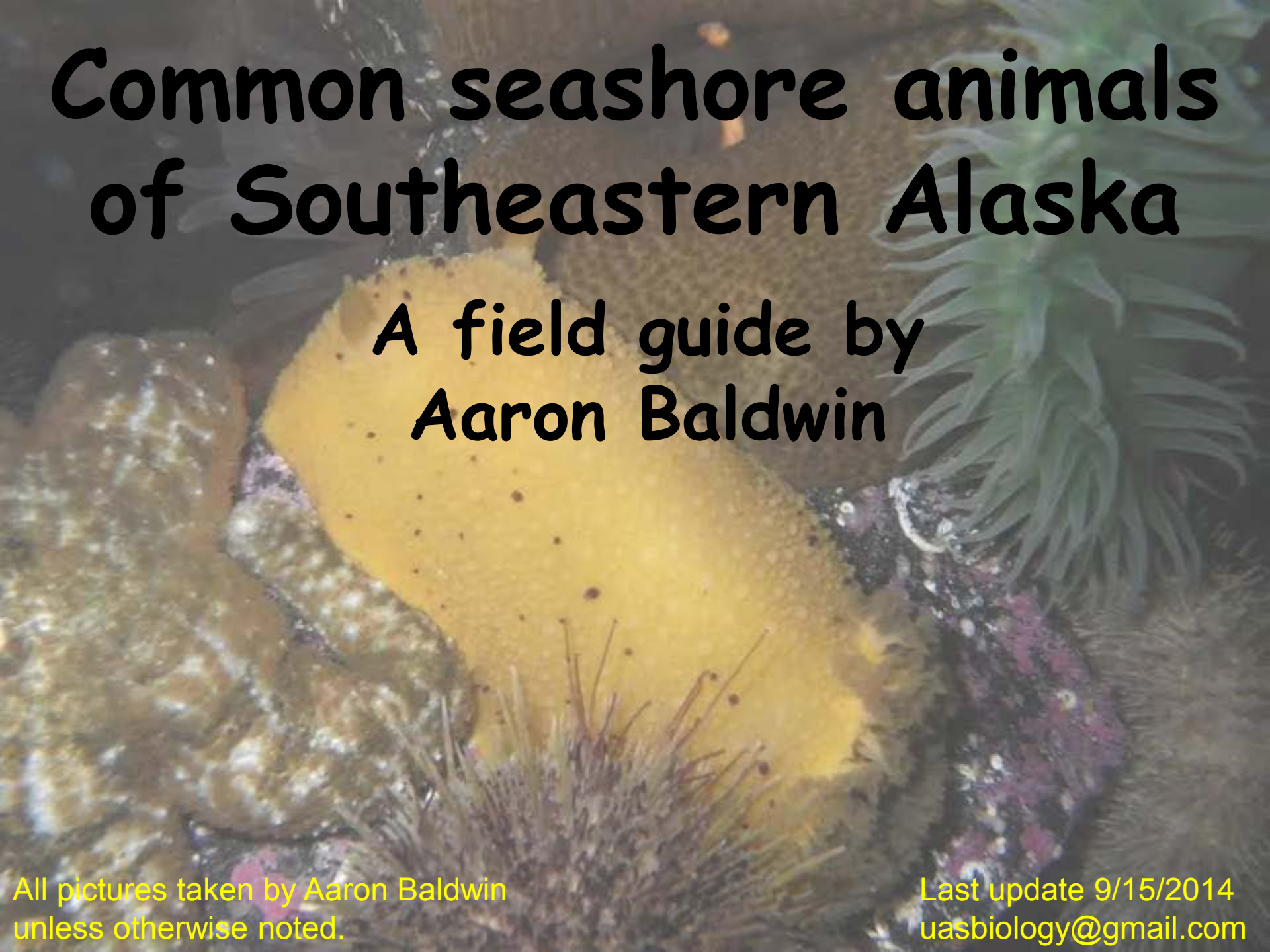
Common seashore animals of Southeastern Alaska

A field guide by Aaron Baldwin



All pictures taken by Aaron Baldwin unless otherwise noted.

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Introduction

Southeast Alaska (the “Alaskan Panhandle”) is an ecologically diverse region that extends from Yakutat to Dixon Entrance south of Prince of Wales Island. A complex of several hundred islands, fjords, channels, and bays, SE Alaska has over 3,000 miles of coastline.

Most people who live or visit Southeast Alaska have some idea of the incredible diversity of nature found here. From mountain tops to the cold, dark depths of our many fjords, life is everywhere.

The marine life of SE Alaska is exceptionally diverse for several reasons. One is simply the amount of coast, over twice the amount of the coastline of Washington, Oregon, and California combined! Within this enormous coastline there is an incredible variety of habitats, each with their own ecological community.

Another reason for SE Alaska’s marine diversity is that we are in an overlap zone between two major faunal provinces. These provinces are defined as large areas that contain a similar assemblage of animals. From northern California to SE Alaska is a faunal province called the Oregonian Province. From the Aleutian Island chain to SE Alaska is the Aleutian Province. What this means is that while our sea life is generally similar to that seen in British Columbia and Washington state, we also have a great number of northern species present.

http://www.film.alaska.gov/

History of this guide

This guide began in 2009 as a simple guide to common seashore animals of Juneau, Alaska. The guide was made for a few local grade school teachers who wanted something to bring to the field during “Sea Week”. At that time the guide was 12 pages long and contained just 33 species! Because of interest from other teachers I began slowly expanding to include a wider range of species and to make it useful for those on the outer coast. This version now details over 600 species! In addition to expanding the range covered, I also decided to include species not commonly seen on the seashore but often caught by anglers or seen in crab and shrimp pots. This guide is no where near exhaustive, but hopefully will cover the majority of species most people are likely to encounter.

As this work is an ongoing process, user suggestions, corrections and feedback are greatly appreciated. Email uasbiology@gmail.com

Exploring SE Beaches

Exploring Alaska's beaches can be a rewarding educational experience. Like nearly all of Alaska's recreational activities, knowing a few practical facts can make beach exploration safe, comfortable, and protect this delicate resource.

Beach Etiquette

A few simple rules can insure that our beaches can be enjoyed by everyone. Far too many times I have seen tidepool creatures unwittingly damaged by careless beachcombers.

1) **Watch where you step – be aware of where you put your feet, try to avoid stepping on animals!**
2) **When you turn over a rock, always carefully turn it back over. Leaving it flipped over kills the organisms on top of the rock and those underneath.**
3) **Do not try to turn over rocks that are too large – even if you are able to turn them, you probably can not safely return it!**
4) **If you collect an organism to show others, keep it wet. Water in a small bucket is an excellent way to do this. And when you are finished examining your specimen, return it to where you found it or at least a similar habitat.**
5) **Permanent collection of sea animals requires a collection permit in Alaska. If you don't have a permit, leave it there! Photographs are an excellent way to 'preserve' your specimen.**
6) **Sessile (permanently attached) animals usually are usually incapable of reattaching to the substrate. Once removed, they will almost always die so best to leave them where they are!**
7) **As with any outdoor activity, follow the rule "Pack it in, pack it out". Leaving garbage on beaches is unsightly, environmentally irresponsible, and illegal!**

Safety

Probably the greatest and most common beach hazard is falling. Rocky beaches are often slippery, especially when covered in seaweed or diatoms. Stepping carefully and choosing your route can make a difference. Watch for loose rocks, as these can tilt or shift when you step on them. Surge channels should be navigated carefully, as unexpected waves have a lot of force in these areas.

It is pretty much inevitable that any exploration trip to the intertidal zone will lead to at least one good barnacle cut or scrape. While generally a minor annoyance rather than a real danger, it is best to make sure the cut or scrape is cleaned soon after returning home.

One rare but present danger that is unique to beachcombing in Alaska are bears. Bears will often forage at low tide, especially in more remote areas. On one occasion I observed a mother and cub out on the outer coast walking around some large boulders. While there was no danger (I was far above the beach), I could not help but recall how many times I have been head-down looking in tidepools between those same boulders! The take-home message is just be aware (and look up and around occasionally!).

What to bring

While what to bring along varies depending on location and your intent, there are a few basics that make the trip a great deal more pleasant. Rubber boots are a must. I know people who wear canvas tennis shoes, but those same people inevitably will get barnacle-scraped ankles! I always will bring a small back pack along. In this I can keep my phone (in a plastic baggie), binoculars, magnifying glass, etc. as well as somewhere to put extra clothing layers if I misjudged the weather. Also a small container of bug spray can be a great idea. I usually will carry a bucket and dipnet (like a medium aquarium net) in case I want to isolate something for photography or to pick up beach trash that is all too common.

***Halichondria panicea* – Crumb-of bread sponge**
Color yellow, tan, green or light brown-purple. Mid to upper intertidal. The most common intertidal sponge in SE Alaska.

***Haliclona* sp.– Purple intertidal sponge**
Local species is undetermined and may be unnamed. May be purple, green, yellow, or orange. Mid to high intertidal.

***Ophlitaspongia pennata*– Red encrusting sponge**
Forms bright red, thin crusts at the lowest intertidal zone. Several other similar species are sometimes found.

Sponges – Phylum Porifera

The vast majority of Alaska's sponges live below the lowest tide line. I have included here a few species encountered in the intertidal zone as well as some deeper water species.With a few exceptions, most sponges require microscopic examination to identify.

There are three large groups of sponges. The Calcarea are sponges with spicules composed of calcium carbonate only. The Demospongia have calcium carbonate and silica spicules. The Hexactinellida have only silica spicules. The latter group are abundant deep water sponges and can be several meters tall.

***Mycale adharens* – Smooth scallop sponge**
Nearly always on the shells of scallops (*Chlamys* spp.). Usually forming a thinner crust than does *Myxilla incrustans* (below).

***Myxilla incrustans* – Rough scallop sponge**
As the name indicates, this sponge has a rough surface with many raised oscula. May form massive clumps on scallops (*Chlamys* spp).

Spicules!

The “skeleton” of sponges is a complex matrix of proteins and tiny structures called spicules. These spicules are commonly made of calcium carbonate or silica (glass). These spicules come in hundreds of shapes and sizes, and most sponges have several different types. The form and combination of these is unique to each sponge species and is how scientists identify sponges.

Most shallow water sponges belong to the class Demospongia and have spicules made of silica (glass) and a protein known as spongin. Members of the class Hexactinellida are common deepwater species in Alaska and have spicules made of silica but never have spongin fibers. The smallest class is the Calcarea which are distinguished by spicules made of calcite only and lacking spongin fibers.

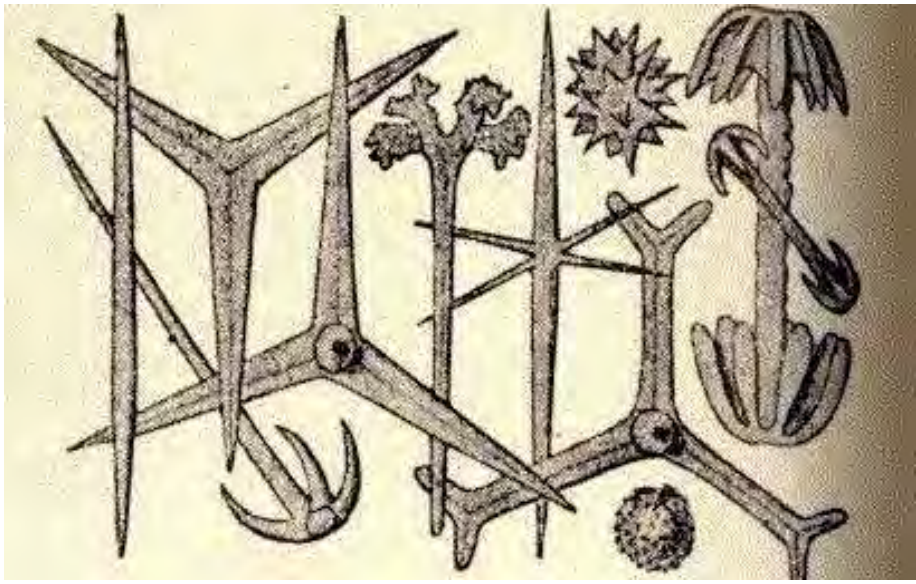
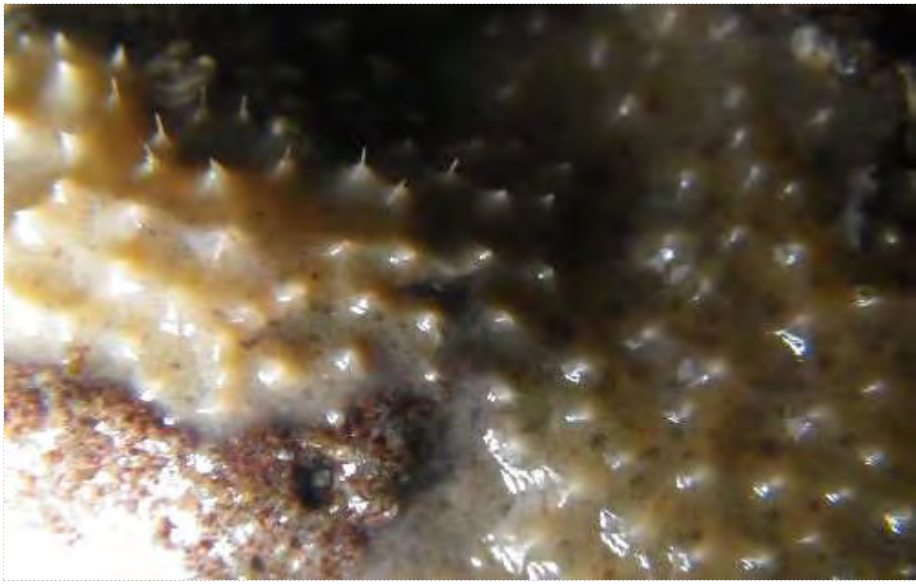


Illustration “Various forms of sponge spicules” from Augusta Foote Arnold’s “Sea Beach at Ebb Tide” 1903

***Sycon compactum* – Tiny vase sponge**
Common species, but easily overlooked in the low intertidal. Forms a single to several simple, thin-walled hollow tubes.

***Halisarca sacrum* – Slippery sponge**
Usually found under rocks, this sponge forms a slick 'film' over the substrate. Yellow to light brown in color. Lacks spicules

***Syringella amphispicula* – Tough yellow branching sponge**
This distinct sponge has a tough outer layer that is like thin plastic. Found in the low intertidal and intertidal. Color and shape are distinct.

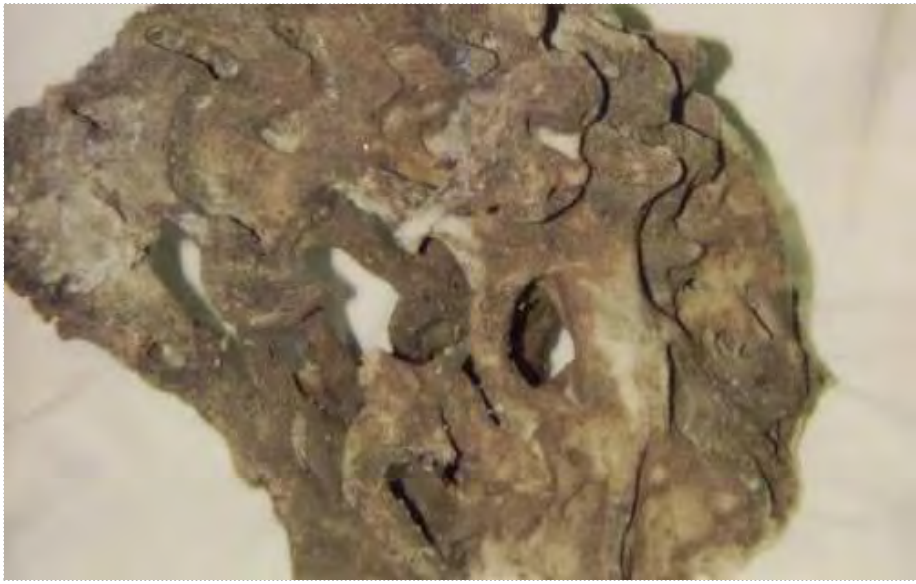


***Aplysilla* sp. – Encrusting hairy sponge**
The spicules of this species stick out of the tiny pointed tubercles. The sponge is found under rocks and is a very thin encrusting species.

***Neoesperiopsis digitata* – Finger sponge**
This subtidal sponge can be occasionally found in the drift zone, especially following storms. Other species may be found.

***Suberites latus*– Hermit crab sponge**
This subtidal sponge grows on shells occupied by hermit crabs and eventually dissolves the shell completely and grows with the hermit.

***Cliona californiana* – Boring sponge**
Bright yellow spots on seashells and barnacles when alive. Remains of seashells riddled with holes frequently seen in beach drift.



***Heterochone calyx* – Vase sponge**
A deep water species, these are occasionally snagged by fishing gear. A very large sponge, often exceeding 1 meter in height!

***Aurelia labiata* – Moon Jelly**
Easily distinguished by the four horseshoe-shaped gonads visible in center of bell. Sometimes phosphorescent.

***Cyanea capillata* – Lions mane jellyfish**
The red or orange color on this species is distinct. These can give a painful sting. Sometimes strand on beach in large numbers.

***Chrysaora melanaster*– Sea nettle or Rising sun jelly**
This oceanic species occasionally washes ashore following storms on the outer coast. The radiating brown stripes are distinctive.

Jellyfish, hydroids, corals, and sea anemones – Phylum Cnidaria

This diverse phylum are united by the presence of specialized stinging cells called nematocysts. These are used both for defense and to immobilize prey.

There are four large groups of cnidarians found in SE Alaska. These are; Scyphozoa (jellyfish), Hydroida (hydroids and hydrocorals), Staurozoa (stalked jellyfish), and Anthozoa (sea anemones and corals).

***Aequorea victoria* – Water jelly**
Frequently seen around docks, the water or many-ribbed jelly has 80 or more radial canals most visible around the margin. Bioluminescent.

***Gonionemus vertens* – Clinging jellyfish**
Unlike many jellies this species often adheres to algae, eelgrass or other fixed objects. One of several dozen hydromedusae found in SE Alaska.

***Polyorchis pencillatus* – Red-eye jellyfish**
A small but often abundant jelly, this species is usually 1-3 cm in diameter. The ~100 or so small red eyes are distinct

Alternate life cycles!

All of the jellies on this page are the planktonic or medusa stages of hydroids. When looking at the sessile or hydroid phase (see the next page) one might never guess that these medusae come from similar organisms. In fact, many times the hydroid phase has been given a different scientific name than the medusa until someone discovers that they are the same animal! There are many medusae and hydroids that have yet to be matched.

Typically the medusa stage is the sexual phase that will produce larva (called planula). The larva will settle on the seafloor and grow into the plant-like hydroid phase that reproduces asexually and will eventually produce hundreds of free swimming medusae.

***Obelia* spp. – Wine-glass hydroids**
Brown, densely tufted algae-like growths. Abundant on floating docks. Complex species, difficult to identify.

***Hydractinia* spp.– Hermit crab fuzz**
These fascinating hydroids nearly always grow on the snail shells occupied by hermit crabs. The hydroid colony eventually becomes the shell and will protect the hermit with their stinging cells.

***Abietinaria* spp. – Course sea firs**
Usually in the lowest intertidal and subtidal. These have a fern-like growth pattern and branches with tiny spines giving the ‘course’ appearance.

Hydroids – Plants or animals?

Hydroids are found nearly everywhere in Alaska’s marine environment but are often overlooked or mistaken for seaweeds. While exposed by the tides hydroids often do resemble marine plants more than they do animals. But when covered by water the careful observer will see hundreds of tiny polyps emerge that resemble tiny sea anemones.

Often the polyps of hydroids come in two basic types. The feeding polyps (gasterozoids) capture tiny animals from the water and feed the colony. These are the most common polyp type. The second type are called gonozoids and their job is to produce the free-swimming medusae as seen on the previous page.

***Stylantheca petrographa* – Encrusting hydrocorals**
Superficially similar to coralline algae – look for abundant star-shaped pores. Usually restricted to the lowest tide zones and subtidal.

***Balanophyllia elegans* – Orange cup coral**
The only true stony coral likely to be encountered in the intertidal zone. Found in semi-protected areas on the outer coast.

***Stylaster* spp. – Branching hydrocorals**
Restricted to moderately deep water, these hydrocorals are sometimes snagged by fishing gear.

Hard corals

Many people are surprised to learn that Alaska has a huge diversity of corals. Most of these live in very deep water and are rarely seen. These deepwater corals are the subject of much study as they are important habitat for many fish, crabs, and shrimp.

The two species above are actually hydroids with a hard skeleton and are thus called “hydrocorals”. The cup corals (left) as well as the sea pens and soft corals on the next page are anthozoans. Anthozoan corals are related to the better-known tropical reef corals, although species in Alaska do not form true reefs.

***Ptilosarcus gurneyi* – Orange sea pen**
Rarely intertidal, common shallow subtidal species. Capable of retracting completely into sand. Bioluminescent when disturbed.

***Gersemnia rubiformis* – Sea raspberry**
Uncommon intertidally except on outer coast, abundant subtidal species. Coral lacking hard parts, polyps (right) extend from fleshy mass.

***Halipteris willemoesi* – Giant sea pen**
This sea pen is always subtidal but is sometimes caught by fishing gear. This species commonly exceeds 1 meter in height!

Sea pens and soft corals

The sea pens and soft corals (also called gorgonians) are collectively known as “octocorals” because the structure of the individual polyps tends to be in eights or multiples of eight. The polyp below has its tentacles retracted but you can count the body divisions

Most of Alaska’s octocorals are very deep water, but a few species are shallow or are brought up by fishing gear. In the Aleutian Islands and Gulf of Alaska some deep water areas have been designated “coral gardens” and are protected from human activities.

***Primnoa pacifica* – Red tree coral**
Probably the most commonly seen of the deep sea corals. Commonly snagged by longline or pot gear. Smells like cucumber when fresh!

***Paragorgia arborea* – Bubblegum coral**
This large, fragile coral is only occasionally seen when snagged by fishing gear. Thick, fleshy yellow to pink or red branches distinctive.

***Isidella* sp. – Bamboo coral**
The skeletons of bamboo corals are usually white with dark brown nodes. Polyps quickly become gelatinous when out of the water.

Deep Sea Corals

The species on this page are all representatives of a diverse group known as deep sea corals. While most are found below 100 meters or more, a few species are shallower. These corals, along with the hydrocorals (page 8) and deep-water sponges are an important component of the deep oceans. They create a complex, three dimensional bottom structure that is used by a large number of other organisms for protection.

These often large corals are usually seen when tangled in fishing gear. Unfortunately, once they dislodged for the bottom the colony cannot re-attach and will probably die. Interest in preserving these fragile and important creatures has resulted in the creation of areas where fishing activity is prohibited or limited.

Sea anemones – A garden of colors!

Most people are familiar with sea anemones. Several species in Alaska occupy the upper tidal zones are commonly seen by beach walkers. These “flowers of the sea” are found in a seemingly endless variety of colors, even within a single species.

Sea anemones use the stinging cells on their tentacles to capture prey. When we touch these, they feel sticky. But for an unlucky small animal these tentacles not only hold them tight but inject a poison that may paralyze or even kill. Anemones with thin, delicate tentacles like the *Metridium* species on this page primarily capture tiny planktonic creatures. Other species have stronger tentacles and can catch fish. The bright green anemones have microscopic plants in their bodies that they “farm” for food!

***Metridium senile* – Plumose anemone**
Most often white or brown, some populations are nearly all orange. Usually less than 10 cm (4”) tall. Tentacles unbranched.

***Metridium farcimen* – Giant plumose anemone**
White or brown, rarely orange. Often over 40 cm(16”) tall, to 1 m (39”) tall. Tentacles branching.

***Anthopleura artemisia* - Moon glow anemone**
Light bands on tentacles distinct, color green, brown, pale orange, or pink. Burrows in sand, abundant in tidepools.

***Anthopleura xanthogrammica* – Giant green anemone**
Restricted to outer coast, often in areas of heavy surf. Most often solid shade of green

***Urticina grebelnyi* - Christmas anemone**
Newly named, bumpy green and red column distinct. Sometimes solid light brown. Often 20 cm (8”) or larger in height. Formerly *Urticina crassicornis.*

***Urticina columbiana* – Sand rose anemone**
Column often completely buried in sand. Column with light, raised tubercles in broken rows. Tentacles long and tapering, “droopy”.

***Urticina coriacea* – Stubby rose anemone**
Column with tubercles slightly lighter colored than background. Column short, often buried. Tentacles short, stubby.

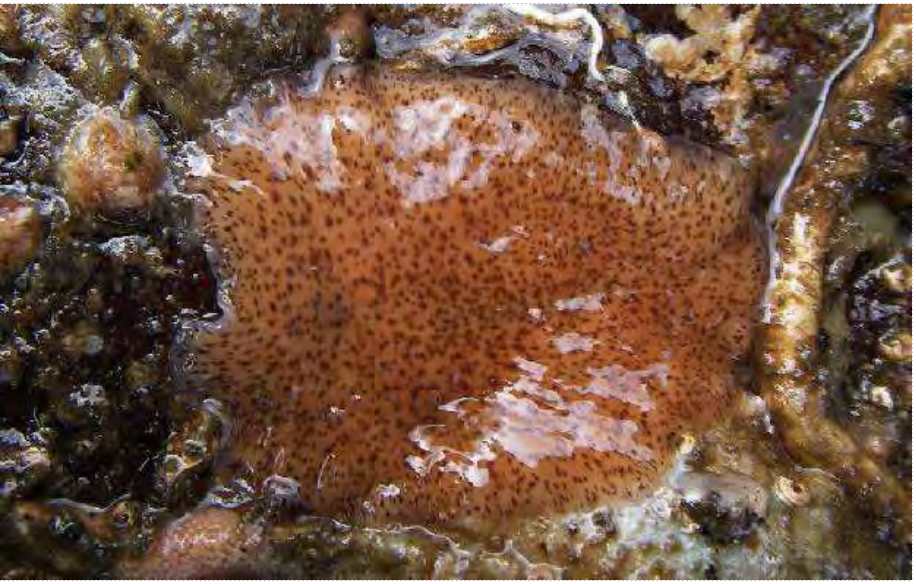
***Urticina piscivora* – Fish eating anemone**
Subtidal, rarely intertidal. Smooth red column distinctive. Color of tentacles and oral area variable.

***Cribinopsis fernaldi* – Crimson anemone**
This species is usually subtidal, although common in the intertidal in Petersburg, Alaska. Red chevron marks on tentacles distinctive.

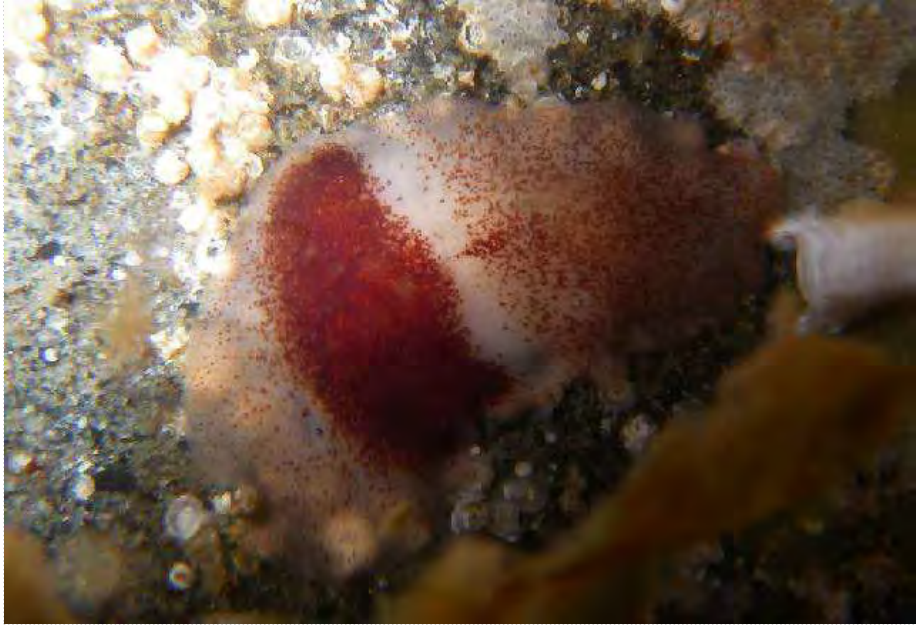
***Cribinopsis albopunctatus* – White spotted anemone**
Formerly called *Urticina lofotenis*. The white tubercles on the column are distinct. Usually found on the outer coast.

