mussels

Owl Limpet

Scaled Worm Snail

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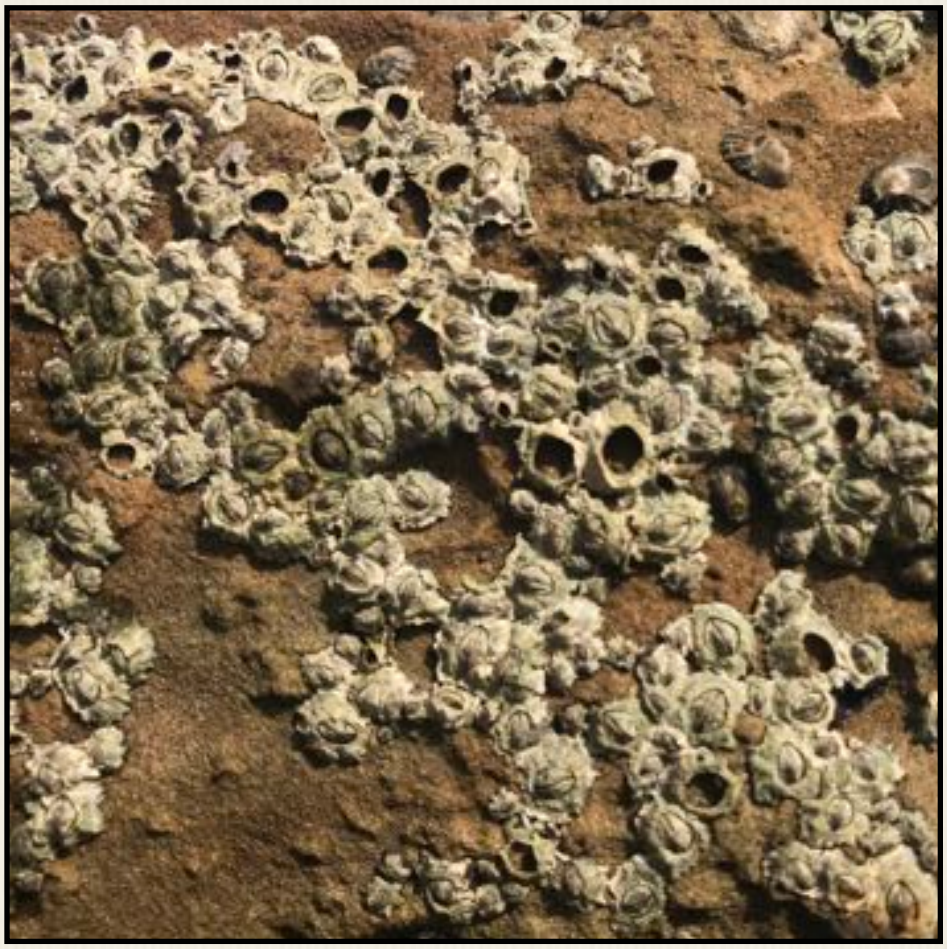
Barnacles

Cthamalus and Balanus spp.



Tidal Zone: High to Low

Description: Averaging 1 cm - 15 cm depending on species. Cream, brown, or pink in color.

Distribution: Canada to Baja California

Interesting Facts: Attach to rocks with their antennae and feed with their feathery legs at high tide.

Thatched Barnacle

Tetraclita rubescens

Tidal Zone: Middle to Low

Description: 2-4 cm diameter pink to red shells that grow into the shape of a volcano.

Distribution: Northern California to Baja California

Interesting Facts: Juveniles are white, turning red once mature.

Gooseneck Barnacles

Pollicipies polymerus

Tidal Zone: High to Middle

Description: Grey to white clusters of individuals from 10-15cm in length grouped on surface of rocks.

Distribution: British Columbia to Baja California

Interesting Facts: The body is covered with plates and scales for protection.

Chiton

Nuttalina fluxa

Tidal Zone: High to Middle

Description: Narrow, eight-plated oval 2.5 cm - 3.5 cm in length. Dark brown to brownish-yellow.

Distribution: Central California to Baja California

Interesting Facts: Can live up to 20 - 25 years. Create pits in the rock to trap algae for food and to hold water during low tide.

Black Turban Snail

Tegula funebralis

Tidal Zone: High to Middle

Description: Smooth, dark, purple-black with white tip of shell. 2 cm - 4 cm in height.

Distribution: British Columbia to Baja California

Interesting Facts: Empty Black Turban Snail shells are a favorite of Hermit Crabs.

Blue-Legged Hermit Crab

Pagurus samuelis

Tidal Zone: High to Middle

Description: Shells about 2.5 cm in height with bright blue color bands on their legs.

