

**a guide to
oregon's rocky intertidal areas**

**OREGON INSTITUTE OF
MARINE BIOLOGY
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Users.....	2
Areas.....	4
North Coast.....	5
South Coast.....	25
Common Intertidal Animals.....	13
Rules and Regulations.....	32
Map of Oregon's Intertidal Areas.....	33

foreword

Oregon's rugged and varied coastline is uniquely fascinating to many people. Historically, Indians lived along the coast and harvested the rich bounty of the intertidal areas as evidenced by extensive shell mounds along many parts of the coast. Today, fishing, clamming, surfing, picnicking, beachcombing, and other pursuits attract thousands of visitors to the coast annually.

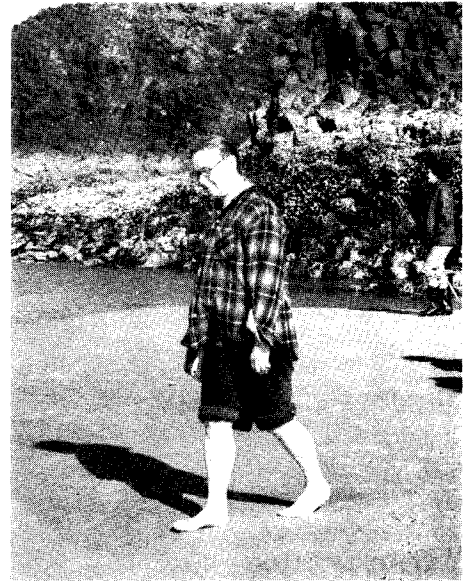
Many people visualize the coast as a sandy beach; however, there are numerous rocky areas along the Oregon Coast. These areas vary from rocks isolated in the sand to headlands jutting out into the sea with surrounding bedrock or boulders. The rocky, intertidal areas have a rich and varied fauna and flora, often unique to a specific habitat or range of environmental conditions. School groups, scientists, and beachcombers find these areas of great interest. As a result, some rocky intertidal areas such as Yaquina Head or Cape Arago, located close to population centers or highways, experience heavy use. This pamphlet focuses attention on a potential overuse and encourages a lessening of pressure on a few areas by pointing out alternate areas available. The pamphlet is also a pictorial guide to the most obvious intertidal invertebrates along Oregon's coast. A summary of regulations protecting intertidal nonfood invertebrates is included. The collector should check the latest synopsis for current information.

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Cover Photo: Sunset Bay, near Cape Arago, along the southern Oregon Coast.
Photographer: Anthony Capone



users

By the late 1950's there was an increasing concern among individuals that the fauna of many of the rocky shore areas was being depleted by excessive collecting. At the request of the Oregon Marine Biological Society and others, the 1961 Legislature gave the Fish Commission of Oregon jurisdiction over all intertidal invertebrates not usually used for food. In 1962, the Commission established regulations governing the harvest of all intertidal, nonfood invertebrates along the Oregon Coast. A daily bag limit was set and collecting by permit only established for certain areas.

Intertidal collecting permits are issued at no charge by the Fish Commission's Newport Laboratory. At the end of the collecting period, permit holders must file a collecting report with the Fish Commission, stating approximate numbers of animals taken, where collected, and for what purpose.

Index groups that can be counted accurately such as starfish, shore crab, and chitons are used to evaluate the relative pressure on different intertidal areas and taxonomic groups.

There are basically five types of users of rocky intertidal areas: (1) clam diggers or fishermen, (2) beachcombers, (3) scientists, (4) commercial collectors, and (5) school groups. The clam digger and fisherman does not usually seek the nonfood animals but may affect them while looking for bait by turning over rocks, digging up the sand, or tearing up mussel or surf grass beds. The casual beachcomber does little damage if he is satisfied by picking up driftwood and shells or in capturing intertidal scenes on film. The exception is the individual who seems to be overcome with a collecting urge and picks up animals without any thought of eventual use and preservation.

Scientists and students working on research projects sometimes take a number of a particular species, but they are usually aware of the danger of overcollecting.



The commercial collector is primarily interested in selected species such as starfish, shore crab, worms, and sea urchins. These he takes in large numbers, varying from a few hundred to several thousand. Commercial harvest is prohibited in "permit only" areas.

Substantial pressure in permit areas comes from school groups, grade school through college, that make field trips to the coast, especially during April and May. Thousands of people are concentrated during this period in areas that may be only a few acres in extent. Although the removal of animals is the most direct way that intertidal populations are affected, the mere presence of hundreds of people in a small area may be of drastic consequence if sea urchin beds are walked over, soft rocks broken apart, and boulders left overturned. This problem is a very real one in California. Ray Chapman, editor of *Outdoor California* (Sept.-Oct. 1968 issue), cites instances of 30 school buses in a single day at one beach and 12 busloads of students at another beach, followed by another 12 busloads 3 days later. The problem at several popular areas in Oregon is only a little less severe. Haystack Rock at Cannon Beach is a graphic example of the effect man can have on a limited area. This cliff is easily accessible and, largely as a result of this, only the hardier, more inconspicuous animals remain.

In issuing collecting permits, the Fish Commission encourages basic conservation practices such as replacing overturned rocks and keeping collecting to a minimum. Schools, after establishing an invertebrate collection, should have little need to collect more animals except for special study or to replace damaged specimens. Study of preserved specimens, or better yet, a slide lecture prior to the field trip, followed by a study of the animals in their natural habitat would be a meaningful way to study intertidal life while leaving it reasonably undisturbed.

areas



Although Oregon's coastline is some 400 miles long, only a handful of areas experience very concentrated use, especially by school groups during the spring low tides. The following section is intended to point out the variety of available areas and to encourage schools and individuals to use these different locations. The following rocky intertidal areas were chosen because of their relative accessibility, size, or interesting fauna. Each area is shown on the accompanying maps and information is given on available facilities, how to get to the beach, what the area looks like, and what is there, especially in terms of dominant communities or unique species. Although the major rocky intertidal areas along Oregon's coast are discussed, there are additional smaller areas of interest such as isolated rocks or, especially on the south coast, entire coves accessible only by game and sheep trails.

The maps were redrawn from U. S. Geological Survey maps, Oregon State Highway Department aerial survey photographs taken in 1967, and from Fish Commission aerial survey photographs.

north coast

For the purpose of this report, the north coast applies to the area between the Columbia River on the north and Coos Bay on the south. The extensive sandy beaches just south of the Columbia River are eventually interrupted by massive headlands and adjoining rocky areas. South of Cascade Head, the coast has predominantly rocky shelves that are broken up by tide channels and pools. South of Cape Perpetua, sandy beaches again become the rule, including the Oregon Dunes National Seashore. The area between Cascade Head and Cape Perpetua is especially popular with the numerous school groups from the populous Willamette Valley.

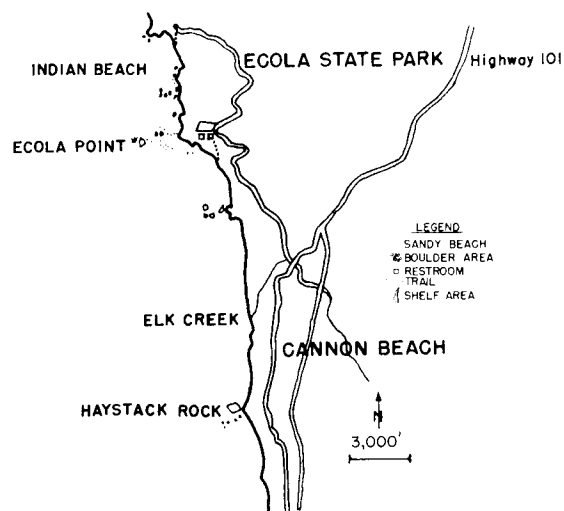
Ecola Point-Haystack Rock

Ecola Point. This intertidal area is located 2 miles north of Cannon Beach, within Ecola State Park. The point can be reached by a good trail leading south from the large, main parking lot, a distance of about 1/4 mile. An alternate approach is to drive down to Indian Beach and walk south along the beach to the point, 1/2 mile away. The road into the park is narrow and winding and may be difficult to manage for buses. The area is also plagued by slides which have closed the road at times. Check with the Parks Division of the Highway Department on the status of the road before planning a field trip to the park.

A mixture of sandy beach, rocky headland, boulders, and some bedrock, the area is typical of the rocky areas of the north-central coast. Tide pools are few and algal growth is moderate. Except for a few offshore rocks and some subtidal kelp beds, the area is exposed to the open sea.

The typical barnacle-mussel bed community is common and with it the common starfish, *Pisaster ochraceous*. Another species much in evidence is the green anemone, *Anthopleura xanthogrammica*.

Haystack Rock (Cannon Beach--collecting by permit only). Located at Cannon Beach is one of several rocky "seastacks" along the Oregon Coast. It is easily accessible and overcollecting is an annual problem. To remedy this, the area was closed to the collecting of nonfood invertebrates except by permit. Parking is on the beach or one block away from the beach. The boundaries of the permit area are 300 yards north and south of the main Haystack Rock. Haystack Rock is one of several federal bird refuges along the coast and may not be climbed.

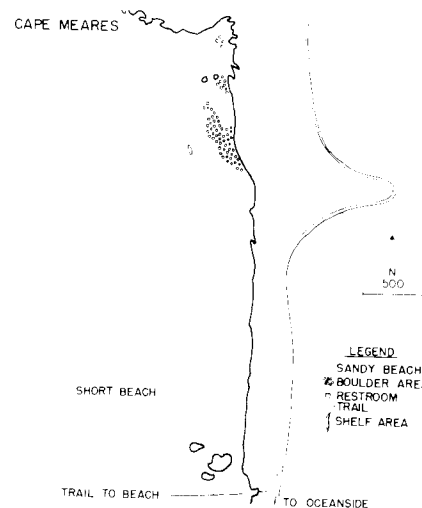


Cape Meares

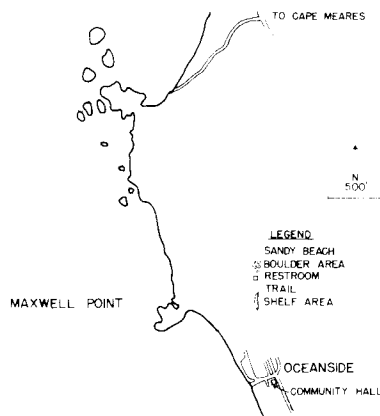
Cape Meares is located about 10 miles west of the town of Tillamook. It can be reached either by driving along the west side of Tillamook Bay past Bayocean or by driving through Netarts and Oceanside. The latter route is shortest. Cape Meares proper is inaccessible to the average beachcomber but there is a rocky intertidal area on the south side of the cape that can be reached from Short Beach, 1 mile north of Oceanside. Parking and access to the beach is limited. From the road, a steep trail leads down to Short Beach and the rocky area, 1/2 mile to the north.

The intertidal area consists of a sandy beach with a large number of boulders up to 4 feet in diameter scattered about. Closer to Cape Meares are a few larger outcroppings and caves. Cape Meares and Maxwell Point provide some protection from the surf.

Algae and surf grass grow in moderate amounts. The animal community includes mussels and a variety of starfish.



Maxwell Point



This area is adjacent to the town of Oceanside, 9 miles west of Tillamook. From an ample parking lot it is but a short walk north to the point. Rest rooms are available in the Community Hall, near the beach parking lot. At low tide, the area can be reached by car from Oceanside. A foot tunnel goes through Maxwell Point, enabling one to go around the point at high tide.

Basically a sandy beach, the area has large isolated rocks and vertical cliffs jutting out from the mainland. Boulders are found between some of the rocky points. Rocky tide pools are scarce although some of the cliffs have sand-bottom pools at their base.

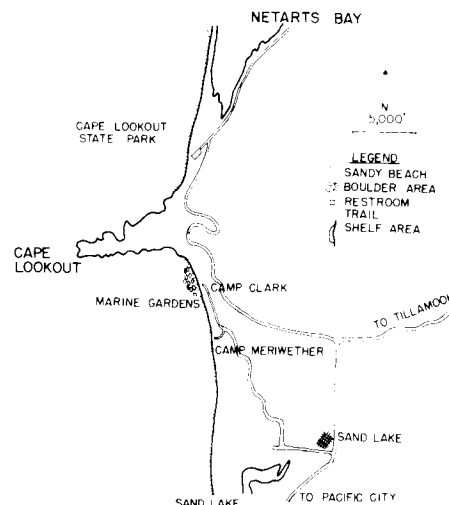
Algal growth is moderate. Mussel beds and the common starfish, *Pisaster ochraceous*, form the dominant animal communities.

