

A GUIDE TO OREGON'S ROCKY INTERTIDAL AREAS

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A GUIDE TO OREGON'S ROCKY INTERTIDAL AREAS

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INTRODUCTION

Oregon's rugged and varied coastline is uniquely fascinating to many people. Before the arrival of white men, 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 millions 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 synopsis of regulations protecting intertidal nonfood invertebrates is included. The collector should check the latest synopsis for current information.

INTERTIDAL AREA USE

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 concerned individuals, 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 permit collecting established for certain areas.

The intertidal collecting permits are issued at no charge by the Fish Commission's Newport Laboratory. At the end of the collecting period, the permit holder is required to file a collecting report with the Fish Commission, stating approximate numbers of animals taken, where they were collected and for what purpose.

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

There are basically five types of users of the rocky intertidal areas. These are (1) clam diggers or fishermen, (2) beachcombers, (3) scientists, (4) commercial collectors and (5) school groups. The clam digger and rock

fisherman does not usually seek the nonfood animals but may affect them by turning over rocks, digging up the sand, or, in looking for bait, tearing up mussel or surf grass beds. The casual beachcomber does little damage if he is satisfied to capture intertidal scenes on film or pick up driftwood or shells. 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 specific research projects sometimes take a larger 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. No commercial harvest is allowed 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 the 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 or 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.

SYNOPSIS OF 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 crab, snails, bivalves, coelenterates and all other nonfood invertebrates.

ADDENDUM

The following information should be included under the section on Permit only areas on page 3.

YAQUINA HEAD. All sand beaches, rocks and tidepools situated intertidally between the sand beach at Moolack Beach on the north and the sand beach at Agate Beach on the south.

SUNSET BAY - CAPE ARAGO. All sand beaches, rocks and tidepools situated intertidally between the Arago lighthouse on the north and a point 3/4 mile south of Cape Arago State Park.

Open areas. In all intertidal areas of Oregon except those listed below it is lawful to take intertidal invertebrates without a permit, provided that 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 by permit only. It is unlawful to wantonly waste or destroy any intertidal animal at any time.

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 fish or take, catch or molest at any time intertidal nonfood invertebrates at the Marine Gardens at Otter Rock near Newport. The closed area is located between Cape Foulweather and the Devil's Punch Bowl State Park. Also closed to the taking of nonfood intertidal invertebrates 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. Intertidal nonfood invertebrates may be taken from the following areas only under a special permit issued by the Fish Commission of Oregon.

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.

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 in Township 9 South, Range 11 West.

NEPTUNE STATE PARK. All sand beaches, rocks and tide pools situated intertidally and abutting the westerly side of Neptune 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.

INTERTIDAL AREA DESCRIPTIONS

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.

THE NORTH COAST

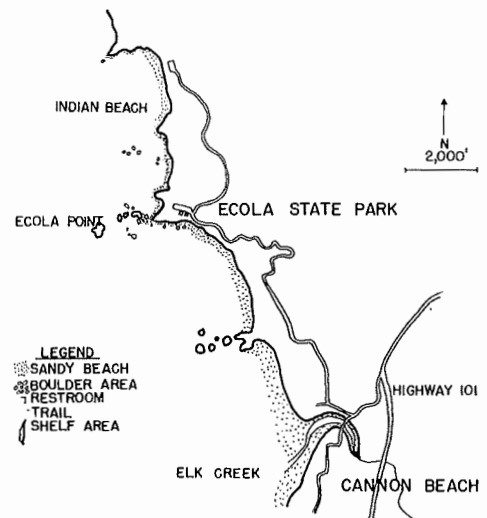
For the purpose of this report, the north coast applies to the coast between the Columbia River on the north and the Salmon River (Lincoln County) on the south. The northern coast has extensive sandy beaches that are popular with razor clam diggers. Some rocky areas do exist, ranging from isolated sea mounts in the sand to massive mountains jutting out into the sea with boulders and tide pools at their base.

ECOLA POINT

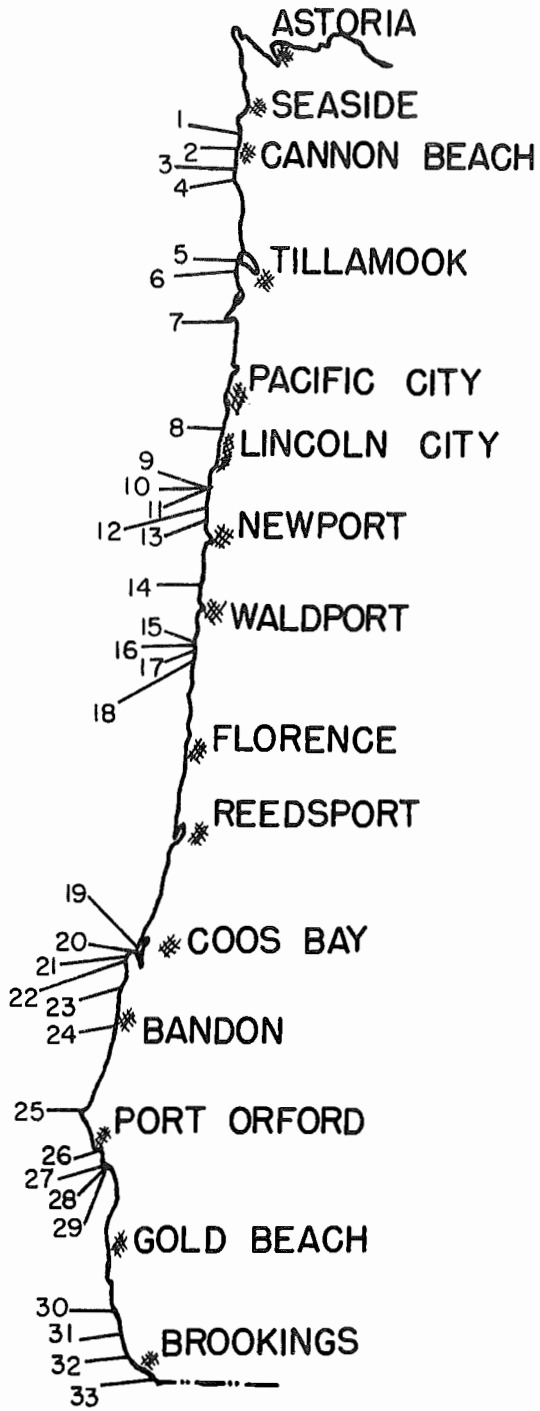
This intertidal area is located 2 miles north of Cannon Beach, within Ecola State Park. The point can be reached by a good trail leading south from the large, main parking lot, a distance of about 1/4 mile. An alternate approach is to drive down to Indian Beach and walk south along the beach to the point, 1/2 a mile away. The road into the park is narrow and winding and may be difficult to manage for buses.

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 off-shore 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 ochraceus. Another species much in evidence is the green anemone, Anthopleura xanthogrammica.



ECOLA POINT



1. Ecola Point
2. Haystack Rock
3. Arch Cape
4. Cape Falcon-Short Sand Beach
5. Cape Meares
6. Maxwell Point
7. Cape Lookout
8. Cascade Head
9. Boiler Bay
10. Depoe Bay
11. Whale Cove
12. Otter Rock
13. Yaquina Head
14. Seal Rock
15. Yachats
16. Cape Perpetua
17. Neptune State Park
18. Bob Creek--Bray Point
19. Fossil Point
20. Arago Lighthouse
21. Sunset Bay
22. Cape Arago
23. Five-Mile Point
24. Coquille Point
25. Cape Blanco
26. Port Orford
27. Rocky Point
28. Humbug Mountain
29. Arizona Ranch Beach
30. Boardman State Park
31. Lone Ranch State Park
32. Harris Beach
33. Winchuck Beach

LOCATION OF INTERTIDAL AREAS

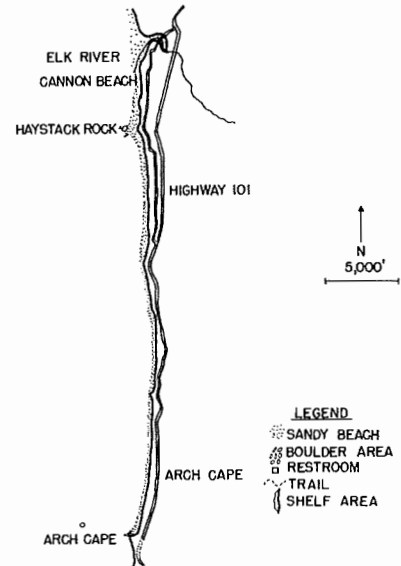
DISCUSSED IN THIS GUIDE

HAYSTACK ROCK

Located at Cannon Beach is one of several rocky "seastacks" along the Oregon Coast. It is easily accessible and only the hardier, more inconspicuous animals may be found. Parking is on the beach or 1 block away from the beach. Haystack Rock is one of several federal bird refuges along the coast and may not be climbed.