Distribution: British Columbia to Baja California

Interesting Facts: They favor empty Black Turban Snail shells and feed on the remains of animals and algae material.

Gray Periwinkle

Littorina planaxis

Tidal Zone: High

Description: Small, grayish-brown snail roughly 1.5 cm tall.

Distribution: Washington to Baja California

Interesting Facts: Unlike most other marine animals, this snail can survive in fresh water.

Chesnut Cowry

Neobernaya spadicea

Tidal Zone: Low to Subtidal

Description: Snail with a 3.8 cm - 6.3 cm long shell. Shell is a light Chestnut brown with a dark brown band that separates a white base.

Distribution: Central California to Baja California

Interesting Facts: In the summer, females deposit 100 or more egg capsules, each capsule containing hundreds of eggs.

Kellet's Whelk

Kelletia kelletii

Tidal Zone: Middle to Low

Description: A sea snail with a spiraled, spindle-shaped shell up to 17.5 cm in length.

Distribution: Northern California to Baja California

Interesting Facts: Predatory sea snail that is also a scavenger. Feeds using a long proboscis that helps the snail sense its environment.

Wavy Turban Snail

Megastraea undosa

Tidal Zone: Low to Subtidal

Description: A large snail with a spiraling conical shaped shell 5 - 10 cm in height.

Distribution: Central California to Baja California

Interesting Facts: An active snail that moves around the rocks in search of algae to eat.

Keyhole Limpet

Megathura crenulata

Tidal Zone: Low

Description: An oval shaped snail growing up to 10 cm in length. The shell is covered with a fleshy mantle, or covering, that can be solid black, brown, mottled, or striped.

Distribution: Central California to Baja California

Interesting Facts: The "keyhole" at the top of the shell is used to expel solid and liquid waste.

Mussels

Mytilus californianus

Tidal Zone: High to Middle

Description: A dark purple to black, teardrop-shaped bivalved mollusk, grouped in masses called "beds" on rocks.

Distribution: Alaska to Baja California

Interesting Facts: Mussels attach themselves to rocks with strong hair-like strands called byssal threads.

Owl Limpet

Lottia gigantea

Tidal Zone: High

Description: 2-6 cm mollusk with a flattened cap-like shell. They feed on algae and use their strong "foot" to stay attached to the rocks.

Distribution: Washington to Baja California

Interesting Facts: Members of this species are born male and turn into females when they reach a certain size (about 4 cm).

Scaled Worm Snail

Thylacodes squamigerus

Tidal Zone: Middle to Low

Description: This snail lives in curvy tubes 12-15 cm long and about 1.3 cm in diameter. These snails group in masses under rocks and in crevices.

Distribution: Northern California to Baja California

Interesting Facts: These snails feed by secreting a triangle-shaped mucus fan. They wave this fan into the current to collect organisms and detritus floating by.

Sand-Castle Worms

Phragmatopoma californica

Tidal Zone: Middle

Description: A 5 cm long worm that builds large colonies under and between rocks. They cement sand grains to form the tubes they live in, building large honeycomb-shaped colonies.

Distribution: Northern California to Baja California

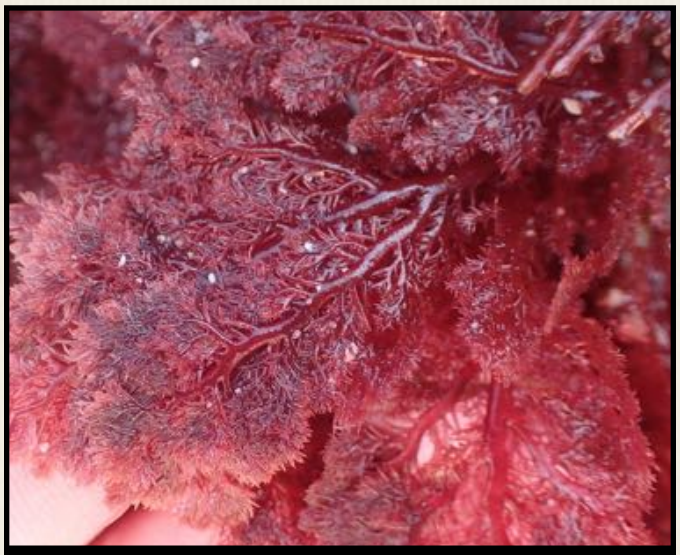
Interesting Facts: The worms are hidden in their tubes at low tide, but reach out tentacles to feed during high tide.