Cape Lookout "Marine Gardens"

This area is 18 miles south of Tillamook, on the south side of Cape Lookout. Turn off Highway 101 onto the Pacific City loop and follow the Boy Scout Camp signs. The road is not suitable for large buses. Since the Boy Scout Camp has to be crossed, permission to trespass must be obtained from the Camping Department, Columbia Pacific Council, Scout Service Center, 2145 S. W. Front Street, Portland, OR 97201.

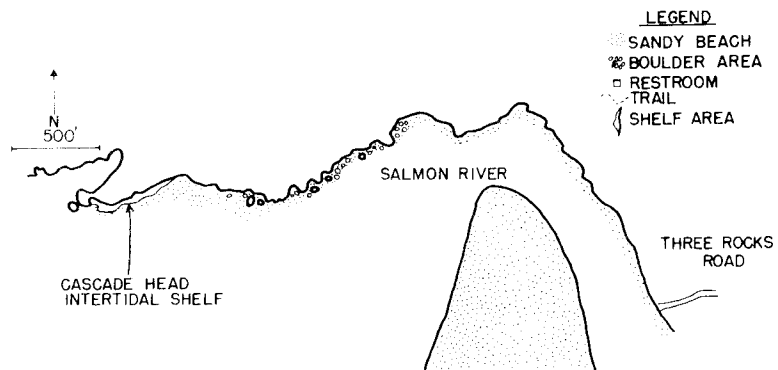
The Marine Gardens are located on the south side of Cape Lookout, about 1 mile north of Camp Meriwether and adjacent to Camp Clark. The sandy beach is scattered with a large number of boulders 2 to 3 feet in diameter.

Algal growth is heavy, covering the rocks and part of the sand. Subtidally, kelp beds help to modify wave action, giving some protection to the intertidal zone. The area has a varied fauna, perhaps because it is relatively isolated. Populations of mussels support an unusually varied population of starfish, including the leather star.



The mouth of the Salmon River (Lincoln County) adjoins the south side of Cascade Head. It is within the Cascade Head Scenic-Research area, established by Congress in 1974. There is a limited intertidal area along the north bank of the river. The area may be reached by turning off Highway 101 onto the Three Rocks Road 3 miles north of Lincoln City. Parking is limited and there are no rest rooms available.

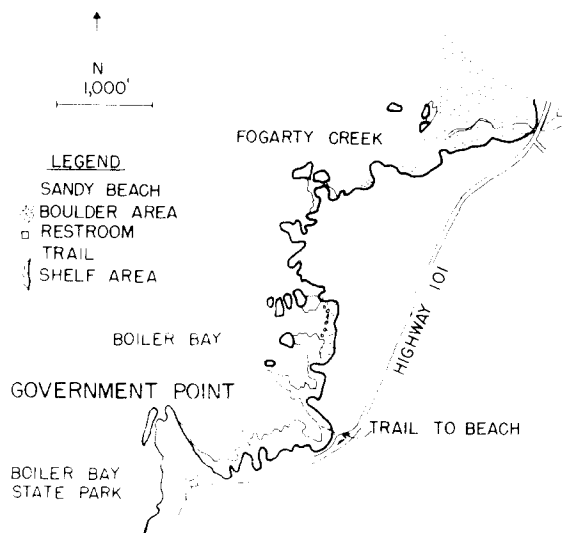
After parking at the end of the road, one has to walk along the bank of the Salmon River to its mouth, a distance of about 1/2 mile. The hike involves climbing over cliffs and should not be attempted by older people or children.



The intertidal area proper is a narrow shelf jutting out from the mainland. It is only some 200 feet wide and slopes steeply down to a sandy beach. Scattered in the sand are various sized boulders that support moderate algal growth and surf grass beds. Some mussel beds are present and with them associated species such as barnacles, common starfish, and snails.

Boiler Bay (collecting by permit only)

Boiler Bay is located 1 mile north of Depoe Bay along U. S. Highway 101. The intertidal area lies northeast from the parking lot of Boiler Bay State Park. There are rest rooms and room for bus parking at the state park. A steep, unimproved trail leads down to the intertidal area from a small gravel parking lot 200 yards east of the state park. The boundaries of the permit area are Fogarty Creek on the north and Government Point (Boiler Bay State Park) on the south.



To the north of the trail, a steep headland has been broken down to varying degrees, leaving rocky ridges and isolated cliffs with flat bedrock shelves and boulder fields in between. The shelf areas are divided to varying degrees by tide channels and wider inlets.

Algae and surf grass beds are abundant, especially in the boulder areas. A varied community of animals is found here, including beds of mussels and purple sea urchins.

Depoe Bay-Shell Cove-Whale Cove

Depoe Bay. This area is located north of the entrance into Depoe Bay, paralleling the shore. The bedrock shelf is pocketed by numerous tide pools. Exposure is extreme and this area would be hazardous even during moderate surf conditions. It is not recommended for larger groups because of its limited area.

Shell Cove (collecting by permit only). Shell Cove is located just south of the town of Depoe Bay and is reached by turning off Highway 101 onto Shell Cove Road. Follow the road west and south until it parallels the shore. The areas adjacent to the intertidal areas belong to a real estate developer and access could be a problem in the future. The boundaries of the permit area are Shell Road on the north and the southern boundary of Section 7 in Township 9 South.

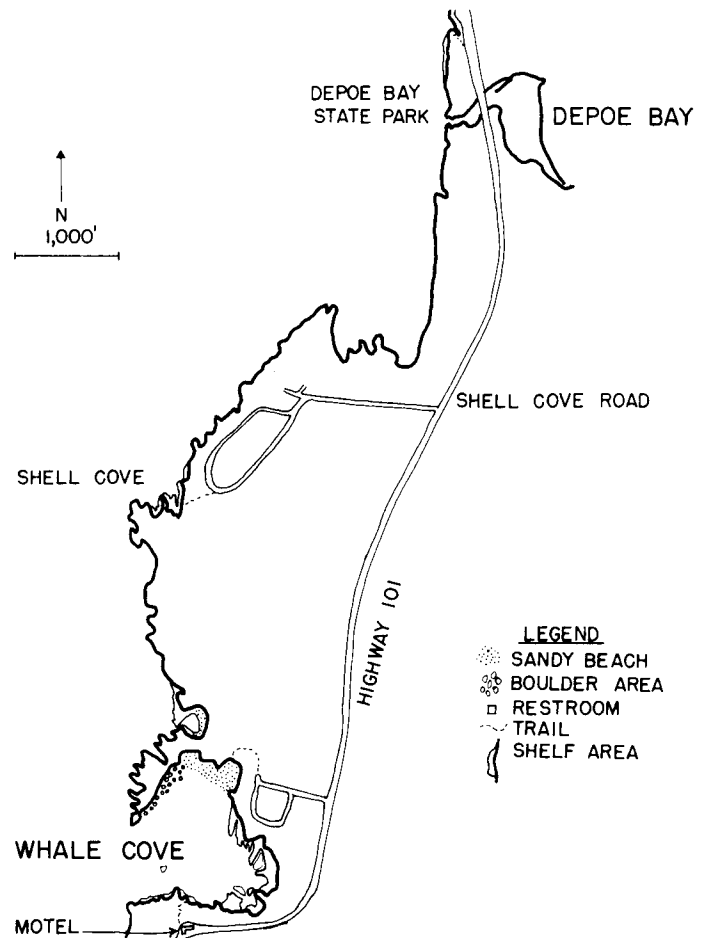
This is a spectacular example of an exposed outer coast. Because of its limited area, this spot is not advisable for larger groups. The bedrock juts out into the ocean forming a shelf in the lower reaches which has numerous tide pools and channels. Evidence of the great force of the waves may be seen in the broad spray zone.

The algae of necessity consists of species such as the "sea palm" and the hardy calcareous types. The colonies of sponge that color some of the channel walls in shades of red, lavender, green, or yellow are very spectacular.

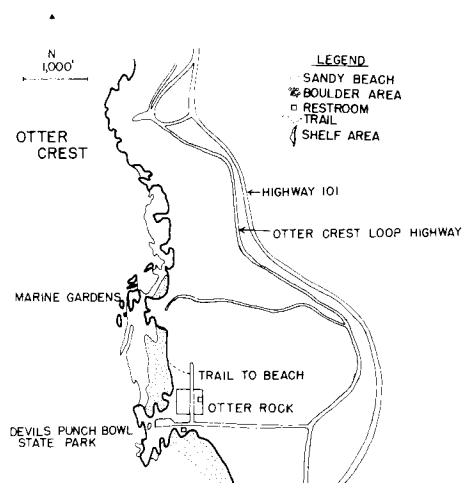
Whale Cove. This picturesque cove is found 1-1/2 miles south of Depoe Bay, off Highway 101. The south side of the cove is accessible from Rocky Creek State Park. The north side is reached from a side road off the main highway. Parking is limited and private property must be crossed to get to the beach.

Habitat varies at Whale Cove. The north side intertidal area lies along a high cliff that reaches out from the mainland. At its base are various sized boulders with a few tide pools interspersed. The northeast end of the cove consists of a sandy beach that grades into flat sandstone shelves on the southeast. These shelves are dissected by several channels. The south side consists of sloping bedrock jutting into the cove with several channels and tunnels cut into it. Algal growth is moderate throughout the boulder areas and surf grass is also present.

In 1967, the Fish Commission of Oregon introduced red abalone in this cove in an attempt to establish this shellfish on the central Oregon Coast. As a result, the taking of shellfish is prohibited in Whale Cove. Current regulations should be checked before any animals are taken from this area.



Marine Gardens at Otter Rock (no collecting of nonfood invertebrates)



Nine miles north of Newport are the Marine Gardens at Otter Rock. Turn off Highway 101 towards the Devil's Punch Bowl State Park and turn right on the last dead-end road before the state park. Rest rooms and ample parking are available here. From the dead-end road, a good trail leads down to the beach. Additional private access to the beach is available from a condominium complex to the north. The boundaries of the closed area are Cape Foulweather on the north and the Devil's Punchbowl on the south.

Flat sandstone shelves predominate in most of the intertidal area. Channels paralleling the shoreline break up the shelves and numerous tide pools pocket the rocks. To the north the area changes to individual cliffs with adjoining boulders and some shelves.

Surf grass and sea lettuce, *Ulva*, cover much of the flat area. Other algae are only moderately abundant although kelp beds are found offshore. Purple sea urchins line many of the pools and channels, and rocks have thriving mussel and starfish populations.

Yaquina Head (collecting by permit only)

North Side. This area is located 3 miles north of Newport. Compared to the south side, the intertidal area is relatively inaccessible except at very low tides. The area may be reached by turning off Highway 101 toward the beach on the first road (Shell Road) north of Lighthouse Road in Agate Beach. Turn west on Fossil Street and follow it to its end. Parking is very limited. From here, a poor trail leads down to the beach and to rocky areas 1/4 mile to the south.

Sandy beach predominates and the rocky areas are mainly ledges, vertical cliffs, and isolated rocks in the sand. Vegetation is light and the whole area is exposed to the surf, especially in the summer. Several caves cut into the headland and these have abundant populations of sponges, colonial ascidians, and coralline algae. The area boundary is the sand beach to the north.

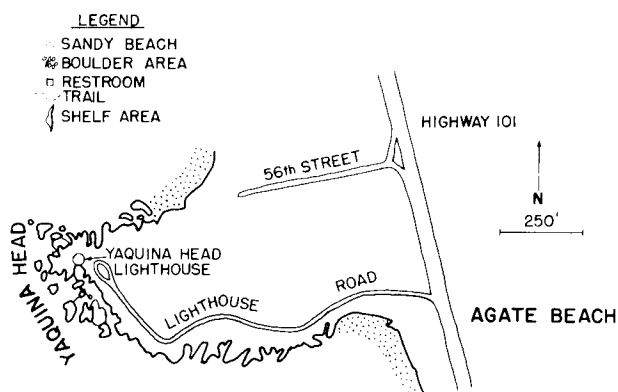
South Side. This is one of the most heavily utilized intertidal areas in Oregon. To reach the area turn west off Highway 101 at Lighthouse Road in Agate Beach. Parking is adequate, but there are no rest rooms available. Since gravel trucks use the same road, cautious driving is recommended. The trail down to the beach is poor.

Long fingers of the basaltic headland jut out into the sea to the north and south of the area. Several rocky outcroppings are present in between, ranging from boulder size to isolated islands. Shelf areas cut up by tide channels and tide pools are widespread landward.

A variety of animals may be found, among them the usual mussel-barnacle-starfish combination and extensive colonies of purple sea urchins.

The sandy beach to the south is the permit area's southern boundary.

Educational programs for school groups at Yaquina Head and other areas are available through the Oregon State University Marine Science Center in Newport (Telephone 503-867-3011).