ARCH CAPE

Arch Cape is located just south of the town with the same name. The area consists of a sandy beach with several large rock outcroppings. The beach is readily accessible and popular. As a result, animal life is quite limited.

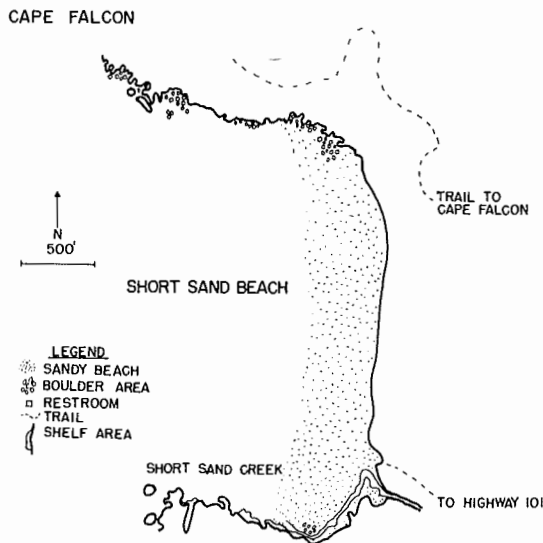


HAYSTACK ROCK-ARCH CAPE

CAPE FALCON-SHORT SAND BEACH

This area, about 8 miles south of Cannon Beach, has a very beautiful setting. It is located within Oswald West State Park and rest-rooms and camping facilities are available. From the large parking lot just off Highway 101, a short trail leads down to Short Sand Beach and Smuggler's Cove. A few rock ledges and outcroppings are found along the south and north shores of this cove but access to the area is limited and not safe. Because of the limited intertidal zone, animals are not particularly abundant but the most common species

can be found. An excellent 2-mile trail leads out to Cape Falcon but the intertidal areas are inaccessible to the average beachcomber.



CAPE FALCON-SHORT SAND BEACH

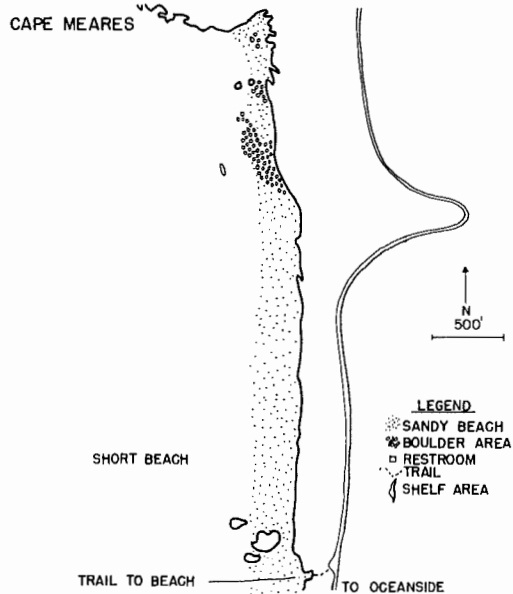
CAPE MEARES

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, 1/4 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. There is little direct protection from the surf although Maxwell Point and Cape Meares border on both sides.

Algae and surf grass grow in moderate amounts. Most of the common intertidal species of animals can be found here including some mussel beds and a variety of starfish.



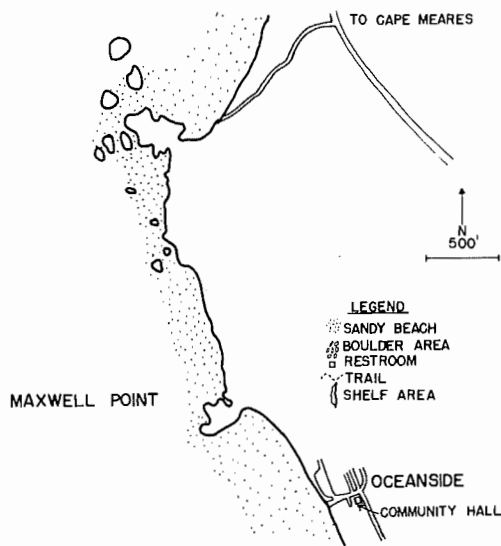
CAPE MEARES

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 bases.

Algal growth is moderate and concentrated on the smaller boulders.

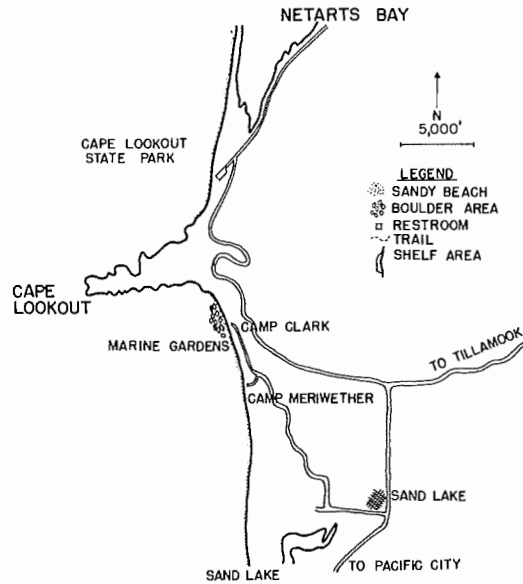


MAXWELL POINT

Barnacles and mussels and the common starfish, Pisaster ochraceus form the dominant 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, Oregon 97201. The area can also be reached from the south along the beach but this requires a four-wheel drive vehicle.



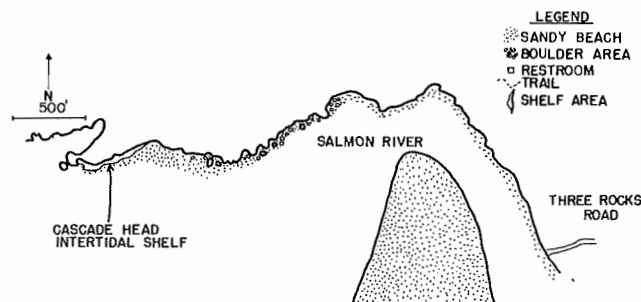
CAPE LOOKOUT

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 area consists of a sandy beach with a large number of boulders, 2 to 3 feet in diameter, scattered about.

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. Most of the other common intertidal invertebrates can also be found.

CASCADE HEAD (Mouth of the Salmon River)

The mouth of the Salmon River (Lincoln County) adjoins the south side of Cascade Head. There is a limited intertidal area along the north bank of



CASCADE HEAD

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 20 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. Away from the shelf, the sandy beach gets wider with isolated boulders forming pools in the sand. Some mussel beds are present and with them associated species such as barnacles, ochre starfish and several kinds of snails. The whole area is probably strongly influenced by fresh water from the Salmon River.

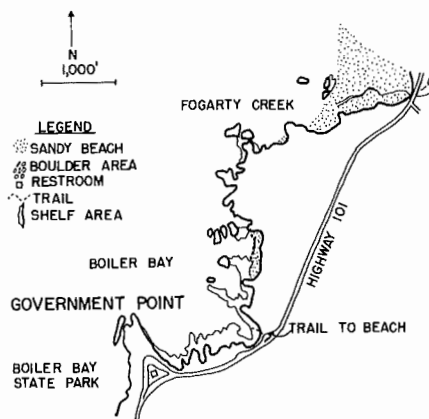
THE CENTRAL COAST

The areas discussed in this section lie between Salmon River (Lincoln County) and Cape Arago to the south. Several highways lead to this part of the coast from the populous Willamette Valley and the bulk of school groups visit intertidal areas in this section. Rocky areas are especially frequent between Lincoln City and Cape Perpetua. South of Florence, sandy beaches and extensive dunes predominate. Cape Arago, south of Coos Bay, again offers a rich and varied rocky habitat.

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.

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 between. The shelf areas are divided to varying degrees by tide channels and wider inlets. To the west of the trail, the



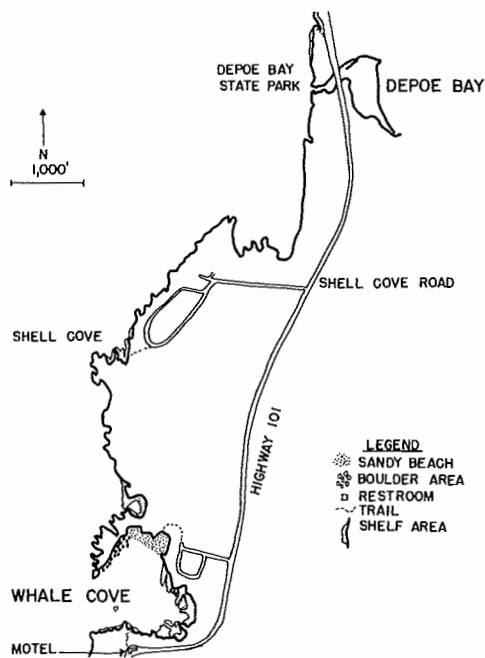
BOILER BAY

shelf area is reduced and interrupted by several tide channels.

