LiMPETS Rocky Intertidal Field Guide

June 2019

Tidepool and Monitoring Etiquette

- **Always keep an eye on the water.** Never turn your back to the ocean.
- **Be aware of your surroundings**, including water and waves, slippery rocks or algae, and tidepool creatures.
- **Step carefully.** Avoid crushing animals, algae, and plants whenever possible.
- **Be gentle.** Always touch lightly so you don't disturb intertidal life.
- **Leave them.** Take only pictures and return the animals, algae, plants, rocks, and shells to where you found them.
- **Remove trash.** Pick it up and dispose of in waste bins.
- **Avoid wading in tidepools.**
- **Give marine mammals space.** Remain 50 yards away from them.
- **Have fun as you explore the intertidal ecosystem!**

Species Identification

Chitons (*Mopalia* spp. / *Nuttallina* spp. / *Tonicella* spp. / others)

Throughout the rocky intertidal

CALIFORNIA SPINY CHITON

- Chitons are molluscs, oval in shape, with 8 overlapping shell plates.

FLAME LINED CHITON

- Often well camouflaged with surroundings.

MOSSY CHITON

- Most are small, up to 2 inches (5 cm) wide.

BLACK CHITON

- They can often be found in crevices or under other organisms.

Turban Snails (*Tegula brunnea / T. funebralis / others*)

High to mid-intertidal and in tidepools

BLACK TURBAN SNAIL

- Up to 1 inch (2.5 cm) long. Color deep purple, black, or brown.

BLACK TURBAN SNAIL

- Always check to make sure it is a snail and not a hermit crab.

BROWN TURBAN SNAIL

- Shell is smooth, a rounded cone shape (no point at tip of shell).

BROWN TURBAN SNAIL

- Shell can be erroded or covered in encrusting coralline algae.

Whelks (*Acanthinucella* spp. / *Nucella* spp. / *Ocinebrina* spp. / others)

High to mid-intertidal

ANGULAR UNICORN SNAIL

- Whelks are predatory snails; shell aperture (opening) is typically oval.

- Shell is coiled or in a spiral; size and color vary.

CIRCLED ROCK SNAIL

- Both ends of shell are pointed.

- Whelks lay transparent to orange capsule-shaped eggs on rocks.

Hermit Crabs (*Pagurus* spp.)

High to mid-intertidal

GRAINYHAND HERMIT CRAB

- Hermit crabs can be found in turban snail shells or whelk shells.

- Hermit crabs use shells as their portable homes.

HAIRY HERMIT CRAB

- This one has white bands on its walking legs.

BLUEBAND HERMIT CRAB

- You may see their eyes stalks, walking legs, and antennae.

Pink Acorn Barnacle *(Tetraclita rubescens)*

Mid- to low intertidal and among mussels

- Large barnacle, up to 2 inches (5 cm) wide.

- Shell is reddish-pink; outside of shell is grooved/thatched.

- They look like pink volcanoes and the top of the shell is sharp.

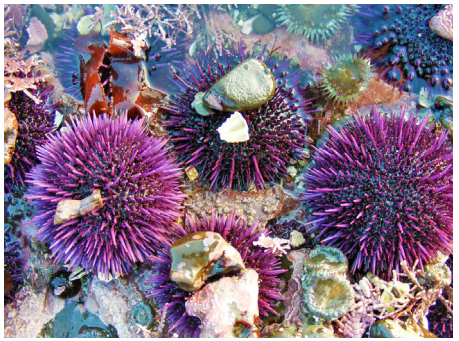
- Do **NOT** count the above barnacle. It looks similar but is not pink!

Purple Sea Urchin *(Strongylocentrotus purpuratus)*

Low intertidal, in rock depressions and tidepools

- Up to 4 inches (10 cm) in diameter; reddish to purple in color.

- Juveniles are pale green; may be as small as a nickel.



- Spherical body with spines, often with attached rocks and shells.

- Their teeth and spines are strong enough to carve holes in rocks.

Aggregating Anemones *(Anthopleura elegantissima)*

Mid-intertidal

- Small, less than 2 inches (5 cm); can form dense aggregations.

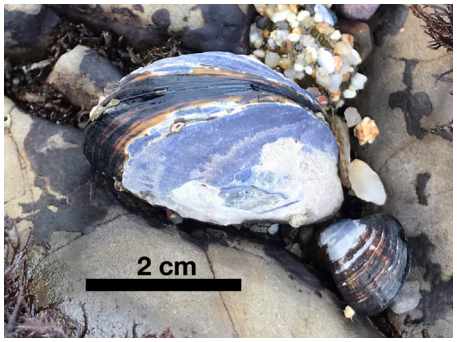
- Aggregations are composed of genetically identical clones.