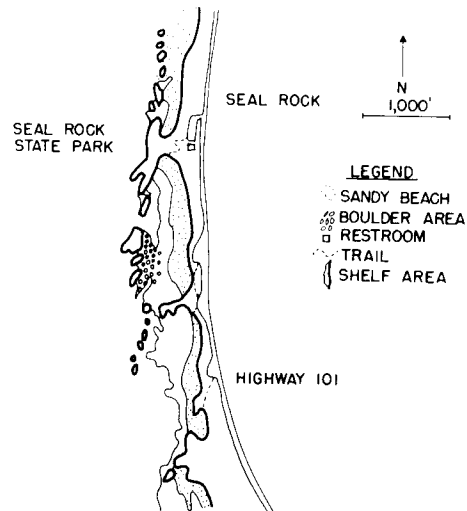


Seal Rock

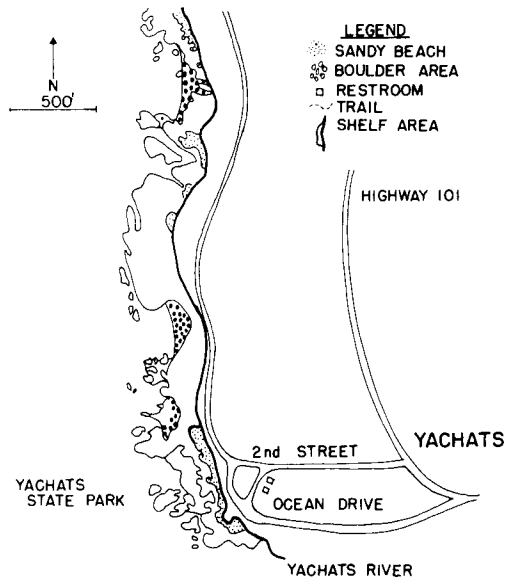
This location is 12 miles south of Newport just off Highway 101. Access is from a state park on the north, or from two turn-off points just south of the main park area. The latter two points are better suited for bus parking. The trails range from good in the park to poor at the turn-offs. The park has rest rooms at the parking area.

From the park, a massive headland juts in a south-westerly direction. To the north of this headland, a chain of cliffs continues north, largely isolated from the shore. To the south, a combination of cliffs, bedrock, and some boulders are found intertidally. Offshore are numerous islands and reefs, giving some protection to the area. A sandy beach is found next to land.

The usual assemblage of mussels, barnacles, and starfish is most common. Algal growth is moderate. Sea lions and seals are sometimes seen on the offshore rocks.



Yachats State Park



Yachats State Park, north of the Yachats River, includes some rocky intertidal areas. From Highway 101, turn west on 2nd Street or Ocean Drive in the town of Yachats. From the large parking lot in the state park, several trails lead down to the beach.

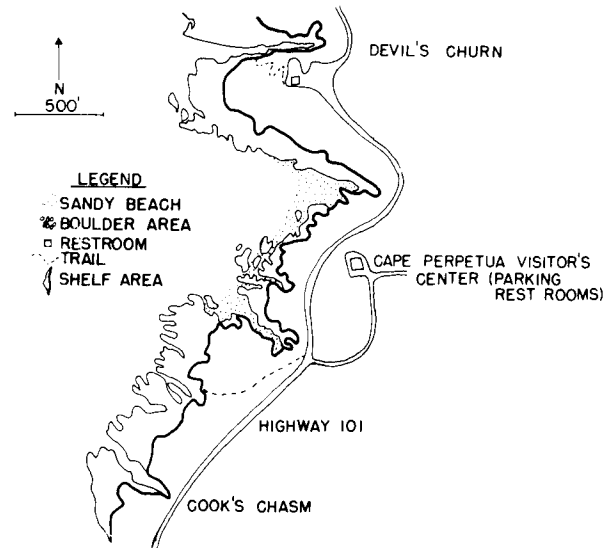
The rocky area extends for about 1/2 mile north of the Yachats River. A smaller area is found south of the river. A basal shelf stretches down into the intertidal area. Only on very low tides is some of the sandy beach seaward of the rocky shelf accessible. Channels and small caves and tide pools are numerous. Very little protection exists from the surf and caution should be used during stormy weather.

Large plants are scarce. Instead, species characteristic of exposed conditions, such as "sea palm" are common. Mussel and barnacle colonies abound together with starfish. Of special interest are colonies of "featherduster" tube worms in the lower intertidal areas.

Cape Perpetua (restricted collecting)

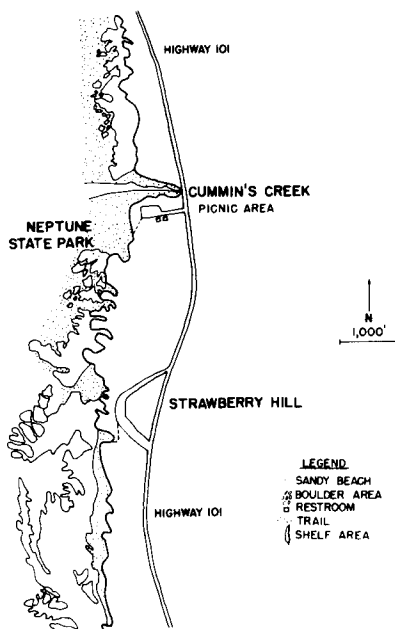
Cape Perpetua is a massive mountain 2 miles south of Yachats. Along its base runs a shelf of varying width. Most of the shelf drops abruptly into the sea and the intertidal zone is limited. There are several turn-offs on Highway 101 from which the bedrock shelves can be reached. The U. S. Forest Service has a Visitor's Center in this area and maintains a network of trails that lead down to the intertidal zone and other points of interest. The Visitor's Center offers guided tours and special programs for school groups if they are contacted in advance. Write the U. S. Forest Service Visitor's Center, Yachats, OR 97498 for details (Telephone 547-3289). Bus and car parking and rest rooms are available at the Visitor's Center. *No intertidal, nonfood species may be collected in the Cape Perpetua Recreation Area between the northern boundary of Neptune State Park and the mouth of North Cape Creek.*

The area is best explored at the lowest tides and even then the surf can be a problem. The bedrock drops off onto a sandy beach and from here one can see the special beauty of the area. The channels and caves are lined with lush populations of sponges, colonial ascidians and encrusting algae. Mussel beds with accompanying starfish and barnacles are common and green anemones line the sides of the protected pools.



Neptune State Park (collecting by permit only)

This park is located about 13 miles south of Waldport, along Highway 101. It forms the southern boundary of Cape Perpetua and has varied and extensive intertidal areas. The park is discussed by two major areas, the main picnic area and the Strawberry Hill area. The boundaries of the permit area correspond with the state park boundaries.



Picnic Area. The main picnic area has ample parking, rest rooms, and easy access to the beach. Many of the rocks are steep, requiring climbing, and present hazards of falling or getting trapped by the incoming tide. Only on the lowest tides are the better intertidal areas accessible and this is primarily a fishing area.

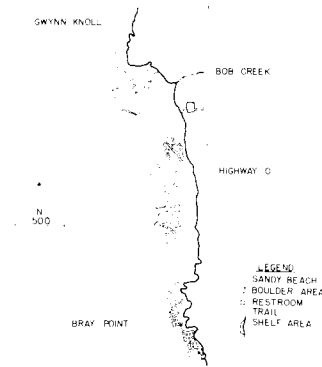
Strawberry Hill. The best intertidal areas are reached from the Strawberry Hill parking lot. From here, a good trail leads south to the beach and the rocky intertidal area. Another, more primitive trail extends north and west to the beach. Basically bedrock with some sandy areas intermixed, this location also has numerous tide pools, channels, and boulders.

Algae and surf grass are abundant. Most of the common species of animals may also be found here. One exception is the purple sea urchin which is rare intertidally. As in many areas, a periodic sanding in of the rocky areas occurs.

Bob Creek to Bray Point

This area adjoins the southern boundary of Neptune State Park and represents a continuation of the Cape Perpetua basal shelf that reaches out into the sand, a situation found for several miles in this vicinity. The basal shelf is exposed to varying degrees in the sand and is broken up by tide channels and some pools. Access and limited parking is available just south of Bob Creek.

The variety of species is limited but the ones present are numerous. Mussel and barnacle populations support good numbers of starfish and the pools have large populations of green anemones. The exposed areas have the usual aggregations of sponges and ascidians. Tube worms are also present in the lower zones.

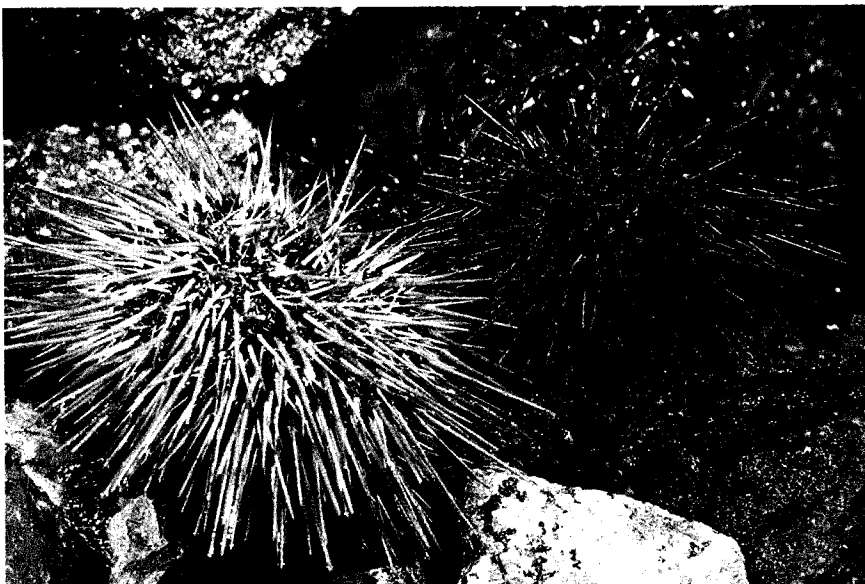


common intertidal animals

The intertidal zone of Oregon's rocky shore has an unusually rich flora and fauna. Within a limited area one finds a variety of environments and animals that have adapted to these particular conditions. The animals shown and described represent a selection of the most obvious species that the amateur beachcomber is likely to see along the Oregon coast.



(1)

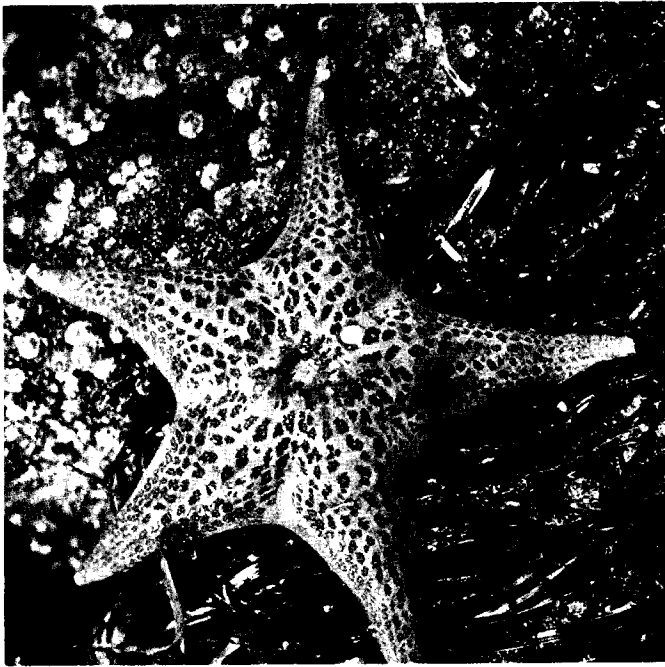


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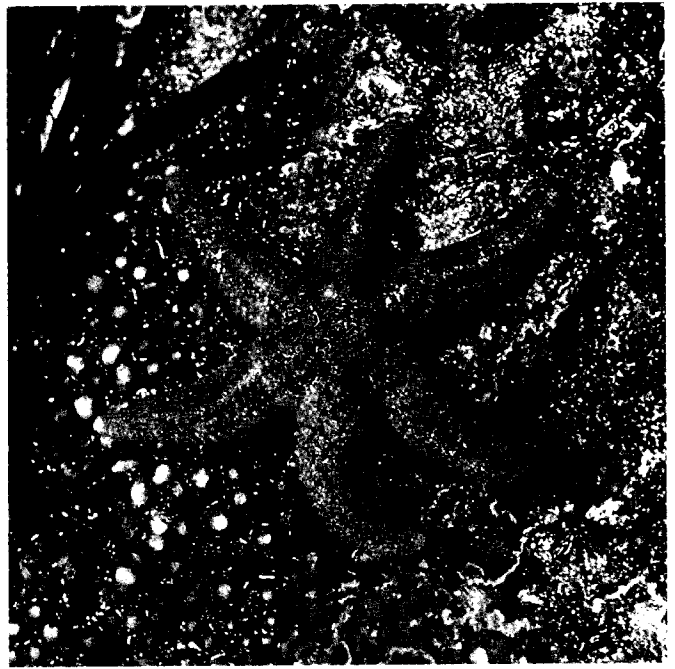
(1) The purple sea urchin, *Strongylocentrotus purpuratus*, by far the commonest of Oregon's two species, may completely line the sides of tide pools in favorable areas. Often this 3½" animal lives in a shallow depression which it has hollowed out of the rock.