***Epiactis prolifera* – Brooding anemone**
Radiating white lines are distinct. They are most often red, but may be brown or green. Sometimes have tiny anemones around the base.

***Notoplana sanjuania* – Common flatworm**
This is one of many nearly identical species common in intertidal systems. Proper identification involves microscopic dissections.



***Kaburakia excelsa* – Giant flatworm**
Mostly confined to outer coast, rarely encountered in Juneau. Size, reaching 10 cm (4”) is distinct. Body about as wide as long.



***Notoplana sanguinea* – Saddleback flatworm**
This is the only member of the genus that can be positively identified in the field. The red band behind the eyes is distinctive.

Flatworms - Phylum Playhelminthes

The free-living flatworms are all grouped as Turbellarians. This separates them from the other flatworm groups, Trematoda (the flukes) and the Cestoda (the tapeworms) both of which are exclusively parasites.

There are several intertidal species in SE Alaska, most of which require complicated preservation methods followed by dissections to identify.

***Entobdella hippoglossi* – Halibut skin parasite**
A careful examination of a halibut will occasionally reveal the presence of these flat, white worms on the skin. These are harmless to humans.

***Anisakis simplex* – Fish nematode or roundworm**
These worms are often seen when cleaning fish as small, coiled structures on the organs and meat. These cause anisakiosis in humans.

***Diphyllobothrium* spp. – Salmon tapeworms**
There are many species of cestode (tapeworm) that infect salmon. Many of these are able to infect humans who eat undercooked salmon.

Parasitic Worms

A large number of worms and worm-like creatures have specialized as internal or external parasites on fishes. The two above are members of the phylum Platyhelminthes (flatworms). Monogeneans such as *Entobdella* (above left) are ectoparasites and generally harmless to humans. There are, however, several internal parasites of fishes that are capable of infecting people who eat raw or poorly-cooked fish.

Because of this it is important to make sure that all fish intended for human or pet consumption is cooked or otherwise thoroughly treated. Fish that is intended to be eaten raw or partially cooked such as sushi or cold-smoked can be safely treated by freezing at -4 degrees or colder for a week or longer.

***Emplectonema gracile* – Green ribbon worm**
High intertidal, often in masses. Thin body is green on top and pale yellow below. May be abundant. *E. burgeri* is similar but mottled yellow and purple.

***Paranemertes peregrina* – Purple ribbon worm**
Found with *Emplectonema gracile* & *E. burgeri*, this species is often 4-5 mm wide. Peach colored underneath.

***Amphiporus angulatus* – Many-eyed ribbon worm**
Pink to purple on top, white to orange underneath. Head with distinct markings (see inset). Up to 10 cm (4”) long, 1-2 cm (.4”-.8”) wide.

The ribbon worms - Phylum Nemertea

These soft bodied predators are often abundant in intertidal habitats. Their generally round or oval cross-sections distinguish them from the flatworms, Unlike annelids nemerteans do not have any distinct segments, setae (hairs), or parapodia (structures for wlaking or swimming). Nemerteans have a powerful proboscis they can extend to capture prey.

Many nemerteans can be identified in the field by color, which is often distinctive by species. Positive identification of some species, however, often requires detailed dissections.

***Amphiporus bimaculatus* – Two spotted ribbon worm**
Similar to *Amphiporus angulatus*, but has two triangular markings on light-colored head. Body color variable but often red or orange.

***Cerebratulus montgomeryi* – Rose ribbon worm**
The nearly solid red to maroon body with a white stripe on front of head is distinct (see inset). Often over 1 meter (39”) in length.

***Cerebratulus marginatus* – White-sided ribbon worm**
This large (up to 1 m or 39”) worm is usually pale to dark brown or tan with a distinct white margin sides of body. Strong swimmer.

***Tubulanus polymorphus* – Orange ribbon worm**
Usually restricted to outer coast. Red to orange body without white front as in *C. montgomeryi*. May exceed 3 meters (10 feet) in length.

***Hemipodus borealis* – Northern iridescent worm**
The pink body and long pointed head are distinct. When disturbed large proboscis extends with four black teeth at end.

***Nereis brandti* – Clam worm or giant pileworm**
This impressive worm can reach over 1 m (39”) in length! Common on sandflats, the careful observer may see the front half extending from the burrow then quickly retreating when disturbed.

***Nereis vexillosa* – Pile worm**
Abundant intertidal species, often 15 cm (6”) long. Commonly found crawling around rocks or in mussel beds.

Segmented Worms – Phylum Annelida

This large and complex phylum has probably hundreds or more representatives in Alaska. There are many undescribed species. Many of these are very difficult to separate in the field and require micro-dissection.

Most of our marine species are in a group called the polychaetes. These often have well-developed parapodia, which are leg-like structures used for walking, burrowing, or swimming. There are also some marine oligochates and leaches which lack parapodia.

For some groups I found it better to just include a representative of the family as sorting out to species or even genus in the field is close to impossible.

***Nereis procera* – Little pileworm**
Unlike many other species of *Nereis*, this species is light pink in color. The shape of the head, 4 eyes, and long cirri distinguish this from bloodworms.

***Nephtys caeca* – Goddess or sand worm**
This burrowing species is commonly seen by clam diggers. Lighter colored than most *Nereis* spp., this species cannot bite.

The Phyllodocid Polychaetes

The bloodworms, pileworms, clam worms, goddess worms, paddle worms, scale worms, and sea mice (as well as many others not shown here!) belong to a very large order of polychaetes called the Phyllodocida. These worms are characterized by having serially-repeated appendages called parapodia on each segment that they use like a centipede uses its legs. In phyllodocids these parapodia are nearly identical the whole length of the worm. Most phyllodocids also have antennae, strong jaws, and a reproductive phase called an epitoke. In the epitoke phase the parapodia become strong swimming paddles and the worm will often swim to the surface to spawn and die. The epitoke is particularly impressive in the giant clam worm *Nereis brandtii*!

***Eteone longa* – Elongate paddle worm**
A very common burrowing species, this small (<5 cm or 2”) worm resembles the pileworms but has four small antennae on the head.

***Arctonoe fragilis* – Fragile commensal scale worm**
Found in the ambulacral groove of sea stars, this species lacks the red 'belt' of *A. vittata.* Scales often missing.

***Harmothoe imbricata* – Free-living scale worm**
This abundant species is often under rocks or in mussel clumps. Several species in this family, often require microscopic dissection to id.

***Arctonoe vittata* – Red-banded commensal scale worm**
Segments 7 and 8 with a distinct brown to red 'belt'. Scales more firmly attached than in *A. fragilis*.

Scale worms – Superfamily Polynoidea

This group of closely related families are collectively called the scale worms. The most commonly encountered species are in the family Polynoidae. Most species have 15 pairs of dorsal scales called elytra, although a few have more or less. Scale worms are often commensal with other invertebrates. Turn over large sea stars to see the scale worms in the genus *Arctonoe.* Other species are free living and can be found under rocks in the intertidal zone.

The large sea mice (next page) have their elytra mostly covered by dense fur and are sometimes found crawling over sand but are typically burrowing.

***Halosydna brevisetosa* - Eighteen-scaled scale worm**
Carefully counting the paired scales reveals that this common species has eighteen pairs rather than fifteen like most common species of polynoids.

***Eunoe nodosa* – Giant scale worm**
A very large species (10 cm or 4”) found in the shells occupied by large hermit crabs. Common but not often seen.

***Gaudichaudius iphionelloides* – White-banded scale worm**
Not common, this scale worm is distinct in having the elytra covered in honeycomb-like polygonal patches. Found under low intertidal rocks.

***Aphrodite negligens* – Sea mouse**
A robust, distinct species found occasionally on sand flats or buried in loose sand and gravel.

***Pholoe glabra* – Little scale worm**
These small (<2 cm) worms belong to their own family, the Pholoidae. The scales are more firmly attached than in polynoids. Under rocks in sand.

***Typosyllis* sp. – Necklace worms**
Resembling the related pileworms, these have long cirri on the parapodia that have a beaded appearance. On rocks with bryozoans and sponges.

***Armandia brevis* – Eyed Ophelia worm**
These small (1-2 cm) worms are found in sand around seagrasses. The deep ventral groove and eyes at the base of each parapodia are distinct.

***Ophelina breviata* – Short Ophelia worm**
Common in sand under rocks. The red gills, deep ventral groove, and pointed head are distinct. No jaws like bloodworms, which are similar.

***Notomastus pacificus* – Pacific threadworm**
This abundant species is found in anoxic (black) sediments on mudflats. Digging will reveal hundreds of these delicate worms in some areas.

Maldanidae – Bamboo worm
Members of the family Maldanidae have elongate segments with 'nodes' in between somewhat resembling bamboo stalks. These live in flexible tubes that resemble straws sticking out of the sand.

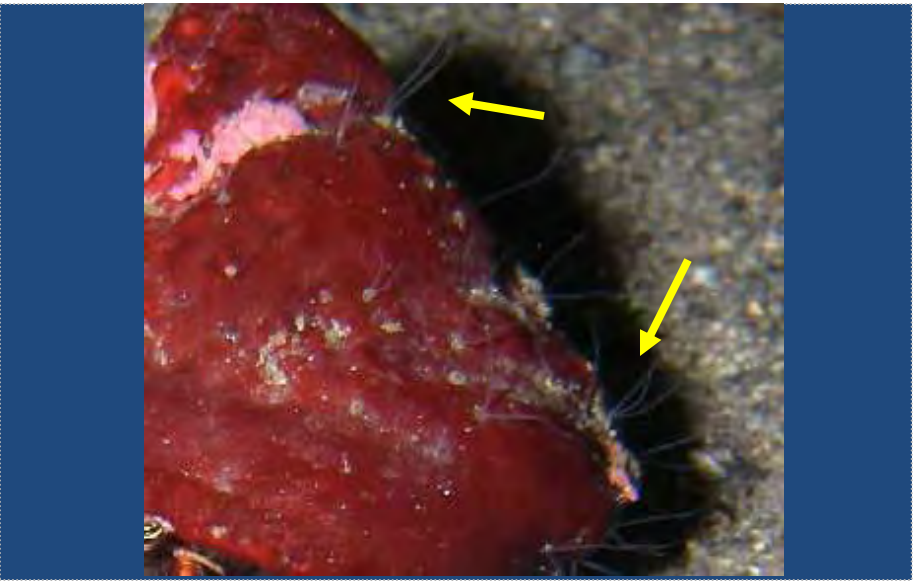
***Aberenicola pacifica* – Pacific Neapolitan lugworm**
Common on sand flats, the presence of this species is revealed by the volcano-like mounds around the burrows with coiled castings.

Bamboo worms, Threadworms, and Lugworms

These worms (and the Ophelia worms on the previous page)all belong to a large polychaete subclass called the Scolecida. Most members of this family are deposit or suspension feeders. The three families represented on this page are deposit feeders which means they ingest sediment and extract nutrients from that, similar to earthworms in terrestrial habitats.

Studies have shown that bamboo worms can be critical components of the nutrient cycle in some habitats. They feed on deeply buried sediment and excrete at the surface, returning buried nutrients to the surface. Lugworms and threadworms (Arenicolidae and Capitellidae) aerate anoxic sediments with their burrows. The burrows of lugworms harbor other invertebrates that benefit both from the protection and the clean water supply.

***Prionospio steenstrupi* - Bristle worm**
Abundant in sediments, this species can be found by gently sieving low intertidal sand. The paired palps are easily lost, as in this specimen.



***Dipolydora commensalis* - Hermit crab borer**
This spionid worm burrows into the snail shells occupied by hermit crabs. The paired feeding palps are usually all that is visible in this species.

Spio spp. – Spionid tubeworms
Common but easily missed, spionid worms are found in a wide variety of sandy habitats. The long paired palps are used to capture particles.

The only eating utensil you will ever need!

The remaining polychaetes in this guide belong to the subclass Canalipalpata. The defining feature of this diverse group is a feeding structure called a palp that has a ciliated groove. The groove extends the length of the palp and contains millions of tiny structures called cilia that carry food down the palp to the mouth. The size of the groove and structure of the cilia allow the worm to be very selective about the size and type of food item that is carried to the mouth.

Some worms, like the spionids on this page, have only a single pair of palps. Others, like the spaghetti worms and feather duster worms, have dozens or more. In feather duster worms the palps are modified to form feather-like radioles.

***Brada villosa* – Hairy sand peanut**
Not likely to be mistaken for any other species. Body short and grub-like. Common under rocks in the low intertidal.

***Flabelligera affinis* – Bristled cage worm**
Common but easily missed, this species somewhat resembles the hairy sand peanut (above). The mucous sheath of this species is partially opaque and wrinkled, often with adherent detritus.

***Flabelligera infundibularis* – Transparent-tube cage worm**
This fascinating polychaete lives inside of a green gelatinous casing. The actual worm can be seen inside with hooks extended for walking.

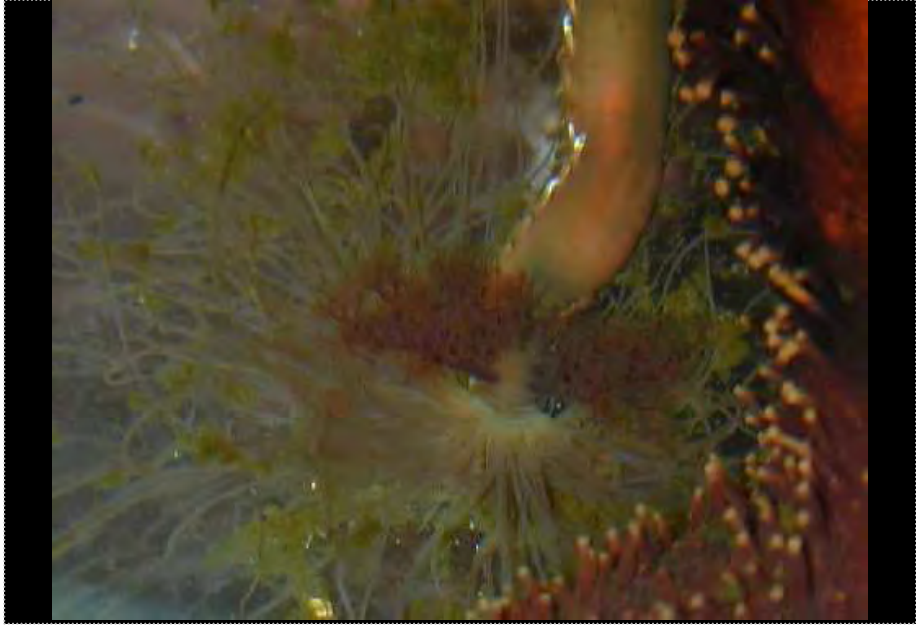
The Bristle Cage Worms

The three worms on this page represent an unusual family of worms called the Flabelligeridae or bristle cage worms. The common name comes from the fact that many species have a crown of very long, stiff setae (hairs) on the head that form a ‘cage’ extending forward.

The hairy sand peanut is an unusual member of this family that lacks the ‘cage’ or a mucous casing. When observed carefully in the water, these worms will extend the paired feeding palps (see inset above) showing their relationship with the Canalipalpata (spaghetti worms, spionid worms, feather dusters, etc.).

***Thelepus* spp. – Spaghetti worms**
Common under rocks in mud tubes. The flesh colored buccal tentacles are distinct. Most of these abundant worms require dissection to id.

***Cistenides granulata* – Ice cream cone worm**
The tusk-shaped tube of this worm is commonly encountered in the intertidal zone. Prefers sand around rocks. Formerly *Pectinaria granulata*



***Eupolymnia heterobranchiata* – Parchment tube spaghetti worm**
The papery tubes of this species are covered in gravel and shell. Tubes attached under rocks. Body green. Tree-like gills, 1 pair short, 1 pair long.

The spaghetti worms

Very common but easily missed in a wide variety of habitats, spaghetti worms include four families in our area. The most common family, the Terebellidae, give the group its common name because of the tangled mass of buccal (“mouth”) tentacles. The buccal tentacles extend out over the surface and capture prey items or organic particles that are then transported to the mouth.

Most spaghetti worms and their relatives are difficult to identify in the field. Microscopic examination of their gills, parapodia, and setae (hairs) is often required. The two species shown above are intended only to represent the family, and may not be the most commonly encountered species in some areas.

***Cirratulus* sp. – Filament worms**
Common under rocks in mud tubes. Resemble the related spaghetti worms, but have filaments (gills) running down entire body.

***Chaetozone* sp. – Spiny filament worms**
Unlike *Cirratulus* spp., the body segments of these worms (not shown) each have a ring of setae so their back half is accordion-like.

***Neosabellaria cementarium* – Stone mason worm**
The hard tubes of this species are often attached to shells. The tubes resemble concrete. Closely related to the feather duster worms.

***Owenia* sp. – Thread tubeworms**
The specific identity of this common intertidal worm has not been determined. Forms tangled mats of tubes in sand.

***Schizobranchia insignis* – Split branch feather duster worm**
Found intertidally among rocks. Tube, like the following species, is flexible and leathery (typical of Family Sabellidae). Radioles branched.

***Eudistyla vancouveri* – Vancouver feather duster worm**
This large (diameter of crown often 5 cm, 2”, or more) is common on floating docks. Green and red radioles typical, but variable.

***Myxicola infundibulum* – Slime tube feather duster worm**
Found in rock crevices, this unusual worm lives in a tube of transparent slime. The radioles are connected together forming a funnel.

The Feather Duster worms

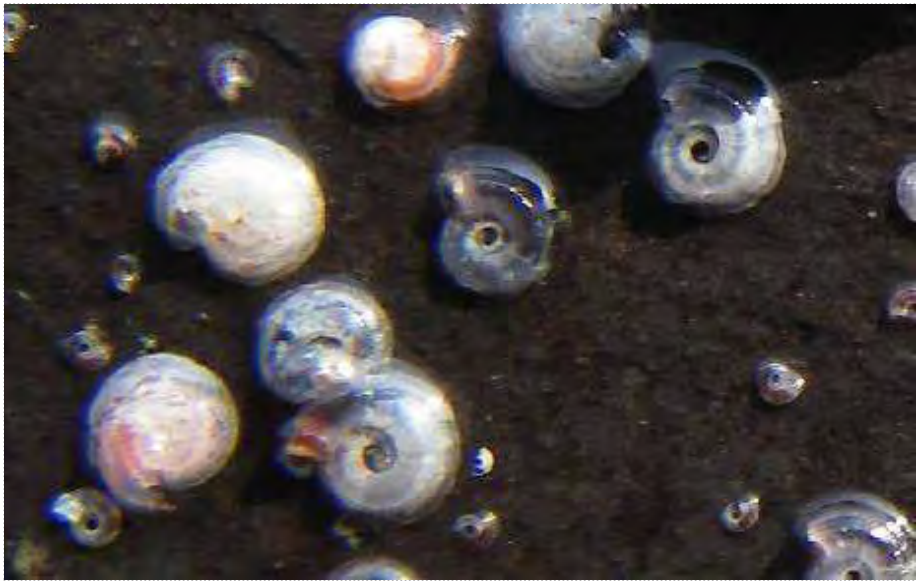
Two closely related families are collectively known as feather duster worms. The species on this page are in the family Sabellidae and typically have a tube composed of flexible proteins. The other family, Serpulidae, always have a tube composed of calcareous (shell-like) material.

The feeding tentacles of feather duster worms are called radioles. The radioles are typically extended into the water column and trap planktonic organisms which are transported to the mouth. Feather duster worms are difficult to positively identify in the field and often require dissection of their microstructures to determine species.

***Serpula columbiana* – Calcareous tube worm**
Common low intertidal and subtidal species. Tubes often growing in tangled masses. Formerly known as *Serpula vermicularis*.

***Crucigera zygophora* – Yoke-bearing calcareous tube worm**
Usually solitary, this tubeworm has thinner and fewer radioles than seen in the more common *Serpula columbiana*. Radioles often bright red at base.

***Pseudochitinopoma occidentalis* – Western serpulid**
A tiny (3 cm or 1.25”) species that forms thread-like tubes on rocks and shells. The shell has a dorsal keel that is distinct.



***Paradexiospira vitrea* – Glassy dwarf tubeworm**
Representative of the family Spiorbidae. Species are difficult to field id – best to leave at family. All with small spiral shells ~5 mm in diameter.

Family Enchytraeidae – Aquatic oligochaetes
Oligochaetes are the group that includes the common earthworm. This family is one of the more common in our area, difficult to id.

***Notostomobella cyclostoma* – Striped sea leech**
This marine leech is parasitic on sharks and rays, but most often seen on large crabs where it lays its eggs. Does not appear to feed on the crabs.

***Echiurus sitkaensis* – Alaskan spoonworm**
Spoonworms are generally placed in the phylum Echiura, which may eventually be placed within the annelids based upon genetics.

***Phascolosoma agassizii* – Peanut worm**
The peanut worms belong to a small phylum called the Sipunculida. These worms have a tough skin and a long retractable neck.

***Leptochiton rugatus* – Dwarf white chiton**
Small, rarely over 1 cm (0.4”) in length. White plates and girdle, often with rusty covering. Found under rocks partially buried in sediment.

***Cyanoplax fernaldi* – Fernald’s baby chiton**
A small (under 1 cm) chiton, this species is found in the upper intertidal zone among mussels and barnacles. Plates often eroded.

***Cyanoplax dentiens* – Gould’s baby chiton**
Most often found on the outer coast. Lives in the upper intertidal zone among barnacles and limpets. Often with black and white spotted girdle.

The Chitons – Phylum Mollusca, Class Polyplacophora

Chitons, locally known as gumboots, are primitive mollusks characterized by eight separate shell (called plates) surrounded by a tough band of tissue called the girdle.

Like snails, chitons feed by scraping organisms off of the substrate with a file-like tongue called the radula. The radular teeth of a chiton are composed of iron as the they must be durable.

There are about 75 species of chiton found in the north Pacific, more than any other area of the world. Eight species are found in the intertidal of Juneau.

***Tripoplax trifidus* – Three-ribbed scale chiton**
Recognized by the three broad ribs radiating outward from the center of plates 2-7. Orange to brown colored plates. Girdle with snake-like scales.

***Lepidozona interstinctus* – Smooth scale chiton**
Usually shallow subtidal, often on empty clamshells. Color highly variable. Plates appear smooth. Girdle with snake-like scales.

***Lepidozona mertensii* – Merten's scale chiton**
Usually found on the outer coast. Color typically brown, but violet specimens are common in Sitka. Girdle with snake-like scales.

The Scale chitons

This group of chitons are united by having their girdles covered with rows of scales. Under a microscope these scales resemble the overlapping scales as seen on snakes and lizards. Like most chitons, scale chitons feed on encrusting bryozoans, sponges, and algae.

This family, the Ischnochitonidae, is quite diverse. There are many other Alaskan species not shown here. Identification of these can be difficult as the key features are typically the patterns of ridges, pits, etc. on the plates. Like many chitons, color is generally not a good character as the plate and girdle coloration can be extremely variable.

***Tonicella lineata* – Red lined chiton**
One of the most common intertidal chitons, the pattern of lines on the plates are distinct. Color often obscured by algal growth.

***Tonicella undocaerulea* – Blue lined chiton**
Found on the outer coast, the blue lined chiton nearly always has bright blue zigzag lines. Like most of the genus, feeds on pink coralline algae.

***Tonicella venusta* – Lovely chiton**
Found primarily on the outer coast, the lovely chiton is often mistaken for juveniles of other lined chitons. White stripes on girdle are distinct.

***Tonicella insignis* – White lined chiton**
Common in the low intertidal and subtidal. The fine white lines on red background of plates is distinct. Girdle often with green spots.

***Schizoplax brandtii* – Spit-plate chiton**
Common in Juneau, this species has split down the center of each plate. Plates often dark blue-gray. Girdle typically black and white spotted.

***Katherina tunicata* – Black katy chiton or gumboot**
Common species often harvested for food. Shiny black girdle covers all but the center of the plates. Important subsistence species.

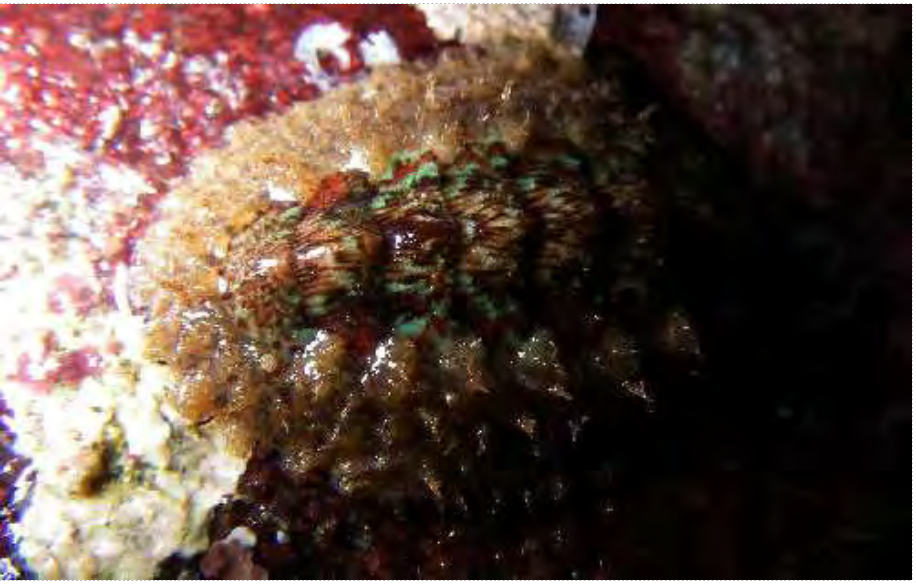
***Boreochiton beringensis* – Northern red chiton**
Found in the lowest intertidal and subtidal. Plates mottled red, green, or blue and girdle often mottled dull pink and white.

Plates, radula, and girdle

Scientists that study chitons rely on a complex combination of plate, girdle, and radula features to classify them into families, genera, and species. Increasingly, genetics has become an important tool for resolving the relationships between chiton species as well as higher level classification.

The radula (scraping tongue) of chitons is a cartilaginous band that bears many rows of metal-infused teeth. The specific shape and number of these teeth has been used to demonstrate the uniqueness of a proposed new species. The radula of the gumboot chiton (left) is large and easy to find by carefully cutting between the head and foot on the underside. The radula can be examined under magnification to see the rows of teeth.

***Mopalia kennerleyi* – Northern hairy chiton**
Common, found in the same habitats as the gumboot chiton. Girdle hairy with a distinct notch on posterior end.



***Mopalia ferreirai* – Ferreira's hairy chiton**
Low intertidal on outer coast. Similar to the closely related spectacular hairy chiton. The girdle hairs are thicker and girdle usually lacking stripes.

***Mopalia spectabilis* – Spectacular hairy chiton**
Usually found on the outer coast. The girdle hairs are moss-like. Plates often with turquoise flecks and lines. Girdle commonly striped.