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

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. Large green anemones are present in the pools and many of the other common species are found.



DEPOE BAY-SHELL COVE-WHALE COVE

SHELL COVE--DEPOE BAY (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.

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 consist 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.

The intertidal areas south of Shell Cove are more restricted and inaccessible. Private property further limits access. North of Whale Cove the bedrock flattens out somewhat. All of these areas are exposed to heavy surf action.

WHALE COVE

This picturesque cove is found 1-1/2 miles south of Depoe Bay, off Highway 101. Private property must be crossed to gain access to the area. The

south side of the cove is accessible from a motel-restaurant complex. Another entry route is from a side road off the main highway. Parking is limited and there are no rest-rooms.

Habitat varies at Whale Cove. The north side of the cove is somewhat protected year round, but the south part is exposed to winter storms. The north side intertidal area lies along a high cliff that juts out from the mainland. At its base are various sized boulders with a few tide pools interspersed. The east 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.

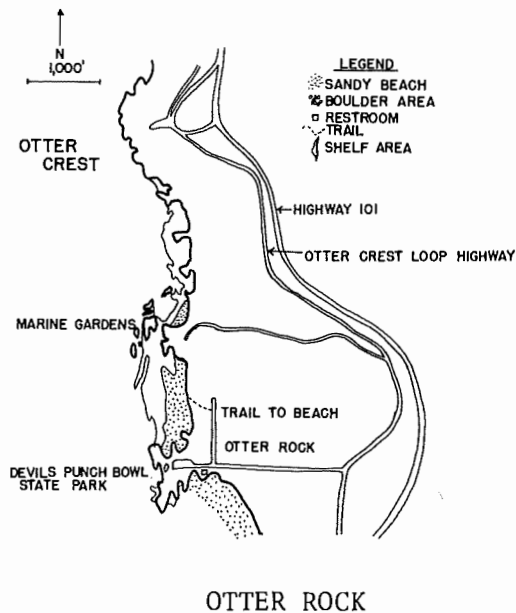
In 1967, the Fish Commission of Oregon introduced red abalone in this cove in an attempt to establish this shellfish on the central Oregon Coast. As a result, the taking of shellfish is prohibited in Whale Cove. Current regulations should be checked before any animals are taken from this area.

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. Buses should be parked at the Devil's Punch Bowl parking lot. Rest-rooms are available here. From the dead-end road, a good trail leads down to the beach.

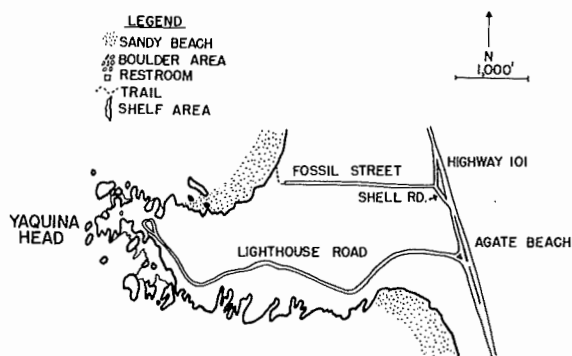
Flat sandstone shelves predominate in most of the intertidal area. Channels paralleling the shoreline break up the shelves and numerous tide pools pocket the rocks. Off-shore are numerous cliffs. To the north the area changes to individual cliffs with adjoining boulders and some shelves. Cape Foulweather marks the northern boundary of this area.

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



YAQUINA HEAD (North Side)(COLLECTING BY PERMIT ONLY)

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. Barnacles and mussels are common, together with the common starfish, Pisaster ochraceous. Several caves cut into the headland and these have abundant populations of sponges, colonial ascidians and coralline algae.



YAQUINA HEAD

YAQUINA HEAD (South Side)(COLLECTING BY PERMIT ONLY)

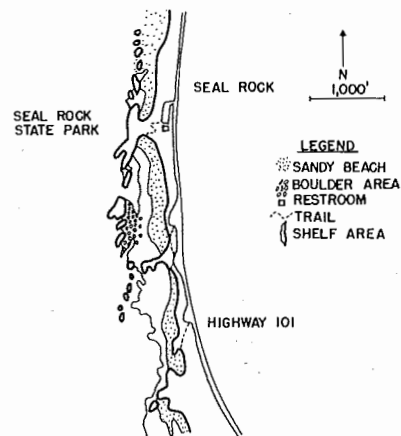
This is one of the most heavily utilized intertidal areas in Oregon. To reach the area, turn west off Highway 101 at Lighthouse Road in Agate Beach. Parking is adequate, but there are no rest-rooms available. Since gravel trucks use the same road, cautious driving is recommended. The trail down to the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

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.



SEAL ROCK

are found intertidally. Offshore are numerous islands and reefs, giving some protection to the area. A sandy beach is found next to land.

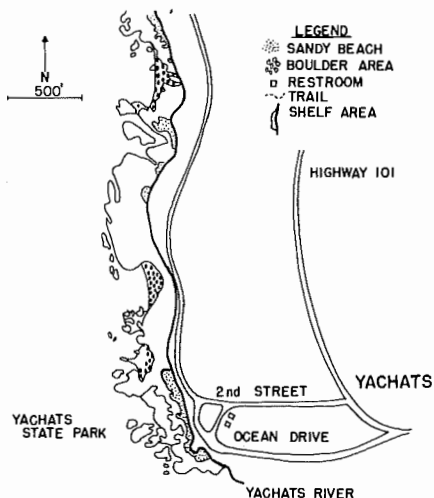
The usual assemblage of mussels, barnacles and starfish is most common. Algal growth is moderate. Sea lions and seals are sometimes seen on the offshore rocks.

YACHATS STATE PARK

From the mouth of the Yachats River stretching north lies Yachats State Park which 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. Rest-rooms are available.

The rocky area extends for about 1/2 mile from the Yachats 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.

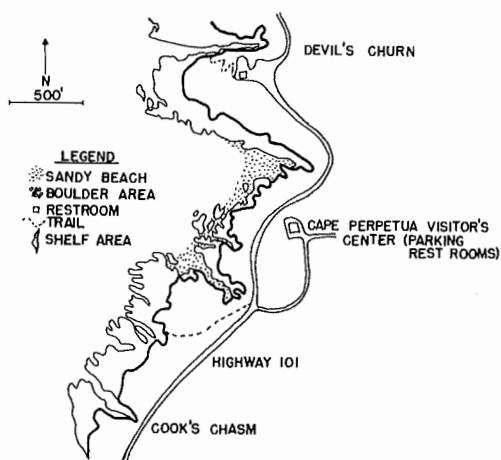
Large plants are scarce. Instead, species characteristic of exposed conditions, such as "sea palm" are common. Mussel and barnacle colonies abound together with starfish and large numbers of tube worms. Green anemones are very common in the pools.



YACHATS STATE PARK

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. 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.

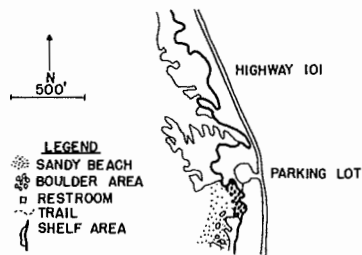


CAPE PERPETUA

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.

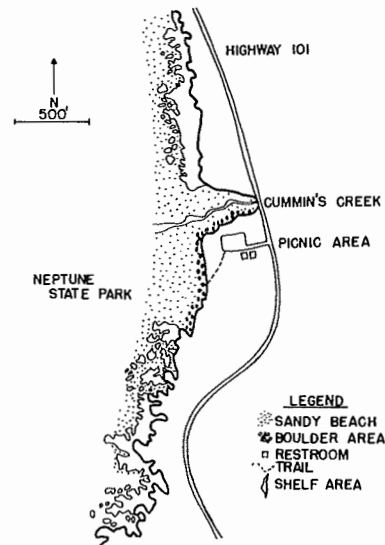
NEPTUNE STATE PARK (COLLECTING BY PERMIT ONLY)

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 three major areas, the north end the main picnic area and the Strawberry Hill area.



NORTH NEPTUNE STATE PARK

North Neptune State Park. There is a small gravel parking lot in the north end of the park with trails leading down to the beach. This is primarily a fishing area as the rocks and cliffs are too vertical to form many intertidal areas.

