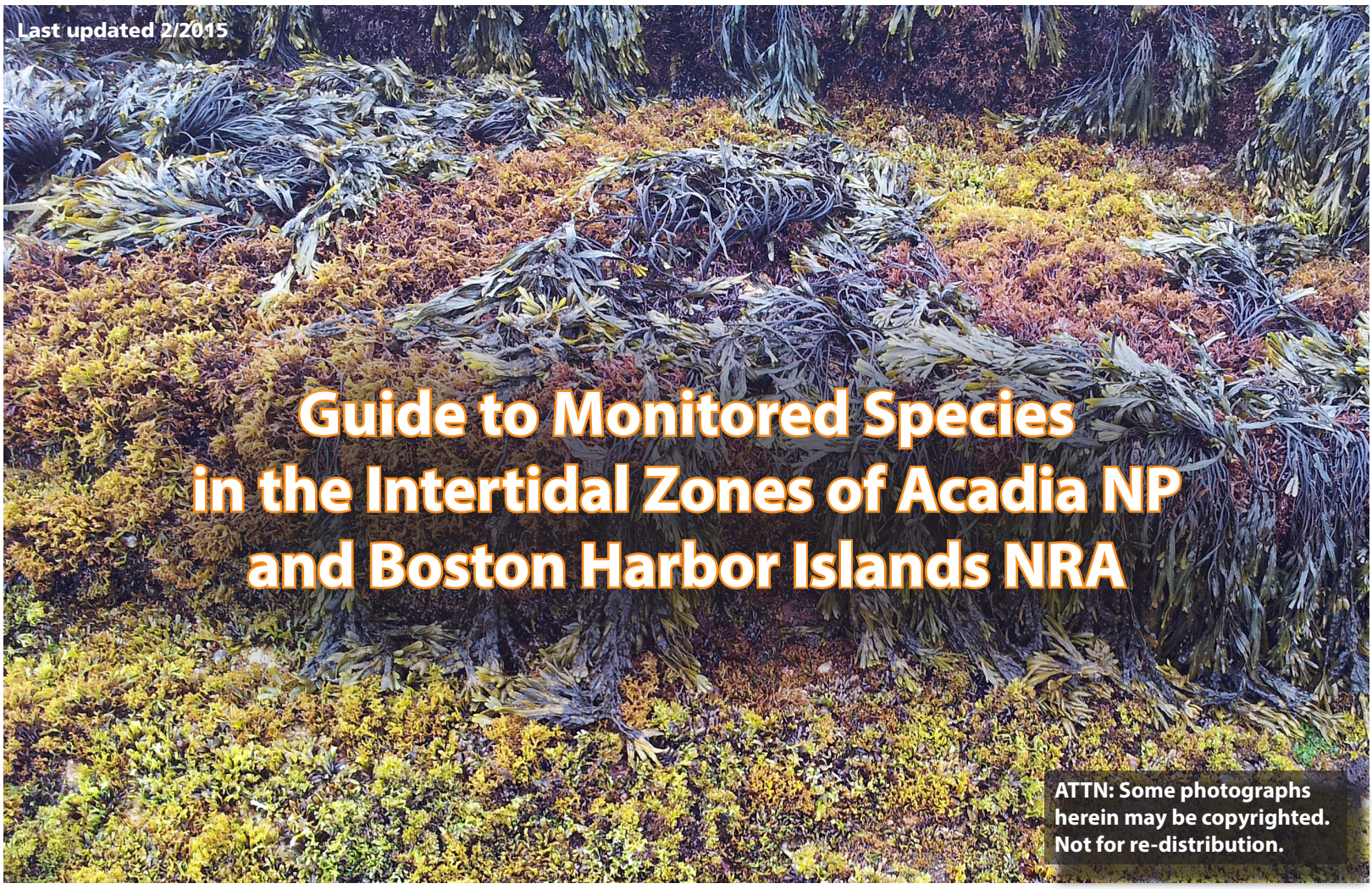


Last updated 2/2015

Guide to Monitored Species in the Intertidal Zones of Acadia NP and Boston Harbor Islands NRA

ATTN: Some photographs herein may be copyrighted. Not for re-distribution.

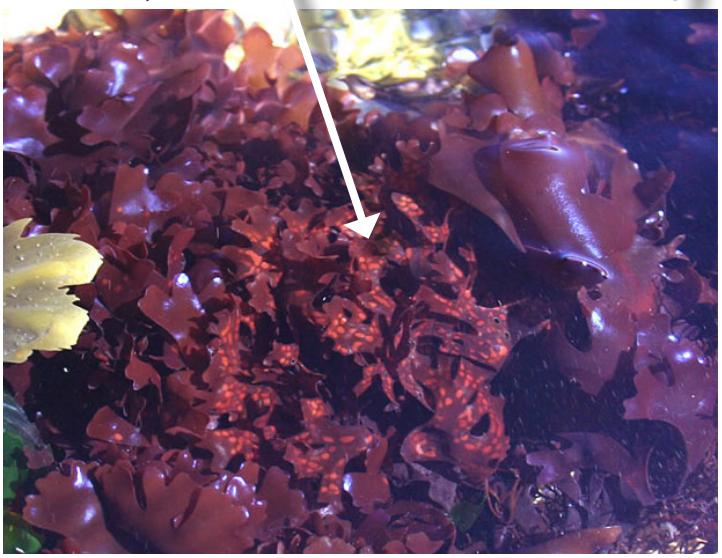
RED ALGAE

Irish Moss

Chondrus crispus



- Small, branching algae ~20 cm long.
- Fanlike morphology of branching highly variable.
- Fronds not channeled and stipes flat.
- Found in the *lower intertidal* and shallow subtidal zones.
- Turns white when exposed to freezing low tides in winter or very warm low tides in summer.
- Gametophytes show blue iridescence and the fertile sporophytes exhibit a spotty pattern.
- Present year round.