Marine Algae

Coralline Algae

Dead Man's Fingers

Feather Boa Kelp



Plocamium

Rockweed

Seagrass

Sea Bubble

Sea Lettuce

Wireweed

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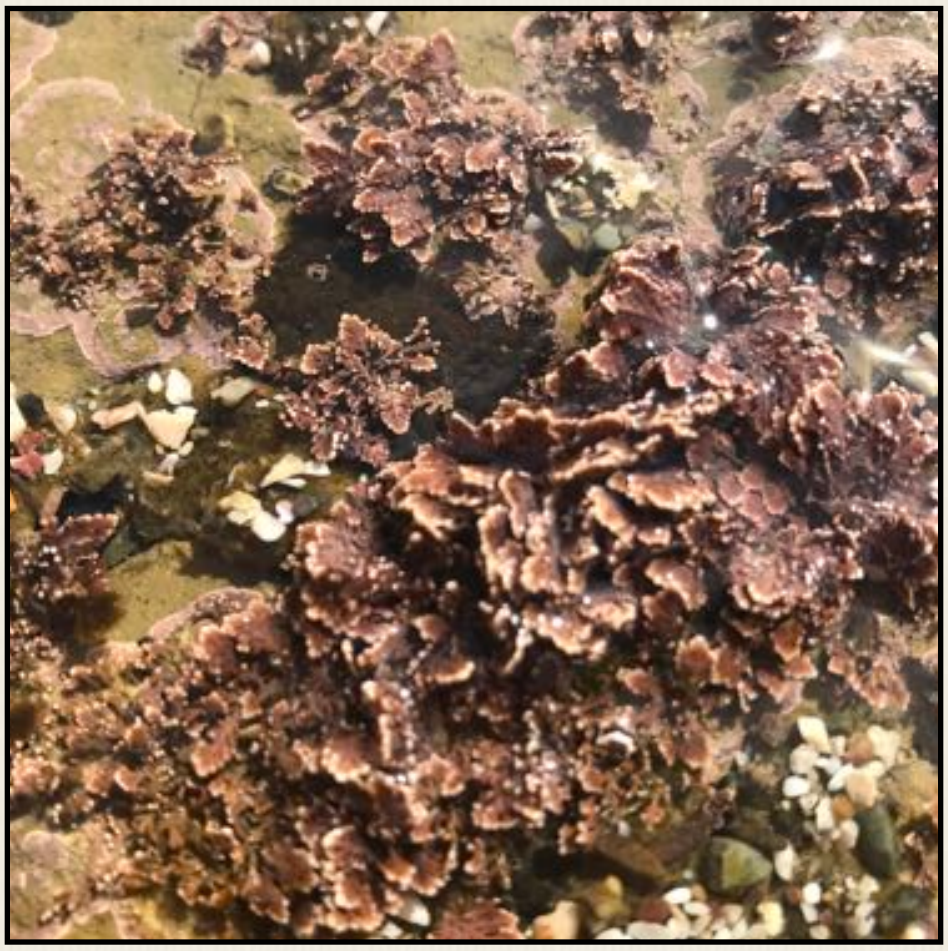
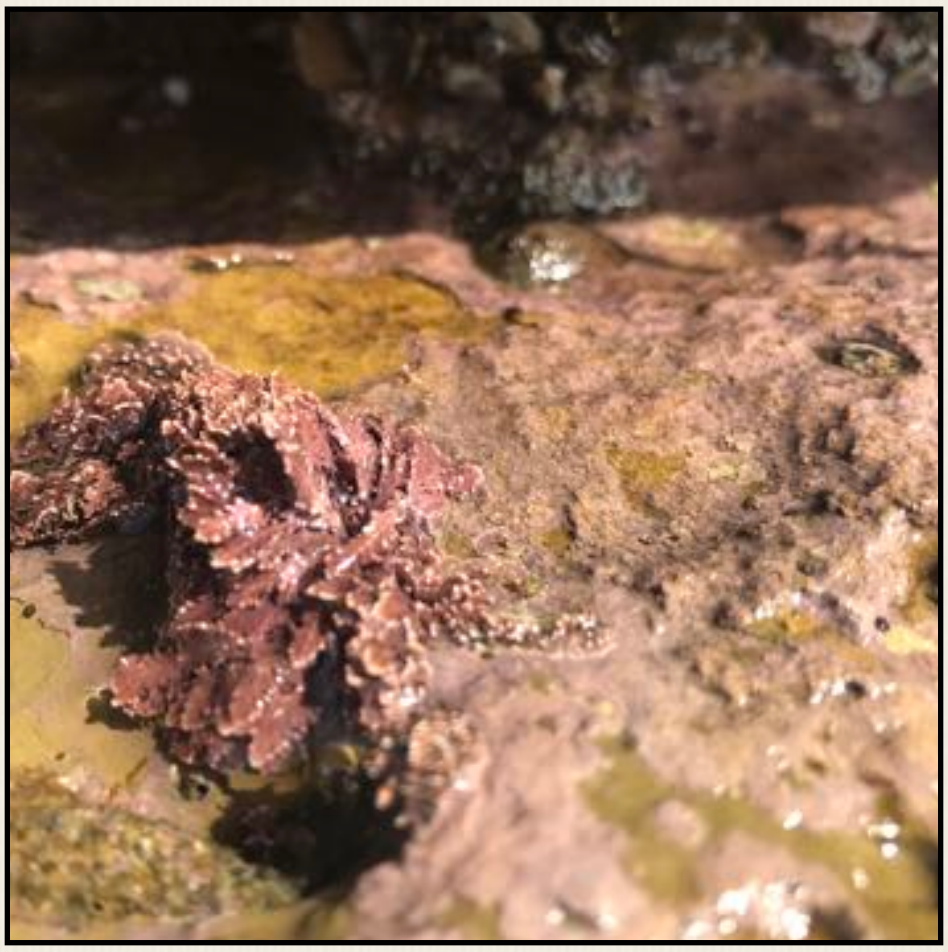
Coralline Algae