The ribbon worm, *Tubulanus polymorphus*, also occurs in the habitat occupied by the urchins. This bright red nemertean worm is a conspicuous member of a group of animals which often live concealed in mussel beds or underneath rocks.

(2) The red urchin, *S. franciscanus*, is primarily a subtidal species, but a few enter the lower intertidal reaches. It may be either red or purple; however, its longer spines and generally larger size of up to 8" separates it from the purple urchin.



(1)



(2)

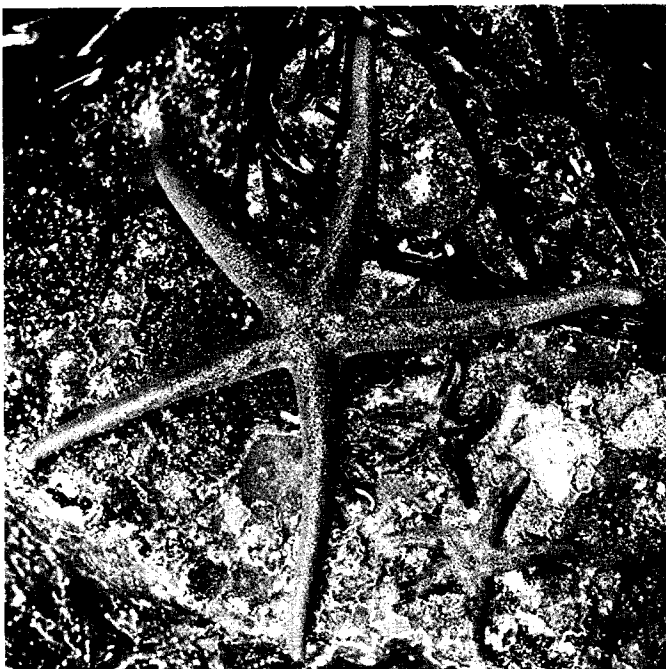
The northwest coast has an unusually diverse collection of starfish. Of the numerous species along our coast, many are subtidal or restricted to the lower intertidal area.

(1) The leather star, *Dermasterias imbricata*, is not common intertidally. This species, up to 10" in size, takes its common name from its soft, smooth surface.

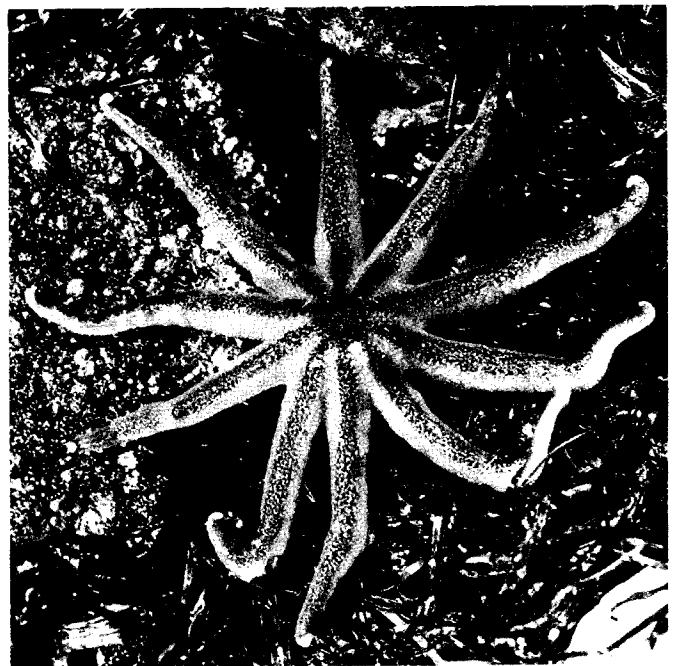
(2) A common intertidal species is the six-rayed star, *Leptasterias hexactis*, but because of its secretive habits and size of less than 3", it often goes unnoticed. Unlike most starfish, the female retains her eggs and releases tiny starfish in the early spring.

(3) Another starfish of less than 4" is the blood star, *Henricia leviuscula*, named for its bright red color. Note the younger individuals of this species which are sand colored or mottled.

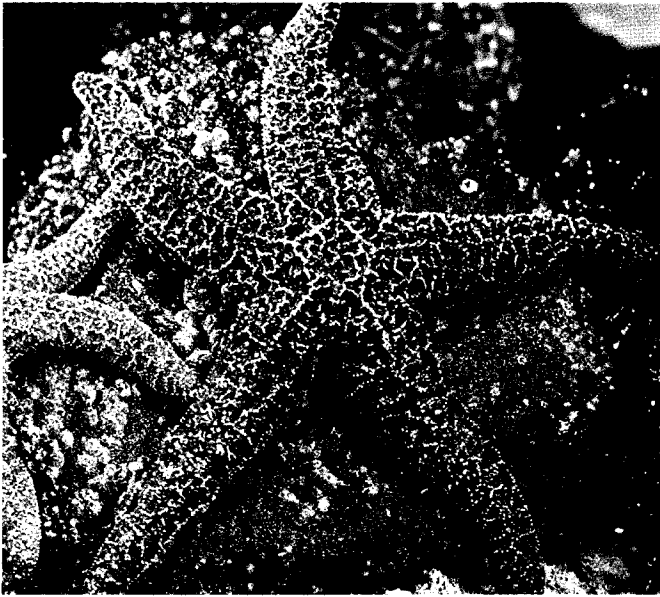
(4) A rather uncommon species intertidally north of Coos Bay is the sun star, *Solaster stimpsoni*. This species grows up to 12", and characteristically has 10 rays.



(3)



(4)



(1)



(2)

(1) The most common intertidal sea star in Oregon is *Pisaster ochraceus*, appropriately called the common sea star. It grows to a size of 12", and is found in three color variations--purple, orange, and brown. It is especially numerous around mussels, its favorite food.

(2) The giant as well as the speedster of the Oregon starfish is the 24-rayed star, *Pycnopodia helianthoides*. This species attains a diameter of 24", and the number of rays present will vary depending on age and losses due to injury. It is most common subtidally, but it does enter the lower intertidal zone.

(3) At first glance, the slender-rayed star, *Evasterias troscheli*, looks much like the common star. It is the same size, but it has narrower rays and lives further down in the intertidal area.



(15)

(3)



(1)

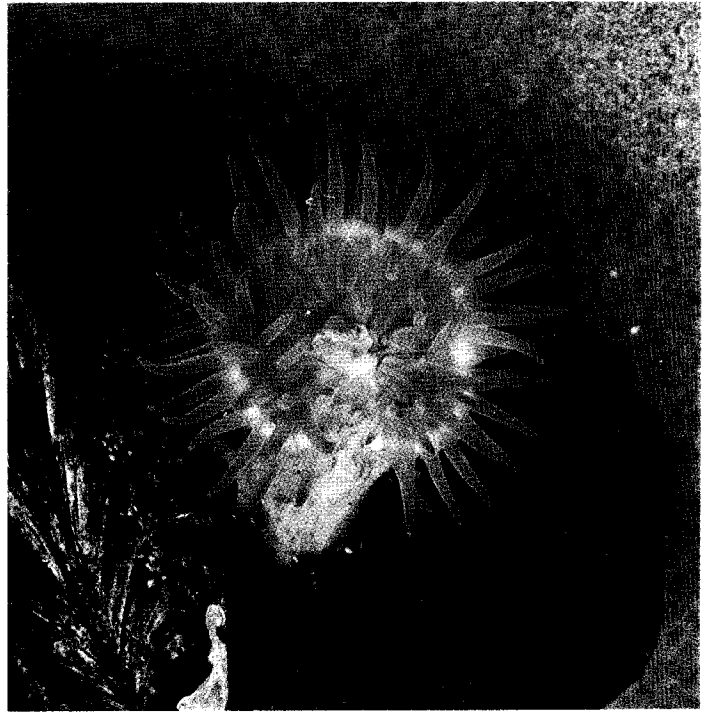
(1) In many places anemones are among the most showy animals of the intertidal zone.

(2) The large green anemone, *Anthopleura xanthogrammica*, grows to a size of 6-10". It gets its color from small algae living within the tissues of the animal.

(3) A smaller, closely related anemone, *A. elegantissima*, grows to about 1-2" in diameter. It is called the aggregating anemone as it tends to group together in large numbers, sometimes covering a rock. This anemone shows characteristic pink-tipped tentacles when open.



(2)



(3)



(1)



(2)

Intertidal crabs range in size from the edible red rock crab to the tiny pea crab which lives within mussels.

(1) The purple shore crab, *Hemigrapsus nudus*, is one of the more common intertidal crabs. Small in size, up to 1½" across the back, it remains hidden during daylight low tides; at night it is a common sight scampering about on the rocks.

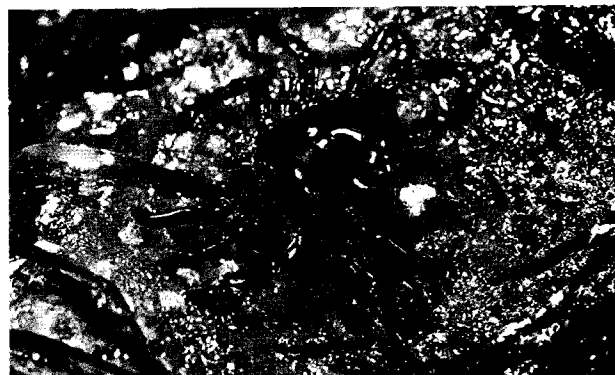
(2) Porcelain crabs, *Petrolisthes cinctipes*, are also very common under rocks. It is readily separated from the purple shore crab by its flattened body and claws and smaller size of less than ½".

(3) The kelp crab, *Pugettia producta*, so named because its color well matches the algae among which it lives, reaches a size of up to 2". It is endowed with sizable claws as anyone carelessly sifting through kelp may discover.

(4) Perhaps one of the most common and interesting of the intertidal crabs is the hermit crab, *Pagurus hirsutiusculus*. The abdomen does not have a hard covering, and the crab protects itself by occupying the empty shell of a snail, carrying it around as a "house."

(5) The Oregon cancer crab, *Cancer oregonensis*, is a very versatile crab of both marine and estuarine habitats. This ¾ - 1" crab characteristically hides in pockets or cracks in the intertidal rocks.

(6) Another small crab of less than ¾" is the softbellied crab, *Oedignathus inermis*, named for its soft thick abdomen. It also secludes itself in pockets or cracks in intertidal rocks.



(3)



(4)



(6)



(5)

The attractive nudibranchs are also called sea slugs. In contrast to their terrestrial namesakes, the different nudibranch species vary greatly in form and color.

(1) *Hermisenda crassicornis*, is a delicate-looking animal about 1" long with numerous, slender projections on its back. It may sometimes be seen clinging upside down on the surface film of quiet tide pools.

(2) *Duvaucelia festiva*, is another good example of the delicate-appearing nudibranchs found in intertidal pools.

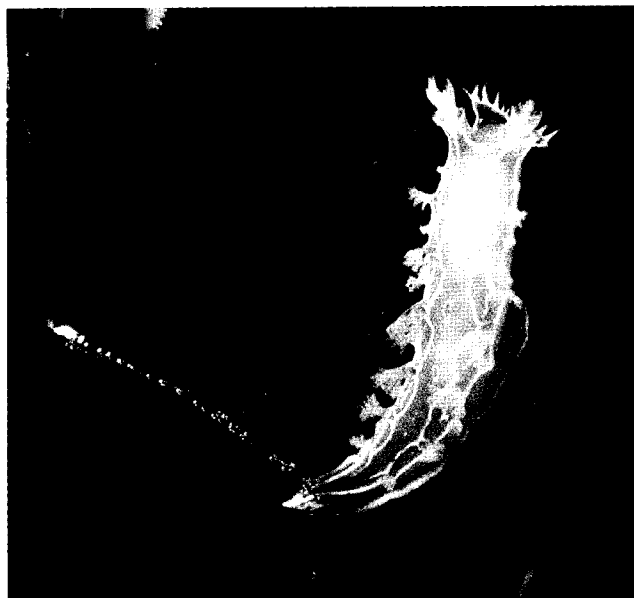
(3) Perhaps the most common nudibranch in Oregon is the sea lemon, *Archidoris montereyensis*. This animal, which grows up to 5" long, prefers a diet of sponge.