- Greenish body often with pink-tipped tentacles.

- Often covered in sand and shells and open when underwater.

Sea Mussel *(Mytilus* spp.*)*

Mid-intertidal



- Shell up to 8 inches (20 cm); bluish-black in color; radial ribbing.

- Sea mussels are bivalve molluscs with two shells.

- Mussels use byssal threads to attach to rock.

- Can form extensive beds that create habitat for many species.

Limpets *(Lottia* spp.*)*

Splash zone to mid-intertidal

L. SCABRA, ROUGH LIMPET

- Snail-like mollusc with one shell; can be smaller than a dime.

L. PELTA, SHIELD LIMPET

- Shell is cone shaped or flat; smooth or ribbed in texture.

L. SCABRA, ROUGH LIMPET

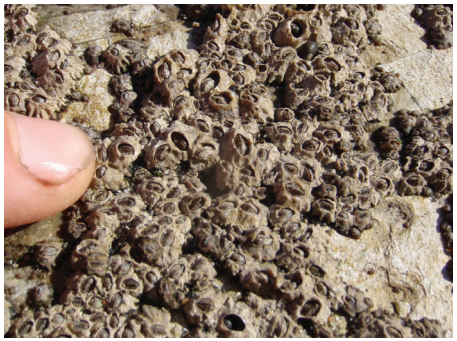
- Shell color can vary based on diet and habitat.

L. GIGANTEA, OWL LIMPET

- Owl limpet often 2 inches, can reach 4 inches (5 to 10 cm).

Common Acorn Barnacles *(Balanus glandula / Chthamalus dalli / C. fissus)*

Mid- to low intertidal



- Very small in size with a rough shell up to ¾ inch (2 cm) wide.

- Often growing on rocks or the shells of other organisms and have the profile of a volcano.

- Top of shell has a hole where the barnacle's feeding legs come out at high tide.

- Often found in aggregations.

Leaf Barnacle *(Pollicipes polymerus)*

Mid intertidal on wave exposed rocks

- Up to 3 inches (8 cm) in length with a dark brown, rubbery stalk.

- Also known as a goose-neck barnacle.

- Topped with 5 or more white plates.

- Usually found in tight clusters; often mixed with sea mussels.

Honeycomb Tube Worm *(Phragmatopoma californica)*

Mid- to low intertidal

- Small individual worms build tubes of cemented sand grains.

- These “sandcastle worms” can be found in cracks and crevices.

- Worms emerge to feed while underwater at high tide.

- Aggregations can form masses up to 6.5 feet (2 m) in length.

Surfgrasses *(Phyllospadix scouleri / P. torreyi)*

Low intertidal and subtidal to 6m

- Grows up to 0.5 cm wide and 6.5 feet (2 m) long.

- Leaves are bright green, narrow, long, and wiry.

- Photo above shows a close-up of the female flower stalk with fruit.

P. TORREYI & P. SCOULERI (RIGHT)

- One species is thin and wiry while the other is flat and ribbon-like.

Green Pin-cushion Alga *(Cladophora columbiana)*

High to mid-intertidal

- Bright green and spongy.

- Consists of branched filaments.

- Forms bright green, densely matted tufts.

- Resembles small clumps of moss.

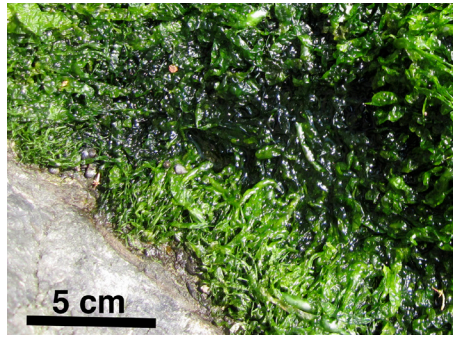
Sea Lettuces *(Ulva* spp.*)*

High intertidal to subtidal

- Oval shaped blades, up to 16 inches (40 cm).

- Bright green or yellow-green; often look like wilted lettuce.

- Thin, almost transparent sheets, only 2 cell layers thick.



- Usually grow as sheets, but some species can form cylindrical tubes.