Corallina spp.





Tidal Zone: Low to Subtidal

Description: A red algae with calcium carbonate segments, giving it a pink or white color.

Distribution: Globally

Interesting Facts: This algae is stiff and crunchy to the touch due to the calcium carbonate segments.

Dead Man's Fingers

Codium fragile

Tidal Zone: Low to Subtidal

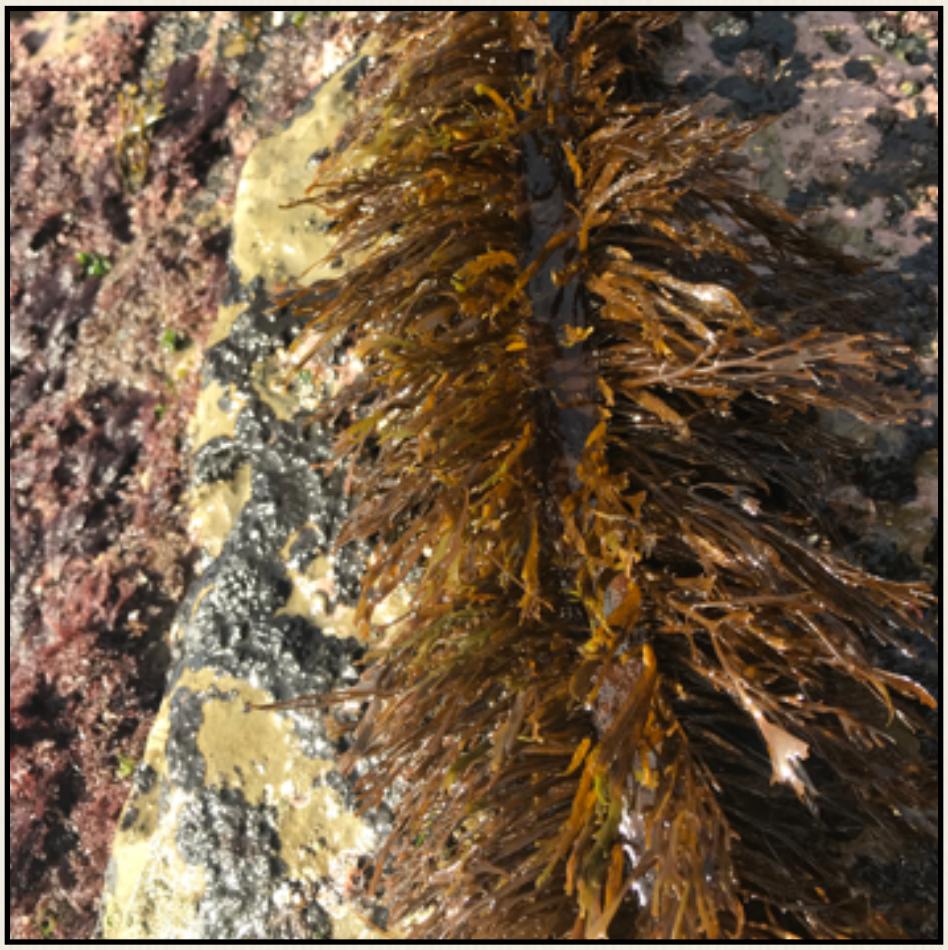
Description: A dark green algae that forms finger-like branches up to 30 cm long and 1 cm in diameter. It attaches to rocks at a base point and hangs off the rock at low tide.