(4) The red nudibranch, *Rostanga pulchra*, rarely grows over ½" long. This small but brightly colored species often goes unnoticed because it often lives on an equally bright red sponge colony.

(5) The ringed nudibranch, *Diaulula sandiegensis*, reaches a size of approximately 2". It lacks the bright colors of some of its relatives but is still attractive.



(1)



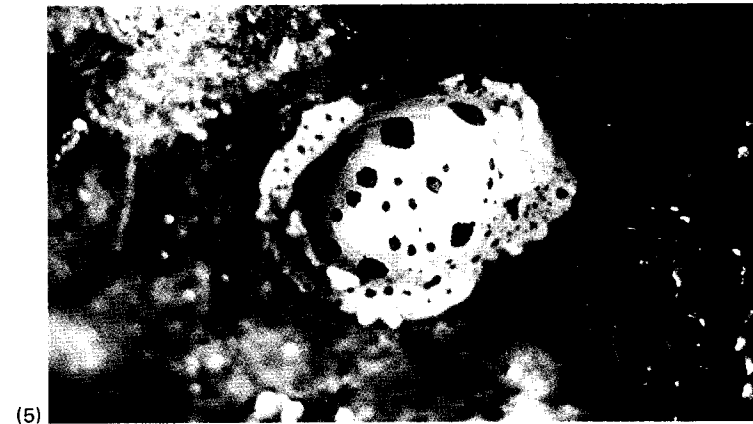
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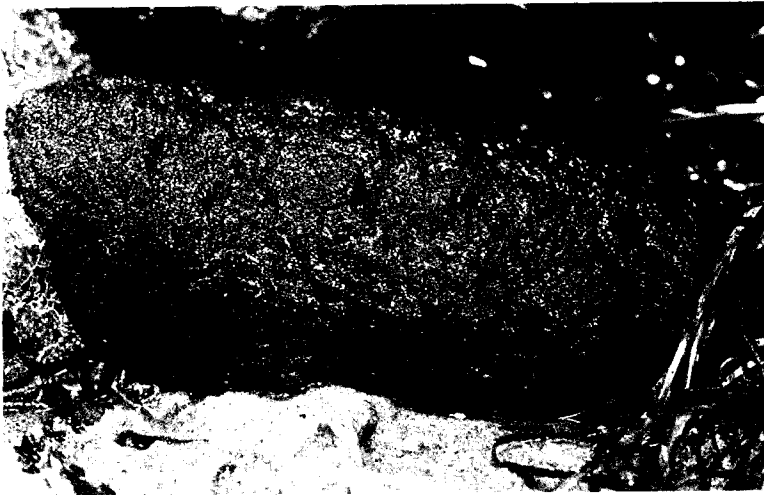
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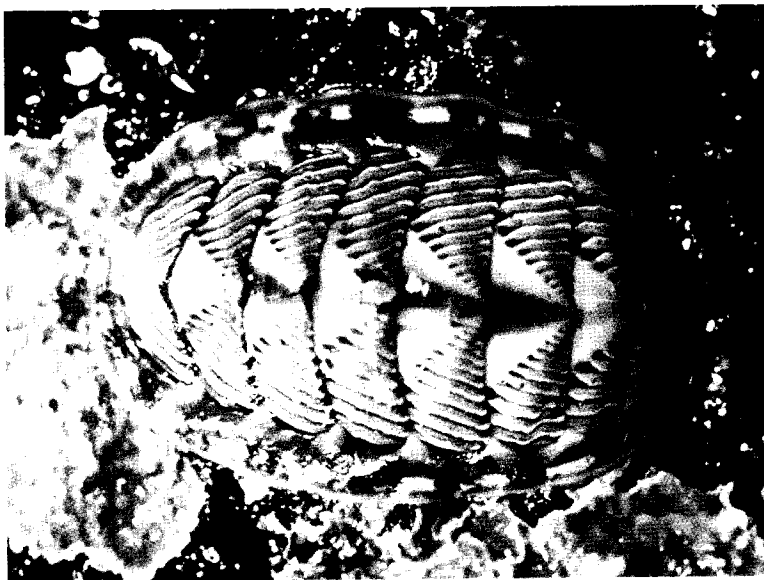
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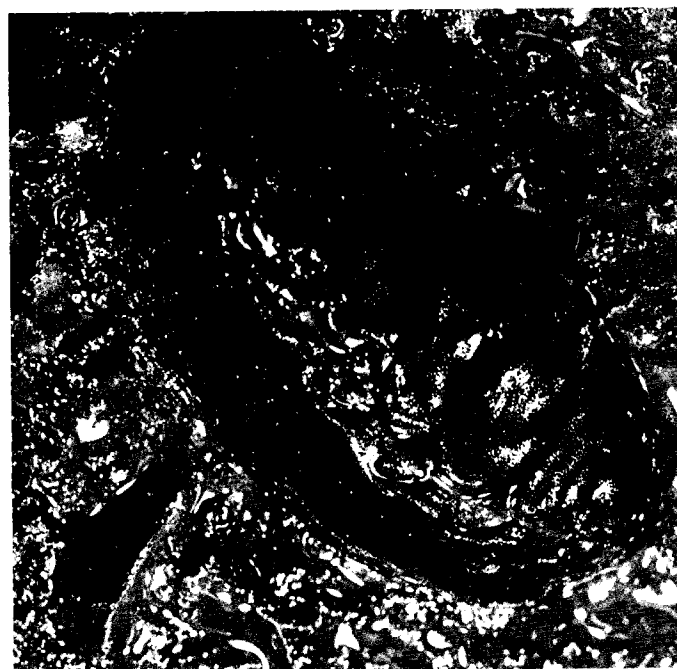
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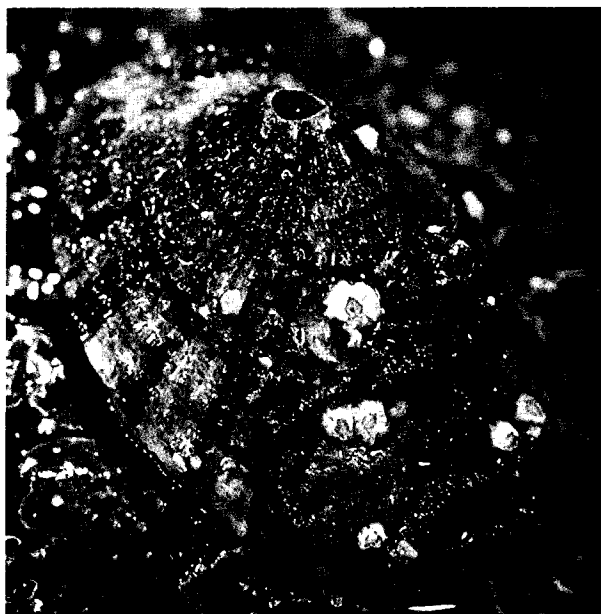
Chitons are related to snails; most eat sea weeds and are found in a variety of habitats.

(1) The gumbot chiton, *Cryptochiton stelleri*, is a conspicuous animal of the middle and lower intertidal areas, reaching a size of 12". A rusty red girdle completely covers the back plates of this animal.

(2) Probably the most handsome of the Oregon chitons is the lined chiton, *Tonicella lineata*. This animal has valves with colorful and characteristic designs. Although quite common it is often unnoticed because of its secretive habits and small size of less than 1½".

(3) Another large chiton growing up to 6" long is the leather chiton, *Katharina tunicata*. This species which seeks out exposed, surf-swept rocks, presents a sharp contrast of black girdle and white back plates.

(4) In contrast to the leather chiton, mossy chitons of the species, *Mopalia*, which occur up to 2" long, are much more withdrawn in their habits. They are usually found underneath rocks or buried in silt.



(1)



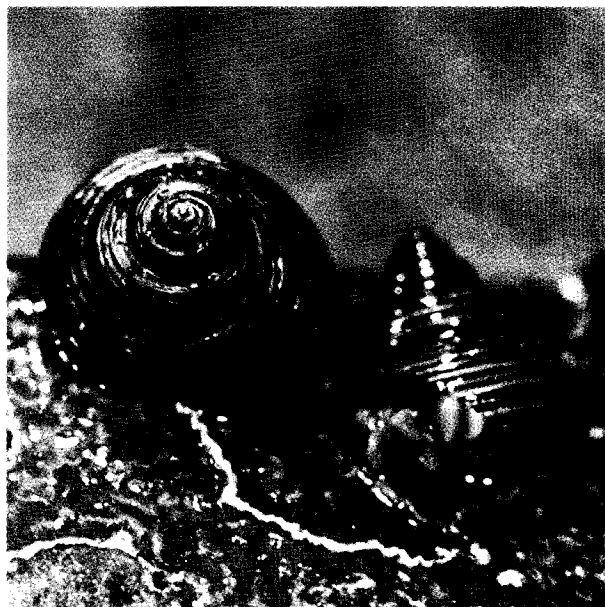
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(6)

(1) Limpets are a common and widespread group of snails ranging from the uppermost tide levels to below sea level. The keyhole limpet, *Diodora aspera*, has a characteristic hole on the top of its shell. This species grows up to 2" and inhabits the lower intertidal areas.

(2) The Bishop's hat limpet, *Acmaea mitra*, a smaller snail which grows to about 1½" is found in the same areas as the keyhole limpet. The shells of both snails are sometimes encrusted with algae or barnacles causing them to blend in with their habitat.

(3) A small limpet found in the upper intertidal zone is the finger limpet, *Collisella digitalis*. It reaches a size of up to 1".

(4) Black turban snails, *Tegula funebris*, are perhaps the most common, obvious snail of the intertidal areas. They reach a size of 1¼". At low tides they can be found in aggregations in rock crevices.

(5) The rock snail, *Thais emarginata*, is a small snail of up to 1" long. Its shell color varies from a somber brown to orange and white stripes. It is common in mussel beds where it is an important predator on acorn barnacles.

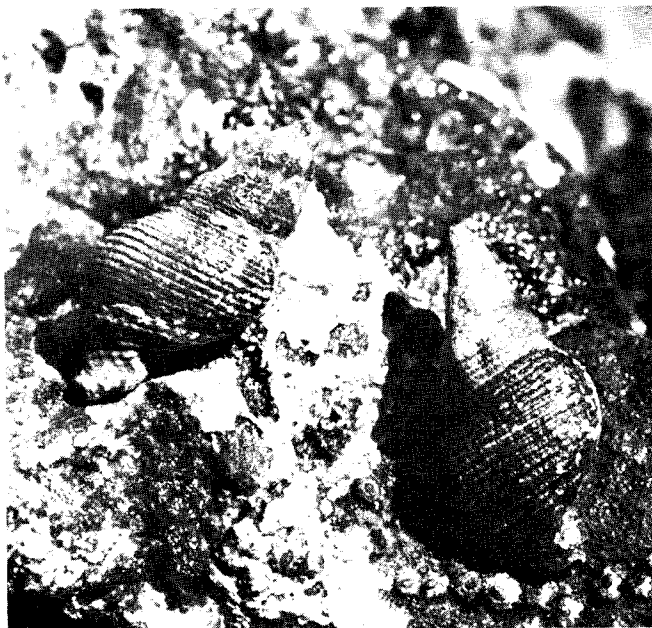
(6) Another small snail of under ¾" is the blue-top shell, *Calliostoma ligatum*, which is found in the lower intertidal zone and in pools and channels. The shell has alternating light and dark ridges with a blue sheen most obvious on older shells.

(7) An often unseen snail of the intertidal areas is Dire's whelk, *Searlesia dira*. At low tide it is often found half buried in the sand and shell fragments under rocks or upon parting the leaves of surf grass. It grows to a length of 1½".

(8) The leafy hornmouth, *Cerastostoma foliata*, is one of the largest intertidal snails in Oregon and it inhabits the middle and lower intertidal areas. Its highly sculptured shell of up to 3" is a favorite among shell collectors.



(3)



(7)



(8)

(21)



(1) Several species of barnacles are found along the Oregon coast. One of the largest, attaining 2-4" in length, is the gooseneck barnacle, *Pollicipes polymerus*, which thrives on the exposed face of rocks and mussel beds. Its flexible stalk helps it endure the force of the waves.

(2) Several acorn barnacles occur along the Oregon coast. These animals exist in tremendous numbers and may extend up into the upper intertidal zone where only salt spray and the larger waves reach. *Balanus cariosus*, is a larger species growing to ½" or more in diameter.