The Hairy chitons

Members of the genus *Mopalia* are collectively known as the hairy or mossy chitons. As the name suggests, most of these have a girdle covered in hairs. The hairs may be thick or fine, sparse or very dense, depending upon the species. These chitons feed on a large variety of sessile invertebrates. The closely related Veiled chitons are actually predators on mobile animals such as shrimps and amphipods!

The Northern hairy chiton (upper left) is our most commonly encountered species. This species used to be known as *M. ciliata* until that species was split into northern and southern groups. The northern group was renamed *M. kennerlyi*. This change was fairly recent so the old name is commonly seen in field guides.

***Mopalia lignosa* – Woody chiton**
Restricted to outer coast. Girdle hairs sparse, girdle often spotted. Feather-like pattern on plates typical, background color green to white.

***Mopalia hindsii* – Hind's hairy chiton**
A large outer coast species, these sometimes have nearly black plates. The "basket-weave" pattern on the plate margins is distinctive.

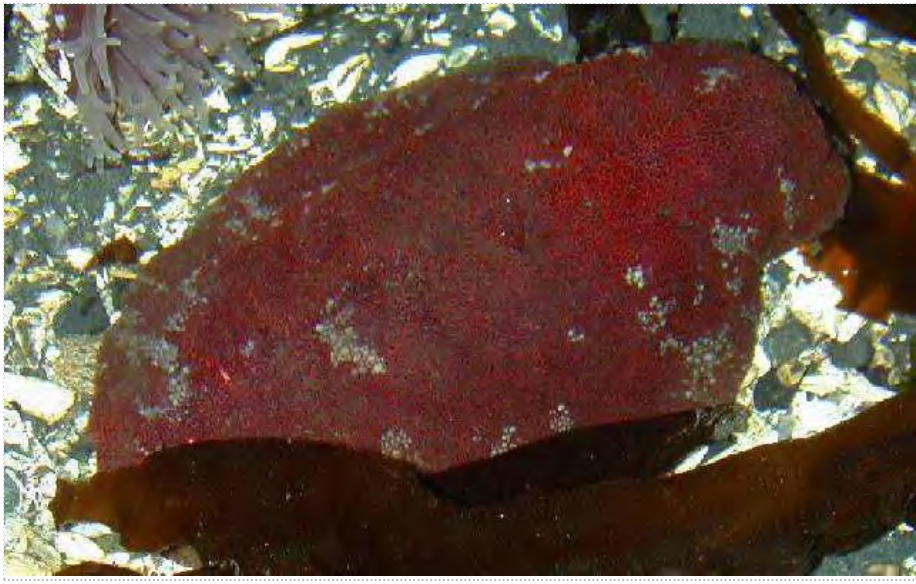
***Mopalia vespertina* – Smooth hairy chiton**
The nearly smooth plates and sparse, fine girdle hairs are distinct. The plates are often a shade of green, sometimes with white sections.

***Mopalia swanii* – Swan's hairy chiton**
The girdle hairs of this species are very fine so that the girdle appears naked. The plates are variable in color, sometimes all orange or white.

***Mopalia imporcata* – Branched hairy chiton**
A small species, usually subtidal. Common on empty clamshells. Heavily sculptured plates and finely branched girdle hairs are distinct.

***Mopalia cirrata* – Long-haired hairy chiton**
Sometimes common but easily missed, this small (<2 cm) chiton is found in the lowest intertidal. The very long girdle hairs are distinctive.

***Placiphorella rufa* – Red carnivorous chiton**
Most often subtidal but common. Enlarged girdle used to capture small crustaceans and even fish for food. Often upside down under rock ledges.



***Cryptochiton stelleri* – Giant chiton**
The world's largest chiton, reaching 35 cm (14") or more. Low intertidal and subtidal. Plates completely covered by girdle.

***Haliotis kamtschatkana* – Pinto abalone**
Found in the lowest intertidal on the outer coast, this species is the target for an important sport fishery. Feeds on large brown algae such as kelp.

***Cranopsis cucullata* – Hooded keyhole limpet**
Common but easily missed, this species is usually under 2 cm (3/4”) in length. The “keyhole” is slit-shaped. Often attached to pebbles or shells.

***Diodora aspera* – Rough keyhole limpet**
A common low intertidal species. Shell often with alternating black and white stripes. Often exceeds 5 cm (2”) in length. Oval “keyhole” on top.

The snails and slugs – Phylum Mollusca, Class Gastropoda

The largest group of mollusks, gastropods are typified by a single shell. This shell is most often coiled, but may be cap-shaped as in the limpets or absent as in the terrestrial slugs and marine nudibranchs.

Gastropods usually crawl on a large, muscular foot. The head and eyes are usually well-developed. Gastropods exploit multiple niches, with some being herbivores, others scavengers and predators. Many species are parasitic. The opening of most snails is protected by a structure called an operculum.

***Scelidotoma bella* – Elegant emarginula**
Found in the lowest intertidal and subtidal on the outer coast. This rare keyhole limpet lacks the characteristic keyhole found in most of the family.

***Margarites pupillus* – Puppet margarite**
A common mid to low intertidal species. The pink color and regular spiral lines are distinct. Like all margarites, the interior is iridescent silver.

***Margarites marginatus* – Smooth margarite**
This small (<1 cm) species is abundant on rocks and algae in the low intertidal. The exterior of the shell is smooth and often pearly. *M. helicinus* is a synonym.

***Margarites beringensis* – Bering margarite**
This common low intertidal snail is found on or around brown algae. Smooth shell is usually iridescent dark grey to black. Often > 1 cm.

***Calliostoma ligatum* – Blue ringed topsnail**
Common on the outer coast. Resembles the margarites, but has a taller spire. Often a light brown color with light rings and some blue.

***Calliostoma annulatum* – Purple ringed topsnail**
This uncommon beauty is usually subtidal. The gold and purple coloration is distinctive. This color unfortunately fades when the shell dries.

***Cidarina cidaris* – Spiny topsnail**
Always subtidal, but hermit crabs occasionally bring them into the intertidal. The beaded white or silvery exterior is distinctive.

***Bathybembix bairdi* – Baird's margarite**
This uncommon deep water snail has most often been found by dissecting the stomachs of flatfish such as the Dover sole pg). Commonly reaching 5 cm.

***Lirularia succincta* – Tucked topsnail**
This small (<1 cm) snail is abundant in the low intertidal on the outer coast. The silver exterior distinguishes this from margarites.

***Homalopoma luridum* – Dwarf berry turban**
Look in the lowest intertidal of exposed beaches for this small (<1 cm) snail. Operculum is white and calcareous unlike most local snails.

***Pomaulax gibberosus* – Red turban snail**
Rare in SE Alaska. A large snail (> 5 cm) with a calcareous operculum sometimes used in traditional Native artwork, usually as inlay in wood carvings.

***Tegula pulligo* – Dusky turban**
This common snail prefers to live in the canopy of large kelps such as *Macrocystis*, but is also found in the low intertidal of rocky beaches.

***Littorina sitkana* – Sitka periwinkle**
An abundant upper intertidal species found on *Fucus* and other algae. Variable color and sculpturing. Shell about as tall as wide.

***Littorina scutalata* – Checkered periwinkle**
Abundant high intertidal species. Variable shell color, often with alternating light and dark rectangles, the source of common name.

***Littorina plena*–Black periwinkle**
Common upper intertidal species, found on *Fucus* and other algae. Solid purple to black exterior usually has fine spiral ridges, may be eroded or pitted.

***Lacuna variegata* – Variegated lacuna**
Common mid to lower intertidal species. Often found on kelps and other brown algaes. Shell much thinner than in genus *Littorina*.

***Cryptobranchia concentrica* – Ringed blind limpet**
Usually little more than 1 cm (0.4”), this all white limpet is common on rocks in the lower intertidal zone.

***Acmaea mitra* – White cap limpet**
Almost always on pink coralline algae which often grows on the shell, this limpet had a nearly circular outline and solid white shell with tall apex.

***Tectura rosacea* (?) – Little rose limpet**
Rarely seen but sometimes common, this small (<1 cm) limpet is always found on coralline algae. The brown net-like pattern on shell is distinct.

***Lottia persona* – Mask limpet**
A common upper intertidal species, the relatively smooth shell with spots and stripes is distinct. Much higher peaked shell than *Lottia scuta*.

***Lottia scuta* – Plate limpet**
A common upper to mid intertidal species. The large circular or broadly oval shell is relatively flat. May reach 5 cm (2”) in length or more.

***Lottia digitalis* – Fingered limpet**
Found in the highest intertidal zone on the outer coast, the heavy ribs and apex nearly reaching front margin of shell are unique features.

***Lottia paradigitalis* – Dwarf ribbed limpet**
An abundant species in the upper to mid intertidal zone. Rarely reaching 1 cm (0.4”), this limpet is often eroded on top. Shell chalky white inside.

The Incredible Limpets

Unlike most snails, limpets have a simple, cap-like shell. Few other marine species have done so well in the highest intertidal zone as have these interesting snails. Some, like the fingered limpet (left), live high in the splash zone and are only submerged during the highest tides of the year. These rely on moisture from splashing waves and rainwater to keep their gills moist and are able to extract oxygen from the air.

Limpets can be difficult to identify. Important features are the relative height, length, and width of the shell, the position of the apex of the shell (center, toward the anterior end). The interior of the shell varies by species as well, may be solid white, with an apical brown spot, opaque, etc. Limpets scrape algae from the rock surface using their radula.

***Lottia instabilis* (rock form) – Speckled limpet**
Common in the low intertidal, this limpet resembles the plate limpet but longer than wide and lacking dark spot on interior. Formerly *L.* ochraceous.

***Lottia pelta* – Ribbed limpet**
An upper intertidal species. Similar to *Lottia persona*, the shell is thicker and posses faint ribs. Inside of shell with apical brown spot.

***Lottia pelta* (eelgrass form) – Eelgrass limpet**
Restricted to the outer coast, this species is almost always found on eelgrass (*Zostera marina*). May be abundant in some areas. Formerly *L paralella.*

***Lottia triangularis* – Coralline algae limpet**
A very small (<1 cm) species found on coralline algae. The shell is very narrow, about twice as long as wide. Common on outer coast.

***Turritropis cancellata* – Checkered hairy snail**
The soft hairs on the outside of this snail are distinct. These are nearly always found on or near tubeworms upon which they are kleptoparasitic.

***Vitreolina columbiana* – Cucumber sucker**
These shiny snails are ectoparasites of sea cucumbers in the intertidal zone. Note the bent spire. Usually under 1 cm.

***Ariadnaria borealis* – Northern hairy snail**
Usually subtidal, the thin shells are sometimes used by intertidal hermit crabs. Also found as fossils in the Juneau area.

Parasites!

The snails on this pages, as well as many others, are parasitic on or inside other invertebrates. The hairy snails (above) have a fascinating feeding style called kleptoparasitism. They do not feed directly on their host organism but steal the food the host captures. The checkered hairy snail and relatives sit at the top of tube worm tubes and wait for the worm to capture a small prey item. The snail then extends its proboscis and steals the food!

The cucumber sucker (left) and relatives are suctorial parasites of sea cucumbers. They pierce the skin of the cucumber and feed off of its body fluid.

***Cryptonatica aleutica* – Aleutian moonsnail**
While common in the low intertidal, these snails are usually completely buried. The operculum is calcareous. Related species seen rarely.

***Velutina plicatilis* – Spiral velvet snail**
Common low intertidal species. The incised spiral ridges distinguish this from the related smooth velvet snail (next page). On compound tunicates.

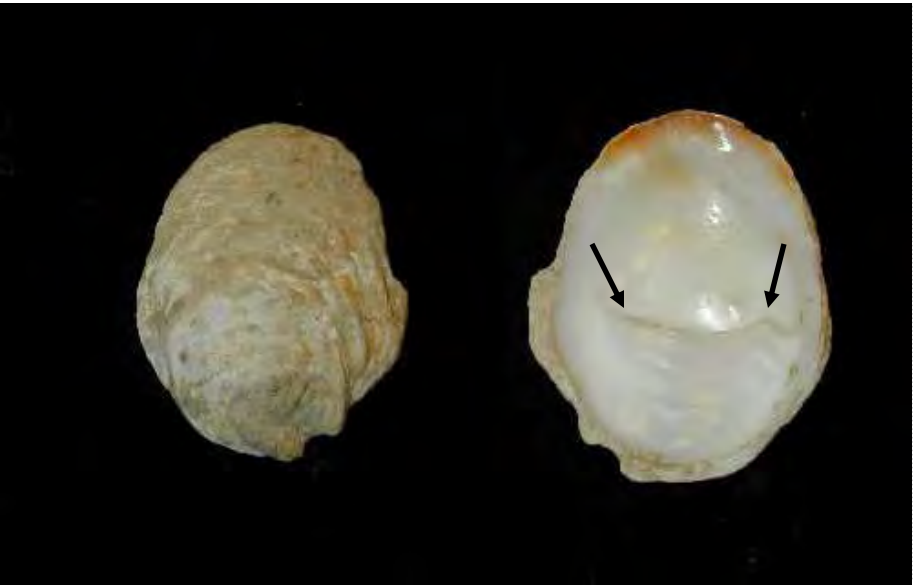
***Euspira pallida* – Pale moonsnail**
Common subtidal species usually under 4 cm in height. Corneous operculum. Giant relative, *E. lewisii*, (>10 cm) found south of Ketchikan.

Opercula – the snail's door

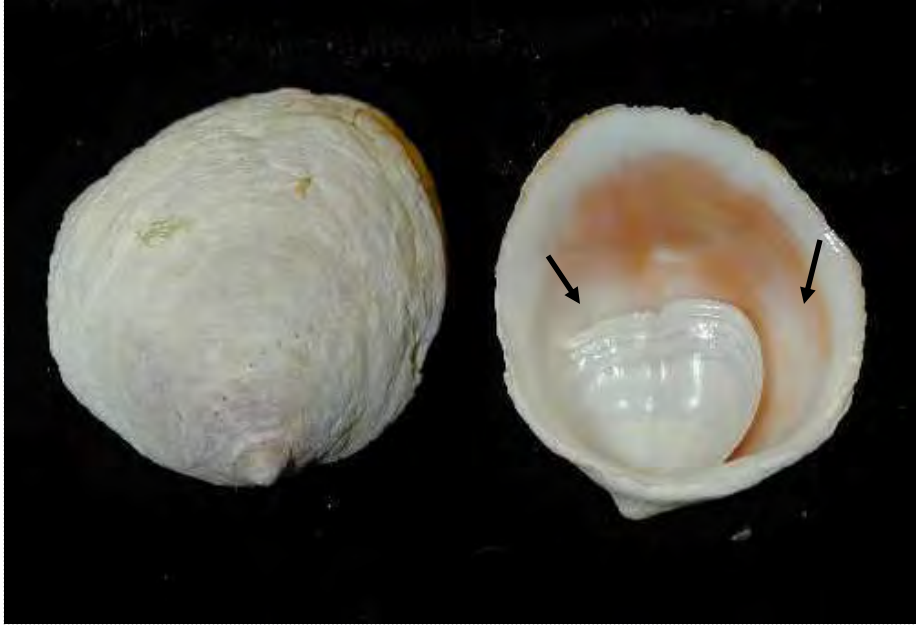
The majority of gastropods in marine waters have a structure on the back of their foot called an operculum. When the snail withdraws into its shell, the operculum blocks the opening. This serves to protect the snail from predators and to prevent drying out at low tide.

The moonsnails (above) demonstrate two main types of opercula seen in gastropods. Members of the genus *Cryptonatica* have a calcareous or 'stony' operculum that is made of the same material as the shell. Other moonsnails, such as *Euspira*, have an operculum made of protein. Proteinaceous or corneous opercula are typical brown colored and somewhat flexible. Most Alaskan marine snails have corneous rather than calcareous opercula.

***Limneria prolongata* – Smooth velvet snail**
The smooth velvet snail is common on encrusting organisms in the low intertidal. The shell lacks the spiral lines seen in *V. velutina*.



***Crepidula perforans* – Pacific white slipper shell**
While found on a variety of substrates, this species is most common on the inside of large snail shells with hermit crabs. Shelf crosses shell.



***Crepipatella dorsata* – Half slipper shell**
Unlike the Pacific white slipper shell (below left), this species is usually found on rocks in the low intertidal. Shelf inside does not cross shell.

Slipper shells

These limpet-like snails are characterized by a structure inside the shell called the shelf. Unlike limpets, slipper shells feed by a method called suspension feeding. Water containing plankton or other particles is cycled though the snail's mantle cavity and food is trapped by the gills and transported to the mouth.

There are several other species of slipper shell not illustrated here. One, the hooked slipper shell (*Crepidula adunca*) is found on the outside of other snail shells and has a dark brown shell. Another subtidal species, the shaggy white slipper shell (*Crepidula nummaria*) has a tattered yellow periostracum and is found on rocks, dead shells, etc.

***Epitonium indianorum* – Money wentletrap**
While empty shells are sometimes common in the intertidal, the live snail is rarely seen. Spire is over two times taller than wide.

***Boreoscala greenlandica* – Greenland wentletrap**
Spiral sculpture in between the varices are a unique feature of this rare species. Found buried in sand and gravel in the low intertidal.

***Epitonium tinctum* – Tinted wentletrap**
Look for these in sand around outer coast sea anemones. Spire is shorter than the money wentletrap, less than two times taller than wide.

Wentletraps – The Staircase Snails

From the Dutch word for “staircase” the common name of this family of snails comes from the regularly spaced varices on the shell of most species that reminded early shell collectors of a spiral staircase. This family is extremely diverse, with hundreds of species found mainly in the tropics.

Wentletraps are nearly all predators of sea anemones. They will use their mouthparts to pierce the skin of an anemone and feed off of the body fluids. The best way to find these snails is to look for the empty shells being used as hermit crab homes. To find live snails, the patient searcher will carefully dig around the sand and gravel at the bases of sea anemones.

***Opalia borealis* – Boreal wentletrap**
A predator of the giant green sea anemone, this outer coast species has relatively low varices that are fewer and less distinct than in other species

***Olivella baetica* – Baetic olive snail**
Usually smaller than the purple olive snail (<2 cm), this common species usually tent-like patterns on the shell. Outer coast and inside waters.

***Olivella biplicata* – Purple olive snail**
Found on high-energy outer coast sandy beaches. A larger species, commonly 2 cm or more in height. Often dark purple color around aperture.

Lebensspuren – Traces of life

Many intertidal marine organisms, including the olive snails on this page, are rarely found on the surface of the sediment but are hidden under the sand. To the untrained eyes, an open sand flat may appear barren and lifeless. But a second glance may reveal tracks, trails, bumps, or burrow openings that indicate something is hiding just below the surface. These signs of life are called Lebensspuren from the German for “life traces”

A practiced beach explorer can quickly learn to match the smallest hint of Lebensspuren to the animal responsible and, like a rabbit out of a magician’s hat, expose a Dungeness crab, a buried moonsnail, or a beautiful olive snail!

***Granulina margaritula* – Pear marginella**
Look for these tiny (<3 mm) snails among bryozoans and algae on the tops of rocks in the low intertidal zone. Large tropical family.

***Stylidium eschrichtii* – Threaded bittium**
A very common species on the outer coast. Look for this species under rocks and especially around the roots of surfgrasses. Other bittiums occur.

***Cerithiopsis stejnegeri* – Dwarf beaded cerith**
These tiny (<5 mm) snails are easily recognized by their purple color and tall, beaded spires. Often on sponges and bryozoans under rocks.

***Fusitriton oregonensis* – Oregon or Hairy triton**
This is Alaska's only relative of the famous Triton's trumpet snails found in the tropics. Common subtidal species, only rarely intertidal.

***Nucella lamellosa* – Frilled dogwinkle**
Abundant mid to upper intertidal species on the outer coast, inside populations most often low intertidal or shallow subtidal. Highly variable.

***Nucella canaliculata* – Channeled dogwinkle**
Resemples *Nucella lima*, but has a thicker shell and more regular and more deeply incised lines. Distribution sporadic. Variable coloration.

***Nucella ostrina* – Dwarf dogwinkle**
Most often seen on the outer coast. The small (2 cm, 0.8”) shell is highly variable in color. Formerly *Nucella emarginata*.

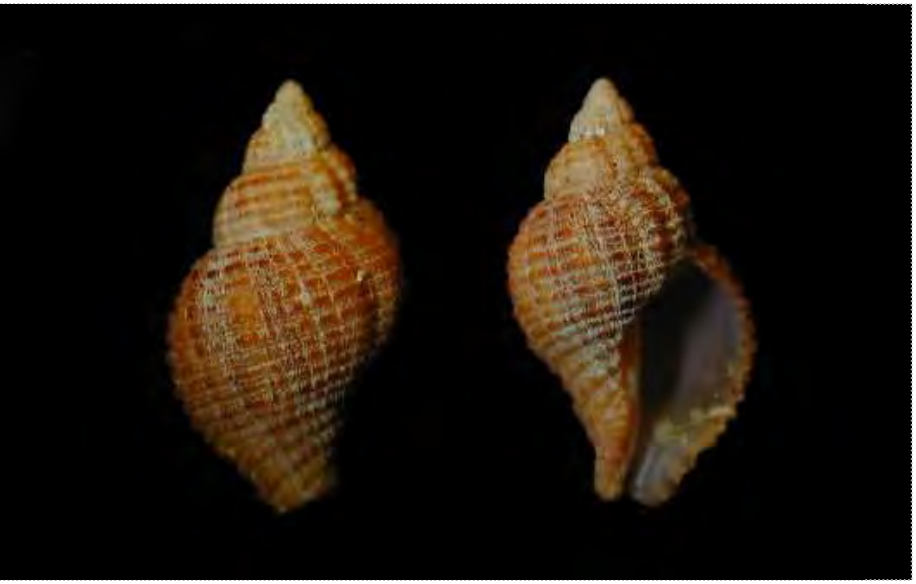
The Murex Snails

This very large family of predatory snails has both tropical and cold water representatives. Unlike many of the better-known tropical species in this family, most of ours lack the elaborate varices or long spines that typify this group.

This family includes the common dogwinkles in our region as well as the lesser known trophons and rocksnails. Many local species are predators of barnacles and mussels and are commonly found in areas with their prey items. Most murexes are capable of drilling holes into the shells of their prey, which is the source of the common name ‘oyster drills’ given to some members of this family.

***Nucella lima* – File dogwinkle**
Common intertidal species in Juneau. Ribs not as well defined as in *Nucella canaliculata*. Variable color and sculpturing.

***Ceratostoma foliatum* – Leafy hornmouth**
A common species on the outer coast, the aperture of this species has a characteristic sharp pointed tooth used to open barnacles. Variable color.



***Ocinebrina lurida* – Lurid rocksnail**
Common low intertidal species on the outer coast. Color is distinct, solid light orange to dark red. Spiral sculpture strong, varices weak to absent.

***Ocinebrina interfossa* – Sculptured rocksnail**
Locally common on the outer coast. The varices in this species are strong, as is spiral sculpture. Usually solid light gray to light purple color.

***Ocinebrina sclera* – Rough rocksnail**
Another common species on the outer coast. The varices are rounded and the spiral sculpture with small spines. Shell with brown or red flecks.

***Boreotrophon stuarti* – Stuart's trophon**
A large and beautiful species, this is most often subtidal but juveniles are sometimes intertidal. Crabbed specimens not uncommon in some areas.

***Boreotrophon multicostatus* – Many-ribbed trophon**
Common in some places, this trophon has a patchy distribution. Exterior of shell white, interior often purple.

***Scabrotrophon maltzani* – Sandpaper trophon**
Rarely intertidal, common in the shallow subtidal. The very long siphonal canal is distinct. Sculpturing variable, and related species may occur.

***Colus halli* – Hall's whelk**
Rarely intertidal, often caught in crab and shrimp traps. The dark to light brown periostracum and smooth shell are distinct.

***Lirabuccinum dirum* – Dire whelk**
A very common species in the upper to mid intertidal of the outer coast. Exterior usually gray, interior chocolate brown with fine dark lines.

***Volutharpa ampullacea* – Paper whelk**
A common intertidal species that is often missed. These are usually buried in sediment under and around rocks. Egg capsules are conspicuous.

The Whelks – Family Buccinidae

The buccinids are a family of snails that often numerically dominate arctic and temperate waters. This family includes a number of small common intertidal species as well as the largest shelled mollusks found in Alaska. Most buccinids are predators and scavengers, and many are considered pests in crab and shrimp pots as they climb in to eat the bait.

In addition to the species shown in this guide there are many others that are not as commonly seen but may be encountered. Many of these are subtidal and rare. The taxonomy of this group is confusing, and new species are regularly being discovered.

***Buccinum baeri* – Baer's whelk**
A common species that is often missed. Buried in sand under mid intertidal rocks. May be in large groups. Small operculum is distinct.

***Buccinum plectrum* – Sinuous whelk**
Usually subtidal, but empty shells are often seen. Attracted to crab and shrimp pots. Wavy ribbing on shell is distinct.

***Buccinum morchianum* – Pacific northern whelk**
Another species only rarely encountered in the intertidal. The fine spiral lines and knobbed spiral ribs are distinct.

***Beringius kennicotti* – Kennicott's whelk**
Usually subtidal, juveniles sometimes intertidal. The massive ribs and flaky brown periostracum are distrinct.

***Neptunea lyrata* – Ribbed neptune**
Often confused with the unnamed *Neptunea* sp. (right). This species has low spiral cords with smaller cords in between. Aperture often dark.

***Neptunea pribiloffensis* – Fat neptune**
Much thinner shell and more inflated than other *Neptunea*. Spiral cords weak. Abundant subtidal species, shells common in intertidal drift.

***Neptunea* sp. (undescribed) – Willet's neptune**
A common species that has yet to be scientifically named. The darker colored spiral cords without smaller cords in between are distinct.

The Neptune Snails

These very large snails are usually found subtidally, but it is not uncommon to find the shells washed ashore or being used by our largest hermit crabs. Two common species (*Neptunea* sp. undescribed and *Neptunea pribiloffensis*) may occasionally exceed 15 cm (6") in length.

Some neptunes deposit their egg capsules in tall columns, while others deposit in flats rows. The egg capsules are occasionally washed ashore or brought up by fishing gear. The capsules are typically yellow when alive, transparent when embryos have hatched. Sometimes the capsules will contain tiny snails, complete with little shell!

***Nassarius mendicus* – Lean basket snail**
This common snail lives in sandy areas and remains buried most of the time. These are mostly scavengers on dead fish and invertebrates.

***Amphissa columbiana* – Wrinkled dove snail**
This common snail is highly variable in color, ranging from yellow to dark brown, often with striking markings on shell. Mostly scavengers.

***Alia carinata* – Keeled dove snail**
A very common intertidal snail on the outer coast. Often abundant in eelgrass beds. Strong keel is distinct. Rarely over 1 cm in height.