Distribution: Temperate waters worldwide

Interesting Facts: A single Dead Man's Fingers algae is said to be only one large cell because there are no cell walls separating one nucleus from another.

Feather Boa Kelp

Egregia menziesii



Tidal Zone: Middle to Low

Description: A dark brown algae that grows from a holdfast, or base, up to 5 m long. Blades about 5 cm long grow from a flattened center 'stipe' that give it a feather boa look.

Distribution: Alaska to Baja California

Interesting Facts: The seaweed limpet (*Notoacmea insessa*) exclusively feeds and lives on this kelp.

Plocamium

Plocamium pacificum

Tidal Zone: Middle to Low

Description: Red algae with a height of about 50 cm; bright red fanning branches give it a lace-like appearance.

Distribution: Temperate waters worldwide

Interesting Facts: Some species fronds are annual, growing back each year from the base.

Rockweed

Silvetia compressa

Tidal Zone: Middle to Low

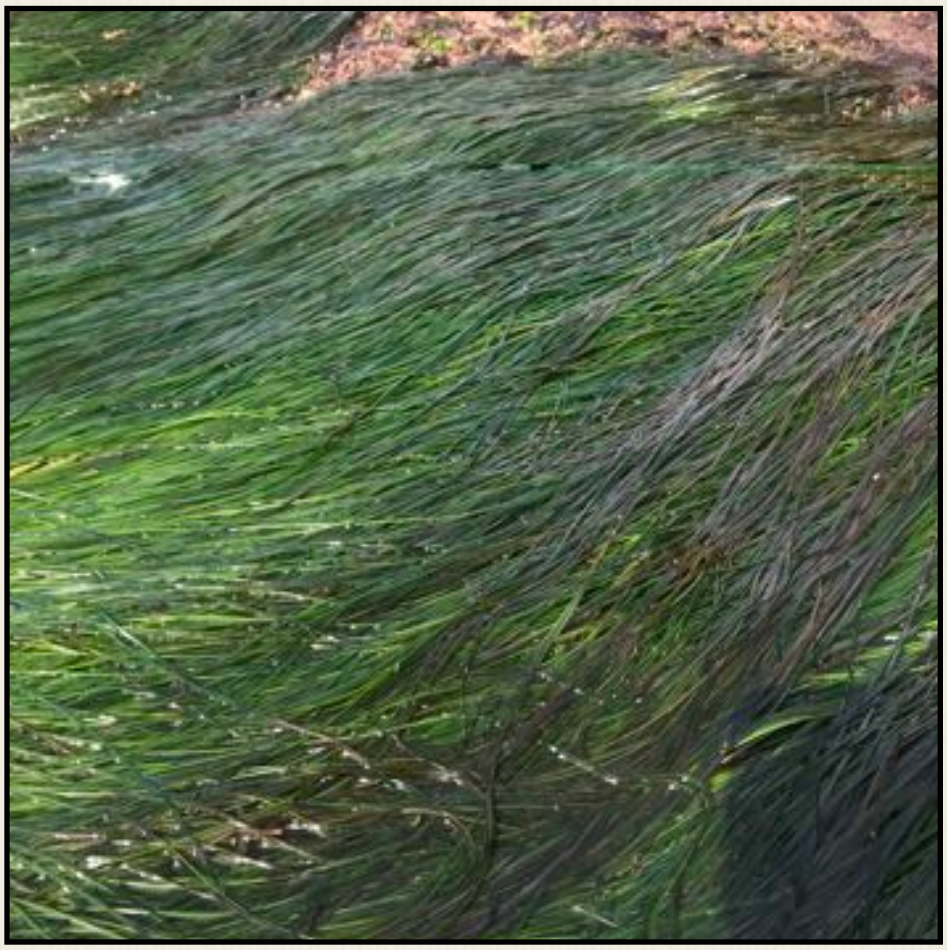
Description: An olive brown to yellowish brown algae that grows about 30 - 90 cm in length. Thick, narrow fronds cover rocks to form beds.