(3) Many of the worms that live on the rocky, outer coast have evolved protective tubes to shelter them from the pounding surf. One such worm is the serpulid tube worm, *Serpula vermicularis*.

(1)



(2)



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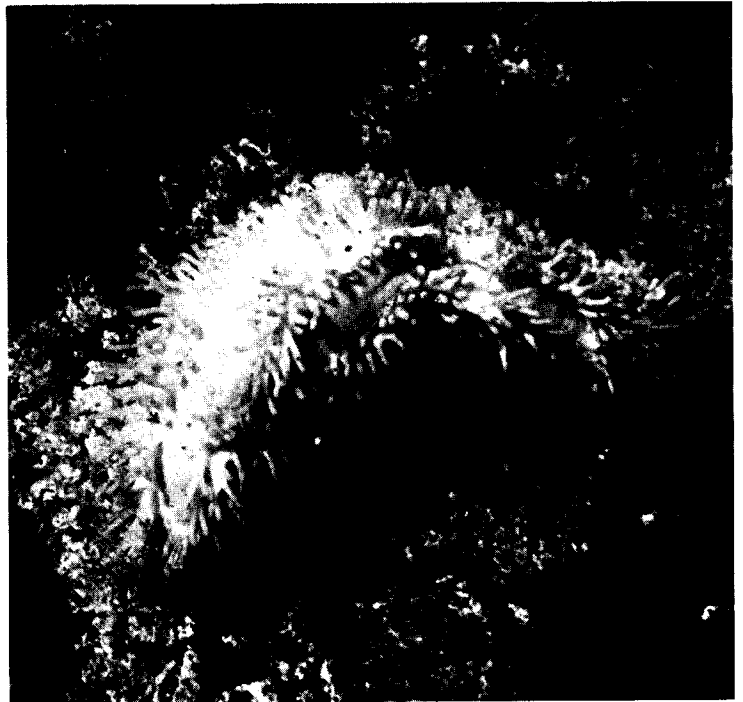
(1) There are several kinds of marine "pill bugs" in the intertidal areas. Some live among the algae and surf grass, but *Ligia pallasii* lives on the upper edge of the intertidal zone, hiding in caves and cracks in the rocks.

(2) A common intertidal animal is the white sea cucumber, an unpretentious species with the tongue-twisting name of *Eupentacta quinquesemita*. It grows to a size of about 3''.

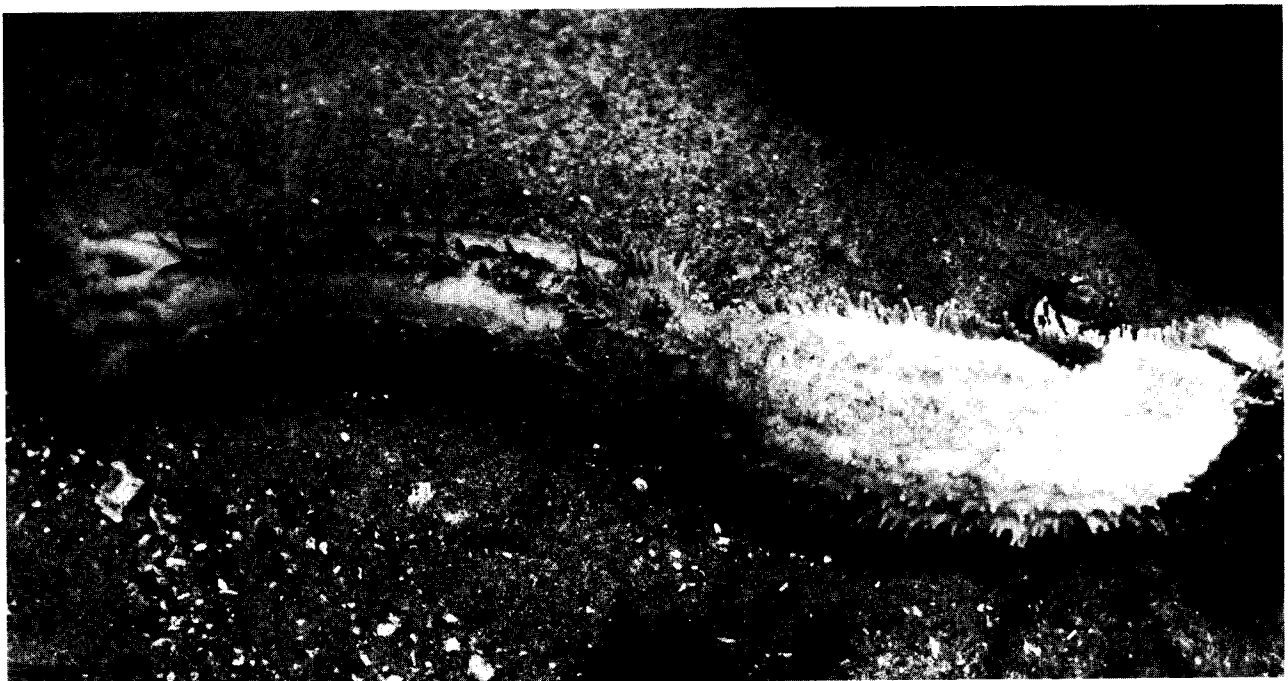
(3) In the shallow intertidal pools the observer may sometimes notice a bright red feathery "plume" protruding out of a crack in the bedrock. He is probably looking at the feeding and respiratory tree of the red sea cucumber, *Cucumaria miniata*. This species grows up to 10'' long.



(1)



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(1)

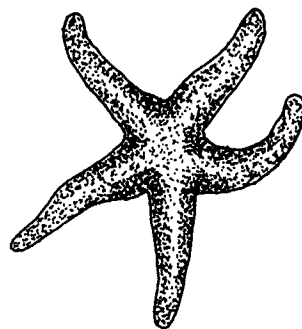


(2)

Ascidians occur in a variety of shapes and may be either solitary or colonial. Unlikely as it may seem, these animals are considered a probable link between vertebrates and invertebrates.

(1) A common example of a solitary ascidian is *Styela montereyensis*. Looking somewhat like a slender, orange vase, it grows to a length of about 3½".

(2) Colonial ascidians grow to varying sizes and superficially resemble sponges which occur in similar, wave-swept habitat. *Amaroucium californicum*, is a typical colonial ascidian.



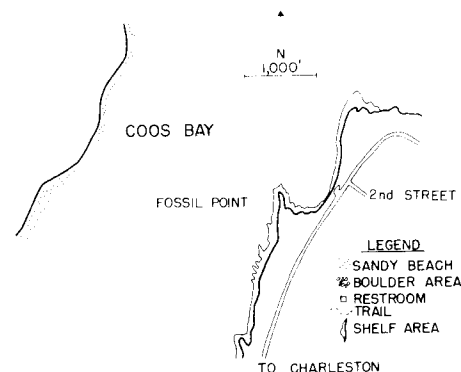
south coast

In the arbitrary division of this guide, the southern Oregon Coast stretches from Coos Bay to the California border. While sandy beach predominates north of the Coquille River, the topography of the land further south becomes more rugged and inaccessible. The extreme southern Oregon Coast between Gold Beach and the California border is perhaps the most spectacular stretch of an already spectacular coast. The coastline is generally steep with headlands alternating with small, sandy coves, and numerous islands and reefs offshore. Often the beach can only be reached by a meandering trail or game path. Scouring sand is a recurring problem in some areas and may prevent the build-up of intertidal populations. Because the rocky shores are so extensive, only the larger and more accessible areas are discussed.

Fossil Point (Coos Bay)

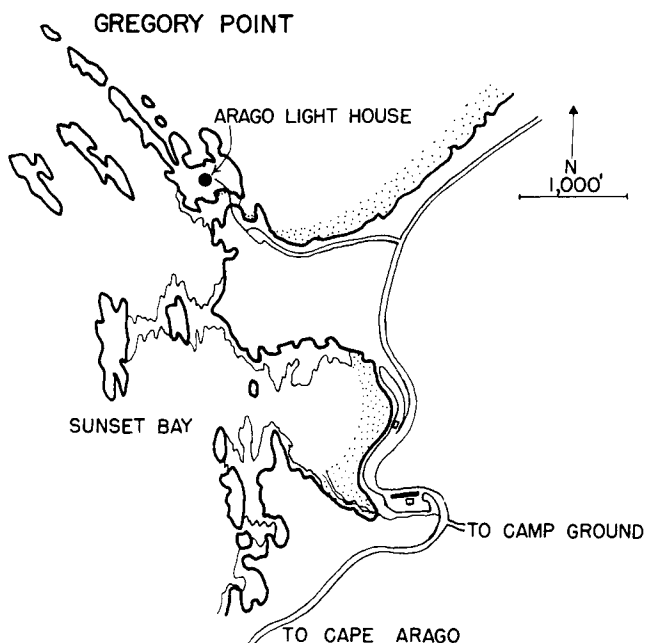
This area is located 3 miles south of the Empire district of Coos Bay. Very limited parking is available off the road near 2nd Street.

Fossil Point is unique in that, although in Coos Bay, it is close enough to the mouth of the bay to provide a habitat for some open coast forms.



Arago Lighthouse-Sunset Bay (collecting by permit only)

Arago Lighthouse. This picturesque lighthouse is found 2 miles south of Charleston. Access is via a narrow, paved road and permission to trespass must be obtained from the U. S. Coast Guard. Parking is limited and access to the beach is very poor. There are no public rest rooms. The Arago Lighthouse forms the northern boundary of the Sunset Bay-Cape Arago permit areas.



The intertidal area lies primarily between the mainland and Gregory Point, stretching in a northwesterly direction. The area consists of bedrock of varying height with some sizable pools interspersed. Some sandy beach is also present.

In addition to purple sea urchins and other common animals, one may find numerous red sea cucumbers in the tide pools.

Sunset Bay. Sunset Bay is less than 1/2 mile south of the Arago Lighthouse and is about 9 miles south of Coos Bay. It is a popular state park with picnic, camping, and rest room facilities adjoining the area. The bay is bordered by a sandy beach on the east with vertical cliffs and flat shelf areas on the south and north. The north side of the cove has a uniformly wide shelf area with several tide channels cutting into it. The south side is characterized by an initial narrow shelf around a sandstone cliff broadening out into a wide shelf with smaller sandstone ridges. The initial narrow shelf is a potential trouble spot during incoming tides. Tide channels of varying depths cut into the area. Offshore are numerous cliffs and reefs. Vegetation is only moderate in the intertidal area but includes beds of surf grass. A good selection of the usual animals is present.

Cape Arago State Park (collecting by permit only)

Cape Arago, 11 miles south of Coos Bay is broken up by three coves and has abundant intertidal areas. Rest rooms are found near the middle cove and parking is available at all three coves.

North Cove. This is the largest of the three coves. It is easily accessible from the ample parking lot.

The intertidal area is immense, extending to Shell Island and beyond on the lower tides.

The cove has a sandy beach with a large number of boulders scattered about and some bedrock shelves and higher cliffs rising out of the sand. There are numerous pools and channels among the boulders and bedrock.

Algae grow luxuriously and dominate in some spots. Intertidal animals are present in good numbers. Offshore, large colonies of sea lions and seals may be seen and heard.

Middle Cove. A steep but well-constructed trail leads down into the intertidal area. This cove is separated from the north cove of Cape Arago by extensive reefs and steep outcroppings. The south cove is accessible from the middle cove but some climbing is required and school groups should not try this route.

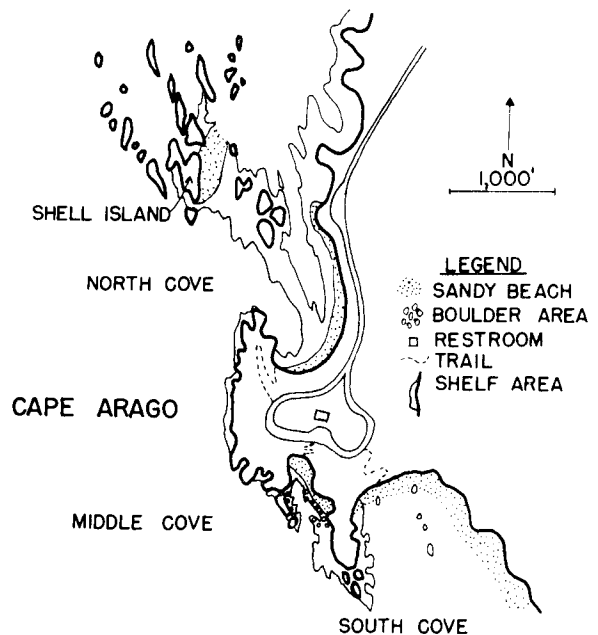
The middle cove is the smallest and most exposed of the three Cape Arago coves. From the north corner of the cove, a steep headland extends in a southwesterly direction. The headland is broken up by deep tide channels and is eventually reduced to a series of cliffs and reefs. Landward from these cliffs are extensive boulder areas with some bedrock shelves and pools. Sandy beach is found along the upper edge of the cove.