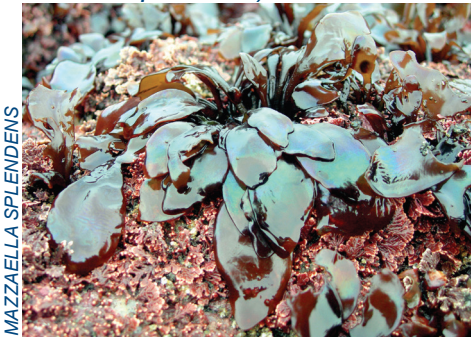
Iridescent Algae *(Mazzaella flaccida / M. splendens)*

Mid- intertidal to upper subtidal

MAZZAELLA SPLENDENS

- Large, oval blades; up to 12 inches (30 cm) tall

MAZZAELLA SPLENDENS



- Can appear iridescent; red/purple, brown or green in color.

MAZZAELLA FLACCIDA

- Can feel rubbery and bounces back like a rubber band when stretched.

MAZZAELLA SPLENDENS

- Can sometimes have reproductive bumps.

Rockweeds *(Fucus gardneri / Pelvetiopsis californica / P. limitata / Silvetia compressa)*

High to mid rocky intertidal

FUCUS GARDNERI

- Can be olive-green to tan in color; up to 10 inches (25 cm) tall.

PELVETIOPSIS CALIFORNICA

- All rockweeds have dichotomous branching and can appear leathery.

SILVETIA COMPRESSA

- Can be darker, shriveled and tough when dried out.

P. CALIFORNICA & P. LIMITATA

- Some have midribs while others are slender lacking midribs.

Scouring Pad Alga *(Endocladia muricata)*

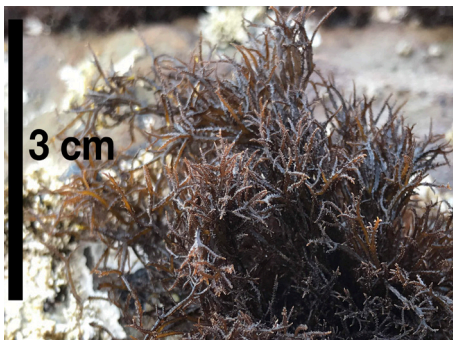
High intertidal, vertical rock faces, and on mussels

ENDOCLADIA MURICATA

- Short, bushy clumps; 1-3 inches (3-8 cm) tall.

ENDOCLADIA MURICATA

- Dark reddish-brown with branches covered with short spines.



ENDOCLADIA MURICATA

- Touch this alga; **it feels rough**, not slimy or smooth even when wet.

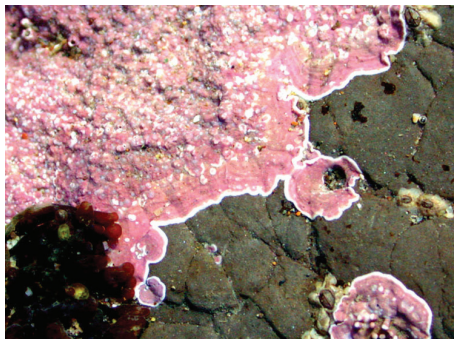
CAULACANTHUS USTULATUS

- Do **not** count this alga, it lacks spines and is smooth.

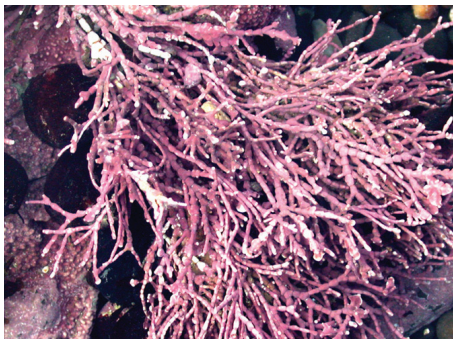
Coralline Algae *(Bossiella* spp. */ Calliarthron* spp. */ Corallina* spp. */ many encrusting species)*

Mid-intertidal to shallow subtidal

- Pink to white in color; only count spots bigger than a pencil eraser.



- Encrusting coralline alga can look like spilled paint.



CALLIARTHRON SPP.

- Upright forms are relatively stiff with calcium carbonate in cell walls.

CORALLINA SPP.

- Many species are branched and have tiny, jointed segments.

Tar Spot Algae *(Mastocarpus* spp. */ Ralfsia* spp. */ others)*

Common on rocks throughout the intertidal

RALFSIA SP.

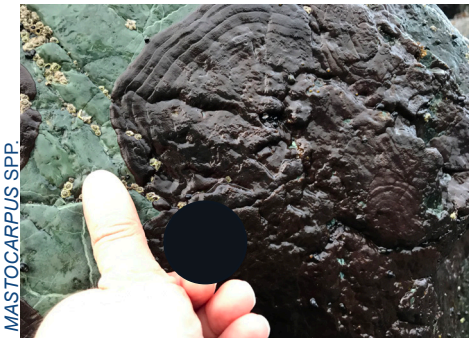
- Black crust on rock; only count spots bigger than a pencil eraser.