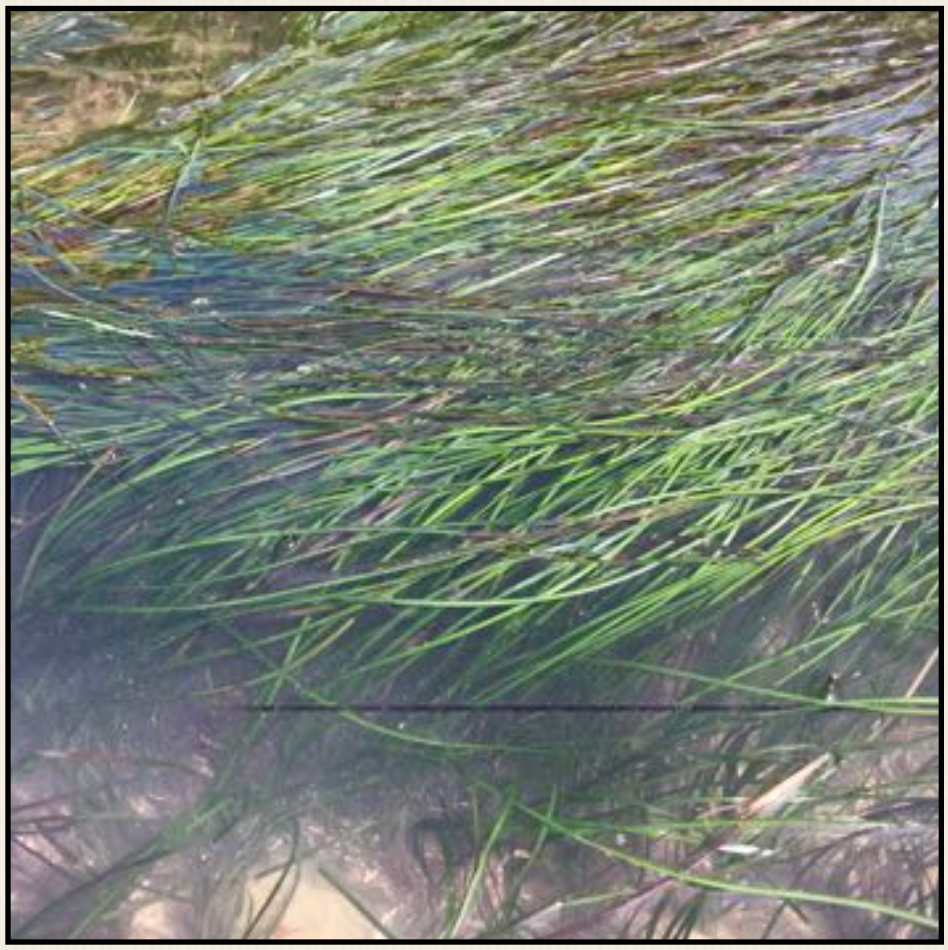
Distribution: British Columbia to Baja California

Interesting Facts: Supports many other animals within its beds by creating a damp microhabitat.

Seagrass

Phyllospadix scouleri





Tidal Zone: Middle to Low

Description: Green blades about 2 mm wide and up to 90 cm long. Grows from base clumps and spreads using a root-like system of rhizomes.

Distribution: Alaska to Baja California

Interesting Facts: This is a flowering plant with male and female flowers on different plants.

Sea Bubble

Colpomenia spp.

Tidal Zone: Middle to Low

Description: A brown algae forming thin hollow bubbles ranging in size, up to 30 cm in diameter and 10 cm high.

Distribution: Globally

Interesting Facts: This algae has been known to grow on oysters and carry them away when the bubble gets large enough.

Sea Lettuce

Ulva californica

Tidal Zone: Middle to Low

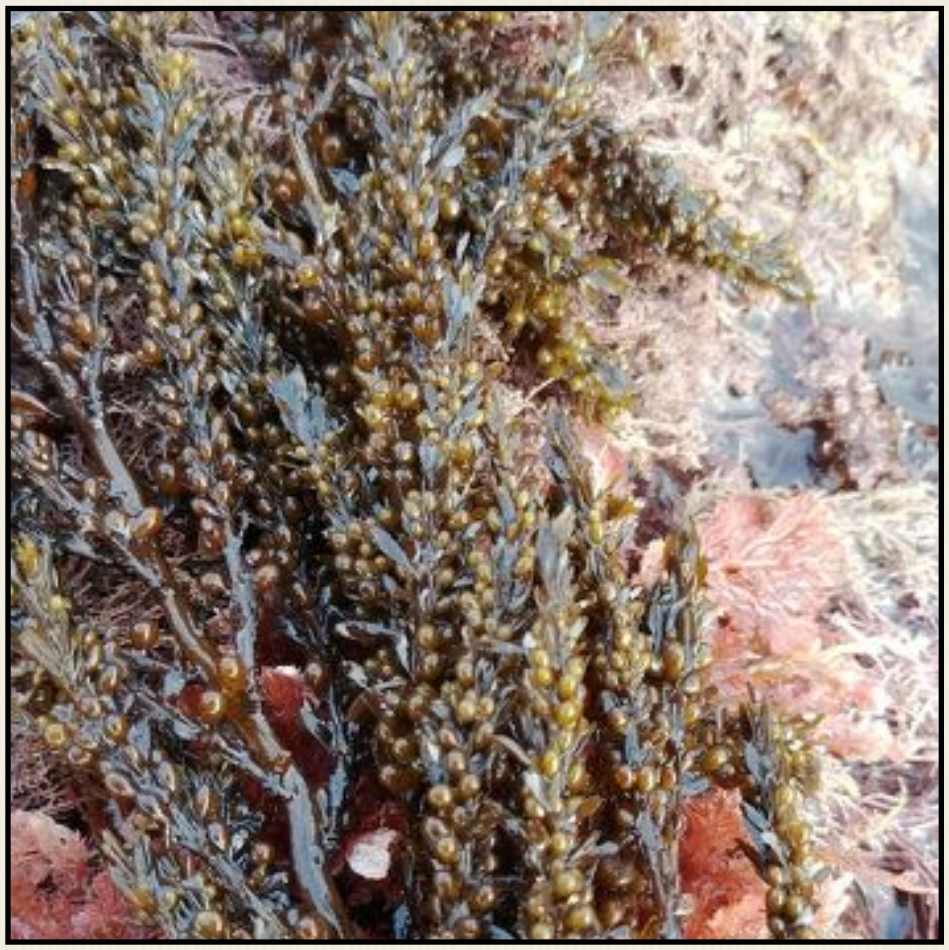
Description: An emerald green algae that grows like turf on top of rocks.