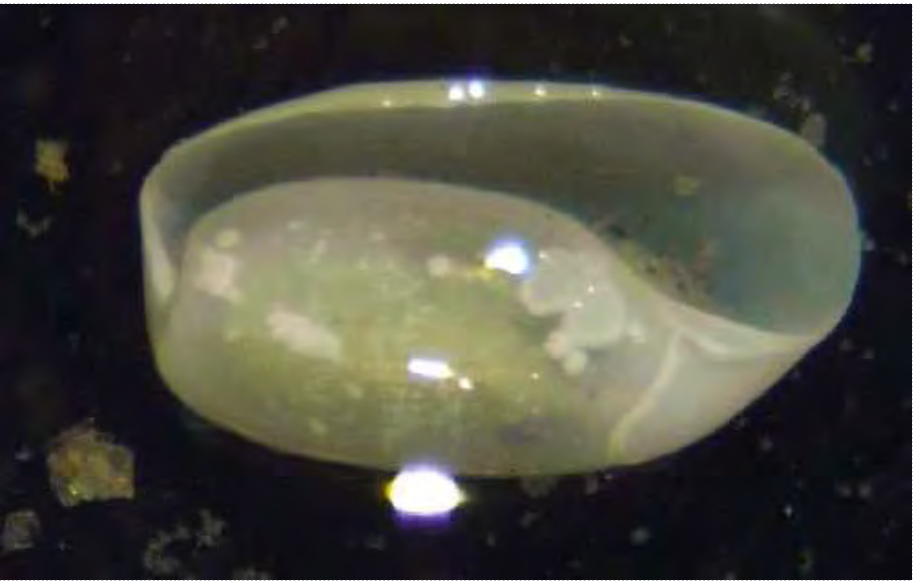
***Kurtziella crebicostatus* – Violet band mangelia**
Sieving sand in the lowest intertidal zone may reveal this small (<2 cm) but beautiful snail. The violet spiral banding is distinct.

Cone Shells in Alaska?

The turrids, including the snakeskin turrid to the left and the violet band mangelia on the previous page are members of the superfamily Conoidea. This family includes the famous cone shells of the tropics. Like cone shells, turrids have a radula that is used as a harpoon to deliver a powerful toxin to their prey. Some cone shells can deliver a painful or even fatal sting to humans unlucky enough to pick them up by the wrong end. Ours are completely harmless except to the unlucky worms they encounter.

There are several dozen members of the turrid family found in the Northeastern Pacific. I have included two common species, but several others may be found by careful sieving of low intertidal and subtidal sediments.

***Ophiodermella inermis* – Snakeskin turrid**
When the tide begins coming in, look for this species in eelgrass beds as they emerge from the sediment. Tall spire and fine spiral lines are distinct.



***Acteocina culcitella* – Western barrel bubble shell**
The narrow shape of this small (<1.5 cm) bubble snail helps distinguish it from related forms. These are mainly subtidal in sand and mud.

***Haminoea vesicula* – White bubble snail**
This common inhabitant of eelgrass beds looks very much like a nudibranch when alive as the shell is completely covered by the mantle.

***Onchidoris bilamellata* – Barnacle eating nudibranch**
Very common under rocks in the mid intertidal zone. Brown and yellow mottling is distinctive. Usually under 3 cm (1.2”).

***Montereina nobilis* – Sea lemon nudibranch**
A large species (to 15 cm, 6”). Yellow color with brown and black dots distinctive. Low intertidal and subtidal. Formerly *Peltodoris nobilis.*

***Dialula sandiegensis* – Leopard nudibranch**
Common in the low intertidal. Always with brown spots, but number of spots and background color variable, from white to brown.

Dorid Nudibranchs

The dorid nudibranchs (superfamily Doridoidea) are a diverse group that is characterized by an oval, usually firm rounded body covered in abundant, short papillae. Many dorids are specialized feeders on sponges, bryozoans, and colonial tunicates.

This group is probably the most often encountered group of nudibranchs in the intertidal zone. Many species are easy to identify based on color pattern. The body color, presence or absence of spots, pattern of coloration on papillae or body margin, etc. are good field characters.

***Adalaria* spp. – Tiny white dorids**
Searching carefully under rocks may reveal this small (< 1 cm) dorid that lives on bryozoans. Group difficult to identify to species.

***Cadlina luteomarginata* – Yellow rimmed doris**
Sometimes common in the lowest intertidal, the yellow spots on the short papillae and yellow margin of body are distinct features.

***Acanthodoris nanaimoensis* – Nanaimo spiny doris**
The cream to yellow tipped papillae with maroon gills and rhinophores are distinct features. Low intertidal and subtidal.

***Acanthodoris pilosus* – Hairy spiny doris**
Common but easily missed. Under rocks in the low intertidal zone. Some populations are white. Sharp pointed papillae distinct.

***Rostanga pulchra* – Red sponge doris**
This dorid almost perfectly matches the red sponge upon which it lives and feeds. Usually less than 2 cm in length, on multiple species of red sponge.

***Triopha catalinae* – Clown nudibranch**
A common nudibranch, the (usually!) solid white body with orange tipped gills, papillae, and rhinophores is unique. Dark individuals sometimes common.

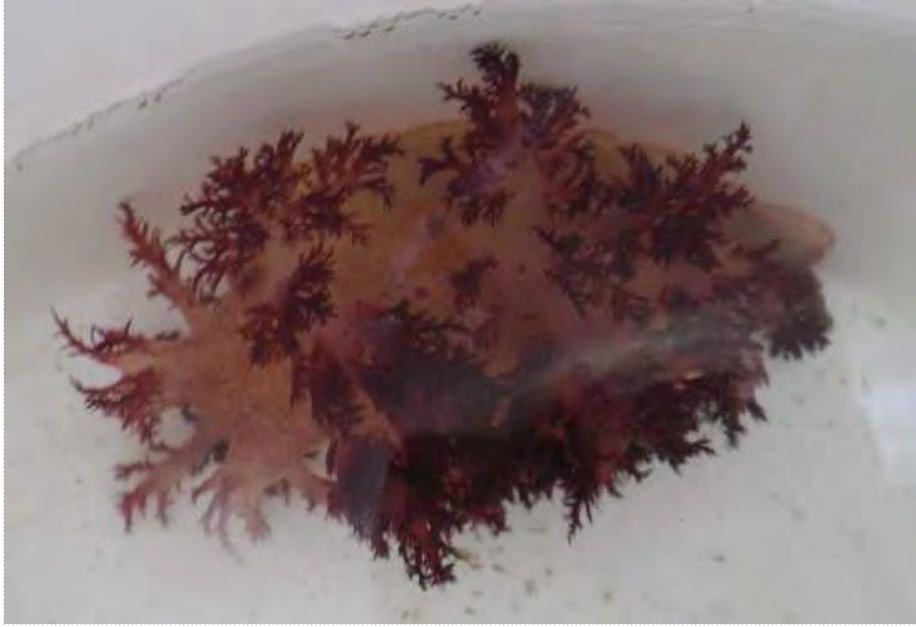
***Aegires albopunctatus* – Salt and pepper nudibranch**
Usually subtidal, this uncommon dorid cannot be confused with any other species with its long papillae and white color with dark spots.

Naked gills and rhinophores

The term nudibranch literally means “naked gills”. This refers to the fact that, unlike most gastropods, the gills of nudibranchs are not contained in the mantle cavity. In the majority of species, the gills are feathery structures in a ring that extend from the posterior portion of the dorsum (back).

The rhinophores (“nose bearing”) of nudibranchs are clublike structures on the head that detect chemicals in the water. The chemicals may be from predators, prey, or potential mates. Both the gills and the rhinophores of nudibranchs can be withdrawn into the body, so are usually seen only when the animal is underwater.

***Melibe leonina* – Hooded nudibranch**
This bizarre species does not resemble a nudibranch at first glance. Strong swimmers. Sometimes abundant in eelgrass beds when spawning.



***Dendronotus rufus* – Red dendronotid**
Most often subtidal, the spectacular dendronotids commonly exceed 15 cm in length. Several species occur in southeastern Alaska.

***Dirona albolineata* – Frosted nudibranch**
When exposed by the tide, this species looks like a blob of jelly. Underwater the beautiful white-fringed cerata extend.

***Aeolidia papillosa* – Shag rug nudibranch**
Common in the low intertidal and on floating docks. This nudibranch feeds on sea anemones. Color variable, from light brown to purple.

***Hermissenda crassicornis* – Opalescent nudibranch**
This beautiful nudibranch can often be seen in the low intertidal on large brown algae where it feeds on hydroids. Color pattern distinct.

***Janolus fuscus* – White and orange tipped nudibranch**
A beautiful and rarely seen nudibranch in Alaska, this species has distinct bright orange-tipped cerata with a white “cap” on the end.

***Flabellina triophina* – Red flabellina**
Common on the outer coast, this is one of many similar species of *Flabellina* found in Alaska. Species difficult to separate.

Eolids – Armed to the Cerata

This group of nudibranchs, the Eolids (including the frosted and shag rug nudibranchs from the previous page) have a unique defense mechanism. When they feed on sea anemones and hydroids, the stinging cells of their prey are transported to the tips of their cerata without firing. These stinging cells are then used to defend the nudibranch from predators! The cerata of eolids contain elongate extensions of their digestive system which allows transport of the stinging cells. The bright colors of this group are a warning to would-be predators that these soft bodied creatures carry a powerful sting.

***Odostomia columbiana* – Clam sucker**
This tiny (under 5 mm, 0.2”) snail is extremely common but easy to miss. Parasitic on other mollusks. Related to nudibranchs despite coiled shell.

***Siphonaria theristes* – Pacific false limpet**
Resembles true limpets but apex of shell is asymmetrical. Body extends past shell. Found in the upper *Fucus* zone, patchy distribution.

***Onchidella borealis* – Leather limpet**
Common in the upper intertidal, near the top of the *Fucus* zone. Related to land snails and slugs. No shell, spiny margins distinct.

Life in the high tide zone

Several groups of snails, such as the true limpets, leather limpets, false limpets, and periwinkles live in the highest portion of the intertidal zone and may only be submerged during the highest tides. Many of these are capable of limited gas exchange with the air and use their mantle cavity and gills as a type of lung. Others, such as the true limpets, seal themselves to the rock to prevent drying out.

The unusual leather limpet faces another problem. As a relative of the land snails and slugs (Pulmonata), it has to cope both with drowning if submerged too long and with cell damage due to salt concentration. This species produces a thick mucous to protect against salt and can ‘hold its breath’ during high tide!

***Yoldia hyperborea* – Northern yoldia**
Rarely intertidal, although shells was up on beach. Commonly found in shallow mud dredgings. Many other *Yoldia* species present.

***Acila castrensis* – Tent nut shell**
The pearly interior and tent-like radial grooves on exterior are distinct. Common shallow subtidal species found in dredgings.

***Nuculana pernula* – Common nut clam**
One of many in the genus found in the subtidal zone. A common food for many flatfish and found in their stomachs. Abundant in dredgings.

The bivalves – Phylum Mollusca, Class Bivalvia

This common group includes clams, mussels, and scallops as well as a host of lesser known forms. All are characterized by two shells (bivalved) held together by a proteinaceous ligament.

Important commercial species are included in the Bivalvia such as scallops, oysters, and the famous geoduc. Bivalves lack a head, unlike most mollusks, and therefore the radula as well. Most species posses a powerful foot for locomotion or burrowing. Many species can also use the foot to secrete strong fibers called byssal threads. Most of our bivalves can be easily identified in the field.

***Ennucula tenuis* – Little nut clam**
Another subtidal species, this clam is about the same size and shape as a cherry pit, but with an iridescent yellow-brown exterior. May be common.

***Mytilus californianus* – California mussel**
This huge mussel commonly reaches 20 cm (8”) or more. Usually found on rocks with heavy surf. Longitudinal ribs on shell are distinct.

***Mytilus trossulus* – Blue mussel**
Abundant mid-high intertidal species, forms distinct zone. Accumulates PSP from plankton, considered unsafe to eat in Southeastern Alaska

Byssal Threads

Many bivalves, such as the mussels on this page, are capable of secreting a tough proteinaceous fiber called byssal threads. These fibers are secreted by the foot and are a liquid that immediately hardens on exposure to seawater.

The byssal threads serve several purposes. For many species, these threads anchor the animal to the substrate or to other members of the species. The threads may also be used to temporarily bind a potential predator such as a seastar or dogwinkle snail. By dissolving old threads and reattaching, many species can use the threads to slowly move along the substrate like a slow-motion spider.

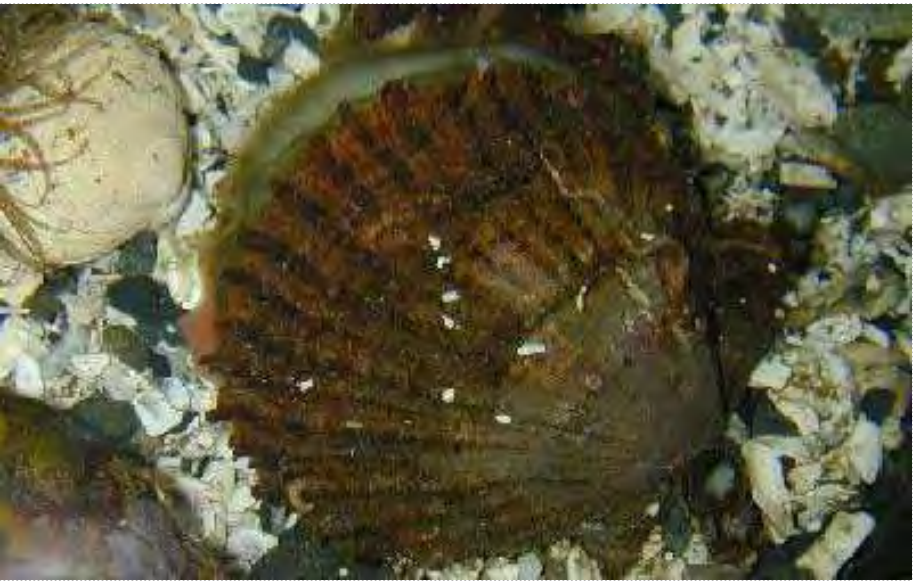
***Modiolus modiolus* – Northern horse mussel**
Sometimes low intertidal, forms dense subtidal beds. Color and shape help separate from *Mytilus*.

***Musculus niger* – Black mussel**
Common name due to black patina that forms on outside of shell. Makes 'nest' of byssal threads. Common species in the shallow subtidal.

***Musculus discors* – Discordant mussel**
Look for this mussel in kelp holdfasts washed ashore where it often occurs in groups. The yellow periostracum is distinctive.

***Patinopecten caurinus* – Weathervane scallop**
A very large (>15 cm or 6" diameter) scallop usually found in the subtidal. Important commercially harvested species in Alaska.

***Chlamys hastata* – Spiny pink scallop**
Similar to *C. rubida*, the tiny spines on the rays distinguish this species. Usually subtidal, although juveniles may be common in low intertidal.



***Crassadoma gigantea* – Rock scallop**
This unusual scallop permanently attaches to the substrate and grows an irregular shape. Lowest intertidal on the outer coast.

***Chlamys rubida* – Smooth pink scallop**
More rounded shape and smooth ribs distinguish this species from *Chlamys hastata*. Common subtidal species.

Scallops

Well known to seafood lovers, this group of bivalves are characterized by wing-like extensions around the umbo of the shell. Another unique characteristic of scallops is that, unlike other bivalves, they have eyes that line the margin of the mantle. These eyes can detect predators and there may be several dozen on a single scallop. Like mussels, scallops can secrete byssal threads.

When a predator approaches many scallops are capable of swimming to safety by clapping their shells. This swimming is somewhat haphazard, but often sufficient to move the scallop away from a seastar predator. The powerful adductor muscle that allows this swimming behavior is also what makes these bivalves a target for harvesting by humans.

***Parvamussium alaskense* – Alaska glass scallop**
A subtidal scallop, this species is frequently found in the stomachs of flatfish. Only scallop with lower valve smooth with raised ribs on inside.

***Crassostrea gigas* – Pacific oyster**
While not native to Alaska, this import from Asia is a fairly important farmed species in some areas. Purple markings are distinct.

***Pododesmus machrochisma* – Jingle shell**
A common low intertidal and subtidal species. Flat shell conforms to substrate. Attached valve has a large tear-drop shaped hole . Interior greenish

***Mya truncata* – Truncate soft-shelled clam**
The most common soft-shelled clam in our area. Sometimes found dead with siphon skin attached to shell.

***Mya arenaria* – Soft-shelled clam**
Posterior end more pointed, not flattened as in *M. truncata*. Locally common in sand and mud, may burrow deep.

***Cryptomya californica* – California smoothshell clam**
This small (<3 cm) clam is found most often in the burrow lining of mudshrimps or other burrowing invertebrates.

***Tresus capax* – Fat Horseclam**
The large, rounded shells are common in beach drift. Brown, rough siphons often seen at low tide in sand and gravelly areas.

***Mactromeris polynyma* – Pink-necked clam**
Common in some regions, large flattened shells are distinct. Siphons with pink or red tips. Juveniles with yellow periostracum

***Hiatella arctica* – Nestling clam**
Common under low intertidal rocks. Cannot completely draw in siphon. The red-tipped siphons and rectangular shell shape are distinct.

***Zirfaea pilbryi* – Rough piddock**
Burrows into clays and soft mudstones. Large off-white siphons with brown to black wart-like pustules. Very difficult to dig out of substrate.

***Panopea abrupta* – Geoduc clam**
The largest burrowing clam in the world and an important fishery. Rarely intertidal, common subtidally in certain areas.

Siphons – A Snorkel and a Straw!

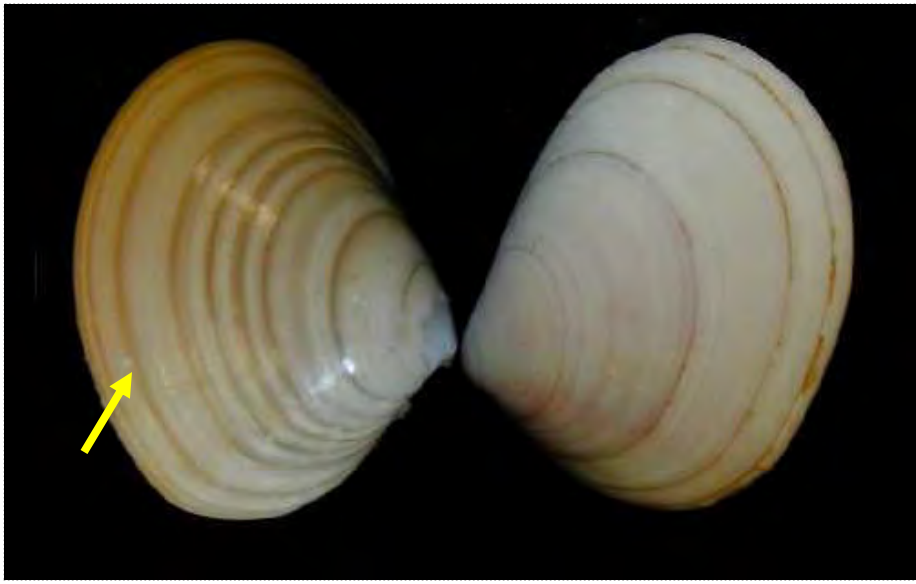
One characteristic seen in most bivalves are the paired siphons that extend from the posterior end. A typical bivalve (such as a clam) that is buried in the sediment is actually upside-down, with the anterior end pointing down and the posterior end toward the sediment surface.

In most bivalves the siphons are fused into a single structure with two internal tubes. Some groups, like the tellins and macomas on the next pages, have the two siphons separate. One is typically for drawing in water (incurrent siphon) and the other for expelling water (excurrent siphon). The incurrent siphon brings in water containing both oxygen and plankton (food). Oxygen depleted water containing organic waste is expelled through the excurrent siphon.

***Bankia setacea* – Shipworm**
The calcareous burrows of these bivalves are often seen in driftwood. The worm-like body has a small pair of shells used for excavating wood.

***Angulus modesta* – Plain tellin**
The small (<2 cm) shells of this species are frequently found in drift. Shells are glossy white and partially transparent.

***Angulus carpenteri* – Carpenter's tellin**
Similar to the plain tellin, Carpenter's tellin has faint pink radial stripes on an off-white to yellow background. Shell usually under 2 cm in length.



***Angulus nuculoides* – Salmon tellin**
Similar to the Baltic macoma (next page), this uncommon species has a much thicker shell with characteristic brown growth lines.

***Macoma nasuta* - Bent-nosed macoma**
Posterior of shell distinctly bent in profile. Abundant species. Like many macomas, often buried deep in anoxic (black) mud.

***Macoma balthica* –Baltic macoma**
Abundant throughout the northern hemisphere. Small species (< 2 cm), shell often pink but sometimes white or yellow. Tolerant of fresh water.

***Macoma inquinata* – Stained macoma**
Similar to *M. nasuata*, but lacks bend on posterior portion of shell. Shell often rust stained. Abundant species.

The Tellins and Macoma clams

This family of bivalves are common on most beaches but typically only seen as empty shells cast ashore. Many of the *Macoma* species tend to have a chalky shell while tellins have a glossy shell. All members of the family are characterized by very flat valves.

Unlike most bivalves, tellins and macomas have their incurrent and excurrent siphons separated. The long white, worm-like siphons of macomas are sometimes seen by clam diggers. Macomas are often found deep in the sediment, typically in the black, anoxic layers. They will have their siphons extending into the burrows of larger clams, spoonworms, mudshrimps, etc. to get a constant supply of surface water.

***Clinocardium nuttallii* – Heart cockle**
Common low intertidal species, often not buried. Commonly exceeds 10 cm in length. Displays escape response to sea stars.

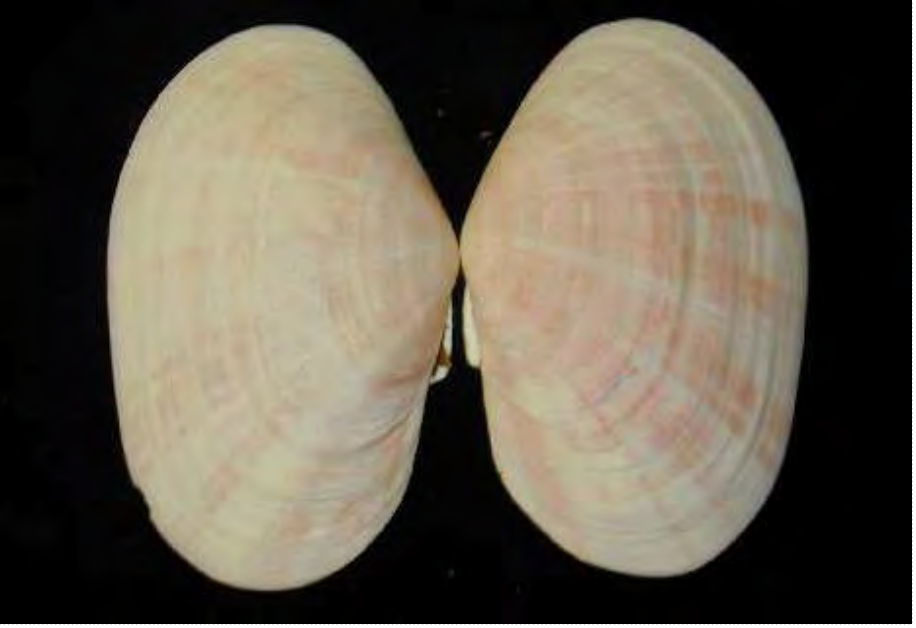
***Serripes laperousi* – Broad smooth cockle**
Similar to the Greenland smooth cockle, the shell is more elongate. Shell with an adherent yellow periostracum. Interior of shell pale yellow.

***Serripes groenlandica* – Greenland smooth cockle**
Juveniles are brightly colored, but adults become dull gray and lose the tent-markings. Rarely intertidal.

The Versatile Bivalve Foot

The majority of bivalves have a muscular foot on the anterior end of the body. While typically used for digging, the foot serves a variety of functions. Members of the family Cardiidae, the cockles, have a very large and powerful foot that they use to vault themselves over the sediment surface. Each flip can move the cockle many times farther than the length of the shell! This response is best seen in the presence of a seastar, but will sometimes do this when the tide turns.

As discussed before, bivalves such as mussels and scallops have a greatly reduced foot that is useless for digging but instead can secrete the tough byssal threads used to anchor to the substrate.



***Gari californica* – California sunset clam**
The oval valves of this species are sometimes common in the drift line, but living clams are rarely encountered. Shell shape with pink rays distinct.

***Semele rubropicta* – Rose painted clam**
Another species rarely seen alive but common as empty valves. Found in the same areas as *Gari californica* (left), the valves are much rounder.

***Siliqua patula* – Pacific razor clam**
Found only on outer coast high-energy sandy beaches. A much sought-after food item, these clams are famous for their digging speed.

***Axinospida serricata* – Tiny sulfer miner**
Tiny, under 1 cm (0.4”) clams that may mine sulfer to feed internal bacterial colonies, as has been documented in related species.

***Turtonia minuta* – Minute venus clam**
Carefully searching coralline algae covered rocks on the outer coast may reveal this tiny (2-4 mm) bivalve nestled among the branches.

***Astarte elliptica* – Elliptical astarte**
A common subtidal species characterized by a brown periostracum and massive concentric (growth) lines separated by deep grooves.

***Astarte esquimalti* – Wavy line astarte**
Another common subtidal species, this species is similar to the elliptical astarte but has finer concentric lines that curve down in the center region.

***Protothaca staminea* – Steamer or littleneck clam**
The equally-sized concentric and radial lines identify this species from juveniles of *Saxidomus*.

***Compsomyax subdiaphana* – Milky venus clam**
Usually subtidal, this clam resembles a butterclam but has a much thinner and more inflated shell. Shell often with adherent sand grains.

***Humilaria kennerleyi* – Kennerley's venus**
Very similar to a butterclam, the shell of this species is extremely thick and has very strong concentric growth lines. Inner lip with fine teeth.

***Saxidomus giganteus* – Butter clam**
Abundant species. Accumulates and stores PSP, so not recommended for harvesting in our region. Only fine concentric lines.

Paralytic Shellfish Poisoning

Most Alaskan bivalves are occasionally rendered toxic by paralytic shellfish poisoning (PSP), sometimes called "red tide". The toxin (called Saxitoxin) comes from blooms of a dinoflagellate algae called Alexandrium catenella. The bivalves feed on the algae and the toxin may be sequestered in the tissue of the clam.

Some bivalves, such as the butterclams (above) not only store the toxin deliberately but alter the chemical to make it even more toxic. Butterclams and mussels can retain a toxic level of saxitoxin for a year or more after an algae bloom. The only safety guarantee is to eat clams that have been recently tested, something not possible on most of Alaska's beaches.

***Pandora bilirata* – Two ridged pandora**
Exclusively subtidal, this very flat bivalve has two distinct ridges on the upper valve. Also, these have a less pronounced “beak” than the threaded pandora.

***Pandora filosa* – Threaded pandora**
Like all pandora clams, the lower valve is flat or even concave. Upper valve with an elongate “beak” on the posterior end. Always subtidal.

***Entodesma navicula* – Northwest ugly clam**
Common in low intertidal rocky areas. The thick periostracum will contract when dried, causing the shell to catastrophically shatter.

***Lyonsia californica* - California lyonsia**
The fragile, pearly shell with thin sandy periostracum is distinct. Found in the lowest intertidal and subtidally, common in eelgrass beds.

***Antalis pretiosum* – Indian tuskshell or Dentalia**
These unusual mollusks are exclusively subtidal. The shells are often seen in Tlingit, Tsimshian, and Haida beadwork and regalia.

***Berryteuthis magister* – Magister armhook squid**
This large squid is occasionally caught on hook and line gear, and is a prominent bycatch in the trawl fishery. Bright red when fresh.

***Enteroctopus dofleini* – Giant Pacific octopus**
While adults are nearly always subtidal, juveniles may be found in the low intertidal. Largest octopus in the world, commonly exceeding 2 meters.