False Irish Moss

Mastocarpus stellatus

- Small, branching algae with fanlike, highly variable morphology.
- ~20 cm long.
- Fronds channeled w/curved stipe.
- Higher tolerances to physical stresses, (freezing /drying) than *Chondrus.* Consequently, most abundant near borders of *mid-and low intertidal* zones, though also grows in pools in the *high intertidal* zone.
- Females typically covered with distinctive bumps, giving the blades a rough texture.
- Present year round.



RED ALGAE

Laver / Purple Laver / Nori

Porphyra spp.

- Some grow up to a meter long but 5-10 cm not uncommon.
- Found in *low and shallow subtidal to mid intertidal* zones.
- Irregularly shaped, reddish-brown blade that is extremely thin (1 cell thick) and translucent.
- Red algae can turn green in summer from low nutrients and exposure to temperatures above tolerance level at low tide.
- May appear pleated or rosette shaped where blade expands around holdfast.
- Present year round.





Common Hornweed

Ceramium virgatum

- Grows up to 30 cm long.
- Deep red (but may be bleached).
- Filamentous frond irregularly branched, narrowing towards pincer-like tips.
- Holdfast a conical disc that extends into a dense mass of filaments.
- Often grows on the stipes and fronds of *Fucus*, *Mastocarpus* and *Laminaria* in the subtidal.
- Refer to this and similar taxa as "other red" on data sheets.





RED ALGAE



Articulated Coralline Algae

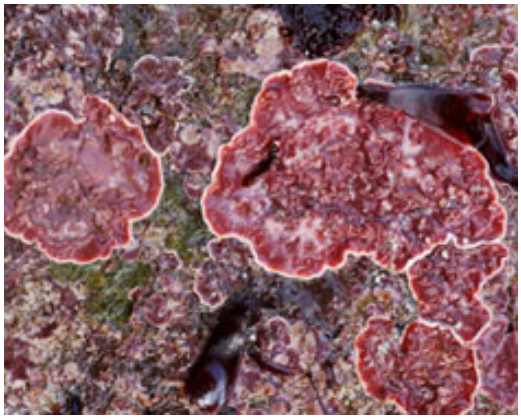
Corallina officinalis

- Small algae found in tide pools of lower intertidal zone.
- Branched with calcified cell walls giving them a jointed appearance.
- Calcification may prevent herbivores from eating the alga and may increase photosynthesis.
- Calcifying algae are under threat from increasing acidity in oceans due to rising CO_2 levels.
- Present year round.

Crustose Coralline Algae

Corallina spp.

- Calcified algae that look like red or pink paint splatters in tidepools.
- Present year round.



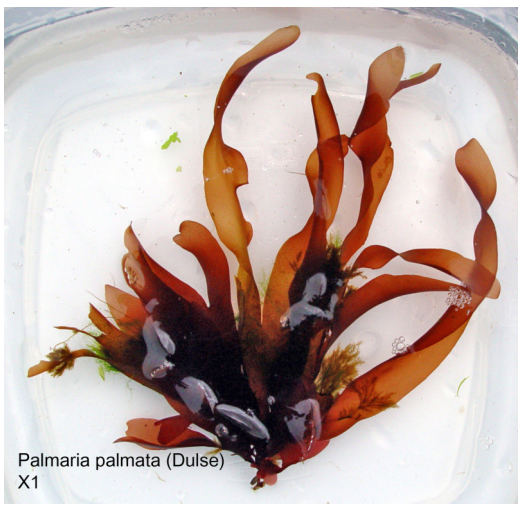


RED ALGAE

Dulse

Palmaria palmata

- Mid-sized macro algae with short stipe and deep rose to reddish purple fronds.
- Flat, often leathery, blades divide into segments up to 50 cm L and 3-8 cm W.
- Palmate branching with finger-like extensions very characteristic; most plants have marginal proliferations at base.
- Young plants can be less leathery and may be thin and slippery.
- Found in *lower intertidal* and shallow subtidal zones.
- Grows on rock, mussels and epiphytic on several kinds of algae.
- Present year round.



Palmaria palmata (Dulse)
X1



BROWN ALGAE

Kelp

eg. *Laminaria* and *Alaria*

- Large, leathery, undivided, flat blade that is about 2 to 5 meters long.
- Lacks air bladders.
- *Laminaria saccharina* has lasagna-like long, flat, ruffled fronds without midrib.
- *Alaria* found in the lower intertidal and shallow subtidal zones. Has a claw-like holdfast and long, undivided blade with a thick ridge (midrib) in the center of the blade.
- Present year round.
- Typically damaged at margins from wave action.
- Fruiting parts (sporophylls) grow near base and may look like stunted fronds.