A good variety of animals can be found. Purple sea urchin beds are extensive especially toward the center and south side of the cove. The solitary coral, *Balanophylla elegans*, has been noted here.

South Cove. A steep but adequate trail leads down to the south cove and the beach. Vertical cliffs on the north side of the cove break down to flat bedrock shelves and boulders of varying sizes in the intertidal area. A sandy beach borders the cove landward.

Algal growth is moderate with beds of bull kelp quieting the wave action subtidally. This is a very popular area for collectors and school groups. Because of this, the more unusual species are not readily seen. However, most of the common animals such as sea urchins, chitons, the common starfish, and crab may be found here.

The southern boundary of the Cape Arago permit area is 3/4 mile south of Cape Arago State Park.

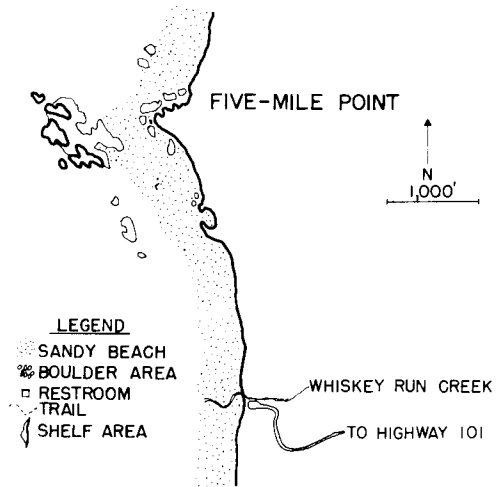


Five-Mile Point (Whiskey Run Creek)

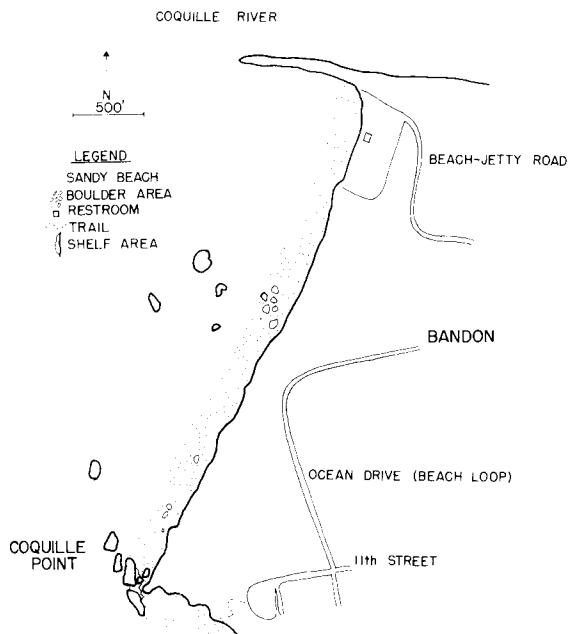
This area is about halfway between Bandon and Coos Bay and may be reached by turning off Highway 101 onto the Seven Devil's Road, 13 miles south of Coos Bay. It is 7 miles to the beach on this paved secondary road. Five-Mile Point is about 1/2 mile north of the small parking lot. This area is not suitable for buses. There are no rest rooms.

The Point is actually made up of two distinct areas. The main area is best studied at the lowest minus tides. It consists of numerous cliffs pushing out of the sand with some stretches of bedrock and many boulders strewn about the cliffs. Algae and surf grass are plentiful. The area is exposed to the open surf. A good variety of common animals can be found.

Directly shoreward from this area is a stretch of sandy beach and beyond this, a region of large boulders and sandy tide pools. Algal growth here is only moderate. In both areas sand scouring is a problem.



Coquille Point (Bandon)



South of the Coquille River and west of the town of Bandon are a series of rocky outcroppings with adjoining boulders of various sizes scattered on the sandy beach. There are only a few tide pools. This type of area extends from the mouth of the Coquille River down to Bandon State Park, a distance of about 2 miles. Best access to the main intertidal area is either from the south bank of the Coquille River or via a trail down a bluff off 11th Street. Bus parking is adequate. Rest rooms are available at the south jetty parking lot.

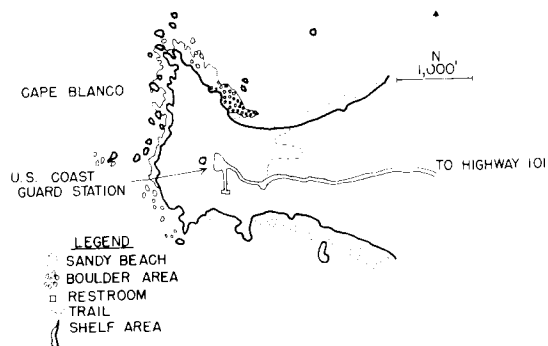
Algal growth is concentrated on the smaller boulders. Some colonies of "sea palm," *Postelsia* are present, indicating the exposed nature of the area. While this area is not exceptionally rich in the variety of the intertidal fauna, many of the common species can be found here.

Cape Blanco

This, the westernmost point in Oregon, has a large intertidal area that is relatively undisturbed. The cape is located 10 miles north of Port Orford. The intertidal area is best reached from the north side of the cape, before entering the Coast Guard Station. Parking space is limited along the road. Only sheep trails lead down the gentle slope to the beach 300 yards from the road. There are also trails leading down the west end of the cape but these are unsafe and also involve crossing the Coast Guard Station. The Coast Guard Station is open to the public on a limited basis. A state overnight campground is located near Cape Blanco.

The north side of the cape has an intertidal area of approximately 400 yards paralleling the shore and extending 50-100 yards out into the ocean. A slightly larger area is found on the west side of the cape. The north and west ends of Cape Blanco are connected by a short, narrow tunnel that is passable only at low tide. From the sandy beach on the north, the intertidal area gradually changes from scattered boulders to flat bedrock with boulders interspersed. Towards the northwest point of the cape, large cliffs reach across the intertidal area, ending in some islands offshore. Tide pools and crevices are common. Several of the channels are deep and there is a chance of being trapped by the incoming tide.

Algal growth varies from heavy to moderate in the boulder areas. Subtidally, beds of kelp modify wave action, especially on the north side. Purple sea urchin beds are common in the area. The dendritic tentacles of red sea cucumbers can be observed in most tide pools. A variety of other animals are found here.



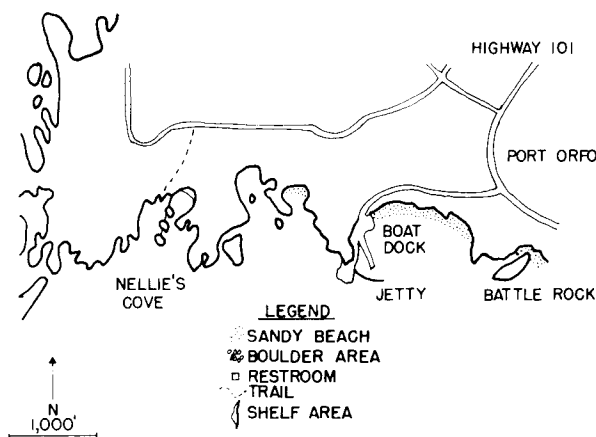
Port Orford

Although there are several coves and limited rocky intertidal areas in the Port Orford area, many of them are inaccessible or require crossing private or government property. The Port Orford boat dock is one place that has some accessible intertidal areas. Parking is limited at the dock.

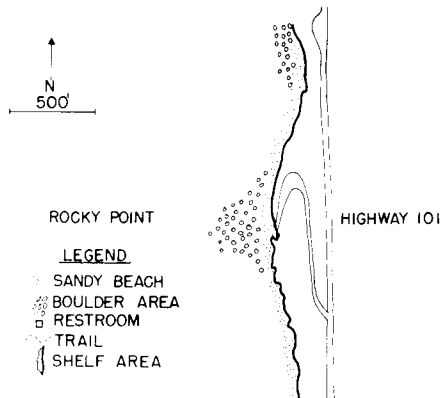
The intertidal area lies north of the dock and consists mostly of large boulders. Offshore are extensive kelp beds. Also of interest at the boat dock is the jetty where both the protected and the exposed side provide a habitat for animals. Since the jetty is exposed, there is danger from large waves.

Although the variety of species present is not exceptional, the common groups of snails, starfish, anemones, and other animals are available.

Nellie's Cove has a limited intertidal area and access is through the former Coast Guard Station and permission to trespass is required.



North Humbug Mountain State Park (Rocky Point)



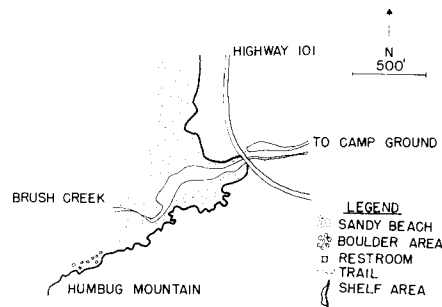
About 3 miles south of Port Orford, just inside Humbug Mountain State Park, is an excellent intertidal area. From a dirt road with limited parking, the beach is only a short 100-yard walk away. This is a gently sloping, sandy beach with a large number of boulders, 2 feet or less in diameter scattered throughout the zone. A similar, slightly larger boulder field lies a few hundred yards to the north. Offshore reefs and kelp beds probably modify wave action in the area.

The usual community of animals can be found here in good abundance. The sessile jellyfish, *Haliclystus*, has also been noted. As in many of the outer coast areas, Rocky Point has a small population of native littleneck clams.

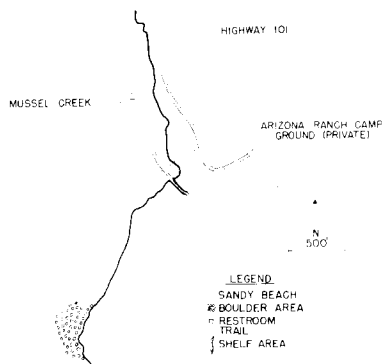
Humbug State Park

This park is about 4 miles south of Port Orford. Along the north base of the mountain there is a small intertidal area that is easily accessible from the Humbug Mountain State Park camping grounds. A trail leads from the camping grounds to the area 300 yards away. The rocky area is made up of several cliffs projecting from the mainland with boulders of varying size scattered about in the sand.

Algal growth is light and the area is exposed to the surf. This is not a particularly rich intertidal area, but the most common species are easily found.



Arizona Ranch Beach



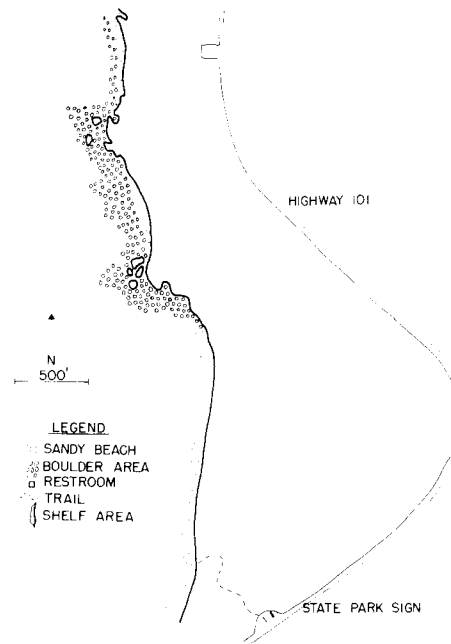
This is a small intertidal area 12 miles south of Port Orford and adjacent to Arizona Ranch camp ground. Access is through private property and a fee is charged. After driving through the Arizona Ranch picnic and camp grounds the rocky area is about 100 yards away. Parking is adequate. This is a small area about 300 yards wide. From the steep headland, a mass of boulders lie scattered on the sandy

The dominant feature of the area is the algae that grow so thick as to form pools of calm water between the rocks. A few mussel colonies, starfish, sea cucumbers, and other animals make this area of interest.

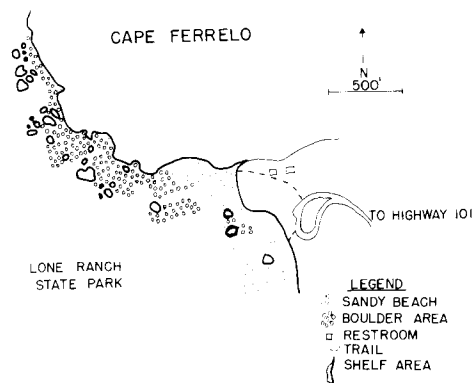
North Samuel Boardman State Park

This area is located at and just beyond the northern boundary of Boardman State Park, 14 miles north of Brookings. From a gravel turn off at the state park sign, a broad but unimproved trail leads down to the shore. The intertidal area forms a half-moon shape and consists of an accumulation of boulders of varying sizes on a sandy beach. The rocks, together with the lush vegetation, form small pools and crevices partly protected from the surf.