Distribution: Alaska to Baja California

Interesting Facts: This algae is only two cells thick.

Wireweed

Sargassum muticum



Tidal Zone: Middle to Low

Description: A brown algae growing from a holdfast up to 10 m in length with small air sacks.

Distribution: Native to the East Coast of Japan; now found globally

Interesting Facts: This invasive species was introduced to the California Coast in the 1940s and, while now abundant, can be toxic to native species that try to eat it.

Fish

Garibaldi

Opaleye

Leopard Shark

Moray Eel

Wooly Sculpin

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Garibaldi

Hypsypops rubicundus

Tidal Zone: Low to Subtidal

Description: The largest of the Damselfish family, these bright orange fish average about 30 cm in length. The juveniles have bright blue spots until they mature.

Distribution: Northern California to Baja California

Interesting Facts: This territorial fish is the state marine fish of California.

Opaleye (Rudderfish)

Girella nigricans

Tidal Zone: Low to Subtidal

Description: Juveniles in the tidepools average 5 - 10 cm and adults are 45 - 60 cm in length. They are a dark olive green with two light spots on either side of the dorsal fin.

Distribution: Northern California to Baja California

Interesting Facts: The juveniles can breathe air when exposed at low tide.

Leopard Shark

Triakis semifasciata

Tidal Zone: Subtidal

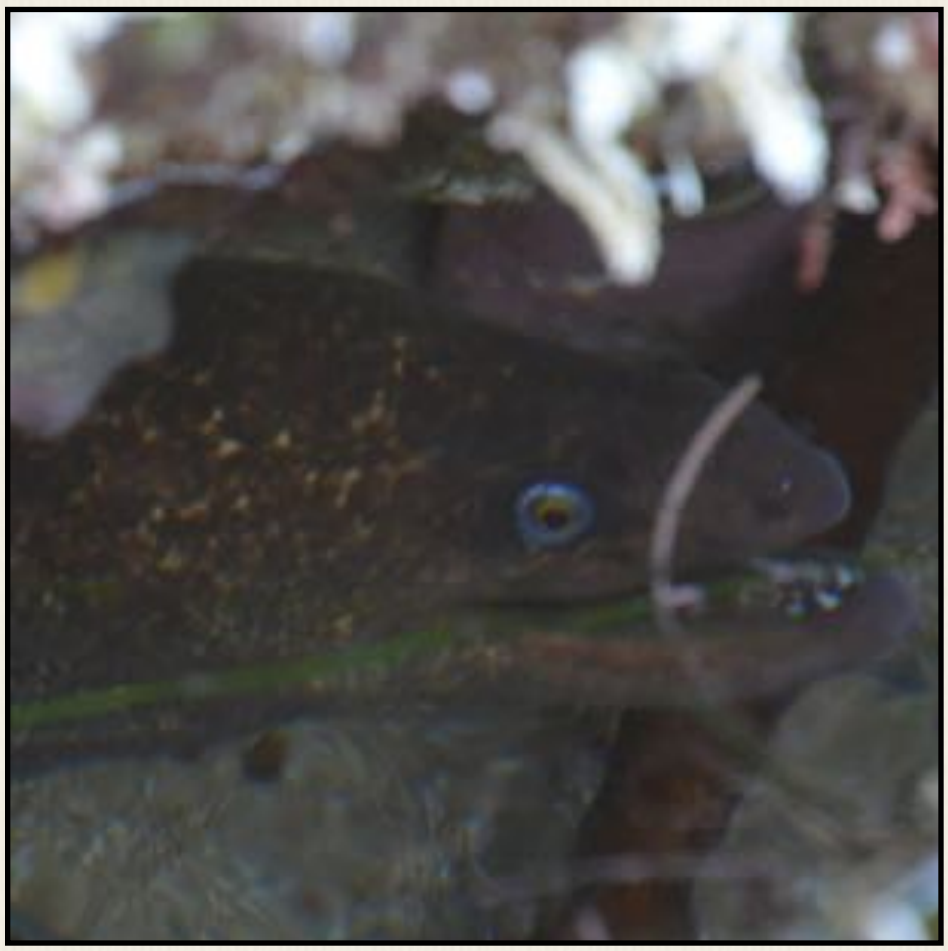
Description: A silvery-gray shark up to 2 m long with dark oval spots across its back and spots on its sides.