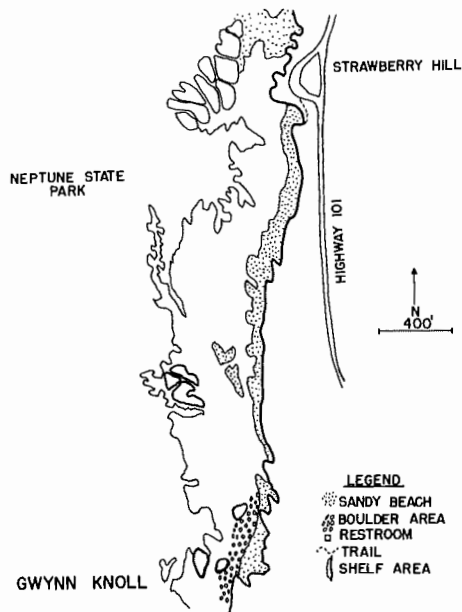


NEPTUNE PICNIC AREA

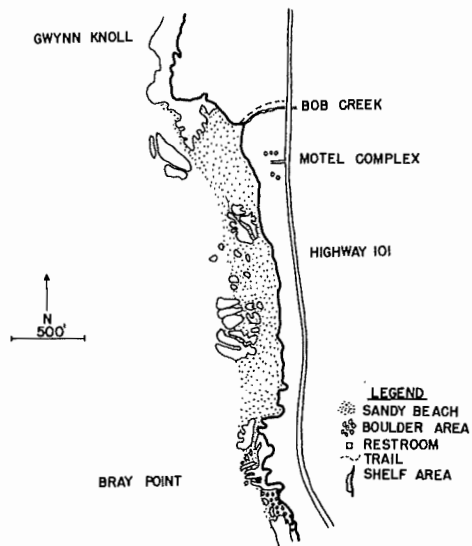
Neptune State Park Picnic Area. The main picnic area has ample parking, rest-rooms and easy access to the beach. Many of the rocks are steep, require climbing and present hazards of falling or getting trapped by the incoming tide. Again, this is primarily a fishing area.

Neptune State Park-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.



NEPTUNE STATE PARK-STRAWBERRY HILL

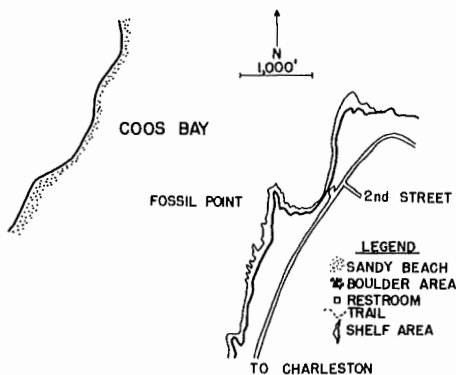


BOB CREEK-BRAY POINT

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. Easiest access is along Bob Creek but private property must be crossed and parking is limited.

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.



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.

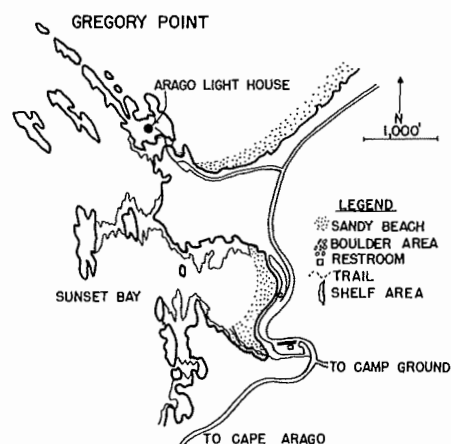
FOSSIL POINT (COOS BAY)

ARAGO LIGHTHOUSE (COLLECTING BY PERMIT ONLY)

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 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.



ARAGO LIGHTHOUSE-SUNSET BAY

SUNSET BAY (COLLECTING BY PERMIT ONLY)

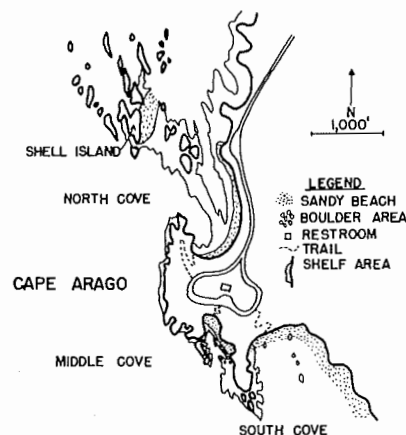
Sunset Bay is less than 1/2 mile south of the Arago Lighthouse and is about 9 miles south of Coos Bay. It is a popular state park with picnic, camping and rest-room facilities adjoining the area. The bay is bordered by a sandy beach on the east with vertical cliffs and flat shelf areas on the south and 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. Bull kelp grow subtidally. Most of the usual animals are 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, Cape Arago. 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.



CAPE ARAGO STATE PARK

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, Cape Arago. 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 Balanophyla elegans has been noted here.

South Cove, Cape Arago. 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.

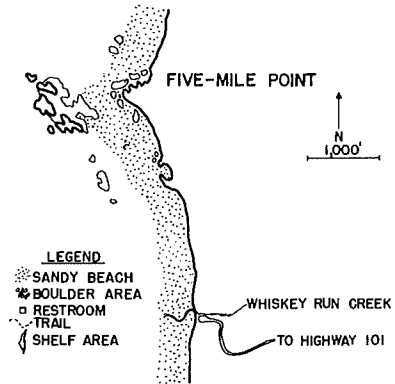
Algal growth is moderate with beds of bull kelp quieting the wave action subtidally. This is a very popular area for collectors and school groups. Because of this, the more unusual species are not readily seen. However, most of the common animals such as sea urchins, chitons, the common starfish and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

THE SOUTH COAST

In the arbitrary division of this guide, the southern Oregon Coast stretches from south of Cape Arago 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 with 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.

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. The beach is 7 miles away 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.



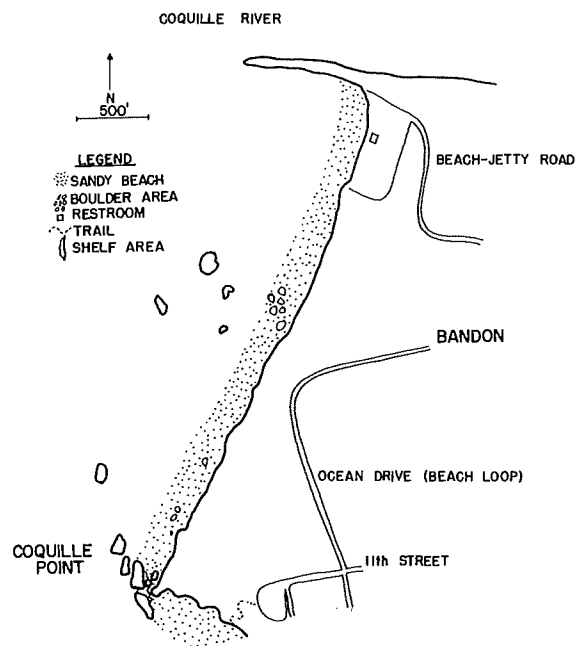
FIVE-MILE POINT

The Point is actually made up of two district 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 large numbers of 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, moved in by winter storms, 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.

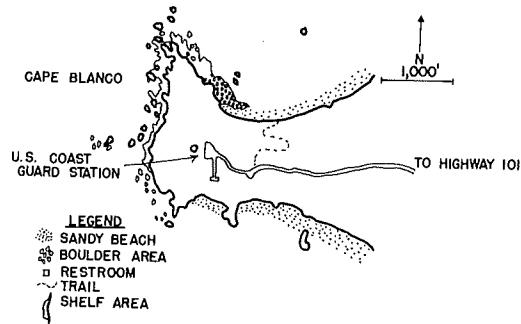


COQUILLE POINT

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.



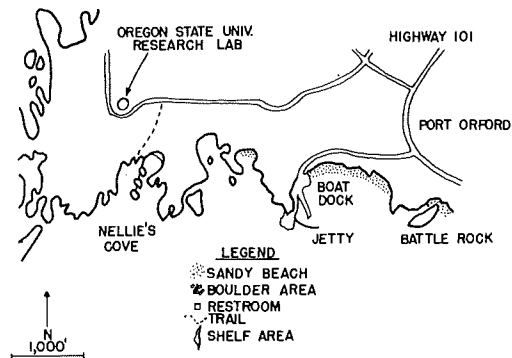
CAPE BLANCO

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. Sandy beaches adjoin both the north and south sides of the cape. As one follows the beach line around Cape Blanco, from the sandy beach on the north, the intertidal area gradually changes character with more and more boulders interspersed in the sand. Gradually, the sand is replaced by flat bedrock, mixed with boulders of varying size. On the northwest point of the cape, large masses of the headland point out into the intertidal zone, culminating in some islands offshore. Tide pools and crevices are common. Several of the tide channels are deep and there is a possibility of being trapped by the incoming tide. The mixture of bedrock and boulders prevails on the west side of Cape Blanco, with taller outcroppings also being present offshore. The south side is largely made up of vertical cliffs and sandy beach.