Only the larger rocks have a number of mussels or barnacles attached. A good variety of other animals are present, including several kinds of starfish, snails, and the usual variety of small crabs.



Lone Ranch State Park (Cape Ferrelo)



This extensive intertidal area is located 5 miles north of Brookings. Lone Ranch State Park has ample parking space, rest rooms, and easy access to the beach via good trails.

The sandy beach has a large number of rocks scattered about, varying in size from less than a foot to small cliffs. Tide pools are few but open spaces among the rocks provide several quiet areas. Numerous rocky overhangs and caves provide additional protection from waves.

Algae are plentiful throughout the area, including beds offshore. The flora and fauna of this area are relatively undisturbed and rich. One common species that is absent is the purple sea urchin.

Harris Beach (collecting by permit only)

The Harris Beach Permit Area extends beyond the boundaries of the state park and includes the area between the north bank of the Chetco River and a point 1/2 mile north of Harris Beach State Park. This extensive area includes several rocky points and small sandy coves. For convenience, the area is discussed under three main divisions. Rest rooms are found at the picnic area and the campground. Parking is available in all areas.

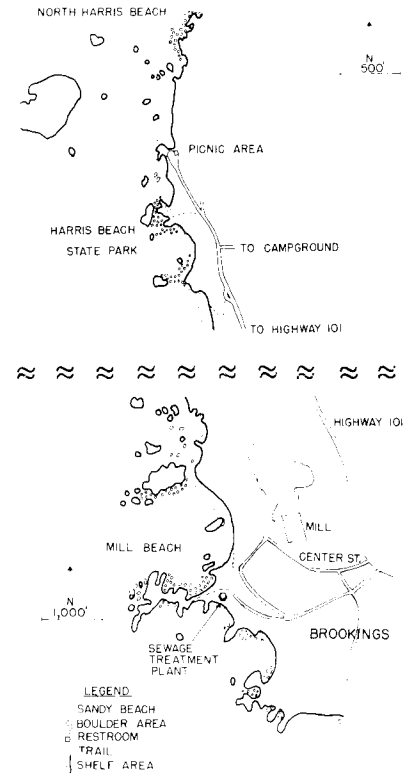
North Harris Beach. From the parking lot at the main picnic area it is but a few yards down to the beach. A sandy beach stretches north for a hundred yards and then merges with a rocky point jutting out from the mainland. This point has been partially broken up, and isolated rocks and boulder fields are scattered in the area. The main rocky area is about 300 yards long, bordered by sandy beach on the north and south. Extending north are additional rocky points and sandy coves, eventually merging into Lone Ranch State Park.

Harris Beach. The main Harris Beach intertidal area is located directly west of the campgrounds. The rocky areas are accessible from the main parking lot by walking south along the beach or from a trail that leads down to the beach from the main park road. On the north, a massive rock reaches southward into the sea. A small tunnel has been carved in the rock and the waves surge through this hole onto the boulder fields that lie landward. As one goes south, this boulder field is again replaced by a smaller cliff. Another scattering of boulders lie around the cliff, only interrupted by small stretches of sandy beach. Thus, the beach continues south, a series of steep cliffs or outcroppings with boulder areas adjoining the larger cliffs and with sandy coves between.

Mill Beach. This is the southernmost part of the Harris Beach Permit Area. Turn toward the ocean at Center Street or any of the adjoining streets in downtown Brookings. Turn right at the plywood mill and park next to a small ball park. An unimproved road and several trails lead down to the beach. To reach the south side of Mill Beach Cove, take the trail that goes past the sewage treatment plant.

Mill Beach Cove is a half-moon shaped area with steep headlands reaching into the sea on the north and south. Around the base of the headlands are the usual boulder fields and some larger cliffs. Landward, the beach is sandy.

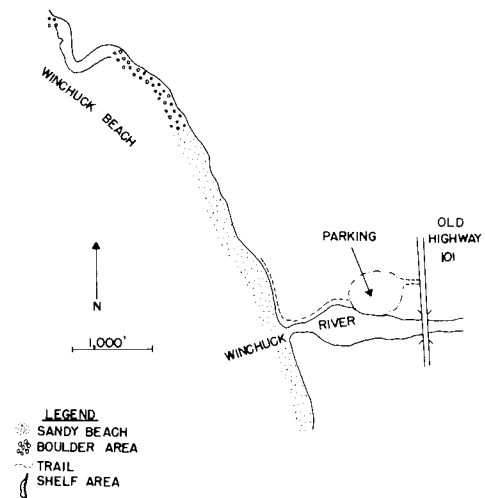
Throughout the Harris Beach Permit Area, algae grow luxuriously in the lower sections of the boulder fields. Animals are also abundant. Sponges color the surge channels, most of the common species of starfish are abundant and some unusual species such as solitary corals and umbrella crabs are found.



Winchuck Beach

Access to Winchuck Beach is from a road paralleling the north bank of the Winchuck River. Limited parking and day-use facilities are available.

The rocky intertidal area is about 3/4 mile to the north of the parking lot. Most of the area consists of a scattering of boulders on a sandy beach, but there is also a limited bedrock shelf area, a condition more common on the central coast. Among the animals found here is the brown turban snail, *Tegula brunea*.



rules and regulations

Oregon Administrative Rules, Chapter 625, Sections 10-670 through 10-740 extends protection to all intertidal invertebrates living intertidally on the bottom and including such forms as starfish; sea urchins; sea cucumbers; shore, hermit, and other small crabs; snails; bivalves; coelenterates; and all other nonfood invertebrates. It is unlawful to wantonly waste or destroy any intertidal animal at any time.

Open Areas

In all intertidal areas of Oregon, except in closed or permit-only areas, it is lawful to take intertidal invertebrates. The personal-use bag limit shall not exceed 10 in any combination of species per day, except there is no limit on the number of kelp worms *Nereis*, ghost shrimp *Callinassa*, mud shrimp *Upogebia*, and sand crabs *Emerita* that may be taken. Commercial harvest of intertidal invertebrates, and personal harvest in excess of the daily bag limit, shall be allowed provided a permit is obtained from the Fish Commission. ^{1/}

Shellfish such as abalone, littleneck clams, mussels, and piddocks (rock oysters or rock borers) may be harvested in all areas in accordance with existing shellfish regulations. As regulations may change, the collector should check current regulations so that he does not inadvertently break the law.

Closed Areas

It is unlawful to take, catch, or molest at any time intertidal nonfood invertebrates at the Marine Gardens at Otter Rock near Newport. This closed area is located between Cape Foulweather and the Devil's Punch Bowl State Park. Also closed is the Cape Perpetua Recreation Area (U. S. Forest Service) between the northern boundary of Neptune State Park and the mouth of the North Cape Creek. Whale Cove (Lincoln County) is closed to the collecting of shellfish (mollusca and arthropoda) to protect several thousand red abalone planted in the cove by Commission biologists.

Permit-Only Areas

The commercial harvest of intertidal, nonfood invertebrates is prohibited in permit-only areas; however, these animals may be taken for other purposes from the following areas by obtaining a special permit from the Fish Commission: ^{1/}

Haystack Rock (Cannon Beach)

All sand beaches, rocks, and tide pools lying intertidally within 300 yards to the north and south of the main Haystack Rock.

Boiler Bay

All sand beaches, rocks, and tide pools lying intertidally between the mouth of Fogarty Creek (Lincoln County) on the north and Government Point (at Boiler Bay State Park) on the south.

Shell Cove (Depoe Bay)

All sand beaches, rocks and tide pools lying intertidally between a line projected due west from Shell Road on the north and in the southeast quarter of Section 7, a line projected due west along the southern boundary of Section 7, Township 9 South, Range II West.

Yaquina Head

All sand beaches, rocks, and tide pools situated intertidally between the sand beach at Moolack Beach on the north and the sand beach at Agate Beach on the south.

Neptune State Park

All sand beaches, rocks, and tide pools situated intertidally and abutting the westerly side of Neptune State Park.

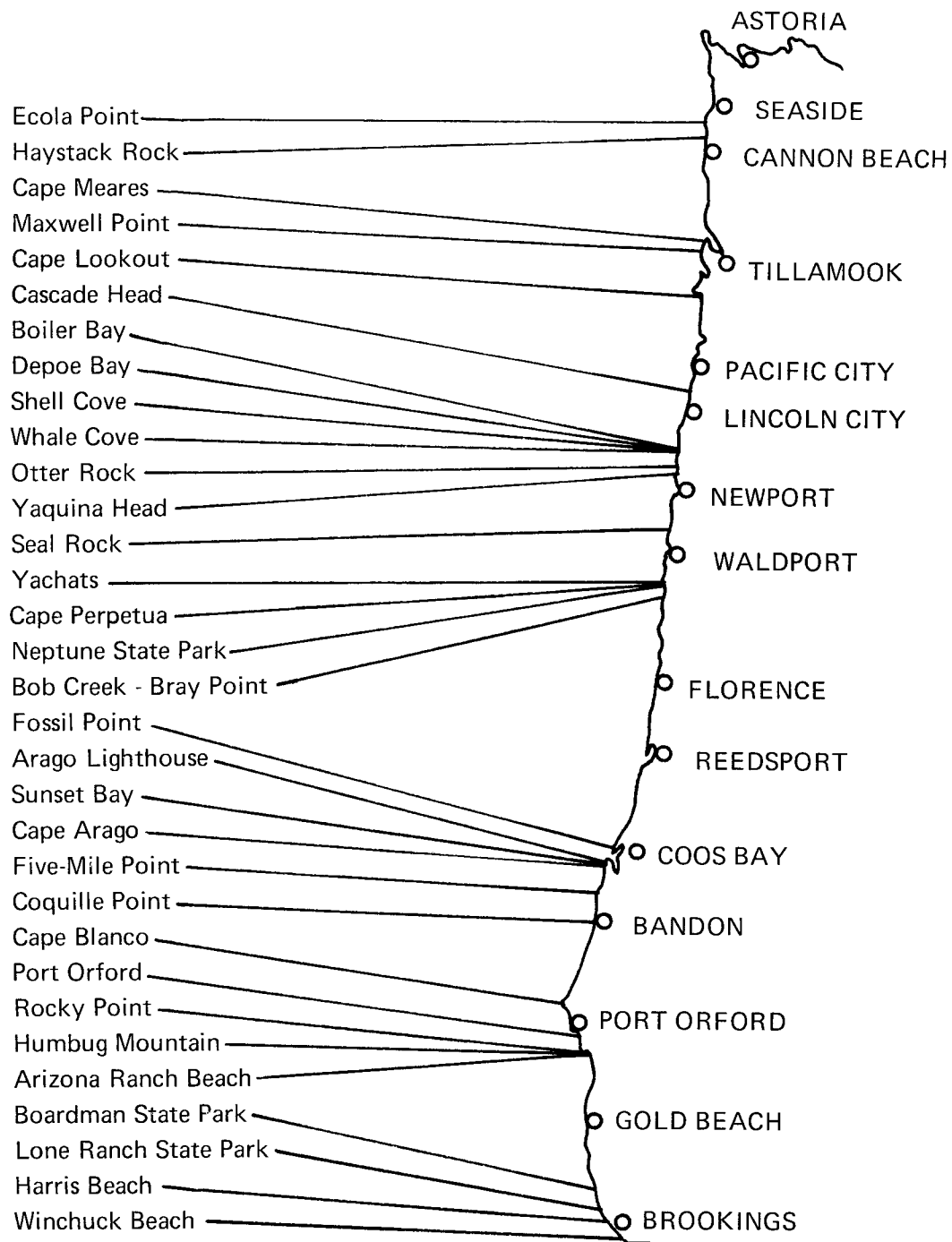
Sunset Bay-Cape Arago

All sand beaches, rocks, and tide pools situated intertidally between the Arago Lighthouse on the north and a point 3/4 mile south of Cape Arago State Park.

Harris Beach

All sand beaches, rocks, and tide pools lying intertidally between a line projected due west 1/2 mile north of Harris Beach State Park on the north and the mouth of the Chetco River on the south.

^{1/} Merged with the Oregon Wildlife Commission on July 1, 1975, to create the Oregon Department of Fish and Wildlife. Obtain permits from the Marine Region of the Oregon Department of Fish and Wildlife at the Marine Science Center, Marine Science Drive, Newport, Oregon 97365.



LOCATION OF OREGON'S INTERTIDAL AREAS