Alaria spp.





Laminaria saccharina





BROWN ALGAE

Knotted Wrackweed and epibiont

Ascophyllum nodosum



- Narrow, somewhat compressed, olive-brown fronds without mid-rib up to 2 m long.
- Egg-shaped air bladders inside fronds at regular intervals.
- Fertile parts yellowish "conceptacles" that look like air bladders, but are on short stalks (most prolific in spring).
- *Ascophyllum* "epibiont" is any species growing on *Ascophyllum*.

Rockweed/Bladder Wrack and epibiont

Fucus spp./Fucus vesiculosus

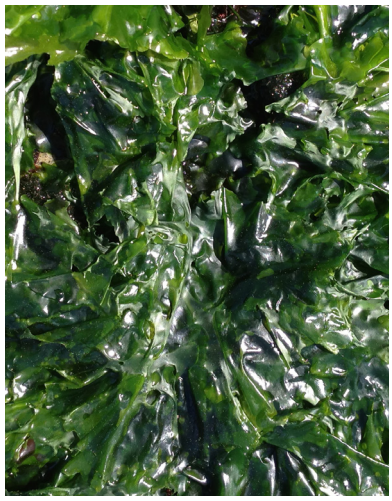


- Long fronds w/mid-rib and bladders that are typically paired. Bladders may be absent in young plants.
- Fertile parts bumpy "conceptacles" that look like air bladders, but are at ends of fronds.
- *Fucus* "epibiont" is any species growing on *Fucus*.

GREEN ALGAE

Sea Lettuce
Ulva spp.

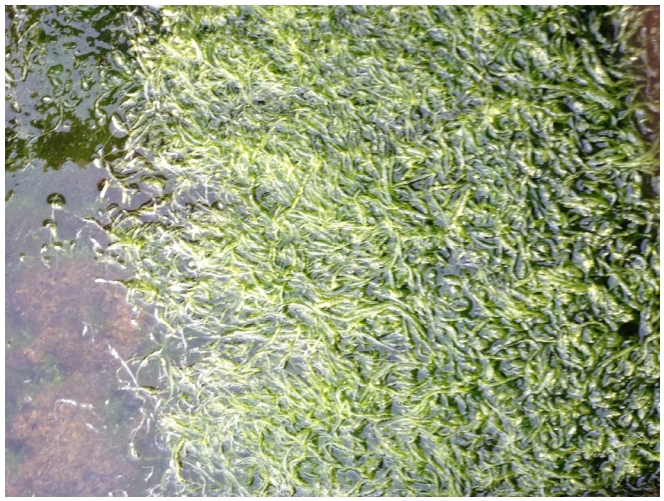
- Mid-sized (up to 20 cm long) macroalgae.
- Very thin (2 cells thick) with delicate margin, no stipe, and small disc-shaped holdfast.
- Blades that have upper white sections have just released reproductive cells; this occurs most often near full and new moons, just after dawn.
- Found in tide pools and in the lower intertidal zone.
- Present year round, but most abundant in summer–fall.



"Green Seaweed"
Acrosiphonia spinescens

- Present in low to mid-intertidal zones on exposed rocky shorelines.
- Has hook-like branches that cause clumping of filaments together gving the alga a matted rope-like appearance.
- Record this and similar taxa as "other green" on data sheets.







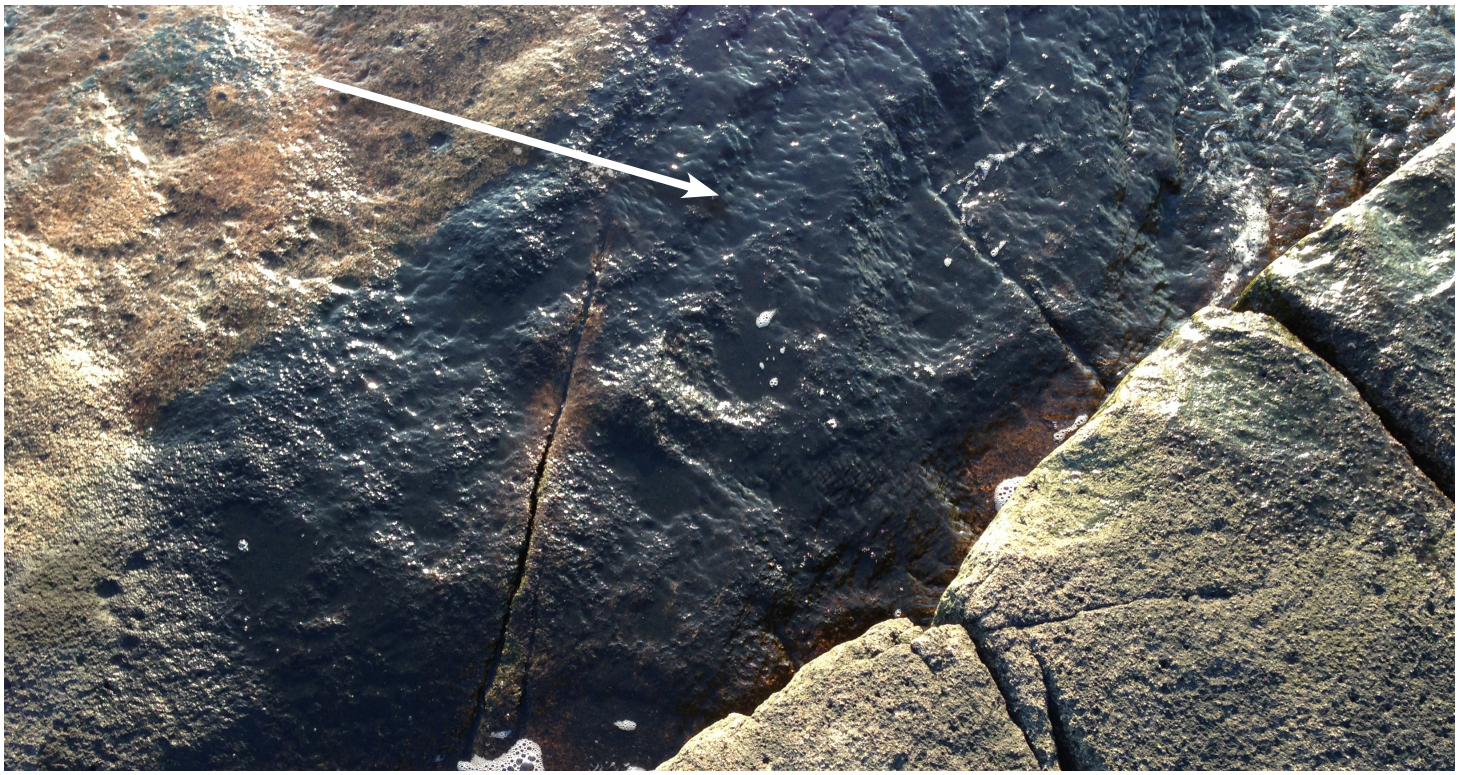
Gut Weed, Grass Kelp
Enteromorpha intestinalis