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.



PORT ORFORD

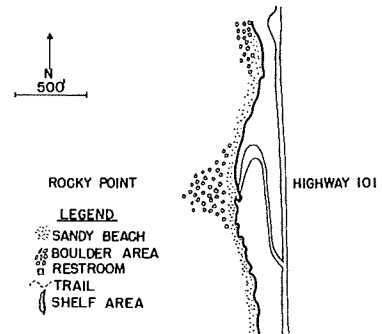
The intertidal area lies north of the dock and consists mostly of large boulders. Offshore are extensive kelp beds. Also of interest at the boat dock is the jetty where both the protected and the exposed side provide a habitat for animals. Since the jetty is exposed, the danger from large waves is present.

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 but access is through Oregon State University's Marine Research Laboratory at the former Coast Guard Station and permission to trespass is required.

NORTH HUMBUG MOUNTAIN STATE PARK (Rocky Point)

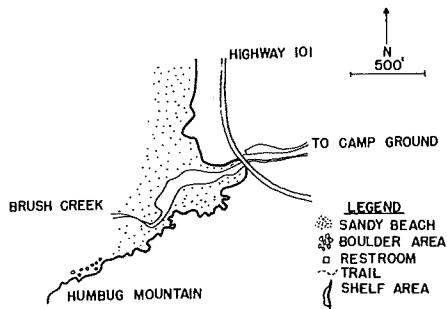
About 3 miles south of Port Orford, just inside Humbug Mountain State Park, is an excellent intertidal area. From a dirt side road with limited parking, the beach is only a short 100-yard walk away. This is a gently sloping, sandy beach with a large number of boulders, 2 feet or less in diameter scattered throughout the zone. A similar, slightly larger boulder field lies a few hundred yards to the north. There is little obvious protection from the surf, although algal growth is moderate throughout the area.



NORTH HUMBUG MTN. STATE PARK

The usual community of animals can be found here in good abundance. The sessile jellyfish Halicyllustus has also been noted.

HUMBUG MOUNTAIN STATE PARK



HUMBUG MOUNTAIN STATE PARK

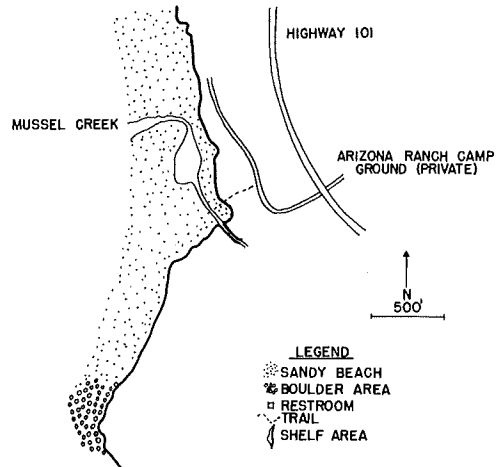
This park is about 4 miles south of Port Orford. Along the north base of the mountain there is a small intertidal area that is easily accessible from the Humbug Mountain State Park camping grounds. A trail leads from the camping grounds to the area 300 yards away. The rocky area is made up of several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

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.

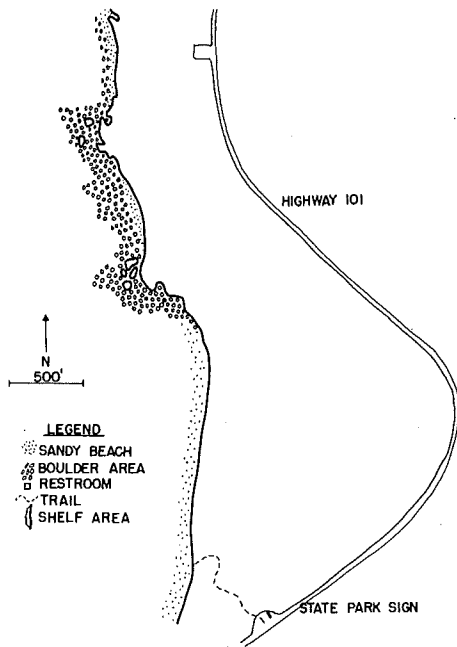


ARIZONA RANCH BEACH

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 any numbers 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.



NORTH SAMUEL BOARDMAN STATE PARK

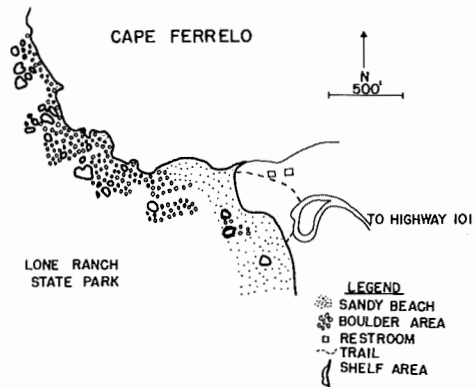
LONE RANCH STATE PARK

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

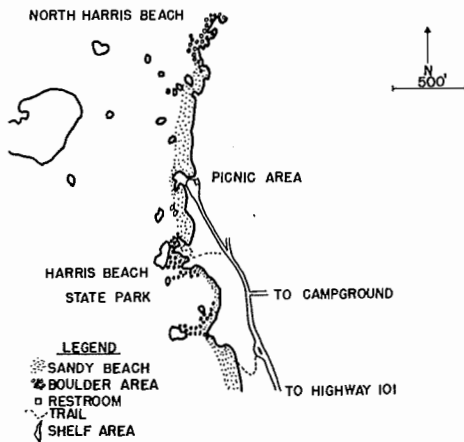
among the rocks provide several quiet areas. Numerous rocky overhangs and caves provide additional protection from waves.

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.



HARRIS BEACH

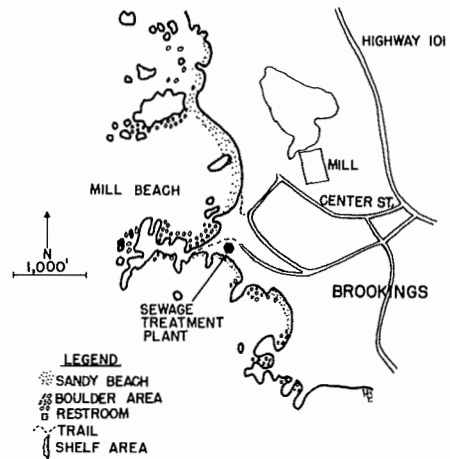
North Harris Beach. From the parking lot at the main picnic area it is but a few yards down to the beach. A sandy beach stretches north for a hundred yards and then merges with a rocky point jutting out from the mainland. This point has been partially broken up, and isolated rocks and boulder fields 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.



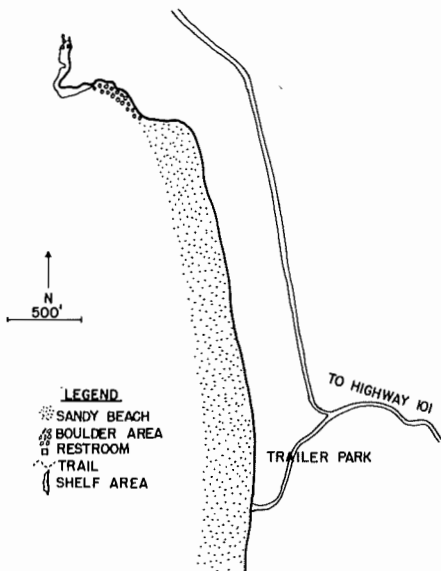
MILL BEACH

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

The Winchuck Beach intertidal area is located 4 miles south of Brookings. Private property must be crossed to gain access. The easiest route is through a trailer park and a small fee is charged at the time of this printing. Parking space is limited and there are no public rest-rooms.

The rocky intertidal area starts about 200 yards north of the trailer park's parking lot and extends for about a mile northward. 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.