Tuskshells and Cephalopods

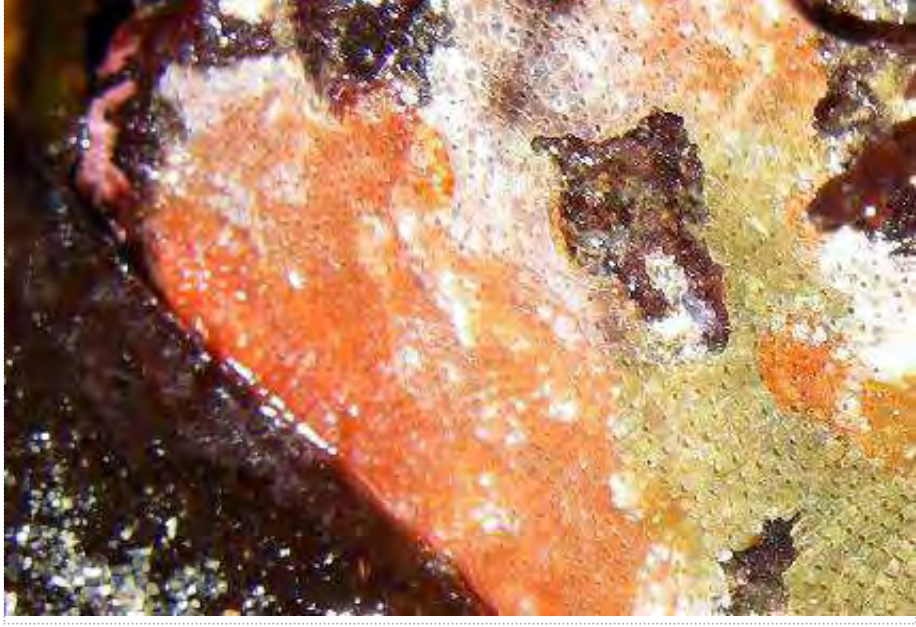
Two mollusk classes not normally encountered by the casual beach explorer are the Scaphopoda or tuskshells and the Cephalopoda (octopuses and squids).

Scaphopods, called tuskshells or dentalia, are deeper water predators of other burrowing invertebrates. The shells are tusk-shaped and nearly always white. *Antalis pretiosum* was harvested by First Nation peoples and used for beadwork and traded inland (at least as far as the Mississippi River!)

Cephalopods are generally few in species but well known to most people. Octopus are highly intelligent predators of the ocean bottom. Squid and relatives tend to be open water (pelagic) and often form large schools. Cephalopods are masters of color change.

***Membranipora serrilamella* – Kelp bryozoan**
Abundant as white crust on large brown algae (kelps). Often found in drift. Colonies begin in a circular shape, then become irregular.

***Dendrobeania lichenoides* – Lichen bryozoan**
Distinguished by the flexible, fan-shaped lobes that are not attached to the rock around their margins. Very common low intertidal species.



***Membranipora fusca* (?)– Orange crust bryozoan**
Found on lower intertidal rocks, this bryozoan can be abundant. Living portions of the colony are orange, dead portions white.

The Moss animals – Phylum Bryozoa

These hydroid or coral-like animals are always colonial. While they resemble colonial cnidarians, these tiny creatures posses a lophophore similar to that of the brachiopods. It is thought that bryozoans, along with brachiopods, mollusks, ribbon worms, and annelids (along with a few smaller phyla) form a natural group called the Lophotrochozoa.

This is an extremely diverse group, and difficult to identify even in the lab. Proper id's often require examination by specialists. There are a few species in our region that can be identified by color, shape, or habitat.

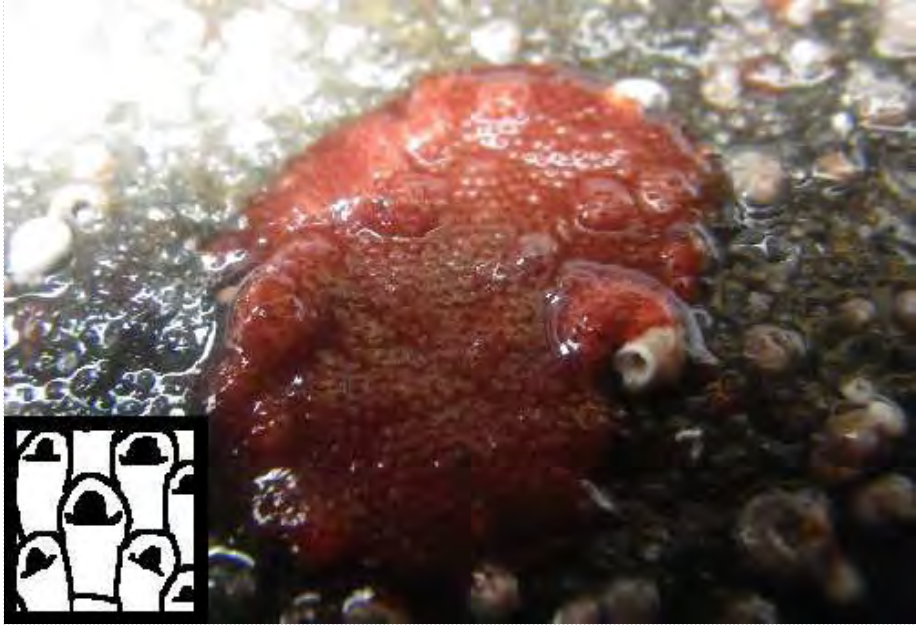
***Dendrobeania murrayana* – Fan bryozoan**
Common subtidal species. The flat tan or brown branches that are truncate at ends are distinct. Colony resembles seaweed and is flexible.

***Crisia* sp. – White tuft bryozoan**
This delicate branching bryozoan is common in the low intertidal. Resembles some hydroids, white to cream color distinct.

***Flustrellidra corniculata* – Spiny leather bryozoan**
Young colonies often on coralline algae , larger colonies encrusting on rocks in the low intertidal on exposed portions of the outer coast.

***Alcyonidium pedunculatum* – Smooth leather bryozoan**
A strange bryozoan found in the subtidal. Zoids embedded in a firms semi-transparent gelatinous matrix. Zoids small and light colored.

***Stomachetosella cruenta* – Red hardhat bryozoan**
Forms dark red to maroon hard patches on the undersides of low intertidal rocks. Zooids hexagonal and orifice round.



***Eurystomella bilabiata* – Derby hat bryozoan**
Forms dark pink to maroon hard patches on the undersides of low intertidal rocks. Oriface shaped somewhat like the profile of a derby hat (see inset).

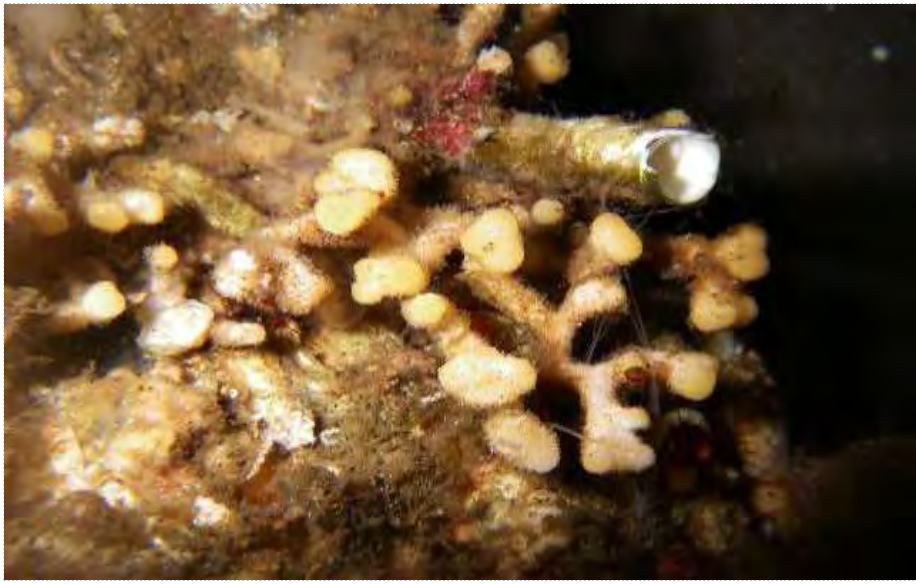
***Electra crustulenta arctica* – Hard crust bryozoan**
Forms raised, hard irregular patches on rocks in the low intertidal zone. Opening with single tooth (see inset) visible with magnification.

***Primavalens insculptata* – Fluted bryozoan**
Sometimes abundant on the outer coast, the fluted bryozoan forms large brittle colonies on the sides of boulders. The yellow margin is distinct.

***Lichenopora* spp. – Tube bryozoan**
A large, complex genus of bryozoans characterized by raised, tube-like zoids. Low intertidal to deep subtidal on hard structures.

***Patellina verrucaria* – Coral bryozoan**
The distinct cup-like surface with raised margin makes this small (under 1 cm) bryozoan. Low intertidal to deep subtidal, under rocks or on corals and sponges.

***Disporella separata* – Purple encrusting bryozoan**
This beautiful violet bryozoan looks similar to encrusting hydrocorals. These are found in the low subtidal on the outer coast on rocks.



***Heteropora pacifica* – Pacific staghorn brryozoan**
Usually subtidal, this species is occasionally seen in the low intertidal. The yellow branches fork repeatedly as the colony grows.

***Terebratalia transversa* – Common lamp shell**
This is the only species that is regularly encountered in the intertidal zone, and then usually on outer coast. Common subtidal species.

***Hemithyris psittactea* – Black lamp shell**
Rarely intertidal, this species may be common in the shallow subtidal. The dark gray shell is distinctive.

***Laqueus californiensis* – California lamp shell**
Exclusively subtidal, this species is often found attached to sponges, corals, or derelict fishing gear. Smooth shell distinct.

Lampshells – Phylum Brachiopoda

These ancient animals were formerly the dominant suspension feeders in the Paleozoic oceans. Thousands of extinct species are known, while there are only 200 or so living forms.

Like bryozoans, these feed with a specialized structure called the lophophore. Brachiopods attach to the substrate using a fleshy stalk called the peduncle. They can move their shell with the peduncle, but cannot reattach to the substrate. Most species in our region are subtidal, but occasionally found at the lowest tides. Careful searching of recovered corals and sponges (such as those caught by fishing gear) may reveal several species of brachiopod.

***Neomolgus littoralis* – Red velvet mite**
Abundant in the intertidal zone, the bright red color distinguishes this species from other intertidal mites. Usually under 3 mm (0.12”)

***Phoxichilidium femoratum* – Spiny thighed sea spider**
Included as an example of a common but rarely seen group, the Pycnogonida or sea spiders. Found in hydroids and algae.

***Halobisium occidentale* – Beach pseudoscorpion**
These little (<4 mm) arachnids are closely related to true scorpions but lack a tail. These are predators on velvet mites and other tiny animals.

Insects, arachnids, and centipedes – The non-crustacean Arthropods

Arthropods are the most speciose phylum on the planet. It is estimated that over 2/3 of all species are arthropods! Most marine arthropods are in the subphylum Crustacea, but there are several representatives of the Hexapoda (insects and relatives), Myriopoda (centipedes and millipedes), and Chelicerata (arachnids) found as well.

Most of the animals on this page are representative of the arthropod subphylum Chelicerata, class Arachnida. Most chelicerates are terrestrial and include the familiar spiders, scorpions, mites, and ticks. In addition to the species shown here there are several species of mites and spiders that are found in the upper intertidal zone. The bizarre pycnogonids or sea spiders (left) are traditionally classified as close relatives of the arachnids but recent phylogenies suggest that they are in a stand-alone group of arthropods most similar to the extinct Cambrian *Anomalocaris*!

***Onychiurus dentata* – Beach springtail**
This unusual arthropod is common on Alaskan beaches. These tiny (<4 mm) arthropods are related to insects but in a separate class.

Staphylinidae – Intertidal rove beetles
At least two species are common in SE Alaska and found among barnacles in the upper intertidal zone.

***Petridiobius arcticus* – Arctic bristletail**
Common on the highest rocks on the beach or on edge of shoreline forest. Resemble the household “silverfishes” but are not closely related.

Intertidal Hexapods and Chilopods

While the vast majority of the world’s one million or so described insects are terrestrial or freshwater, a surprising number have specialized as fulltime or part-time residents of the intertidal zone. The most prolific group of these are members of the order Diptera, the flies. Several dozen fly species are found exclusively on beaches in Alaska. Many of these feed on rotting algae in the drift zone, but others are predators on other invertebrates or blood drinkers. In addition to the rove beetles (left), the careful beachcomber is likely to find several other beetle species hunting the drift zone or feeding on beach plants. The tiny but common springtails (upper left) are a group of hexapods once classified as insects but now considered a separate class. The Chilopoda (centipedes and millipedes) have relatively few species but may be common on Alaska beaches.

***Oedoparena glauca* – Barnacle maggot fly**
This predator lives its entire life in the intertidal zone. The larva (maggots) feed on barnacles and the pupa are often found in empty barnacle shells.

***Paraclunio alaskensis* – Intertidal midge**
Included as an example of a very diverse group best identified as “midges”, these are usually under 3 mm. May form swarms on exposed algae.

Order Geophilomorpha – Beach Centipede
This may be an undescribed species. Very narrow body, reaching about 4 cm long. 30 or more pairs of legs. Upper intertidal, under rocks.

Order Lithobiomorpha – Beach Centipede
Several species may be present, these are characterized by 15 pairs of legs. Highest intertidal (above barnacle zone) under rocks.

***Chthamalus dalli* – Little brown barnacle**
Small, easily confused with young of other species. Shell brown, plates 'inflated'. Rostrum (arrow) overlapped by adjacent plates.

***Balanus crenatus* – Crenate barnacle**
This smooth and thin-shelled species often grows on smooth intertidal rocks and crab shells, fouling on boats. Mid to low intertidal. Shell thin and fragile.

***Balanus glandula* – Acorn barnacle**
Most common barnacle in our area. Margin heavily scalloped. Leaves calcareous base when removed. Rostrum (arrow) overlaps adjacent plates.

Barnacles and their allies- Subphylum Crustacea, Class Maxillopoda

This large and diverse group contains the barnacles and copepods as well as a number of poorly known taxa. Barnacles are sessile as adults but have planktonic larvae that are an important part of the zooplankton.

The shelled barnacles are classed in two main groups. The acorn barnacles (most of our species) are attached directly to the substrate. The gooseneck barnacles are attached to the substrate by a flexible stalk.

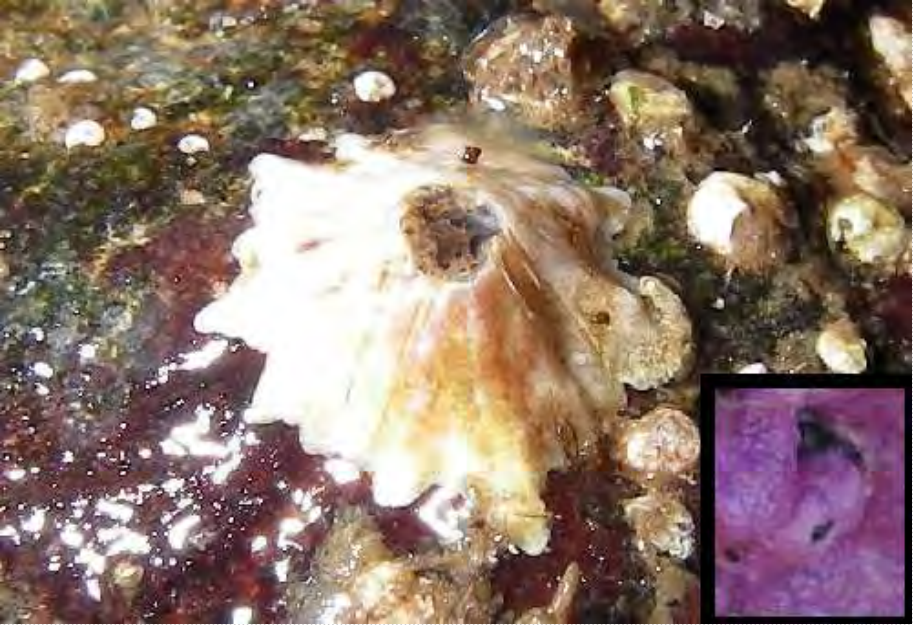
Not shown in this guide are the parasitic shell-less Rhizocephalan barnacles which are internal parasites of decapod crustaceans.

***Balanus nubilus* – Giant barnacle**
Usually subtidal, this species lives in shallower water than the giant barnacle *Chirona evermanni* (next page). Shell usually as wide or wider than tall.

***Balanus rostratus* – Rostrate barnacle**
A highly variable species. Shown is a large form common on the outer coast characterized by sharp ridges and a very low profile.

***Semibalanus balanoides* – Northern rock barnacle**
Easily confused with *Balanus glandula*. Margin not regularly scalloped. No calcareous base when removed. Shell often pitted with small borings.

***Semibalanus cariosus* – Thatched barnacle**
The largest intertidal barnacle, often 4 cm (1.6”) or larger. Margin with small finger-like projections, sides grooved. No calcareous base.



***Solidobalanus engbergi* – Hydrocoral barnacle**
Typically associated with encrusting hydrocorals which often cover the barnacle, specimens are also found without corals. Opening very small.

***Hesperibalanus hesperius* – Shell barnacle**
Almost exclusively found on snail shells. The deep grooves on the plates that disappear before the opening are a distinctive feature.

***Chirona evermanni* – Deepwater giant barnacle**
This deepwater species is often snagged by golden king crab pots. Superficially similar to *Balanus nubilus*, the shell is much taller than wide.

***Cryptolepas rachianecti* – Gray whale barnacle**
Included as an example of the whale barnacles that are exclusively found on the skin of whales and dolphins. Most species are host specific.

***Lepas anatifera* – Pelagic gooseneck barnacle**
Found on the open ocean, these are often cast ashore on driftwood or attached to man-made objects. Shell with a few large plates.

Order Harpacticoida – Harpacticoid copepods
Unlike other orders of copepod, this diverse group are often benthic and infaunal. Many commensal on algaes, crabs, etc. Difficult to id.

***Pollicipes polymerus* – Leaf gooseneck barnacle**
An exclusively outer coast species. Found on rocks in the mid to upper intertidal zone on high energy beaches. Multiple small plates are distinct.

Copepods

Copepods are a group of crustaceans closely related to barnacles. Most are very small, only a few millimeters or less in length. This group is enormously diverse but are generally unnoticed.

Many copepods are free swimming all of their lives, although there are a number of parasitic forms that are sessile inside or on their host. Copepods are a critical component of marine food webs as they feed on microscopic algae called diatoms and are in turn fed upon by larger zooplankters (including larval fish). A major group of copepods, the Harpacticoida, live primarily in the sediment and are abundant in the intertidal zone.

***Maera danae* – Pink beach hopper**
A medium sized species common in the mid to low intertidal zone. Hydrophobic exoskeleton and color are distinct.

***Atylus collingi* – White-eyed amphipod**
Very common on mixed sand and rocky beaches. The dorsal teeth (especially prominent towards back) and white eyes are distinct.

***Spinulogammarus carinatus* – Spiny beach flea**
A large conspicuous species, often dark gray or dark green in color. Sharp spines on posterior dorsum are distinctive, can bee seen with naked eye.

Amphipods, isopods, opossum shrimp, and their allies – Subphylum Crustacea, Order Peracarida

This extremely diverse group are typically small (usually less than 2 cm, 0.8” in length although giants occur). Nearly always abundant, peracarids are united by possession of a marsupium or pouch in the female used for brooding embryos.

Amphipods, sometimes called beach hoppers or sand fleas, have over 700 representatives in Alaska. Extremely difficult to identify in the field, these often require dissection to determine species. I have included only a few common species. Most commonly encountered amphipods are in a group called the gammarids. These are found from the highest tidal zone to the deepest ocean depths. The strange skeleton shrimps (Caprellida) are highly modified amphipods that have elongate body segments. Hyperiid amphipods (not shown) are exclusively planktonic.

***Americorophium spinicorne* – Spiny tube amphipod**
This species prefers low salinity and can even be found far up tidal streams. Huge 2nd antennae distinguish genus, several other species present.

***Thorlaksonius* sp. – Armored amphipods**
This large genus of slow moving amphipods are relatively hard-shelled and variously covered in plates and spines like miniature armored dinosaurs.

***Traskorchestia traskiana* – Common beach hopper, sand flea.**
Abundant in the upper intertidal zone, often under driftwood and algae. These jump very far when disturbed. First antennae reduced.

***Anonyx* spp. – Longline sand fleas**
These large (2-3 cm) amphipods are well known to longline fishermen as they scavenge hooked fish. Bean-shaped eyes distinguish this large family.

***Perampithoe mea* – Eelgrass amphipod**
Green color and red eyes are distinct. Found in eelgrass and surfgrass as well as in low intertidal algae. Related *P. humeralis* lives in kelp.

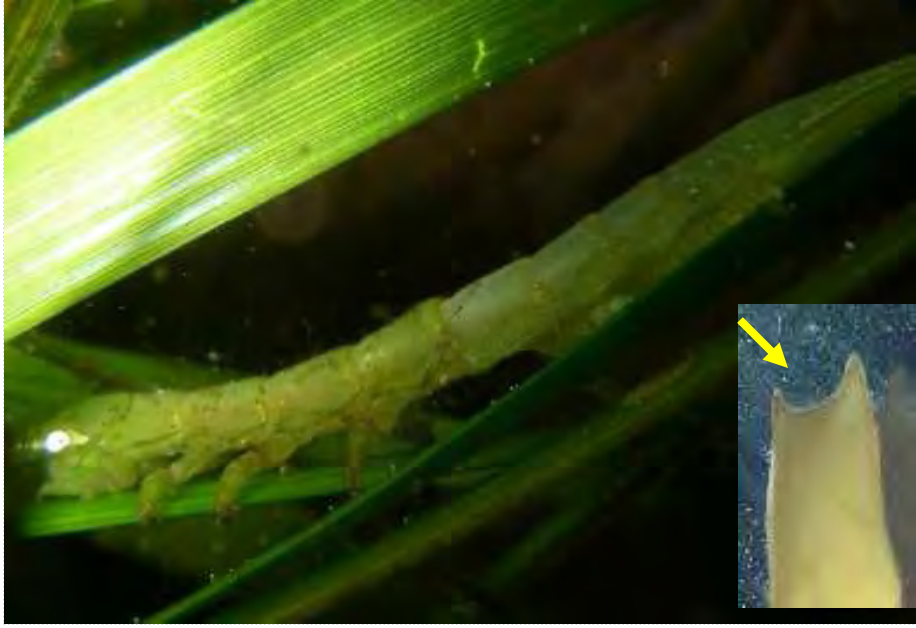
***Microjassa* sp. – King crab amphipod**
This possibly undescribed species lives in the mouth of golden king crabs! Bright pink when alive, easy to observe when host is in aquaria.

***Caprella alaskensis* – Alaskan skeleton shrimp**
This common genus contains many species and are difficult to identify without a microscope. Common on algae and hydroids, which they mimic.

***Cyamus scammoni* – Gray whale louse**
Included as an example of the modified amphipods known as whale lice. Like whale barnacles, whale lice are very host specific.

***Pentidotea wosnessenskii* – Rockweed isopod**
A very common species, usually found on *Fucus* or under rocks in the *Fucus*-zone. Variable color, posterior rounded with pointed tip (inset).

***Ligia pallasi* – Sea slater**
Closely related to the terrestrial sowbugs, this species is commonly 2.5 cm (1”) or more. Lives in the upper intertidal on rocks.



***Pentidotea resecata* – Eelgrass isopod**
This cryptic species can be found on eelgrass and on kelp, camouflaged to match substrate. Posterior concave (inset). Many other species.

Isopods

Another common group of peracarid crustaceans, isopods (unlike most amphipods) have all seven pairs of legs appearing nearly identical in shape. Amphipods generally have the first two pairs of legs modified as grasping structures. As a general rule of thumb, isopods are flattened dorsoventrally (“back to belly”) while amphipods are flattened laterally (“side to side”)

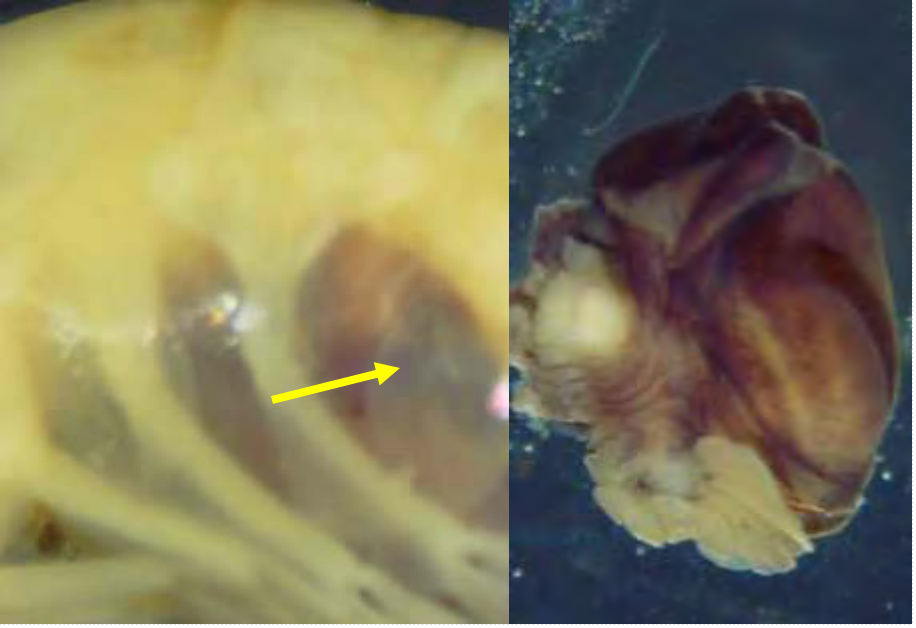
Most people are familiar with the terrestrial isopods called sowbugs or “roly-polies”. The majority of isopod species are marine and can be found at all depths. A large number of isopods are parasitic on fish and other sea creatures. Like all peracarids, isopods brood their embryos in a protective “pouch” made from modified structures on their legs.

***Gnorimosphaeroma oregonense* – Intertidal pill bug**
Resembling the terrestrial 'roly-polie' or pill bug, this species is abundant in the mid intertidal zone. Related species are present.

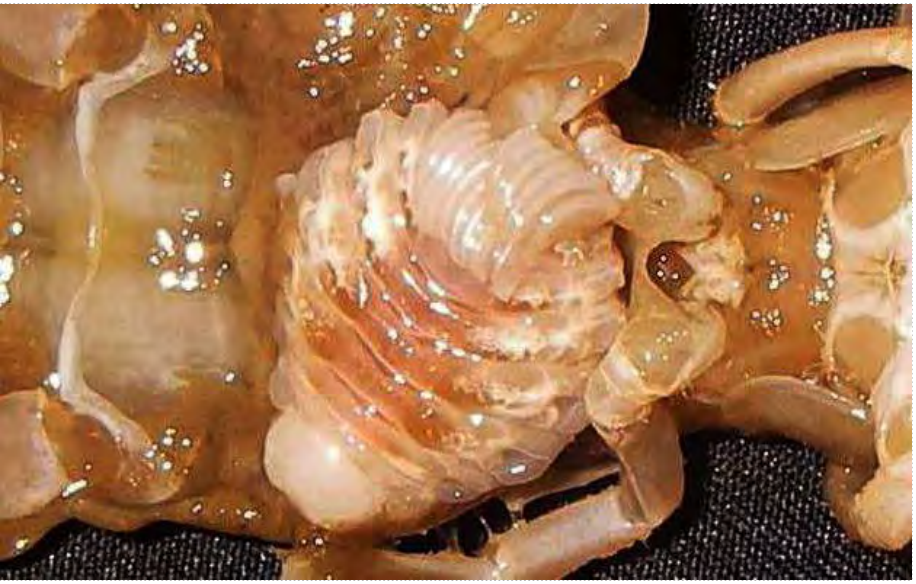
***Ianiropsis tridens* – Three spined little isopod**
A common species on the outer coast often seen on sponges. Bright orange antennae are distinctive as are the white and brown body stripes.