- Fronds can be up to 30 cm long and less than 2 cm wide.
- Tolerates low salinity and is found in the upper intertidal zone in pools and areas of runoff.
- Young individuals are slender blades, whereas older individuals form a tube. Bubbles accumulate inside tube providing buoyancy.
- Gametes and zoospores are released shortly after dawn near new and full moons.
- Individuals that have released reproductive cells turn white.

OTHER ALGAE

Crustose Algae - Non-coralline (crustose, non-calcareous micro and macro algae)
e.g. Calothrix spp.

- *Calothrix* is black coating of blue-green algae on upper intertidal zone rocks.
- Found *above the usual high tide line* where the waves may splash exposed rock.
- Zone is extremely slippery when wet.
- Not much lives in zone besides rough periwinkles.

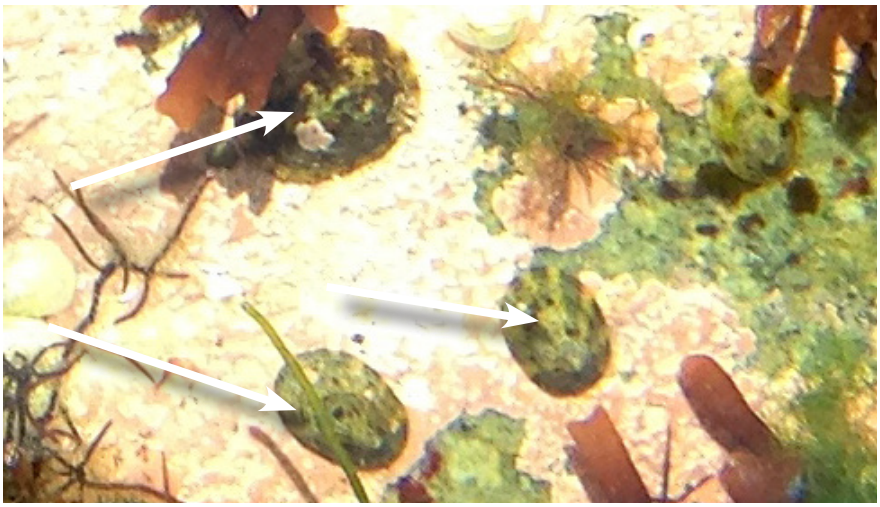


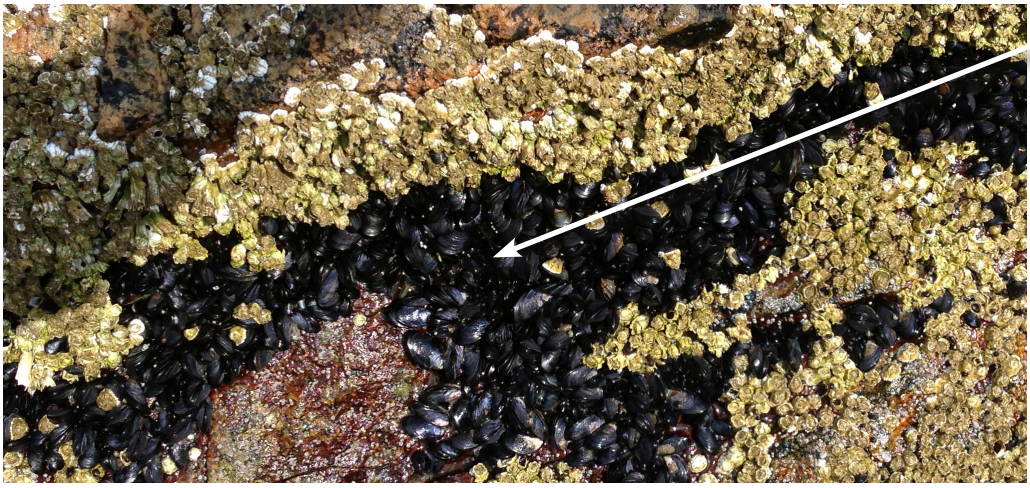
MOLLUSKS

Tortoise-shell Limpet

Tectura testudinalis

- Formerly *Acmaea testudinalis*
- Only species in intertidal with low, domed, single-valved shell.
- Can grow to about 3 cm diameter as adult.
- Herbivore that feeds on algal crusts, including those of calcified red algae.
- Found in tide pools and the lower intertidal zone.
- Young individuals typically brown, but the shell is often worn and white in older animals.
- Shell fragile and animal holds tight to substrate - use caution when collecting for measurement.





Mussel

e.g. *Mytilus edulis*

- Any bivalve in intertidal zone is a mussel.
- "Blue mussels" are a bivalve that attach to rock by byssal threads.
- Sea stars and crabs prey on mussels, restricting them to the mid-and-upper intertidal zones.
- Larvae settle onto shores of Acadia National Park in autumn, when masses of young mussels can be observed on the rocky shore.

MOLLUSKS

Smooth Periwinkle

Littorina obtusata

Example of damage



- Maximum size: ~15 mm
- Almost always found on brown seaweeds, especially *Fucus* and *Ascophyllum*.
- Tight, short spiral. Last shell whorl comprises >90 % of shell height.
- Aperture broadly oval & somewhat tear-drop shaped.
- Colors vary widely, but darker colors found in exposed locations.

Rough Periwinkle

Littorina saxatilis

- Maximum size: 19 mm though often much smaller.
- Rough shell texture w/ elongate spire.
- Sculpture variable, either with strong V-shaped spiral striae, often symmetrical in profile, or with fine spirals giving a superficially smooth appearance.