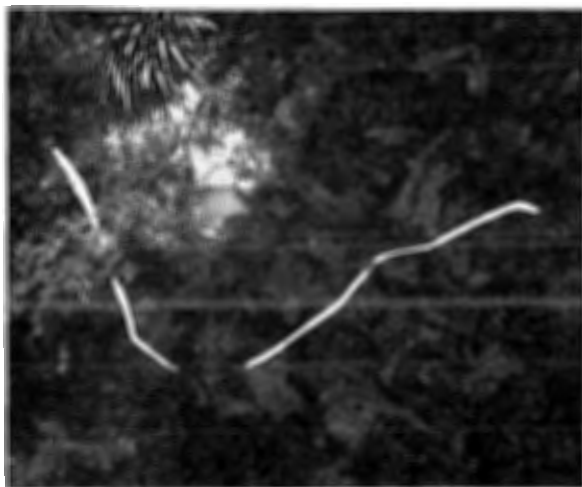


WINCHUCK BEACH

DESCRIPTION OF SPECIES

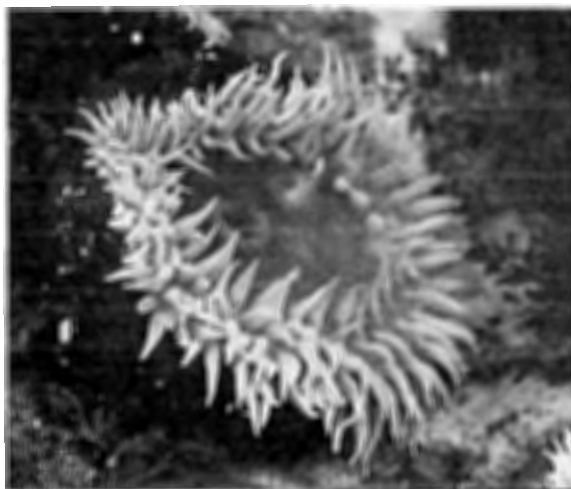
The intertidal zone of the rocky shore has an unusually rich flora and fauna. Within a limited area one finds a variety of environments and animals that have adapted to these particular conditions. The animals discussed in this section are not a complete listing of the species present but include a selection of the most obvious species that the amateur beachcomber is likely to see along the Oregon Coast. The taxonomic scheme used is that suggested by Ricketts, Calvin and Hedgpeth in *Between Pacific Tides*, fourth edition (1967).

Right-Sponge, Haliclona permollis. Size: Variable. Sponges come in many shapes and colors. The intertidal species along our coast are mostly the encrusting type. They make a spectacular show of pastel shades of red, yellow, lavender or green, lining the walls of surge channels and the exposed surfaces of rocks.

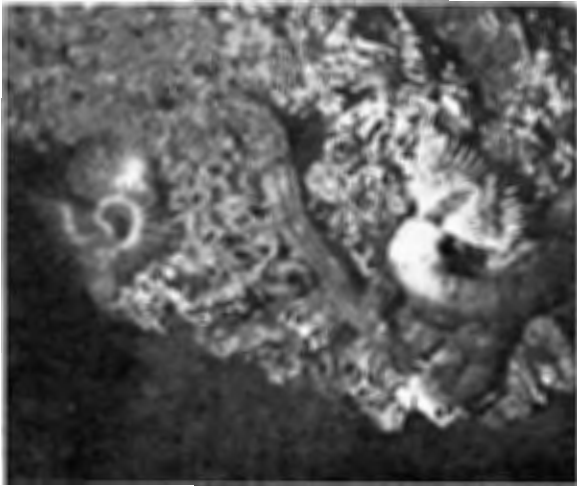
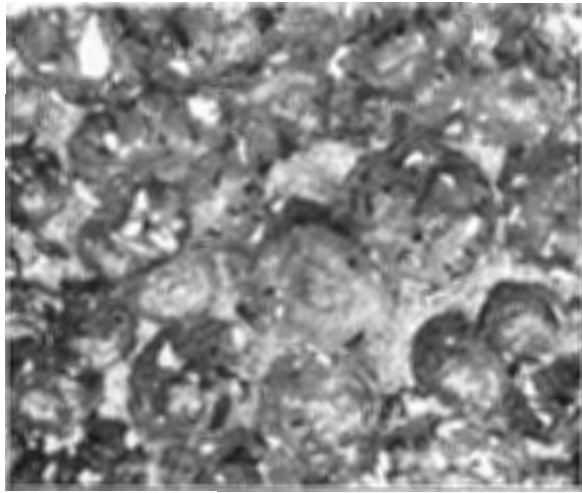


Left-Ribbon worm, Tubulanus polymorphus. Size: Up to 8 inches long. This bright red worm is a conspicuous member of a group of animals many of which live concealed in mussel beds.

Right-Green anemone, Anthopleura xanthogrammica. Size: 6 to 10 inches in diameter. In many places, the anemones are among the most showy animals of the intertidal zone. This large anemone gets its green color from small algae living within the tissues of the animal.

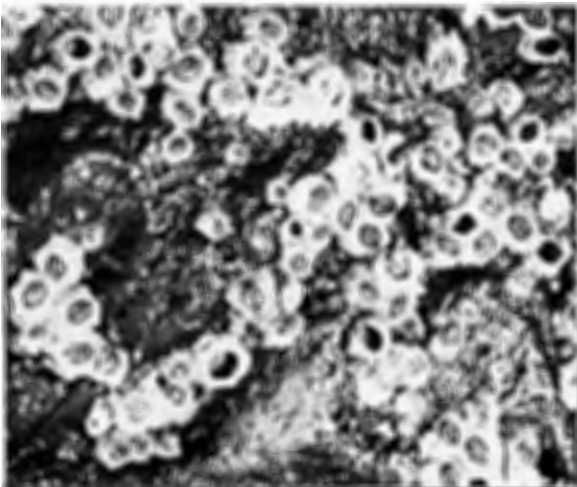


Right—Anemone, Anthopleura elegantissima. Size: 1-2 inches in diameter. This species is closely related to A. xanthogrammica. It is called the aggregating anemone as it tends to group together in large numbers, sometimes covering a rock. This anemone shows characteristic pink-tipped tentacles when open. Other common anemones, not pictured, are the striped anemone Epiactis prolifera found in the lower intertidal and the red and green Tealia crassicornis.



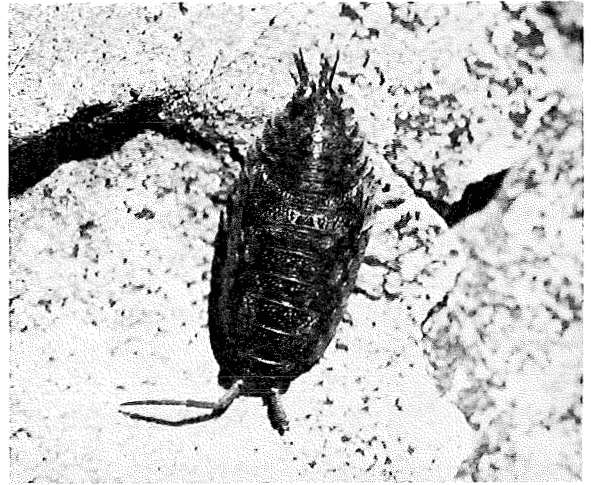
Left—Tube worm, Serpula vermicularis. Size: Tube diameter 1/8 inch. This animal displays its attractive feeding and respiratory "fan" only under water. It lives in a hard, calcareous tube in sheltered spots under rocks and overhangs.

Right—Goose-neck barnacle, Pollicipes polymerus. Size: 2-4 inches long. The goose-neck barnacle thrives on the exposed face of rocks and mussel beds. Its flexible stalk helps it endure the force of the waves.



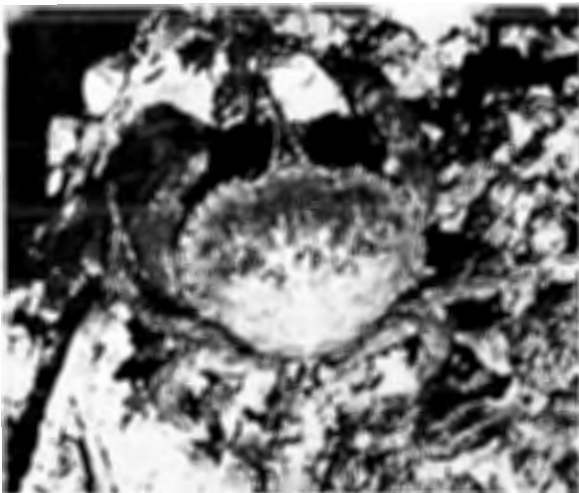
Left—Acorn barnacle, Balanus glandula. Size: 3/16 to 1/4 inch in diameter. This is one of several species of acorn barnacles along the coast. These tiny animals exist in tremendous numbers and may extend up into the upper intertidal zone where only salt spray and the larger waves reach.