MASTOCARPUS SP. & *RALFSIA* SPP.

- Grows in patches that look like tar, but does not smell like tar/oil.

MASTOCARPUS SPP.

- May form large patches. Some feel rough.



MASTOCARPUS SPP.

- Others feel thicker and more rubbery.

Stunted Turkish Towel *(Mastocarpus* spp.*, Mazzaella affinis)*

Mid to high rocky intertidal

MASTOCARPUS SPP.

- Red, brown to blackish; up to 4 inches (10 cm) tall; blades can be narrow and have bumps.

MASTOCARPUS SPP.

- Species shown is light red to purplish-black. Blades are wider, split at the tips, often have bumps.

MASTOCARPUS SPP.

- Sometimes called “cat’s tongue” because it feels very rough.

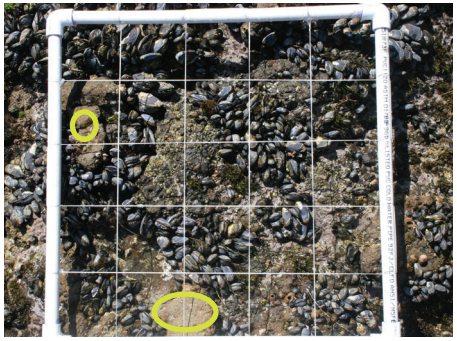
MAZZAELLA AFFINIS

- Can be smooth and golden-reddish-brown.

Bare Rock

- Bare, rocky substrate larger than a pencil eraser.

- Contains no obvious living organisms (as in circle above).



- Count all small patches larger than a pencil eraser.

- Make sure to check under algal canopy for patches of bare rock.

Loose Sand

- Granular (fine sand to gravel) substrate.

- Sand must be loose, unattached to anemones or other organisms.

- Even small patches of sand within square(s) should be counted.

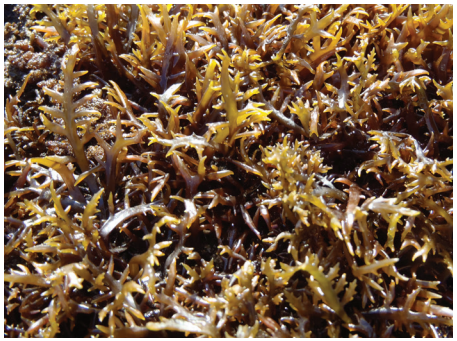
Tar

- Oily, sticky, and shiny when fresh; smells like asphalt. *Do not touch!*

- Thicker than tar-spot algae; sand or debris may be caught in the tar.

- Appears as a 3-D coating on rocks, sessile inverts, or algae.

Any Algae / Plants



- This category includes ALL algae and plants (including LiMPETS taxa and non-LiMPETS taxa).

- Don't forget encrusting algae like coralline or tarspot.

- Count any square that has algae present.

GREATER FARALLONES ASSOCIATION

National Marine Sanctuaries

PACIFIC GROVE MUSEUM of NATURAL HISTORY

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LiMPETS Total Count Taxa

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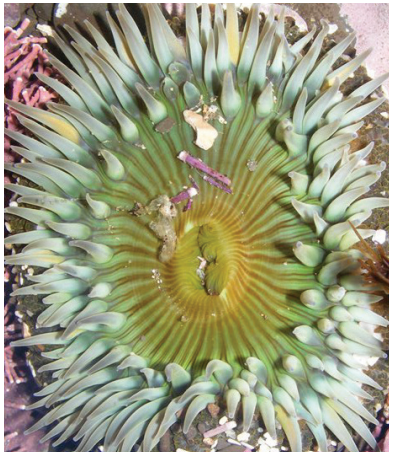
Sunburst Anemone *(Anthopleura sola)*



- Large solitary, more than 2 in (5 cm); has clearly visible radiating lines on oral disk.
- When closed, look on the outside for bumps in rows and columns.

Giant Green Anemone *(Anthopleura xanthogrammica)*

- Large solitary, more than 2 in (5 cm); Radiating lines on oral disk are faintly visible.
- When closed, outside looks velvety and base is spread out.

Ochre Sea Star *(Pisaster ochraceus)*

- Has white spines that form a star in the center of its body.
- Can be purple, orange, or brown. Don't forget to look for juveniles!

Owl Limpets *(Lottia gigantea)*

- Large limpet with an off-set apex; shell can be 2.5 cm to 10 cm (4 in) in diameter.

Abalone *(Haliotis cracherodii)*

- Smooth oval shell with 5-7 small holes; dark green to blue-black. Often found in small groups hiding in cracks.