- Aperture large & rounded, outer lip turned outward where it meets central pillar of a shell.

Common Periwinkle

Littorina littorea

Example of damage

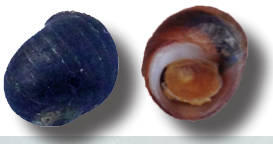


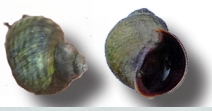
- Maximum size: 30 mm
- Shell sharply conical with pointed apex and ridges.
- Young similar to *L. saxatilis*, but have more ridges and are less elongate.
- Central axis of shell typically white and the juvenile animal itself has transverse black barring of the broad, flat tentacles.
- Aperture ear-shaped, outer lip arising tangential to last whorl with thick inner lip.

Dogwhelk

Nucella lapillus

- Maximum size: 35mm
- Shell oval-conic with short, straight-sided or slightly concave spire.
- Whorls are slightly convex with last whorl large (80 % or more of shell height). Last whorl with 11-14 spiral striae, becoming prominent basally as a keel over siphonal canal.
- Only snail of 4 with siphonal canal.



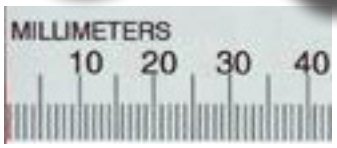


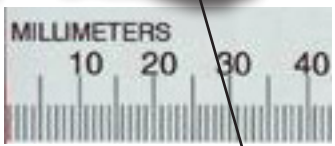


























Green Sea Urchin

Strongylocentrotus droebachiensis

- Only urchin species in North Atlantic rocky intertidal.
- Rounded test, covered in spikes.
- Found in the lower intertidal zone in tide pools and is abundant in the subtidal zone.
- In a natural cycle, large groups of urchins eat their way through kelp beds to create "urchin barrens" where seaweeds are scarce; then, the urchin population decreases because of lack of food, allowing the kelp beds to recover.
- Recent heavy harvesting of urchins on the Maine coast caused notable increases in kelp populations near the shore.





ECHINODERMS

Common or Northern Sea Star

Asterias rubens

- Grows up to 30 cm in diameter.
- Eye spots near tip of each arm on underside are stalked.
- Bumps on arm surface tend to be linear.
- Purple, reddish brown, orange, or yellow.
- Commonly feeds on blue mussels, restricting their lower range on the shore.
- Madreporite can be pale yellow

Blood Star

Henricia sanguinolenta

- Grows up to 10 cm in diameter.
- Often rich red color but can vary from purple to yellow.
- Adults have small disc and slender, tapering arms.

Forbes Sea Star

Asterias forbesi

- Grows up to 15 cm in diameter
- Eye spots near tip of each arm not stalked.
- Bumps on arm surface tend to be scattered randomly.
- Purple, reddish brown, orange, or yellow.
- Madreporite near edge of disk on upper surface usually bright orange.