Right—Pill bug, Ligia pallasii. Size: 1 inch. There are several kinds of marine "pill-bugs," some living among the algae and surf grass. Ligia pallasii lives on the upper edge of the intertidal zone hiding in caves and cracks in the rocks.



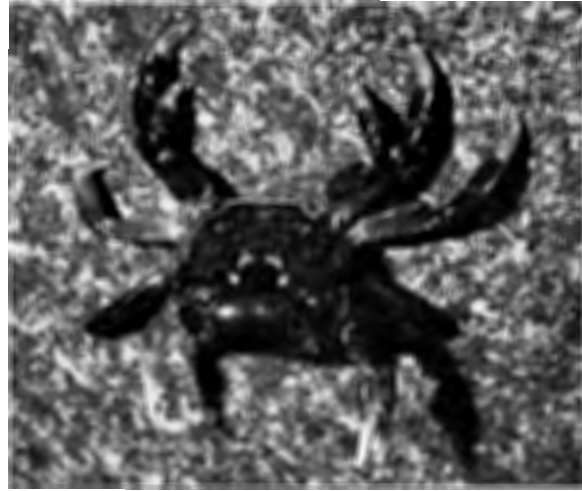
Left—Hermit crab, Pagurus hirsutiusculus. Size: 1-3 inches. Hermit crabs such as Pagurus hirsutiusculus are among the most common and interesting of the intertidal crabs. Their abdomen does not have a hard covering and the crabs protect themselves by occupying the empty shell of a snail, carrying it around as a "house."

Right—Porcelain crab, Petrolisthes cinctipes. Size: Up to 1/2 inch across back. These are very common under rocks. Its flattened body and claws readily separates it from the huskier purple shore crab, also hiding under rocks at low tide.



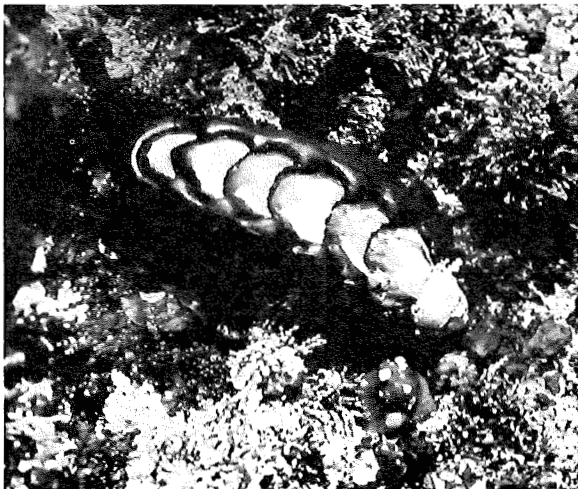
Left—Oregon cancer crab, Cancer oregonensis. Size 3/4 to 1 inch across back. A versatile crab, Cancer oregonensis may be found both in estuaries and entirely marine habitats. It is a small crab, characteristically hiding in pockets or cracks in the intertidal rocks.

Right—Purple shore crab, Hemigrapsus nudus. Size: Up to 1-1/2 inches across back. The purple shore crab is one of the more common intertidal crabs. Although it remains hidden under rocks during daylight low tides, at night it is a common sight, scampering about on the rocks.



Left—Kelp crab, Pugettia producta. Size: Up to 2 inches across back. The color of the kelp crab well matches the algae among which it lives. It is endowed with sizable claws as anyone carelessly sifting through kelp may discover.

Right—Gumboot chiton, Cryptochiton stelleri. Size: Up to 12 inches. The gumboot chiton is a large conspicuous animal of the middle and lower intertidal areas. The rusty red girdle completely covers the back plates of this species. The lower animal is on its back.



Left—Leather chiton, Katharina tuni-cata. Size: Up to 6 inches long. The leather chiton presents a sharp contrast of black girdle and white back plates. This species tends to seek out the exposed, surf-swept rocks.

Right—Chiton, Mopalia sp. Size: Up to 2 inches long. In contrast to the leather chiton, the species of Mopalia are much more withdrawn in their habits. They are usually found underneath rocks or half-buried in silt. There are several species in this genus.



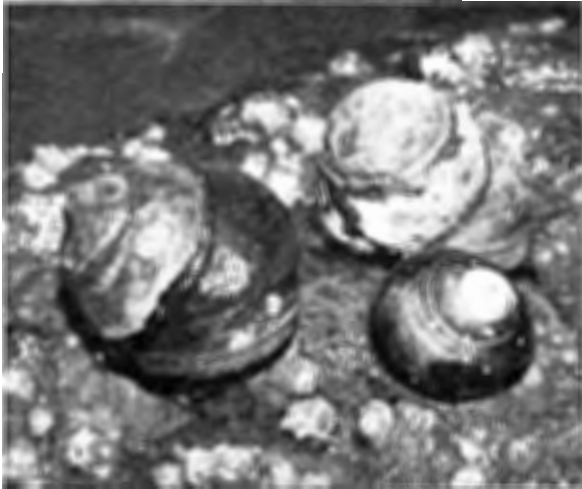
Left—Lined chiton, Tonicella lineata. Size: Up to 1-1/2 inches. Probably the most handsome of the Oregon chitons is the lined chiton. This small chiton has valves with colorful and characteristic designs. Although quite common, it is often unnoticed because of its small size and secretive habits.

Right—Finger limpet, Acmaea digitalis. Size: Up to 1 inch. Limpets are a common and widespread group of snails, ranging from the uppermost tide levels to below sea level. The finger limpet, Acmaea digitalis is found in the upper intertidal zone.



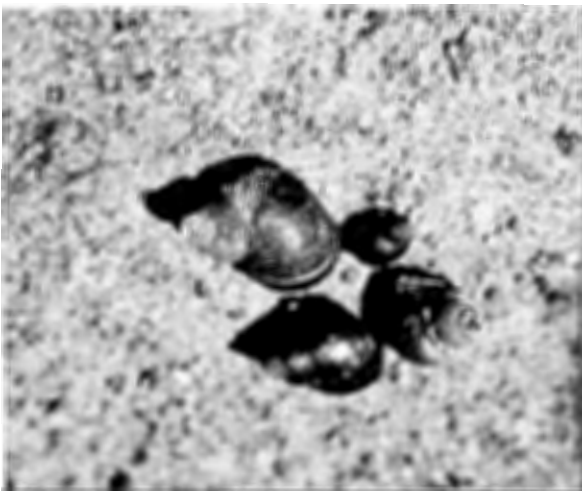
Left—Bishop's hat limpet, Acmaea mitra. Size: Up to 1-1/2 inches. The bishop's hat limpet lives in the lower intertidal. Sometimes, encrusting algae will coat its shell, blending the snail in with the algae on the rocks.

Right—Leafy horn mouth, Ceratostoma foliata. Size: Up to 3 inches. One of the largest intertidal snails in Oregon is the leafy horn mouth. Its shell is somewhat reminiscent of the helmet of the Spanish conquistadores. This snail inhabits the middle and lower intertidal.



Left—Black turban snail, Tegula funebris. Size: Up to 1-1/4 inches. This is perhaps the most common obvious snail of the intertidal area. At low tide it is often found in aggregations in rock crevices.

Right—Keyhole limpet, Diodora aspera. Size: Up to 2 inches. The keyhole limpet has a characteristic hole on top of its shell. It lives in the lower reaches of the shore. A commensal worm may sometimes be found with this snail.



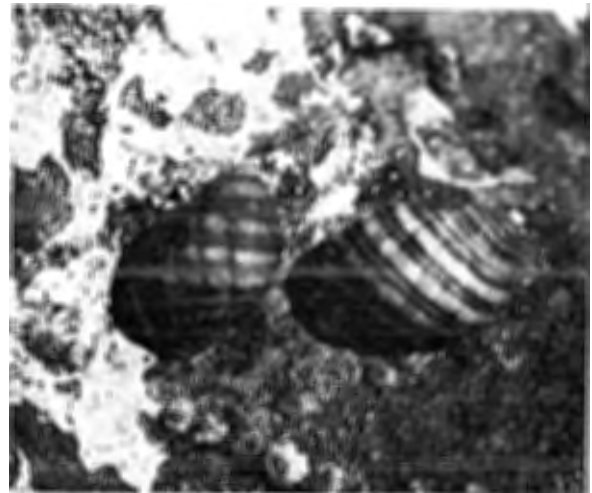
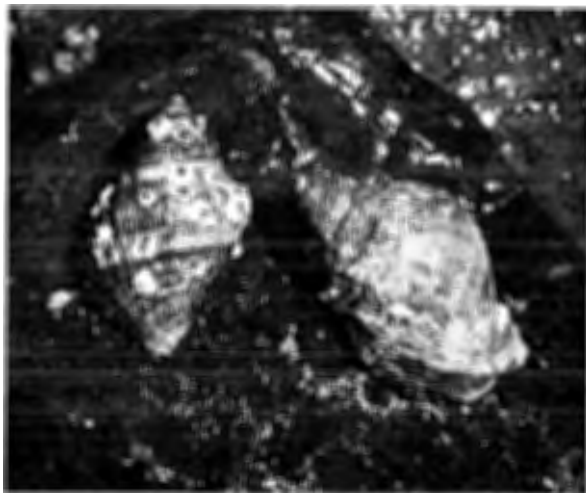
Left—Periwinkle snail, Littorina scutulata. Size: Up to 3/8 inch. A casual observer will never see them, yet periwinkles are very numerous in the upper intertidal area. They are very small and tend to withdraw into cracks in the cliffs at low tide, making them inconspicuous.