***Janiralata occidentalis* – Western little isopod**
Abundant but easily missed in clumps of coralline algae. This small (<5 mm) species is covered with short setae giving a "fuzzy" appearance.

***Argeia pugettensis* – Sand shrimp gill isopod**
One of the bizarre bopyrid isopods (next page), this species lives under the carapaces of sand shrimps and is visible as a swelling on one side.



***Hemiarthrus abdominalis* – Hippolytid shrimp abdominal isopod**
This isopod is most common on the abdomen of the Sitka coastal shrimp. The isopod is usually a dark gray brown color, contrasting with the shrimp.



***Phyllodurus abdominalis* – Mud shrimp isopod**
Lives attached to the abdomen of blue mud shrimps. Not commonly seen without diligent searching. As typical for family, large female with dwarf male.

***Bopyroides hippolytes* – Hippolytid shrimp gill isopod**
Visible only as a large swelling on the carapaces of hippolytid shrimps. Parasite only one side, if gills damaged on both sides shrimp would die.

Parasitic Isopods – The Epicaridea

This aberrant group of isopods are all parasites on other crustaceans, most often decapods (crabs, shrimps, lobsters, etc.) but also on some others such as opposum shrimps (next page). One local species (not shown in this guide) called *Liriopsis pygmaea* is parasitic on a barnacle that is itself parasitic on hermit crabs!

The species shown in this guide all belong to the family Bopyridae. Bopyrids are parasites on decapods and are most often seen either under the abdomen or under the carapace inside of the branchial chamber. Those inside of the branchial chamber cause the carapace (shell) of the shrimp, crab, or lobster to develop a large swelling. Regardless of their position on the host, all species feed on the host's body fluids and may cause considerable harm.

When the isopod first infects a host, it does so as a juvenile. The first isopod to reach a particular host will become a large female. The second one to find the host will become a dwarf male and live as a parasite on the female!

Order Cumacea - Cumaceans
Cumaceans are an unusual group related to amphipods and isopods. Usually small (1-5 mm), look for these in sediment in tidepools.

***Thysanoessa longipes* – Krill**
Known by most people but rarely seen, this is one of six common krill species found in nearshore waters of Alaska. Under 5 cm long.

***Holmesimysis nudas* – Opposum shrimp**
Representative of a large complex group in our region. Mysids are very difficult to identify in the field. Form swarms in shallow water.

Cumaceans,Mysids, and Krill

Cumaceans and mysids are related to amphipods and isopods. Like all peracarids, the females brood their young in a pouch formed by enlarged flaps at the bases of their legs. Cumaceans are usually buried in sediments and can be observed by carefully overturning the top layer of sand in a tidepool. The tiny cumaceans will swim around before re-burying themselves. The nearly transparent mysids or opposum shrimps are sometimes seen in large numbers swimming in shallow water.

Euphausiids or krill look similar to mysids but are are not peracarids and are distant relatives of crabs and shrimps. Krill are almost never observed from shore but are abundant in plankton tows. Krill are an important link in the pelagic food chain and are eaten by fish, whales, and seabirds.

***Upogebia pugettensis* – Blue mud shrimp**
Common species burrowing into sand and mud substrates. Often uncovered by clam diggers. Only local member of Infraorder Gebiidea.

***Petrolisthes eriomerus* – Flattop Porcelain crab**
The only common porcelain crab in SE Alaska. The large very flat claws and the brilliant bue spot on claws and mouth make this crab unmistakable.

***Munida quadrispina* – Squat lobster**
Common in deeper water, these are most often seen in shrimp pots. The abdomen (not shown) of these resembles a small version of a lobster tail.

Order Decapoda: Infraorder Anomura

The order Decapoda are the “Ten legged” crustaceans and include such well known groups as the crabs, shrimps, and lobsters. The order is divided into several infraorders of which at least five are found in Alaska. These are the Axiidea (ghost shrimps), Gebiidea (mud shrimps), Anomura (hermit crabs, king crabs, squat lobsters, and allies), Brachyura (true crabs), and Caridea (true shrimps). All five of these are grouped together in the suborder Pleocyemata which share the trait of having the females brood their embryos on their abdomens.

The anomurans are a diverse group in Alaska. One unifying characteristic of this group is that they all have the 5th (last) pair of legs greatly reduced and often hidden under the carapace. In some, such as the squat lobsers and porcelain crabs, the abdomen has a well-developed tail fan.

***Pagurus hirsutiusculus* – Hairy hermit crab**
An abundant intertidal hermit crab. Shell usually appears too small. Upper to low intertidal, often in groups. Hairy legs and white ‘knees’ distinct.

***Pagurus hemphilli* – Maroon hermit crab**
An outer coast species associated with kelps. Legs maroon with tiny white dots, antennae solid orange. Eyes with black and gold “bull's-eye” pattern.

***Pagurus beringanus* – Bering Sea hermit crab**
Common low intertidal species, often in aggregations. Legs banded with red, white, and olive green or blue are distinct. Antennae solid orange.

Family Paguridae – The Hermit Crabs

Few groups of intertidal animals in Alaska are as diverse and as amusing than are the hermit crabs. The patient tidepool observer will see them forage for food, search for better homes, and squabble over resources.

The abdomen of hermit crabs is mostly uncalcified (soft). The abdomen is protected by an empty snail shell, hollow sponge, worm tube, or other suitable home. The majority prefer a snail shell, and their abdomen is coiled to fit into their home. Many species such as the wide-handed hermits use their right claw as a door when withdrawn into shell, much like the operculum of a snail. Some hermits are difficult to identify in the field. Important traits are the banding patterns (or lack of) on the legs and antennae and the shape and size of the claws.

***Pagurus granosimanus* – Grainyhand hermit crab**
Unbanded olive legs with light blue dots and solid orange antennae help distinguish this species. Prefers large, heavy shells. Mid to low intertidal.

***Pagurus caurinus* – Greenmark hermit crab**
A very small hermit (in shells under 1 cm long) in the lowest intertidal. White bands on legs and solid orange antennae are distinct. Orange tips on claws..

***Pagurus capillatus* – Thick-haired hermit crab**
One of the large hermits seen in the lowest intertidal and subtidal. Often in crab traps. Long hairs in tufts often obscuring spines on claw surface.

***Pagurus setosus* – Thin-haired hermit crab**
Less furry than the very similar P. capillatus. Long hairs not in dense tufts, not obscuring spines on claws. Antennae solid light brown.

***Pagurus kennerlyi* – Blue spined hermit crab**
Another of the large hermits seen in the lowest intertidal and subtidal. Often in crab traps. Blue or white tipped spines distinct. Antennae banded.

***Pagurus quaylei* - Quayle's hermit crab**
Tiny species in shells under 1.5 cm in length. Legs and antennae banded. Long hairs present. Found in the lowest intertidal, most often subtidal.

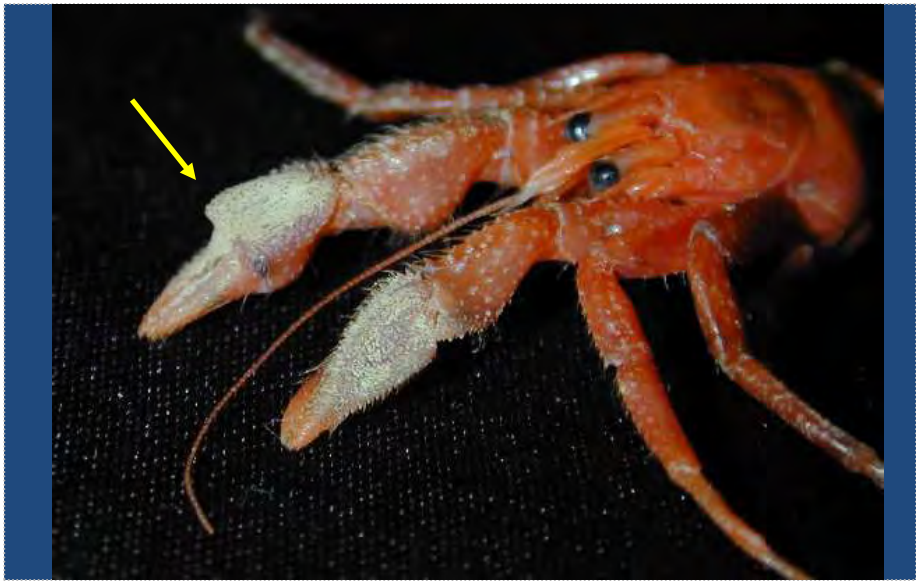
***Pagurus ochotensis* – Alaskan hermit crab**
Another of the large hermits seen in the lowest intertidal and subtidal. Often in crab traps. Iridescent claws with maroon stripe and yellow green eyes distinct.

***Pagurus aleuticus* – Aleutian hermit crab**
A very large hermit found subtidally. Claws uniformly orange-brown, lacking iridescence or maroon stripe on fingers like the Alaskan hermit.

***Pagurus armatus* – Black-eyed hermit crab**
Similar to the Alaskan hermit (left), this species has dark eyes and lacks the iridescence on the claws. Spines on claws sharper and more numerous.

***Pagurus hartae* – Hart's hermit crab**
This tiny (in shells under 1 cm) hermit crab is immediately recognizable by the brilliant violet patches on the claws and legs. Lowest intertidal and subtidal.

***Pagurus stevensae* – Steven's hermit crab**
The overal red to pink color with small spines and hairs distinguishes this subtidal species. Adults often occupy the hermit crab sponge *Suberites.*



***Pagurus cornutus* – Hornyhand hermit crab**
A deepwater hermit often seen in shrimp and crab traps. Ridges on both claws, the right ridge forming a forward-pointing horn.

***Pagurus tanneri* – Longhand hermit crab**
A deepwater hermit commonly seen in crab pots set for golden king crabs. Ridges on both claws, the right ridge does not form horn or knob.

***Elassochirus tenuimanus* – Wide-handed hermit crab**
Another large species. Juveniles common in low intertidal. Wide right claw covered in granules distinct. Blue on legs and claws is typical.

***Elassochirus gilli* – Red hermit crab**
Medium-sized species common in the low intertidal and subtidal. Color unmistakable, yellow orange to scarlet. Legs and claws smooth.

***Elassochirus cavimanus* – Violet hermit crab**
Often large, this species is restricted to deep water but often captured in shrimp traps. The violet and yellow claws are distinct.

***Labidochirus splendescens* – Splendid hermit crab**
This unusual species has a reduced abdomen and uses a tiny shell. The carapace is strongly calcified. Subtidal, often common.

***Orthopagurus minimus* – Tusk shell hermit crab**
This subtidal hermit crab prefers the shells of tusk shells (dentalia). The right claw is about two times longer than the left and much more massive.

***Discorsopagurus schmitti* – Tubeworm hermit crab**
Common in the low intertidal on the outer coast. Nearly always in tubeworm shells, usually those still attached to rocks. Claws nearly equal in length.

Alternative Housing

Breaking the rule of always living in snail shells, several groups of hermit crabs have adapted to alternative homes. Some, as shown on this page, live in tubeworm tubes or in tuskshells. Others will opportunistically live in “shells” created by the sponge *Suberites latus* after the sponge dissolves the original shell. The hermit crab just snips away portions of the constantly growing sponge so never needs to change shells as it grows.

One strange group of hermit crabs (The Parapaguridae, only one deepwater species found in Alaska and not featured in this guide) use a specialized sea anemone that creates a mimic snail shell for the crab that continues to grow with the hermit!

***Dermaturus mandtii* – Wrinkled lithode crab**
This small species is most often seen on the outer coast. They hide in empty barnacles and kelp holdfasts.

***Acantholithodes hispidus* – Spiny lithode crab**
Distinguished from other local king crabs by the small sharp spines on legs and carapace, each tipped with a hair. Bright red claw tips typical.

***Oedignathus inermis* – Paxillose crab**
This crab nestles in rock crevices and empty barnacles in the lowest intertidal and subtidal. These prefer open coast or high-current areas.

The King Crabs – Family Lithodidae

Nearly everyone is familiar with the famous Alaskan king crabs. Red king crab from Alaska can be found in restaurants worldwide. What most people don't know is that there are 21 (possibly 22) species of king crab found in Alaska! Only a few are large enough or common enough to attract commercial attention.

King crabs are closely related to hermit crabs and share many common features with these not seen in the Brachyura or "true crabs". The easiest way to tell a king crab from a true crab is to count the legs. King crabs have four pairs (including the claws) of visible legs with the 5th pair greatly reduced and usually hidden. True cabs have the 5th pair of legs smaller than the others but still visible and functional as legs.

***Hapalogaster mertensii* – Hairy crab**
Similar to *H. grebnitzkii*, this species has an orange-red underside. Both species in loose rockpiles and crevices, low intertidal and subtidal.

***Hapalogaster grebnitzkii* – Northern hairy crab**
Another unusual member of the king crab family. Usually subtidal, rarely intertidal. Blue-grey underside distinguishes it from *H. mertensii*.

***Placetron wosnessenskii* – Scaled crab**
This fast moving agile species is commonly seen in shrimp traps. Legs and carapace covered with overlapping scales, fingers of claws very long.

***Paralithodes camtschaticus* –Red king crab**
Juveniles of this species are found in the low intertidal zone. Adults are shallow to moderately deep water. Six spines in cardiac region.

Paralithodes platypus – Blue king crab
Not as well known as its relatives, the blue king supports a fishery in the Bering Sea. Four spines in cardiac region.

***Lithodes aequispina* – Golden king crab**
Often called ‘brown king crab’, this is the primary species currently harvested in SE Alaska. Never intertidal but commercially important.

***Lopholithodes mandtii* – Puget Sound box crab**
The brilliant scarlet, violet, and orange colors immediately distinguish this from the brown box crab. Rocky areas on outer coast, subtidal.

***Lopholithodes foraminatus* – Brown box crab**
Commonly caught as by-catch in crab traps or snagged on halibut gear. Rarely intertidal. Can close up into tight-fitting ‘box’ when threatened.

***Phyllolithodes papilosus* – Heart crab**
Found in the lowest intertidal in rocky areas on the outer coast. Common name from cardiac region with raised heart-shaped outline.

***Rhinolithodes wosnessenskii* – Rhinoceros crab**
An uncommon subtidal species. The triangular carapace is similar to the heart crab (left) but cardiac region with deep circular groove.

***Cryptolithodes sitchensis* – Umbrella crab**
Usually restricted to the outer coast, there common in the low intertidal. Claws smooth and rostrum widest at tip.

***Cryptolithodes typicus* – Butterfly crab**
Uncommon in the lowest intertidal and subtidal. Distinguished from *C. sitchensis* by rough granular claws. Rostrum widest at base.

***Oregonia gracilis* – Graceful decorator crab**
The long legs and abundant 'decorations' immediately distinguish this common but easily missed species. Decorations dependant on habitat.

***Pugettia gracilis* – Graceful kelp crab**
Low intertidal and subtidal. I call this the "lazy decorator crab" because it usually decorates with only a single piece of algae on rostrum.

***Pugettia producta* – Northern kelp crab**
Juveniles are often olive green while adults become dark maroon. Common in algae, adults often seen on pilings. Smooth carapace distinct.

The True Crabs – Infraorder Brachyura

Brachyuran or true crabs are common in nearly all marine habitats. In Alaska the commercially important Dungeness, Tanner, and snow crabs are members of this group along with a host of other smaller species often seen by beach explorers.

There are eight families of true crabs found in Alaska. Three of these families belong to a large group collectively known as spider crabs. The snow and Tanner crabs belong to this group. Spider crabs usually have a forked (bifid) rostrum and long thin legs. One very diverse family in Alaska are the Pinnotheridae or pea crabs. These are almost always living near, on, or inside of other invertebrates. The Cancridae (rock or cancer crabs) are another diverse family best known for the large edible Dungeness crab.

***Mimulus foliatus* – Foliate kelp crab**
Common in rocky areas of the outer coast. Unlike other kelp crabs the carapace is wider than long and has a “maple leaf” shape.

***Hyas lyratus* – Lyre crab**
Medium to large species. Distinct ‘lyre-shaped’ carapace distinct. Usually shallow to deep subtidal, common in crab and shrimp traps.

***Chionoecetes bairdi* – Tanner crab**
Juveniles rarely found in the intertidal, adults subtidal. Molts commonly washed ashore. Only shallow Tanner crab in region.

***Chorilia longipes* – Longhorn decorator crab**
A decorator crab that doesn’t decorate at all. Deep water, often in crab and shrimp traps. White and orange banded claws typical.

***Cancer productus* – Red rock crab**
Common intertidal species on outer coast, subtidal in inside waters. Brick-red color of adults distinct.

***Romaleon branneri* – Furrowed rock crab**
Uncommon subtidal species, intertidal on outer coast. Our only rock crab with densely hairy carapace. Formerly *Cancer branneri*.

***Metacarcinus magister* - Dungeness crab**
The most important commercial crab in SE Alaska. Common in sandy areas, especially around eelgrass. Formerly *Cancer magister*

***Metacarcinus gracilis* – Graceful rock crab**
Easily confused with small Dungeness crabs, the ridge on top of claws lacks sharp teeth. Found in eelgrass. Formerly *Cancer gracilis*.

***Glebicarcinus oregonensis* – Pygmy rock crab**
A small species found in the low intertidal and subtidal. Carapace more rounded than other rock crabs. Formerly *Cancer oregonensis*

***Telmessus cheirogonus* – Helmut crab**
The yellow-brown color and densley hairy body distinguish this species. Carapace roughly pentangular in outline.

***Lophopanopeus bellus bellus* – Black clawed crab**
This common intertidal species is usually found on the outer coast. The lack of "teeth" between eyes distinguish this from the pygmy rock crab.

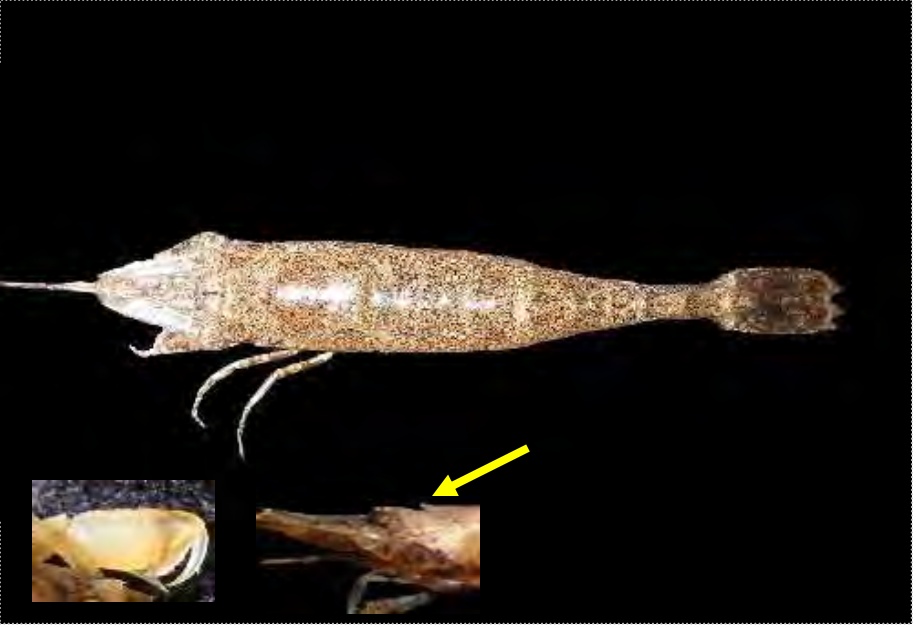
***Pinnixa schmitti* – Schmitt's pea crab**
A common intertidal species associated with tubeworms, spoon worms, sea cucumbers, and brittle stars, or free-living, but never with clams

***Pinnixa littoralis* – Horseclam pea crab**
Nearly every horseclam opened will have a pair of these crabs inside. The female (left) is much larger than the male.

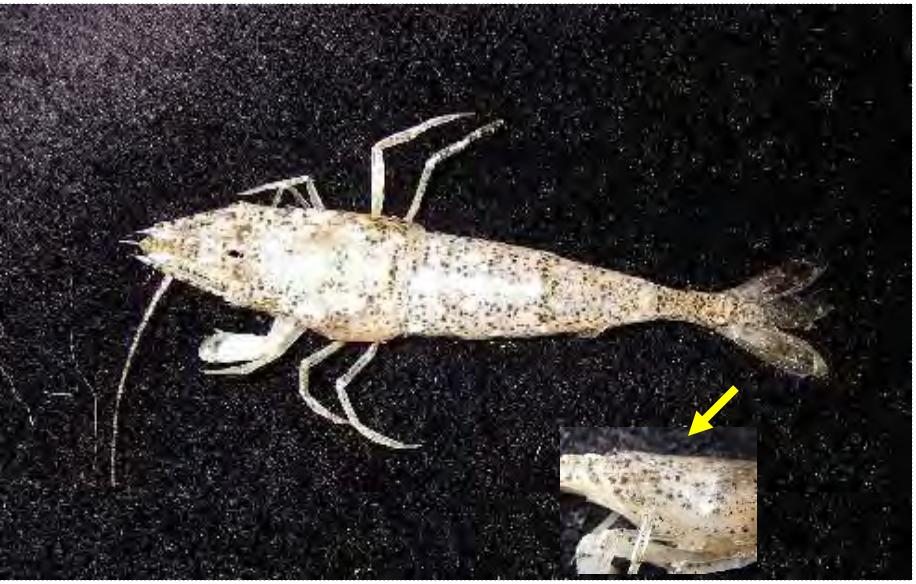
***Fabia subquadrata* – Mussel pea crab**
Found in *Modiolus modiolus* (horse mussel) in inside waters and *Mytilus californianus* (California mussel) on the outer coast. Sometimes very common.

***Hemigrapsus oregonensis* – Green shore crab**
Rare in the Juneau area, abundant on outer coast. Color green to dull gray. Legs with distinct hairs.

***Hemigrapsus nudas* – Purple shore crab**
Absent in inside waters, abundant on outer coast. Color purple, but some individuals are yellow-green when adult. Legs without hairs.



***Crangon alaskensis* – Alaskan sand shrimp**
Genus diverse, difficult to identify to species. Carapace with single dorsal spine, 1st claw 2-3 times longer than wide. Common low intertidal species.



***Lissocrangon stylirostris* – Smooth sand shrimp**
Very similar to other sand shrimps, but only local species without any dorsal carapace spines. Very common low intertidal species.

***Crangon franciscorum* – San Francisco Bay sand shrimp**
Another common member of this diverse genus. Carapace with single dorsal spine, 1st claw 5-8 times longer than wide. Low intertidal to subtidal.

Infraorder Caridea – The True Shrimps

This group is best known in Alaska for the large species in the family Pandalidae that are often sold dockside or in fish markets for food. It is the large powerful abdomen or tail of shrimps that makes them highly sought after for the dinner plate. Alaska is especially rich in shrimp species, with over 100 species recorded. The majority of these are much to small to be considered for human food, but are very important prey items for fish and birds.

There are six families of shrimps found in Alaska. About half of our species belong to the family Hippolytidae or broken-back shrimps. The Crangonidae or sand shrimps are another diverse family. Some families, such as the Oplophoridae and Pasiphaeidae (not in this guide) are completely pelagic and only found in the open ocean.

***Argis dentata* – Arctic argid**
Common subtidal species. The eyes of argids are very close together and seem to “look up”. Other species may be common in subtidal sand.

***Rhynocrangon alatus* – Saddleback shrimp**
An uncommon subtidal species. Rough armored carapace and abdomen is distinct. Sometimes brightly colored

***Scleocrangon boreas* – Tank shrimp**
A large, stout bodied shrimp. Often buried in sand in the low intertidal and subtidal. Commonly seen in trawls.

***Heptacarpus sitchensis* – Sitka coastal shrimp**
A common species in eelgrass. Carapace usually with fine zebra-like stripes on sides. Abdomen variable, sometimes transparent.

***Heptacarpus stylus* – Stiletto shrimp**
Color highly variable, usually matches habitat. Usually with brilliant blue dots. Rostrum long and pointed, nearly always with white stripe.

***Heptacarpus carinatus* – Smalleyed coastal shrimp**
Common in eelgrass, this species is often bright green with white stripe on rostrum, stripe bordered with red. Abdomen with pronounced dorsal hump.

***Heptacarpus brevirostris* – Stout shrimp**
The most common intertidal shrimp. Cryptic in tidepools and on algae and hydroids. Very short rostrum distinct, color variable.

***Heptacarpus pugettensis* – Barred shrimp**
Common on outer coast, patchy distribution in inside waters. Small species about 1.5 cm long, often clings to overturned rocks.

***Hippolyte clarki* – Kelp humpback shrimp**
This abundant outer coast species is found in kelp canopies or in eelgrass beds and is often colored to match substrate. No white stripe on rostrum.

***Eualus suckleyi* – Short scale eualid**
A very common subtidal species. Long rostrum with dorsal teeth past middle half. Coloration is distinctive, red bars with yellow spots.

***Eualus fabricii* – Arctic eualid**
Common subtidal and low intertidal species. Similar to the short scale eualid, rostrum lacking dorsal teeth past middle half.

***Eualus butleri* – Sponge eualid**
A subtidal species distinguished by the very short rostrum. The very similar *E. pusiolus* (doll eualid) requires microscopic examination to separate.

***Spirontocaris prionota* – Deep bladed shrimp**
Common in the lowest intertidal, the “Mohawk-like” rostrum and 3-4 spines on the side of carapace behind the eye are distinct.

***Spirontocaris arcuata* – Rathbun’s bladed shrimp**
Difficult to distinguish from similar species in the field. Carapace with dorsal teeth nearly to posterior margin. Color highly variable.

***Spirontocaris ochotensis* – Oval bladed shrimp**
A common low intertidal species found among seaweed covered rocks. Dorsal teeth only on front half on carapace. Extremely variable in color.

***Lebbeus groenlandicus* – Spiny lebbeid**
This common subtidal species commonly exceeds 8 cm in length. Carapace with four strong dorsal teeth, abdomen with sharp ventral spines.

***Lebbeus mundus* – Cleaner lebbeid**
This subtidal species has been observed cleaning (grooming) large predatory fish, a behavior more common in tropical shrimps.

***Lebbeus grandimanus* – Candy-striped shrimp**
Exclusively subtidal, this beautiful shrimp is nearly always found in association with the crimson anemone *Cribinopsis fernaldi*.

***Betaeus harrimani* – Northern hooded shrimp**
The large claws of this species give these shrimps a lobster-like appearance. Usually in burrows of the blue mud shrimp *Upogebia pugettensis*

***Betaeus setosus* – Fuzzy hooded shrimp**
The large claws of this shrimp are wider than in *B. harrimani*. Associated with porcelain crabs in other areas, ours seem to be free-living.

***Pandalus platyceros* – Spot prawn**
This one of the important commercial shrimp species in Alaska and the largest. Juveniles common in low intertidal eelgrass, adults subtidal.

***Pandalus stenolepis* – Roughpatch shrimp**
A small subtidal species similar to the dock shrimp (next page) but lacks dark stripes on carapace and abdomen. Red and blue spots on abdomen distinct.

***Pandalus hypsinotus* – Coonstripe shrimp**
Another commercially harvested species in SE Alaska. Highly arched carapace with many fine teeth is distinct.

Shrimp or prawn?

As a biologist a common question that I am asked is, “What is the difference between shrimps and prawns?” The answer is somewhat complicated. In popular jargon a prawn is simply a large shrimp, or any shrimp destined for the dinner plate that is larger than “salad shrimp” size.