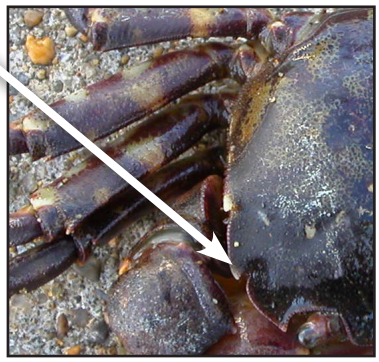
CRUSTACEANS

Asian Shore Crab
Hemigrapsus sanguineus

- Maximum size: up to 5 cm but often much smaller.
- 3 marginal teeth on carapace.
- Carapace very squarish.
- Color ranges from green to purple to orange-brown to red.
- Native to Asia. Invasive species.



- Light and dark bands along its legs and red spots on its claws.





Green Crab
Carcinus Maenas



- Maximum size: 6x9 cm (L x W)
- 5 short marginal teeth on carapace.
- Carapace not as proportionally wide as in *Cancer spp.*
- Found under algae and small rocks, and it eats other invertebrates in the mid- to lower intertidal zones.
- Native to Europe and is an invasive species.
- Smaller than the Jonah crab.

CRUSTACEANS

Rock, Jonah, Edible Crab
Cancer spp.

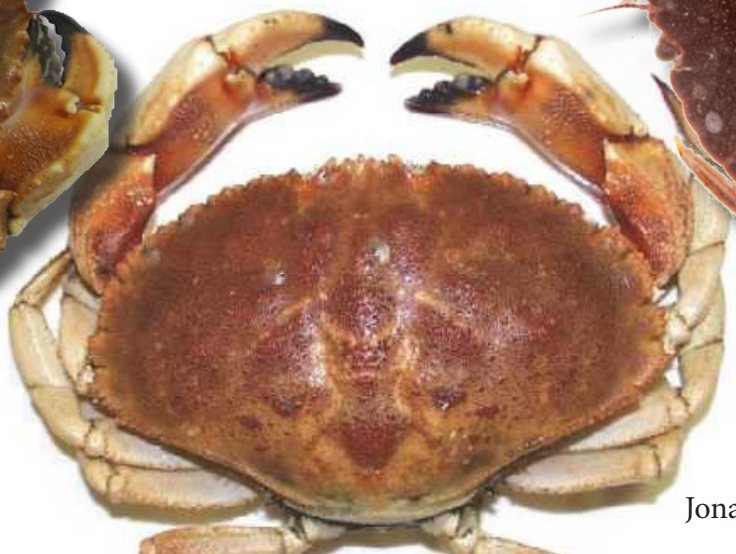
- Maximum size: 13 cm W.
- 8 - 10 marginal teeth on carapace.
- Carapace much wider than long.
- Found in the mid- to lower intertidal zone under algae and among rocks.
- Eats blue mussels and other invertebrates.
- Jonah crab remains often found in ACAD upper intertidal, evidence of bird predation.



Rock Crab



Edible Crab



Jonah Crab

CRUSTACEANS

Barnacles

Semibalanus balanoides

- Sedentary filter-feeding crustaceans.
- Most common North Atlantic barnacle grows up to 15 mm in size and has six greyish wall plates and a diamond shaped operculum





ANEMONES

Frilled Anemone

Metridium senile

- Soft bodied filter feeders.
- When exposed to air, tentacles tuck into base and animal looks like small blob of jelly.
- When under seawater may wave around when feeding.