Distribution: Oregon to Central Mexico

Interesting Facts: Females keep fertilized eggs inside them and can give birth to as many as 33 live pups after a 10 - 12 month gestation period.

Moray Eel

Gymnothorax mordax



Tidal Zone: Low to Subtidal

Description: With a light brown or green snake-like body that is up to 1.5 m in length, these fish hide in rock crevices and wait to ambush their prey.

Distribution: Central California to Baja California

Interesting Facts: This eel has to open and close its mouth to breathe, which can be misinterpreted as aggressive behavior.

Wooly Sculpin

Clinocottus analis

Tidal Zone: Low to Subtidal

Description: This fish comes in many colors (brown, green, and reddish colorations) and is about 18 cm in length when fully grown.

Distribution: Northern California to Baja California

Interesting Facts: This intertidal fish can breathe air for up to 24 hours if exposed at low tide.

Marine Mammals

Gray Whale

Harbor Seal

Bottlenose Dolphin

California Sea Lion

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Gray Whale

Eschrichtius robustus

Tidal Zone: Coastal Waters

Description: Roughly 15 m in length and weighs up to 35,000 kg with characteristic dorsal "hump".

Distribution: Pacific Ocean

Interesting Facts: These whales feed on the ocean floor by swimming on their sides and scooping up sand. They use their baleen to filter out amphipods (small crustaceans).

Common Harbor Seal

Phoca vitulina

Tidal Zone: Coastal Waters

Description: A dark tan, gray, or silver-white speckled seal about 2 m long that weighs about 120 kg. This seal will haul-out on rocks and beaches to rest when not feeding.

Distribution: British Columbia to Baja California

Interesting Facts: They have distinct V-Shaped nostrils and no ear flap because they are a true seal.

Common Bottlenose Dolphin

Tursiops truncatus

Tidal Zone: Coastal Waters

Description: A gray dolphin averaging 3 - 4 m in length and weighing about 498 kg. They have a short, thick snout with a curved mouth.

Distribution: Oceans in Tropical and Temperate zones

Interesting Facts: Bottlenose dolphins use echolocation, or the echo from loud, rapid clicks, to hunt for prey.

California Sea Lion

Zalophus californianus

Tidal Zone: Coastal Waters

Description: Dark to golden brown. Males about 3 m in length and a prominent forehead called a sagittal crest. Females are smaller in stature and lack the sagittal crest.

Distribution: Alaska to Baja California

Interesting Facts: Distinguished from seals by their ear flaps, loud bark, and the ability to "walk" on land using their flippers.

Our Role

The core mission of the National Park Service is to protect and preserve natural resources, processes, systems, and values of America's parks. Our philosophy is to protect, and restore when necessary, native ecosystems and let natural processes play out. Park Rangers and Volunteers document their observations of flora and fauna. Scientists conduct research to try to understand the status and trends of the species and systems they protect. This information is vital to advising park management and philosophy.

Connect With Us

To learn more about how you can help, visit:

- NPS Website
- Field Notes

Cabrillo Guide

Rules for Exploration:

- No running nor swimming
- Stay on the marked trails/sidewalks
- No picking or taking of any kind
- Pack it in, pack it out - No littering

Activity:

1. How do these marine animals survive when it's a low tide?
2. How many different species of flora and fauna you can count on one rock?

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Editor: Nicole Ornelas
Photos: N. Ornelas, P. Simpson,
J. & W. Tam, S. Root
Sources: A. Rosales
***Life Between the Tides* - Brandon & Rokop**

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