Biologically the answer is a bit more complex. Generally when a decapod biologist refers to “shrimp” they are referring to members of the infraorder Caridea (“True shrimps”). The term “prawn” is used for members of the suborder Dendrobranchiata. These look like true shrimps but are only distantly related. Alaska has a few true prawns, but these are small forms with little commercial value. Imported true prawns such as Gulf prawns, tiger prawns, and white shrimp are commonly sold. All Alaska-caught “prawns” are true shrimps!

***Pandalus eous* – Pacific pink shrimp**
The Pacific pink shrimp is a deepwater species that is commercially harvested. The pink color and dorsal spine on abdomen are distinct.

***Pandalus danae* – Dock shrimp**
Common shallow water pandalid. Dark brown to black stripes on carapace and abdomen and white and blue spots are distinct.

***Pandalus goniurus* – Humpback shrimp**
The smallest of the local pandalid shrimps, the transparent body with red lines is distinctive. Note spine on dorsum of abdominal segment three.

***Pandalopsis dispar* – Side stripe shrimp**
Deepwater species that is commercially harvested. Longitudinal white stripes on abdomen and very long antennae distinct.

***Florometra serratissima* - Northern feather star**
This is the only shallow water crinoid likely to be encountered in SE Alaska. Usually below 20 meters, shallower specimens are sometimes found.

***Ophipholis aculeata* – Daisy brittle star**
Most often seen intertidal brittle star. Found in the lowest intertidal. Prefers rocky areas with little silt.

***Ophiura luetkenii* – Gray brittle star**
Common subtidal species, difficult to identify in field. Many other species in genus.

Brittle stars, Sea stars, Sea cucumbers, and Sea urchins – Phylum Echinodermata

This well known group is highly diverse and found throughout the world's oceans. They are exclusively marine. Unlike any other animals on the planet they utilize a water vascular system for movement which is analogous to man-made hydraulic systems.

Echinoderms are closely related to chordates, the group that includes sea squirts, fishes, and terrestrial vertebrates such as humans. The phylum Echinodermata is divided into three living subphyla (and several extinct groups), all of which have representatives in Alaska. These are the Crinozoa (sea lillies and feather stars), Asterozoa (sea stars and brittle stars), and the Echinozoa (the sea urchins and sea cucumbers).

***Amphiodia occidentalis* – Long armed brittle star**
Tiny disk and very long arms define this genus. *A. periercta* is similar but has pointed (instead of blunt) arm spines. Found in mud under rocks.

***Luidia foliolata* – Sand star**
This burrowing seastar is usually subtidal but occasionally found on sand flats in the lowest intertidal zone. Very fragile species, tube feet pointed.

***Gorgonocephalus eucnemis* – Basket star**
This bizarre subtidal brittle star is immediately recognizable due to the branching arms. Prefers areas with strong current.

Brittle Stars and Basket Stars

An abundant but easily missed group, the rapidly moving brittle stars are a favorite of low tide explorers. Unlike sea stars which move primarily with their tube feet, brittle stars move their arms in a snake-like fashion (thus giving them both their class name of Ophiuroidea and their alternate common name, the serpent stars).

Brittle stars are found in a variety of habitats, typically in the low intertidal and subtidal. Many species are burrowing and can be found in soft sediments. Others are only found in rocky areas where they squeeze into crevices and extend their arms into the water column to capture passing organic particles as the drift by. The basket stars have their arms highly branched and covered in sticky mucous. These capture plankton and detritus as it drifts by.

***Mediaster aequalis* – Vermillion sea star**
Not common in the intertidal zone. The pink to bright color and regular circular paxillae covering aboral surface are distinct features.

***Patiria miniata* – Bat star**
Occasionally found on the outer coast, this species has a patchy distribution (common in very few areas, absent in most). Rough aboral surface.

***Ceramaster patagonicus* – Cookie sea star**
This subtidal sea star has a nearly pentagonal outline bordered with regular marginal plates. Most common member of genus in SE Alaska.

Sea Stars – Class Asteroidea

Nearly everyone is familiar with the group of echinoderms known as sea stars (the common name starfish is falling into disuse). Sea stars are common on most beaches, and Alaska has an amazing diversity of these fascinating creatures. A number of our common species are extremely variable in color so one will frequently see groups with individuals that are purple, yellow, brown, orange, or many other colors.

While the basic pattern for sea stars is five-armed, a number of common local species will nearly always have six, and the giant sunflower star can have twenty-four or more! Sea stars are generally predators or scavengers with many specialized at hunting bivalved mollusks (clams, scallops, etc.). Some, like the sun stars (genus *Solaster*) feed mainly on other echinoderms.

***Dermasterial imbricata* – Leather sea star**
Most often seen on the outer coast. Smooth leather-like skin and coloration distinctive.

***Pisaster ochraceous* – Ochre star**
Rare in Juneau area, abundant on outer coast. Color highly variable. Upper intertidal species. Arms widest at disk, unlike *Evasterias*

***Pisaster brevispinis* – Giant pink sea star**
This huge (commonly > 40 cm across) sea star is nearly always pale to bright pink in color. Most often subtidal, rarely low intertidal.

***Leptasterias hexactis* – Rough six-armed sea star**
Easily confused with *L.. alaskensis*. This species has row of larger rounded spines running down each arm. Usually outer coast.

***Leptasterias alaskensis* – Six-armed sea star**
Similar to *L. hexactis* but lacking row of larger spines on aboral surface of arms. Overall smoother appearance. Common in inside waters.

***Leptasterias polaris katherinae* – Katherine's six-armed sea star**
Giant six-armed species (> 15 cm across). Nearly always mottled cream and brown, sometimes reddish. Common subtidal species.

***Leptasterias coei* – Coe's six-armed sea star**
Giant six-armed species (> 15 cm across). Background color most oftenlight to dark brown, no mottling unlike *L polaris katherinae*.

Tube feet, spines, and pincers

The relatively simple shape of sea stars belies a complex set of features that make these animals so successful. If you turn a sea star over and examine the underside (called the oral surface) you will notice that each arm has groove called the ambulacral groove which contains the tube feet. By pumping water in or out of these the sea star can exercise amazing control over these, enabling them to walk, pry open bivalves, even dig holes.

The upper surface (aboral surface) of sea stars is often covered with small spines. The shape and pattern of these spines are important characters for identification. If you look very carefully with magnification you will see that some of these spines form tiny pincers called pedicellariae. The disk of a sea star has a small but conspicuous circular patch called the madereporite used to draw in water.

***Leptasterias aequalis* – Delicate six-armed sea star**
Usually uncommon, the long, narrow arms are distinct. Variably colored, commonly brown, red, or **pink.**

***Leptasterias hylodes* – Five-armed six-armed sea star**
Unlike most congeners, this species only has five arms. May be confused with juveniles of other species, note white, sharp spines on aboral surface.

***Evasterias troschelli* – Mottled sea star**
The most common large sea star in Juneau area. Variable in color. Arms narrower and than in *Pisaster*, also constricted near disk.

***Orthasterias koehleri* – Rainbow sea star**
Quite distinct when the specimen is the bright pink mottled form. However, other colors occur. Large white spines are distinct.

***Lethasterias nanimensis* – Black spined sea star**
A subtidal species that is common throughout SE Alaska. The black spines on the aboral surface are distinct

***Stylasterias forreri* – Fish eating sea star**
Exclusively subtidal species. Aboral surface with rows of long white spines. Aboral surface with raised wart-like papillae. Color variable.

***Pycnopodia helianthoides* – Sunflower star**
A distinct and amazing low intertidal to subtidal species. Soft body and multiple arms (up to 24) are distinct. Color variable.

***Solaster pacifica* – Northern sunstar**
The relatively short arms are fewer in number (8-11) than in other sunstars. Color variable, often solid purple. Intertidal and subtidal.

***Solaster stimpsoni* – Stimpson's sunstar**
Similar in coloration and arm-number to some *S. pacifica*, the arms are much longer and narrower. Intertidal and subtidal.

***Solaster dawsoni* – Morning sunstar**
Color often orange or brown, with yellow margins. Often 10-13 arms. Intertidal and subtidal.

***Crossaster papposus* – Rose star**
Coloration is distinctive. Smaller than sunflower star, with more complex spines. Intertidal and subtidal.

***Henricia levuiscula* – Blood star**
The long narrow arms and orange to red aboral surface are distict. Oral surface usually yellow. Low intertidal and subtidal.

***Henricia pumilla* – Dwarf mottled star**
A recently described species, these are occasionally found in the lowest intertidal of the outer coast. Color pattern is distinctive.

***Henricia sanguinolenta* – Northern blood star**
A common subtidal species. Color is highly variable, often with madreporite contrasting background color. Arm bases slightly inflated.

***Pteraster tesselatus* – Tesselated slime star**
Body very thick and soft. Arms generally short, as long as or shorter than disk. Like all slime stars produces mucous when disturbed.

***Pteraster militaris* – Wrinkled slime star**
Unlike the similar *P. tesselatus*, the arms of this species are generallylonger than disk diameter. Exclusively subtidal species.

***Cucumeria miniata* – Red sea cucumber**
A common large intertidal sea cucumber. The bright orange tentacles are distinctive, although some are dark red-brown.

***Cucumeria frondosa japonica* – Giant black sea cucumber**
The largest sea cucumber in our area. Rarely intertidal. White tentacles with black tips are distinct. Body dark gray-brown.

***Cucumeria vegae* – Tar spot sea cucumber**
A tiny (less than 5 cm, 2”) species that often occurs in large aggregations on intertidal rocks. The dark brown to black color is distinct.

The Sea Cucumbers

This unusual group of echinoderms belong to the class Holothuroidea. Unlike most echinoderms, the ossicles or calcareous plates of most sea cucumbers are small and isolated within the body wall which gives them a soft fleshy body. One notable exception are the creeping pedal sea cucumbers (genus Psolus, next page) that have their upper surface covered with fused ossicles forming strong plates.

Sea cucumbers are characterized by an elongate body with tube feet typically in five rows. Some species have rows of tube feet on the entire body, while others have the tube feet only on the portion of the body closest to the substrate. Others, usually burrowing forms, lack tube feet on the body. The retractable tentacles of sea cucumbers extend from the mouth and are used for feeding. These are actually modified tube feet!

***Cucumaria pallida* – Pale sea cucumber**
Low intertidal and subtidal. Resembles *C. miniata*, but is usually pale pink or pale orange bodied and tentacles are thinner and white.

***Psolus chitonoides* – Creeping pedal sea cucumber**
Common low intertidal and subtidal species. Unattached surface with hard plates, tube feet in rows on bottom. Other species found in deep water.

***Eupentacta pseudoquiquesemita* – White sea cucumber**
The common species in the Juneau area. Common under rocks. Tube feet are soft and smooth feeling.

***Eupentacta quinquesimita* – Stiff footed sea cucumber**
Most common on outer coast. The tube feet of this species are stiff and feel rough to the touch.

***Parastichopus californicus* – Giant sea cucumber**
This large species is commercially harvested for food. The tube feet are confined to the underside. Usually subtidal, occasionally low intertidal.

***Synallactes challengeri* – Challenger sea cucumber**
This exclusively subtidal sea cucumber is occassionaly snagged by fishing gear. Resembles the red sea cucumber but has rows of finer papillae.

***Chiridota discolor* – Jellybean sea cucumber**
This species lacks tube feet and is partially transparent and worm-like. In sand between intertidal rocks.

***Strongylocentrotus droebachiensis* – Green sea urchin**
Longest scientific name of any animal. Abundant mid to low intertidal species. Only common sea urchin in inside waters.

***Strongylocentrotus franciscanus* – Red sea urchin**
A very large urchin, often exceeding 10 cm in test diameter. Nearly always pale to dark red. Longest spines exceed height of test.

***Dendraster excentricus* – Pacific sand dollar**
Common species on exposed sandy beaches. Usually buried, often with edge partially visible. Only intertidal sand dollar found in SE Alaska.

***Strongylocentrotus purpuratus* – Purple sea urchin**
Large urchin, test rarely reaching 10 cm in diameter. Typically light to dark purple. Longest spines usually shorter than height of test. Exposed coast only.

Sea Urchins and Sand Dollars

Sea urchins and sand dollars are members of the echinoderm group known as the Echinoida. Members of this class are characterized by having the body enclosed inside of a rigid test composed of calcium carbonate. The cleaned tests of urchins and sand dollars are frequently found by beach explorers. The outside of the test is covered with long to short stiff spines. These spines are what give the urchins their common name, from the French word for ‘hedgehog’.

Sand dollars are echinoids that are generally flattened and have very short spines giving them a ‘fuzzy’ appearance when alive. These tiny spines are used to move the sand dollar through the sand and also to transport food particles to the mouth on the underside.

***Pyura haustor* – Warty tunicate**
Common low intertidal and subtidal species. Siphons ~1/2 total height of body. Tunic warty and pink to red. Often encrusted with other organisms.

***Halocynthia aurantium* – Sea peach**
This very large (> 10 cm) sea squirt is narrowest at the base. Tunic iridescent pink to orange. Rarely low intertidal, common subtidal species.

***Halocynthia igaboja* – Sea hedgehog**
A common subtidal species, immediately recognizable by the abundant, long bristle-like hairs covering the tunic. Color typically light to dark brown.

Tunicates – Subphylum Urochordata

Most people are surprised to learn that these unusual animals belong to the phylum Chordata, the same phylum as fish and other vertebrates (including humans!). The relationship is made obvious when the larvae are examined as these have a notochord and head, and resemble a small fish. The larvae settle and permanently attach to the substrate and lose most of the obvious chordate characters.

Commonly known as tunicates or sea squirts, these animals may be solitary or colonial. Colonial species are especially difficult to identify in the field. For this section I relied heavily on the photos and identifications by Paul Norwood of the Sitka Sealife Center.

***Cnemidocarpa finmarkiensis* - Broadbase tunicate**
Resembles a small sea peach (previous page) but is usually wider than tall, and widest at base. Very common low intertidal species.

***Boltenia villosa* – Spiny-headed tunicate**
The nearly round, spiny body and short to long stalk identify this common low intertidal and subtidal species. Often attached to tube worms.

***Styela coriacea* – Leathery tunicate**
Common low intertidal and subtidal species. The orange tunic is covered in pointed warts. Body rounded when contracted, tall when expanded.

***Styela truncata* – Cone shaped tunicate**
Distinguished by the tall outline, widest at base and short siphons . Tunic orange to red and wrinkled. Low intertidal and subtidal on outer coast

***Corella inflata* – Brooding transparent tunicate**
Common intertidal and subtidal species. Flattened transparent tunic is distinct. *C. willmeriana* is very similar but lives in deeper water.

***Chelyosoma productum* – Flattop sea squirt**
The semi-transparent tunic and flattened top of this tunicate make it unmistakable. Common low intertidal and subtidal species.

***Metandrocarpa taylori* - Orange social tunicate**
This low intertidal and subtidal species forms groups of small (< 0.5 cm) individuals connected by short stolons. Orange to red in color.

***Distaplia occidentalis* – Mushroom compound tunicate**
Unlike most local compound tunicates, this species is attached to the substrate by a narrow stalk. Purple, yellow, or orange in color.

***Distaplia smithi* - Paddle ascidian**
Found in the lowest intertidal and subtidal on the outer coast. The yellow zooids in a nearly opaque paddle-shaped tunic are distinctive.

***Ritterella pulchra* - Orange lobed tunicate**
Common in the low intertidal throughout SE Alaska, this species forms groups of 1-2 cm smooth orange lobes, each containing many large zooids.

***Aplidium californicum* – Sea pork**
This species forms large, thick sheets on rocks in the low intertidal. Highly variable in color, there are several related species in SE Alaska.

Compound Tunicates

As the name implies, these tunicates typically have several individuals attached to each other and surrounded by a united tunic. Identification of these can be extremely difficult, and ids should be considered tentative (at best!) in the field. I have tried to include some of the more common and/or distinct species, but expect to find others not included.

Compound tunicates have attracted a great deal of attention because of the confirmed presence of several invasive species in SE Alaska. These invasives have the potential to do a great deal of damage to native flora and fauna as well as damage commercial shellfish farms. It is, however, important to recognize that there are a large number of common, indigenous species in SE Alaska that could be mistaken for the invasive species.

***Eudistoma molle* - Red-dotted compound tunicate**
Most often found around surfgrasses on the outer coast. The red-orange to red zooids are embedded in a partially transparent tunic.

***Botrylloides violaceous* – Chain tunicate**
The zooids of this species generally grow in clearly-defined rows. Most often bright orange in color. This is an invasive species in Alaska

***Botryllus schlosseri* – Golden star tunicate**
The zooids of this invasive species are organized into distinct star-like patterns. Dark purple gray to yellow, commonly bright orange in color.

***Didemnum vexillum* – Marine vomit**
Large irregular sheets of this tunicate can completely cover man-made objects around harbors. This is an invasive species in Alaska.

***Eptatretus deani* – Black hagfish or "slime eel"**
A deepwater species that burrows into the body cavity of fish, especially those on longlines. Also a scavenger. Produces quantities of thick mucous.

***Hydrolagus colliei* – Spotted ratfish**
Common in some areas as bycatch in sport and commercial fisheries. Spine on dorsal fin gives painful sting. Only chimaera in Alaska.

***Entosphenus tridentatus* – Pacific lamprey**
The most common and largest lamprey found in marine waters (most are under 30 cm in length). Eel-like body and ring of teeth in mouth are distinct.

The fishes – Subphylum Vertebrata

The marine waters of Alaska support an amazing diversity of fishes. Currently, there are about 500 documented species of marine fishes found in Alaska. Fish are classified into three large groups, the Agnatha (jawless fishes), Chondrichthys (sharks, rays, and chimaeras), and the Osteichthys (bony fishes). Hagfish and lampreys are predators and parasites of other fish. Lacking jaws, these are living representatives of an ancient group with fossils going back over 500 million years.

As this guide is intended primarily as a seashore guide, I wanted to focus on those commonly encountered in the intertidal or shallow subtidal. I also included some of the better-known sport fish and commercially important species as these are commonly seen by many people. Finally, I included a few of the many "weird wonders", those species that are just too unique and amazing to leave out!

***Raja binoculata* – Big skate**
The most commonly encountered skate in SE Alaska. Spotting on body distinct. Egg cases occasionally washed ashore.

***Bathyraja parmifera* – Alaskan skate**
One of a large group of skates known as ‘soft-nosed skates’. Eye sockets with half-ring of small thorns, and row of larger thorns down entire body.

***Raja rhina* – Longnose skate**
Another common skate, longnoses tend to occur in deeper water than big skates. Underside dark. The long pointed snout and color patter are distinct.

Sharks, skates, and Chimaeras: The Cartilaginous Fishes: Class Chondrichthyes

While relatively low in number of species, cartilaginous fishes may be numerically abundant in certain areas of SE Alaska. Unlike the bony fishes, the skeleton of these fish is mainly cartilage.

The small Pacific spiny dogfish is the most often seen shark in SE Alaska. Two other species are occassionaly encountered, the salmon shark (*Lamna ditropis*) and the Pacific sleeper shark (*Somnosius pacificus*). Both of these species are usually caught as bycatch in the longline, seine, or trawl fisheries.

Skates are typically seen as bycatch by sport and commercial fishermen. The big skate (*Raja binoculata*) is the largest and most common species. There are many other smaller species that may be common.

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***Bathyraja aleutica* – Aleutian skate**
A deepwater species commonly seen as bycatch in the sablefish fishery. Pale color and continuous row of thorns on back are distinctive features.

***Squalus suckleyi* – Pacific spiny dogfish**
A common small (usually < 1 meter) shark usually seen as bycatch in commercial and sport fisheries. Spines on front of both dorsal fins distinct.

***Somnosius pacificus* – Pacific sleeper shark**
This large (3-5 meter) shark is considered a pest on longline gear as they both feed on caught fish and get severely tangled.. Very soft bodied.

***Lamna ditropis* – Salmon shark**
Related to the great white shark, salmon sharks have a similar appearance and can regulate their body temperature. No known attacks on humans..

***Oligocottus maculosus* – Tidepool sculpin**
Very common in upper to mid intertidal tide pools. Tolerant of temperature and salinity changes. Dark saddles on back and white cirri are distinctive.

***Leptocottus armatus* – Staghorn sculpin**
The large pectoral fins with yellow bars are distinctive. Preopercle curved with antler-like spinules. Head without spines or cirri. Tolerant of brackish water.

***Oligocottus snyderi* - Fluffy sculpin**
Variable in color, the fluffy sculpin is commonly bright green in color. “fluffy” hair-like cirri on head. Preopercle spine bifid, chin commonly spotted white.

The fishes – Subphylum Vertebrata

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***Hemilepidotus hemilepidotus* – Red Irish lord**
Large intertidal to subtidal sculpin characterized by 4-5 rows of scales around base of dorsal fin. Underside of 'throat' with distinct polka-dots.

***Hemilepidotus spinosus* – Brown Irish lord**
Distinct band of 6-8 scales in row around base of dorsal fin. Low intertidal and shallow subtidal. Less common in SE than the red Irish lord.

***Hemilepidotus jordani* – Yellow Irish lord**
As the common name implies, the yellow Irish lord is often mottled with pale to bright yellow. Unlike the red Irish lord, lacks polka dots on throat.

Sculpins - Superfamily Cottoidea
Double-ugly or double awesome?

Few fish in Alaska are as maligned as are the sculpins. Called "double-uglies" or "bullheads", most people encounter sculpins as unwanted bycatch while fishing. Small species like the tidepool sculpin are abundant in tidepools throughout SE Alaska. Because they are primarily ambush predators, many sculpins are beautifully camouflaged and easily missed.

The superfamily Cottoidea contains four families of sculpins as well as the closely related poachers. With almost 100 species in Alaska, sculpins can be a challenge to identify. Features to look for are the presence and location of cirri (hair-like structures), presence or absence of scales and spines, and the shape and structure of the upper preopercle spine. When handled this spine is often extended outward from sides of head near gill opening.

***Clinocottus acuticeps* – Sharpnose sculpin**
Common intertidal species. Similar to tidepool sculpin but preopercle spine with single curved tip instead of bifid. Variable color.

***Clinocottus embryum* – Calico sculpin**
Unlike the tipepool or sharpnose sculpins, the cirri on top of head are in bushy clusters. Color variable, often gold, green, pink, or bright red.

***Myoxocephalus polyacanthocephalus* – Great sculpin**
A very large species, commonly over 50 cm in length. Preopercle spine long and straight. Commonly enters crab pots. Intertidal to deep subtidal.

***Enophrys bison* – Buffalo sculpin**
Very common in a variety of habitats. Juveniles often white headed, adults commonly gray headed. Long smooth preopercle spine.

***Enophrys lucasi* – Leister sculpin**
The preopercle spine has numerous sharp spinules. Bony projection from upper jaw squared at end. Low intertidal and subtidal, rocky areas.

***Enophrys diceraus* – Antlered sculpin**
The preopercle spine has numerous sharp spinules. Bony projection from upper jaw forked at end. Low intertidal and subtidal, rocky areas.

***Gymnocanthus pistilliger* – Threaded sculpin**
A shallow water sculpin occasionally caught by anglers. Males have elongate, thread-like pelvic fin rays. Opercle spine with 1-4 small spines.

***Triglop macellus* – Roughspine sculpin**
Common subtidal species occasionally caught by shallow-water anglers. Long thin body is distinctive as are the black bars on fins.

***Artedius fenestralis* – Padded sculpin**
Resembles a small red Irish lord, but *Artedius* species have cirri along lateral line. Common low intertidal sculpin.

***Artedius harringtoni* – Scalyhead sculpin**
A common, bright-colored species in the low intertidal and subtidal. Variable in color, the eyes nearly always with radiating bars.

***Jordania zonope* – Longfin sculpin**
This beautiful sculpin is immediately recognizable by the very long cirri on the head. Found in rocky areas, often on boulders in the shallow subtidal.

***Synchirus gilli* – Manacled sculpin**
Common but easily overlooked, this small sculpin is found almost exclusively in near-shore kelp canopies where they swim around the fronds.

***Blepsias cirrhosus* - Silverspotted sculpin**
A common species, especially around eelgrass beds. One of Alaska's most striking sculpins, the long cirri on jaw and unique coloration are distinct.

***Nautichthys oculofasciatus* – Sailfin sculpin**
The common name of this beautiful fish comes from the very tall dorsal fin that can be raised as a display. Common in eelgrass and kelp beds.

***Blepsias bilobus* - Crested sculpin**
Juveniles of this species often hide among the tentacles of jellyfish, apparently immune to the stings . The very large pectoral fins are distinct.

The diversity of sculpins

Despite their superficial similarities, the sculpins on this and the next page are actually members of different families than are the "cottid" or true sculpins. As mentioned previously, there are four families of sculpins in the superfamily Cottoidea. These are the Cottidae (true sculpins), the Hemitripteridae (sailfin sculpins), the Rhamphocottidae (grunt sculpins), and the Psychrolutidae (fathead sculpins).

The fifth member of this superfamily are the poachers, family Agonidae, discussed in the next section. It is no surprise that with such a diverse group of animals many of our species are poorly known. It is highly likely that careful searching will reveal species either unknown to science or not known from Alaskan waters.

***Hemitripterus bolini* – Bigmouth sculpin**
This large sculpin is well named – the huge mouth is filled with rows of small but sharp-pointed teeth. Like many sculpins these are ambush predators.

***Rhamphocottus richardsoni* – Grunt sculpin**
Common in the shallow subtidal, this amazing sculpin prefers to live inside the empty shells of giant barnacles. Pectoral fins with mostly free rays.

***Psychrolutes paradoxus* – Tadpole sculpin**
This unusual sculpin is found in the lowest intertidal zone and in the shallow subtidal. The slick, loose skin is lacking scales or spines.

***Psychrolutes sigalutes* – Soft sculpin**
This sculpin closely resembles the intertidal snailfishes (pg 151), but lacks the “sucker” on the underside. The body is very soft, nearly gelatinous.

***Agonopsis vulsa* – Northern spearnose poacher**
Common on sandy bottoms, especially around eelgrass beds in the low intertidal. Cirri under snout are white, unlike the sturgeon poacher (right).

***Pallasina barbata* - Tubenose poacher**
This poacher is very long and skinny. Similar to the unrelated tubesnouts, the barbel on the lower lip is distinct. Common in eelgrass beds .

***Podothecus acipenserinus* – Sturgeon poacher**
This common shallow subtidal species has distinctive yellow cirri ("whiskers") under snout. Despite resemblance, not related to sturgeons!

Family Agonidae – The Poachers

This strange group of fish are close relatives of the sculpins. Unlike typical sculpins, the body of poachers is covered with bony plates which give them a somewhat primordial appearance. Many species have horns or spines on the plates giving them a dragon or lizard-like quality.

Poachers are found in a variety of habitats and are quite diverse in Alaska with over 20 species known. Many poachers have few to many long cirri extending from the lower jaw. These cirri are sometimes called "whiskers" and their exact function is not known. Poachers feed mainly on amphipods and other small crustaceans and have relatively small mouths.