Silver-spotted Anemone

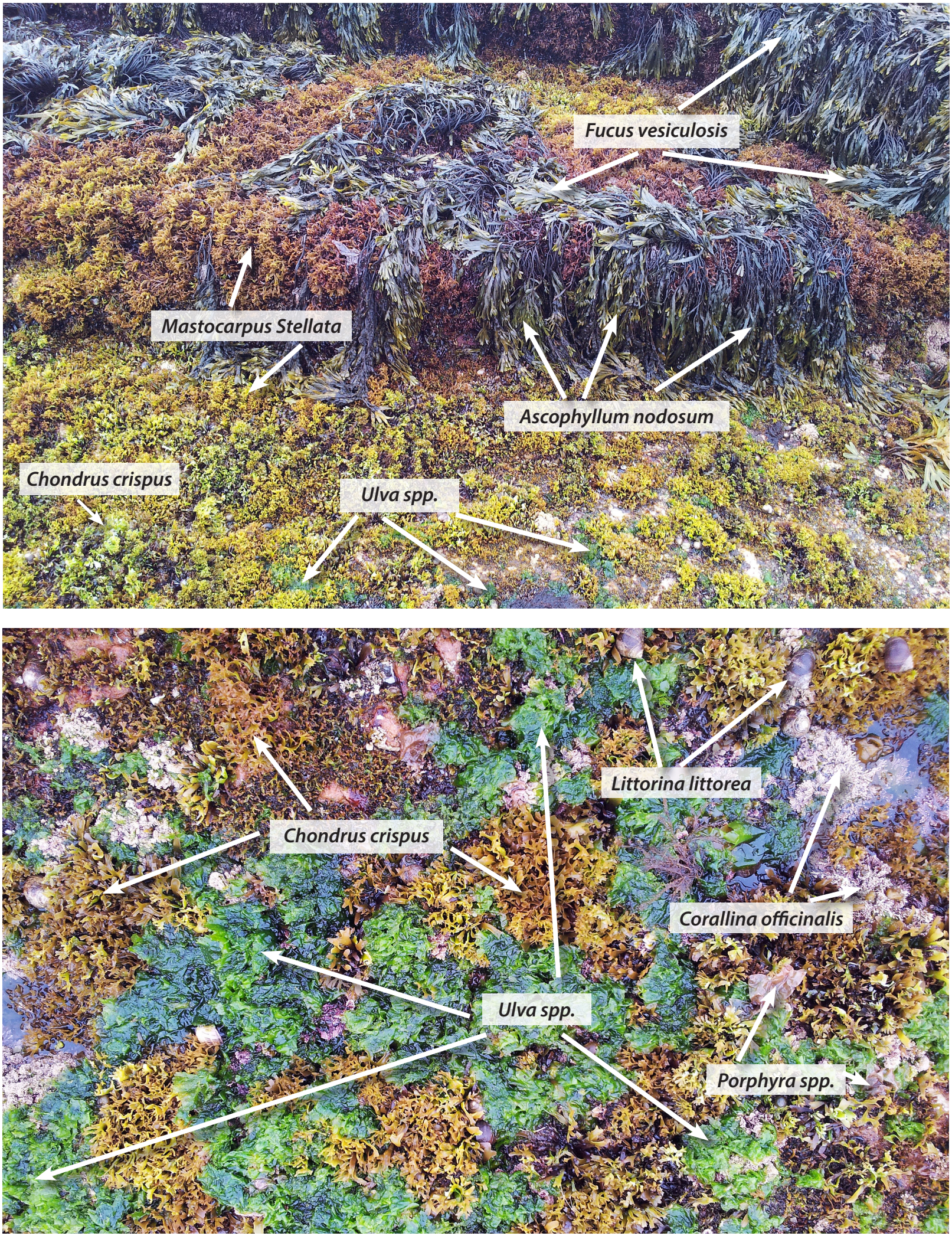
Aulactinia stella

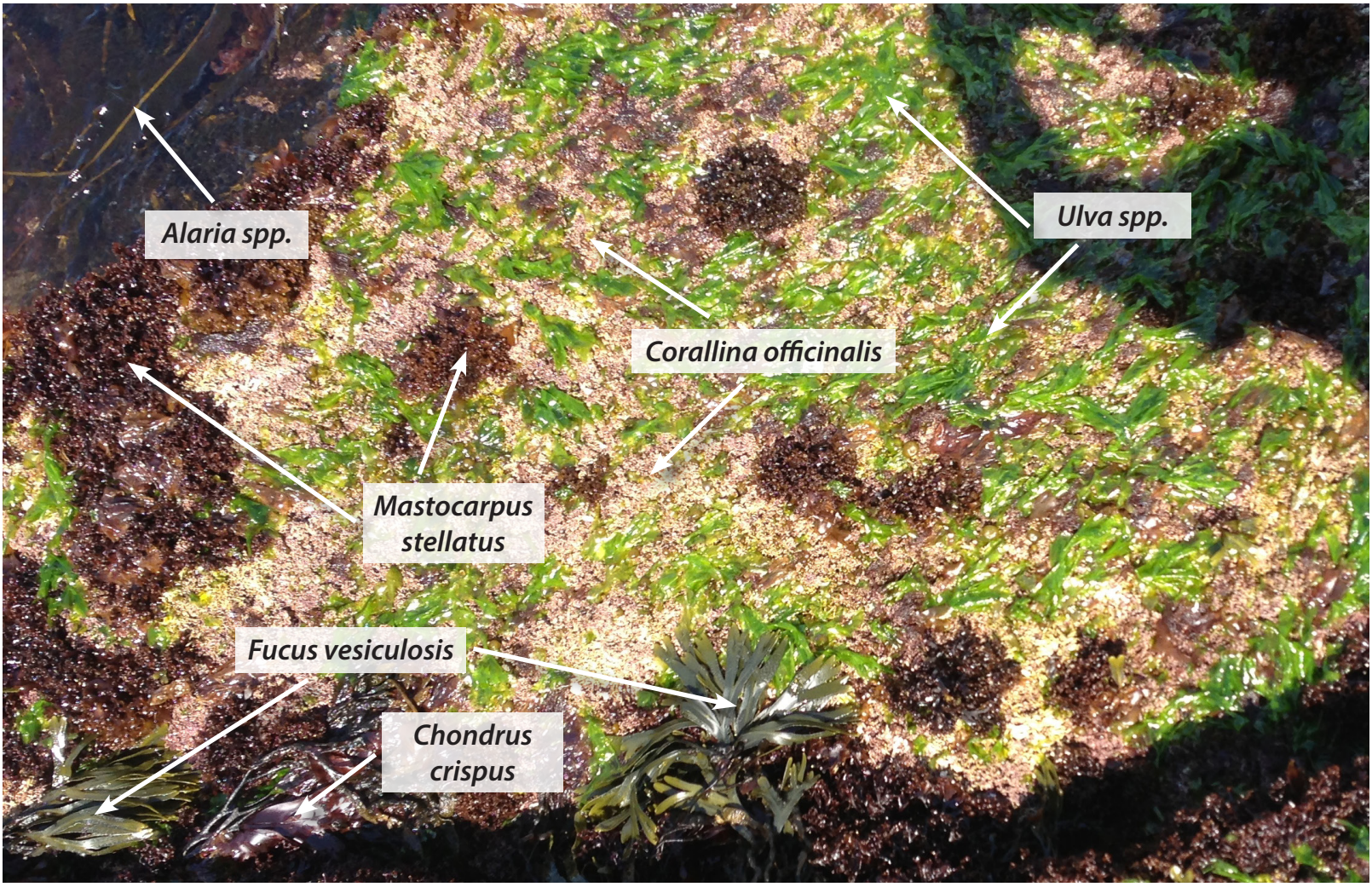
- Sessile - permanently attached to the substrate.
- Common in the subtidal zone, but can be found in cracks and tidepools in the lower intertidal zone.