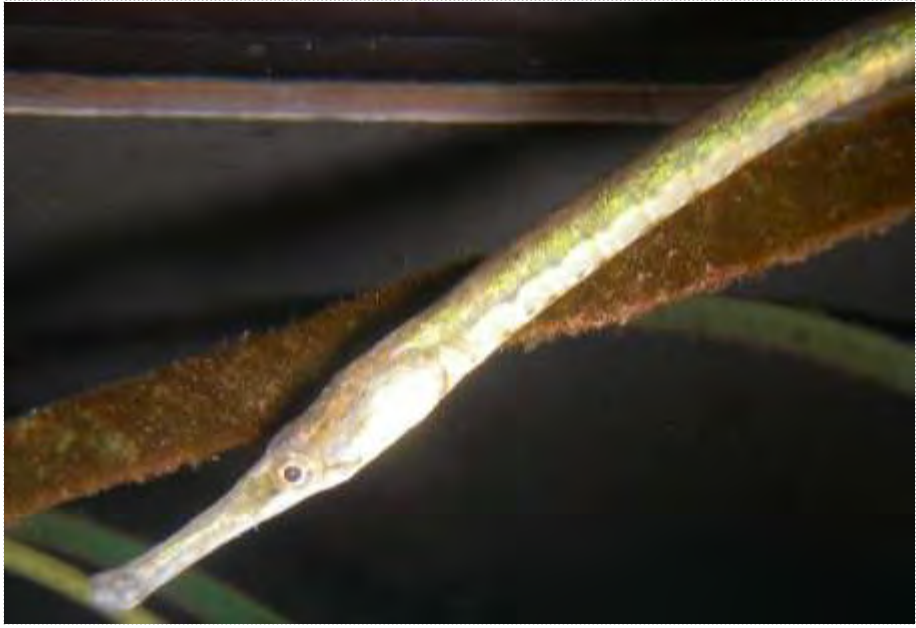
***Leptagonus frenatus* – Sawback poacher**
The white cirri around the mouth and the dark brown fins help to separate this species from the similar sturgeon poacher (previous page).

***Hypsagonus quadricornis* – Fourhorned poacher**
This subtidal species has been observed using its pectoral fins as 'hands' to lift objects while searching for prey.

***Agonomalus mozinoi* – Kelp poacher**
A rare intertidal and shallow subtidal species only recently confirmed in Alaska. Found in rocky areas on the outer coast.

***Bothragonus swanii* - Rockhead**
This bizarre fish has a unique triangular head with a dorsal pit. Found in rocky tidepools on the outer coast. Head extremely well armoured.

***Aulorhynchus flavidus* – Tubesnout**
Abundant in eelgrass. Resembles the unrelated tubenose poacher but lacks the chin barbel and has much smaller pectoral fins. May form large schools.



***Syngnathus leptorhynchus* – Bay pipefish**
Closely related to seahorses, pipefish are common in eelgrass beds. Like seahorses, males brood embryos in a special pouch. Superb camouflage.

***Sebastes caurinus* – Copper rockfish**
A shallow-water rockfish, juveniles may be common in eelgrass and kelp beds. Mottled pink, copper, and brown color distinct.

***Sebastes maliger* – Quillback rockfish**
Another shallow-water rockfish, the quillback is similar to the copper, but tends to be darker. Adults very deep-bodied with tall dorsal fin.

***Sebastes melanops* – Black rockfish**
This common species is a favorite with young anglers. Generally dark gray with lighter underside. May form large schools near shore.

***Sebastes pinniger*– Canary rockfish**
The white stripe and orange cheek stripes make this common species immediately recognizable. Juvenile yelloweye (pg. 148) have two white stripes

***Sebastes nebulosus* – China rockfish**
Arguably the most beautiful of Alaska's rockfishes, the China rockfish has a blue-black body with striking yellow to white spots and blotches.

The Rockfishes – Family Scorpaenidae

A diverse family in Alaska with over 30 species. Because of the similar overall body shape of most local species, identification relies on more subtle features such as number and position of spines, counts of fin rays, and color patterns of fins and body. Some species require detailed counts of several anatomical features for reliable identification.

Like all members of their family, the dorsal and anal fin spines of rockfishes have a toxic mucous covering that can cause quite painful stings to the unwary handler. The degree of toxicity seems to be variable and ranges from mild itching at puncture site to severe swelling accompanied by a fever. It is likely that individual people are more or less sensitive to the toxins and that some species (or even individual rockfishes) vary in toxicity. Take home message – handle with care!

***Sebastes helvomaculatus* – Rosethorn rockfish**
The large white to pink spots on the side of this common rockfish make it unmistakable. Common as bycatch in longline fisheries.

***.Sebastes wilsoni* – Pygmy rockfish**
This small (20 cm) rockfish has a small to moderate symphyseal knob. One of our few rockfishes with the 2nd spine of anal fin much larger than 3rd.

***Sebastes crameri* – Darkblotched rockfish**
Deep bodied fish with dorsal blotches extending to below lateral line. Specimen shown is a juvenile, adults with dark mouths.

Which rockfish is that?

The correct identification of many of Alaska's rockfishes can be a challenge, even for experts. Some species have such unique characters that they can be easily identified on sight. Unfortunately many of our rockfishes are not like that. In this guide I am merely demonstrating the diversity of this group, it is recommended that you search for one of the many excellent guides that deal specifically with rockfishes for a more formal identification.

On the following page I show a few examples of the important features for identification. This is by no means exhaustive, serious workers will count the spines on every fin, the number and strength of the head spines, count gill rakers, count the number of scales on the lateral line, and even examine the color of the body cavity!

Prominent

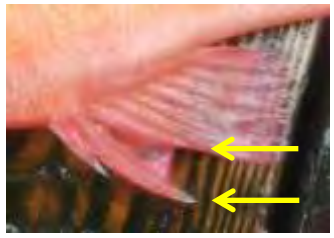
Moderate

Small or absent

Symphyseal Knob (“chin”)

Smaller than or equal to 3rd

Much larger than 3rd



2nd Spine on Anal Fin

Spot or blotch

Striped

None (no markings)

Cheek Color Pattern

Above lateral line

Above and below lateral line

Dorsal Blotches

Small

Large

Mouth Size

White or gray

Red

Indistinct

Lateral Line color

***Sebastes emphaeus* – Puget Sound rockfish**
One of the smallest rockfishes, reaching 18 cm in length. May resemble juvenile redstripes (pg. 150) but lack symphyseal knob.

***Sebastes flavidus* – Yellowtail rockfish**
The gray to olive-brown body and yellow fin margins are distinctive. Often with irregular row of light blotches on sides near dorsal fin.

***Sebastes brevispinus* – Silvergray rockfish**
The very large mouth and prominent symphyseal knob are distinct. The dark body with white to pink belly are unique features.

***Sebastes polyspinis* – Northern rockfish**
This is the only local rockfish with 14 dorsal fin spines (instead of 13). Lower portion of pectoral fins abruptly white or yellow (see inset).

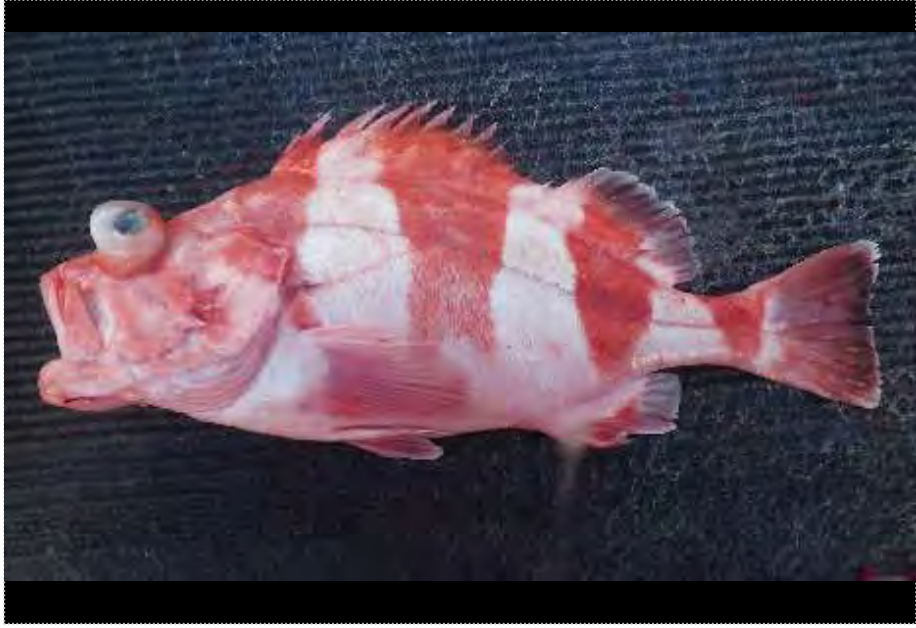
***Sebastes ruberrimus* – Yelloweye rockfish or red snapper**
This large deepwater rockfish is the target of an important commercial fishery. Large individuals are over 100 years old!

***Sebastes aleutianus* – Rougheye rockfish**
A large rockfish, often over 70 cm. Row of sharp spines under eye socket. Fins commonly tipped with black. No spots on dorsal fin.

***Sebastes melanostictus* – Blackspotted rockfish**
Very similar to the rougheye, this species nearly always has small dark spots on dorsal fin (see inset). Formerly considered variant of rougheye.

***Sebastes borealis* – Shortraker rockfish**
This pink to orange-pink rockfish is one of the largest species of *Sebastes*. The club-tipped gill rakers and lack of spines under the eyes are distinct features.

***Sebastes nigrocinctus* – Tiger rockfish**
The five thin vertical brown to red bars on the sides of this rockfish make it unmistakable. Common bycatch in yelloweye fishery.



***Sebastes babcocki* – Redbanded rockfish**
The only other local rockfish with vertical stripes, unlike the tiger has four wide stripes .Common bycatch in longline fisheries.

***Sebastes ciliatus* – Dark rockfish**
Similar to the dusky rockfish (right), the dusky rockfish is uniformly olive-brown to nearly black. Formerly considered the dark form of the dusky.

***Sebastes variabilis* – Dusky rockfish**
This highly variable rockfish is similar to the dark (left) but commonly has a peach, yellow, or white colored belly, especially under the tail.

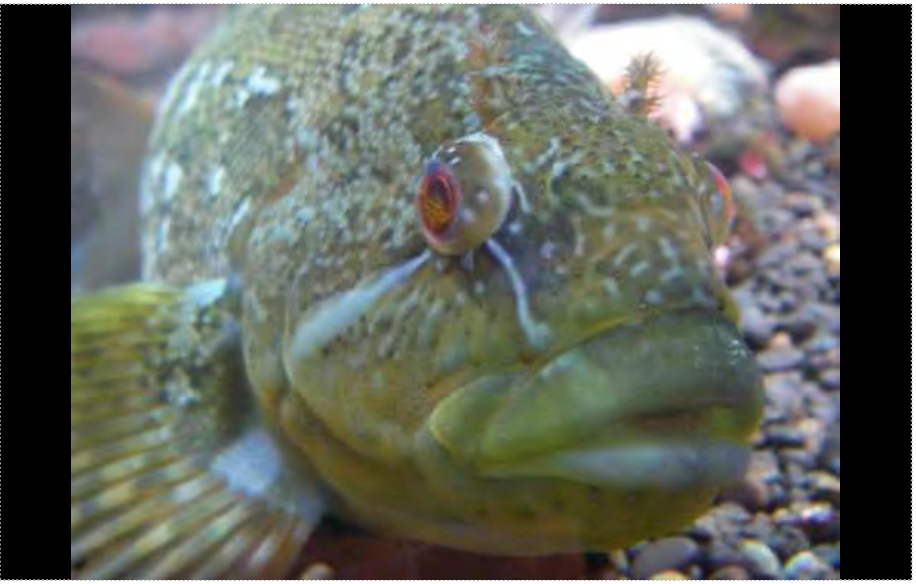
***Sebastes alutus* – Pacific Ocean perch or "POP"**
This small but abundant rockfish is the target of a valuable fishery in the Gulf of Alaska. No dark blotches below lateral line.

***Sebastes variegatus* – Harlequin rockfish**
Similar to the POP (left) the harlequin nearly always has a red-tipped tail. Also dark blotches below lateral line and 2nd spine of anal fin larger than 3rd

***Sebastes proriger* – Redstripe rockfish**
Another rockfish very similar to the POP (above). Red lateral line bordered by green-brown blotches is distinctive as is white at base of anal fin spines.

***Sebastolobus alascensis* – Shortspine thornyhead or idiot**
Unlike rockfishes of the genus *Sebastes*, thornyheads have a row of heavy thorns on their cheeks. Common bycatch in longline fisheries.

***Hexagrammos stelleri* – White spotted greenling**
Unlike other local greenlings, this species usually has abundant roundwhite spots on body and silver sheen**.** Common in eelgrass beds.



***Hexagrammos octogrammus* - Masked greenling**
Similar to the kelp greenling, this species has a single pair of cirri (instead one two) and red eyes (instead of yellow) . Common in rocky areas.

***Hexagrammos decagrammus* – Kelp greenling**
Usually subtidal, the kelp greenling is common in a variety of habitats. Male (shown) with blue spots, female light with small gold or orange spots.

Greenlings – Family Hexagrammidae

This small family of fishes is well represented in Alaska with seven species out of twelve worldwide. Typically greenlings have multiple lateral lines and at least one pair of cirri above the eyes. The well-known lingcod has a single lateral line but does have the cirri.

Two of greenlings in Alaska are the targets of a valuable commercial fishery, the lingcod and the Atka mackerel (both on next page). The kelp greenling is considered good eating and is a part of Alaska's recreational sport fishery. The flesh of greenlings is sometimes green, however this color is harmless and turns white when cooked.

***Hexagrammos lagocephalus* – Rock greenling**
Males (shown) of this species are strikingly colored. Females similar to masked greenlings (previous page) but with a very long lateral line four.

***Oxylebius pictus* – Painted greenling**
An outer coast species found in the shallow subtidal around rocks and algae. Pointed snout and red-brown vertical bars are distinct.

***Ophiodon elongatus* – Lingcod**
This greenling is a voracious predator and is the largest species in family. Juveniles sometimes intertidal eelgrass, adults subtidal on rocky reefs.

***Pleurogrammos monopterygius* – Atka mackeral**
This beautiful fish is often shades of yellow, with dark vertical stripes. Only greenling in Alaska with strongly forked tail. Commercially important species.

***Eumicrotremis orbis* – Pacific spiny lumpsucker**
This bizarre fish is nearly spherical in shape and covered in pointed bony spines. Usually subtidal, juveniles occasionally found in tidepools.

***Gobiesox maeandricus* – Northern clingfish**
Found in the low intertidal in rocky areas of the outer coast. Similar to the unrelated snailfishes, the flattened round head is distinctive.

***Aptocyclus ventricosus* - Smooth lumpsucker**
This large species is rarely seen, although occasionally caught in deepwater crab and shrimp pots. Round, smooth body is distinctive..

Lumpsuckers, snailfish, and clingfish

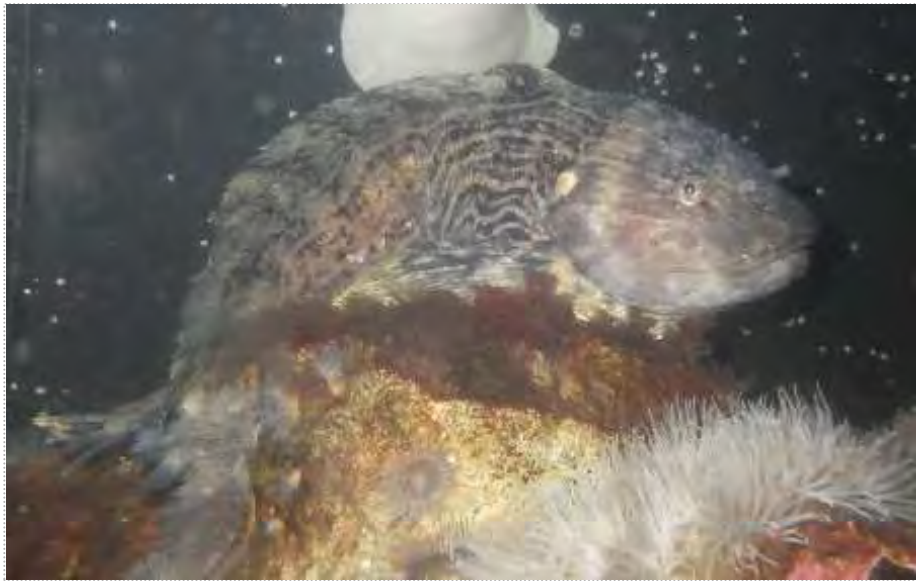
All three of the families represented on this page and the next have their pelvic fins modified to form a suction disk that they use to adhere to the substrate. Lumpsuckers (family Cyclopteridae) and snailfish (family Liparidae) are closely related families. Clingfish (family Gobiesocidae) are related to the true gobies, such as the blackeye goby (Page 155).

The snailfishes are an extremely diverse group with 56 species recorded in Alaska. Many of these are deepwater and poorly known, but there are a few intertidal species and others seen in crab and shrimp pots. A few snailfish species are parasitic in king crabs and use a specialized ovipositor to lay their eggs inside the branchial chambers of the crabs!

***Liparis florae* - Tidepool snailfish**
One of several small snailfishes common in the intertidal zone. Upper and lower jaws with scalloped margins, lips white . Usually 10 cm or less.

***Liparis mucosus* – Slimy snailfish**
A common and extremely variable species. May be yellow, green, red, or pink. Often with fine dark lines. Starburst pattern around eyes typical.

***Liparis callyodon* – Spotted snailfish**
A small intertidal species distinguished by the green , purple, or yellow-brown color with abundant tiny black spots. Fins often barred.



***Liparis gibbus* – Variegated snailfish**
A large, subtidal snailfish commonly exceeding 30 cm. Extremely variable in color and color pattern. Common in crab and shrimp pots.

***Careproctus rastrinus* – Salmon snailfish**
This bizarre gelatinous fish is occasionally caught in crab or shrimp pots. These common exceed 30 cm. in length. Pink color and blue eyes are distinct.

***Icosteus aenigmaticus* – Ragfish**
This huge (over 2 meters) deep-sea fish occasionally washes ashore to the surprise of beachcombers. Body is extremely soft and flabby.

***Alepidosaurus ferox* – Longnose lancetfish**
Another deepwater fish that occasionally washes ashore on the outer coast, These metallic-silver fish resemble barracuda but with a large sail fin.

***Nannobrachium regale* - Pinpont lampfish**
Included as an example of the family Myctophidae, the lantern fishes. This group has photophores that glow in the dark. Important forage for fish and sea mammals.

***Rhinogobiops nicholsii* – Blackeye goby**
Common on the outer coast, these territorial fish can be seen around rocky areas. The black spot on front of dorsal fin is distinctive

***Anoplopoma fimbria* – Sablefish or blackcod**
A valuable commercial species, sablefish are usually caught by longline, bottom trawl, or pots. Unlike true cods these do not have a barbel.

***Erilepis zonifer* – Skilfish**
An offshore species, juveniles are occasionally seen in the SE inside sablefish fishery. Adults lose the white stripes and reach 1.8 meters in length.

***Cymatogaster aggregata* – Shiner perch**
The only common surfperch found in Alaska, this species may be abundant in outer coast eelgrass beds. Males dark during breeding season.

***Anoplarchus purpurescens* – Cockscomb prickleback**
Locally called “blennies” or “eels” these are neither. Abundant under mid to low intertidal rocks, crest equally as tall from snout to back of head.

***Poroclinus rothrocki* – Whitebarred prickleback**
A deepwater species, whitebarred pricklebacks are usually seen as prey items in fish stomachs. The coloration is distinctive.

***Anoplarchus insignis* – Slender cockscomb**
Generally less common than *A. purpurescens* in our region. Usually with distinct white band at base of caudal fin. Crest low toward front of snout.

Pricklebacks, gunnels, wolf-eels, and graveldivers: Suborder Zoarcoidei

This diverse group of fish are characterized by an elongate, eel-like body shape. This similarity is reflected in the common names of several species in this group. They are not closely related to the true eels.

The pricklebacks and gunnels are familiar to most beach explorers as they are often found under rocks at low tide. When looking at pricklebacks, look closely for the small, eerily snake-like graveldivers. Wolf-eels are almost always subtidal, but juveniles are sometimes seen swimming at the surface. In addition to the intertidal families, this group also includes the less well known ronquils, eelpouts, and prowfishes.

***Xiphister atropurpureus* – Black prickleback**
The dark red-brown to black body color and light-bordered darker stripes from eyes are distinctive. Usually outer coast in the low intertidal.

***Xiphister mucosus* – Rock prickleback**
A very large species often over 30 cm in length. Usually brown with yellow mottling. Found under rocks in the low intertidal and subtidal.

***Chirolophis decoratus* – Decorated warbonnet**
Immediately recognizable by the tree-like cirri on head. Cirri between eyes largest. Rarely low intertidal, common subtidal species.

***Chirolophis nugator* – Mosshead warbonnet**
Like its relative the decorated warbonnet (previous page) the head is covered with cirri. The cirri are more numerous and of uniform length.

***Lumpenus sagitta* – Snake prickleback**
A common species found in eelgrass beds, the tan body color with darker spots and stripes is distinct. Commonly 30 cm or more in length.

***Stichaeus punctatus* – Arctic shanny**
Found in the low intertidal and shallow subtidal. Less “eel-like” and more “fish-like” than other pricklebacks. Look for around seaweed-covered rocks.

***Pholis laeta* – Crescent gunnel**
Common in the low intertidal and subtidal. The patterns on the back are distinct, although the fish themselves are variable in color.

***Apodichthys flavidus* – Penpoint gunnel**
Common in eelgrass beds and under rocks with thick algae in the low intertidal and subtidal. Stripe through eye is typical, color variable.

***Anarrhichthys ocellatus* – Wolf-eel**
A favorite of divers, the subtidal wolf-eel is usually found in rocky dens. Despite fearsome appearance wolf-eels are typically docile unless threatened.

***Scytalina cerdale* – Graveldiver**
This strange fish is common under rocks in the mid to lower intertidal zone. The somewhat triangular head resembles a snake's head.

***Cryptacanthodes giganteus* – Giant wrymouth**
This very large (over 1 m) eel-like fish is occasionally hooked by anglers. Similar to a wolf-eel (above) but has eyes towards top of head and small teeth.

***Zaprora silenus* – Prowfish**
This unusual fish may reach a length of 1 meter. The large white pores on the head are distinctive, as are the large pectoral and caudal fisns.

***Ronquilus jordani* – Northern ronquil**
Ronquils are common inhabitants of subtidal rocky areas. The bright yellow on the fin margins is distinctive for the northern ronquil.

***Bathymaster signatus* – Searcher**
Commonly caught by anglers, the searcher is distinct in having a tan colored body and a vertical row of bright orange pores on cheek.

***Bathymaster caeruleofasciatus* - Alaskan ronquil**
The dark red-brown color with blue iridescence distinguishes this ronquil from the others. Juveniles sometimes common in tidepools, adults subtidal.

***Lycodes brevipes* – Shortfin eelpout**
Eelpouts are a large family of subtidal fishes that are very difficult to separate. Unlike ronquils the dorsal and anal fins continue around the tail.

***Gasterosteus aculeatus* – Three-spined stickleback**
These minnow-like fish are found in both fresh and salt water. The three sharp dorsal fin rays are distinctive. Males build nests for eggs!

***Trichodon trichodon* – Sandfish**
These burrowing fish have a distictive upturned mouth that is fringed with numerous fleshy papillae that resemble teeth. Common on sandflats.

***Ammodytes hexapterus* – Pacific sand lance**
These elongate fish are commonly found buried in intertidal sand or trapped in tidepools. Important forage fish for birds, fish, and sea mammals.

***Gadus macrocephalus* – Pacific cod**
A commercially important species, this cod is one of several Alaskan species of Gadidae (cod and pollock). Chin barbel very long.

***Theragra chalcogramma* – Alaska or walleye pollock**
Alaska's most valuable commercial fish and the target of the second largest fishery in the world**.** Barbel tiny and difficult to see, unlike Pacific cod..

***Albatrossia pectoralis* – Giant grenadier or rattail**
These bizarre relatives of cod and pollock are sometimes abundant as bycatch in deepwater fisheries. Several similar species found locally.

***Savelinus malma* – Dolly Varden**
A common species often fished for from shore. Distinguished by the presence of numerous light colored spots on back and sides.

***Oncorhynchus gorbuscha* – Pink salmon or humpy**
Smallest of the Pacific salmon. Recognized by the large oval spots on tail fin and back. Males with large hump when in freshwater.

***Oncorhynchus keta* – Chum or dog salmon**
Recognized by the lack of spots on back or tail and silver wash on tail rays, not membranes. Purple-red stripes on sides when in freshwater.

***Oncorhynchus kisutch* – Coho or silver salmon**
Small spots on back. Unlike the similar king salmon, the coho has spots only on the upper lobe of the tail. Gums white to pink, with thin dark margin.

***Oncorhynchus tshawytscha* – King or Chinook salmon**
Largest of the Pacific salmon, commonly 70 cm or more. Numerous small black spots on back and tail , gums and inside of mouth are black.

Salmon and Chars: family Salmonidae

Few fish are better known in Alaska than are the salmon. Salmon are the target of an extremely valuable commercial harvest with an estimated 100 million fish caught per year. In addition to the commercial fishery, salmon are an important part of the subsistence and recreational fishery.

There are five native species of salmon in Alaska. The rainbow trout, *Oncorhynchus mykiss* (not in this guide), belongs to the same genus as do salmon but is primarily freshwater. Sea-run rainbow trout are called steelhead. The invasive Atlantic salmon, *Salmo salar* (not in this guide), is still infrequent in Alaska but closely watched. The Dolly Varden is a char that is a favorite for beach anglers.

***Oncorhynchus nerka* – Sockeye or red salmon**
No silver wash or spots on tail, tail dull slate gray. Typically 28 or more gill rakers per arch. Male with green head and red body when in freshwater .

***Thaleichthys pacificus* - Eulachon, hooligan, or candlefish**
Members of the smelt family, eulachon live offshore but move into rivers to spawn. Dried fish can be used as candles because of high oil content.

***Clupea pallasii* – Pacific herring**
Typically pelagic and offshore, group near shore when spawning and roe may cover rocks and vegetation in the intertidal. No adipose fin.

***Platichthys stellatus* – Starry flounder**
An extremely common shallow water flatfish. The presence of rough, spiny scales on both sides and yellow and black bars on fins are distinctive.

***Hippoglossus stenolepis* - Pacific halibut**
Always subtidal, this large (commonly over 1 meter) flatfish supports a valuable sport and commercial fishery. Tail shape distinct.

***Atheresthes stomias* – Arrowtooth flounder**
Often confused with halibut, these large flounders have large, sharp teeth in the front of their jaws. Not generally considered good eating due to mushy flesh.

***Lepidopsetta bilineata* – Southern rock sole**
The lateral line of this species is arched high over the pectoral fin. The nearly identical northern rock sole (*L. polyxtra*) has 7 rather than 6 gill rakers

The Flatfishes: Families Pleuronectidae and Paralichthyidae

This group of fish are unusual in having their eyes on one side of their body. For most of our species (family Pleuronectidae), the eye is usually on the right side. The left side, called the “blind side” is typically white. The right side, called the “eyed side” is variable in color and often matches the substrate. Most flatfish will rest partially or wholly buried in the sediment with only the eyes showing. Members of the family Paralichthyidae are called left-eyed flounders as they typically lie with the right side down.

The best known of Alaska’s flatfish is the Pacific halibut, a giant species usually found in deeper water. Halibut are one of Alaska’s most important commercial species.

***Limanda aspera* – Yellowfin sole**
Found in sandy areas, the fins become yellow in adults. Look for the thin, dark line at base of fins. Juveniles common around eelgrass beds in intertidal.

***Microstomus pacificus* - Dover sole**
These deepwater fish are considered good eating. The large body is soft and extremely slippery. Common as bycatch in deepwater fisheries.

***Parophrys vetulus* – English sole**
The tail shape and elongate head help distinguish this common subtidal species. Color of adults often solid red-brown or olive brown.

***Citharicthys stigmaeus* – Speckled sanddab**
One the few local left-eyed flounders in our area. Pelvic fins of sanddabs are not symmetrical. Common shallow water species.