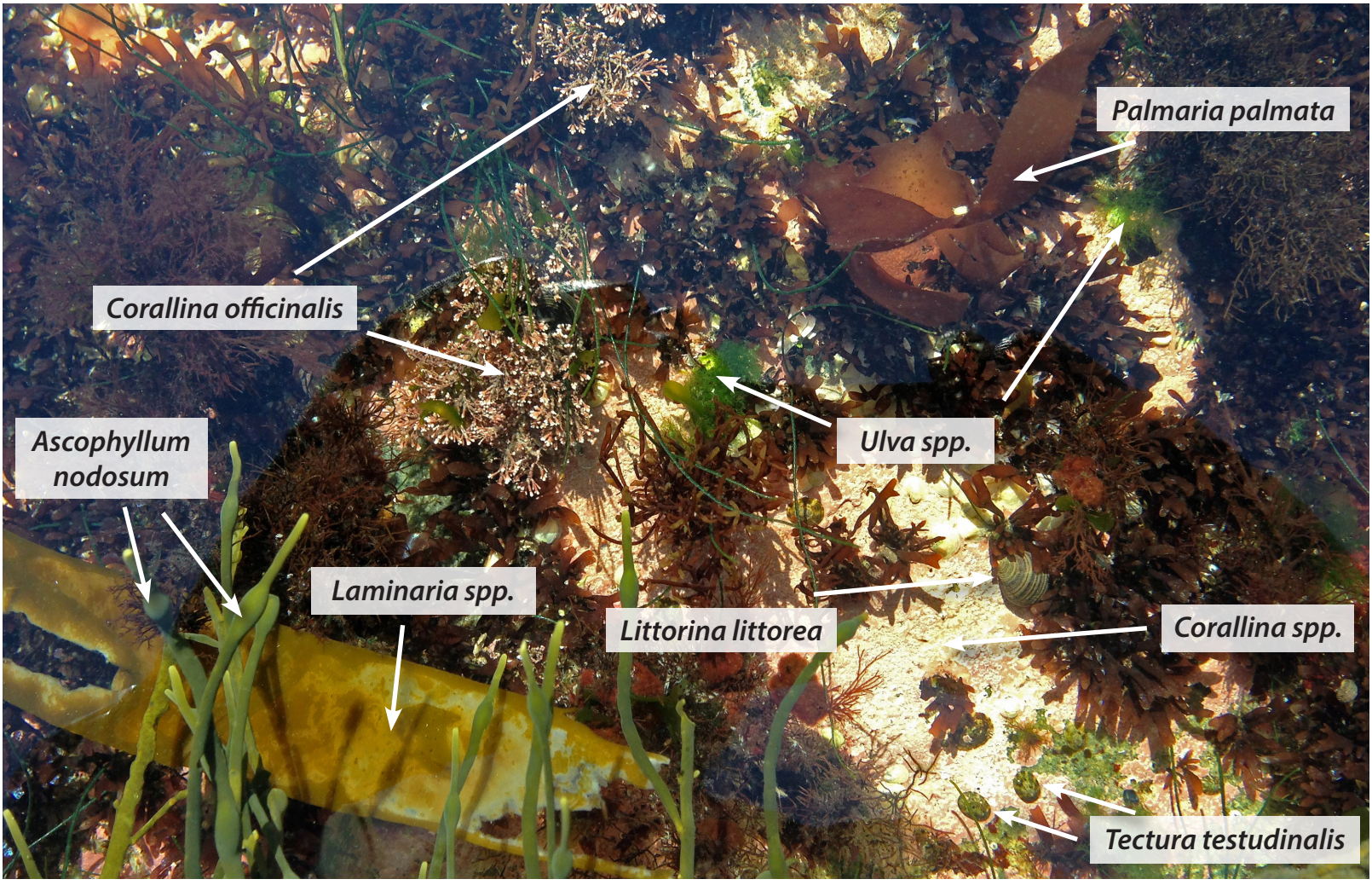







Fucus vesiculosis
Mastocarpus Stellata
Ascophyllum nodosum
Chondrus crispus
Ulva spp.
Littorina littorea
Chondrus crispus
Corallina officinalis
Ulva spp.
Porphyra spp.


Alaria spp.
Ulva spp.
Corallina officinalis
Mastocarpus stellatus
Fucus vesiculosis
Chondrus crispus


Palmaria palmata
Corallina officinalis
Ascophyllum nodosum
Ulva spp.
Laminaria spp.
Littorina littorea
Corallina spp.
Tectura testudinalis