Right-Blue-top shell, Calliostoma ligatum. Size: Up to 3/4 inch. The blue-top shell is found in the lower intertidal zone and in pools and channels. The shell has characteristic light and dark ridges. The blue sheen is most obvious on older shells.



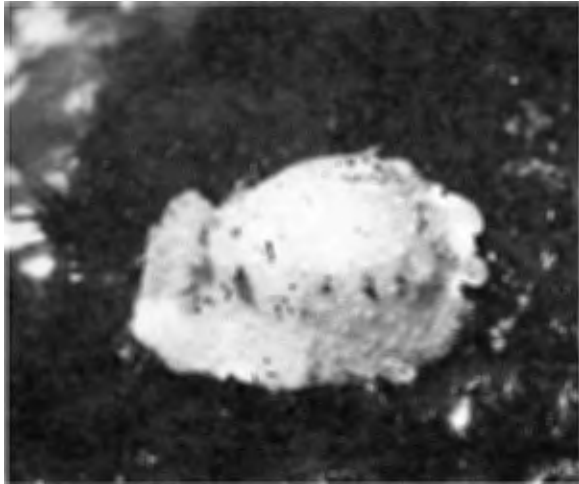
Left-Dire's whelk, Searlesia dira. Size: Up to 1-1/2 inches. Dire's whelk often goes unseen unless one parts the leaves of the surf grass or looks under rocks. At low tide, this snail is often half buried in the sand and shell fragments of these areas.

Right-Snail, Thais emarginata. Size: 3/4 to 1 inch. Thais emarginata is characteristically found among mussels and barnacles. This attractive snail is colored a dark grey with white or orange stripes.



Left-Snail, Thais lamellosa. Size: 1-3/4 to 2-1/4 inches. Also associated with mussel beds is the larger Thais lamellosa. In the spring one can sometimes see large breeding aggregations of these snails and their urn-shaped egg cases.

Right—Nudibranch, Hermissenda crassicornis. Size: Up to 1 inch. Sea slug is a singularly inappropriate name for these attractive animals. The different species vary greatly in form and color. Hermissenda crassicornis is a delicate-looking species with numerous dorsal projections. It may sometimes be seen clinging upside down on the surface film of quiet tide pools.



Left—Sea lemon, Archidoris montereyensis. Size: Up to 5 inches. Archidoris montereyensis is another common nudibranch. Sponges form an important item in the diet of this animal. The "feathery" plume on its back is used in respiration.

Right—Leather star, Dermasterias imbricata. Size: Up to 10 inches. Of the numerous species of starfish along our coast, many are subtidal or restricted to the lower intertidal area. The leather star is not common intertidally. The surface of this starfish is soft and smooth, hence its common name.



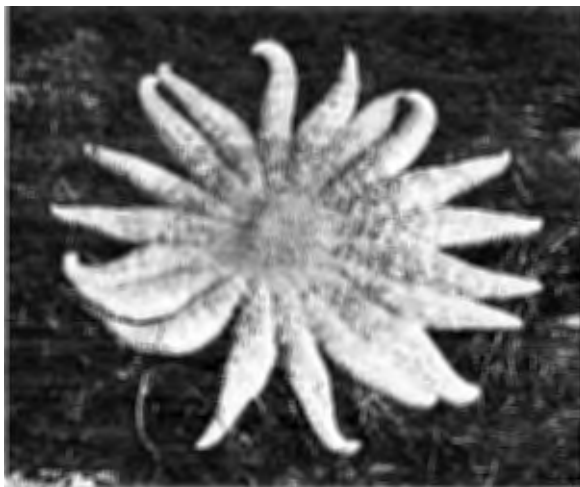
Left—Blood star, Henricia leviuscula. Size: Up to 4 inches in diameter. The blood star is an attractive, bright-red starfish. The younger individuals do not have this adult look but are sand colored or mottled.

Right—Ochre star, Pisaster ochraceous.
 Size: Up to 12 inches in diameter.
 The ochre star is the most common intertidal sea star in Oregon. It is especially numerous around mussel beds where it may sometimes be seen in large clusters. Although three color variations exist, purple, orange and brown, they are all of the same species.



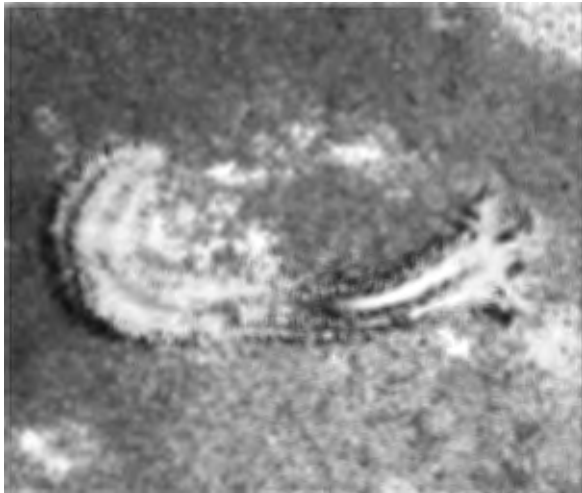
Left—Slender-rayed star, Evasterias troschelli. Size: Up to 12 inches in diameter. At first glance the slender-rayed star looks very much like the ochre star but it has narrower rays and lives lower down in the intertidal area.

Right—Six-rayed star, Leptasterias hexactis. Size: Up to 3 inches in diameter. This species is quite common intertidally but, because of its small size and secretive habits, it often goes unnoticed. Unlike most starfish, the female retains her eggs and releases tiny starfish in early spring.



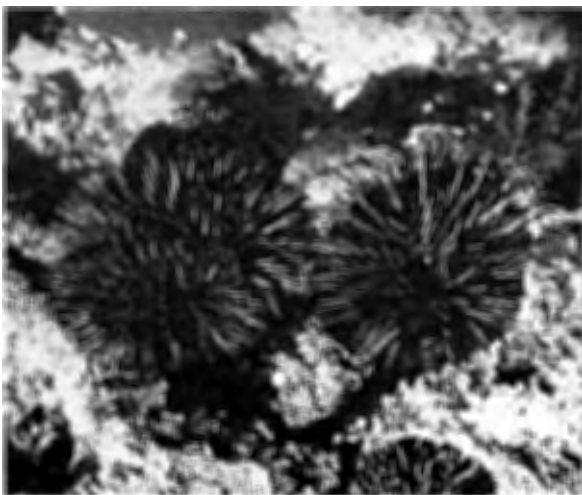
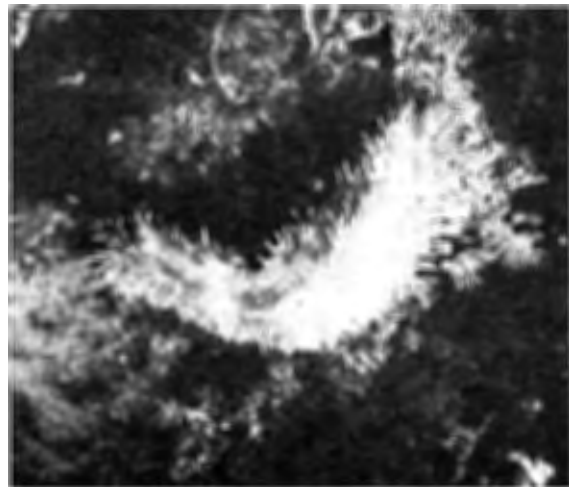
Left—Twenty-four rayed star, Pycnopodia helianthoides. Size: Up to 24 inches. This species is the giant as well as the speedster of the Oregon starfish. It is most common subtidally but it does enter the lower intertidal. The number of rays present will vary depending on age and losses due to injury.

Right—Sun star, Solaster stimpsoni.
Size: Up to 12 inches in diameter.
The sun star is not very common intertidally north of Coos Bay. It has characteristically 10 rays in contrast to a close relative, S. dawsoni, not shown, which has 8-13 rays.



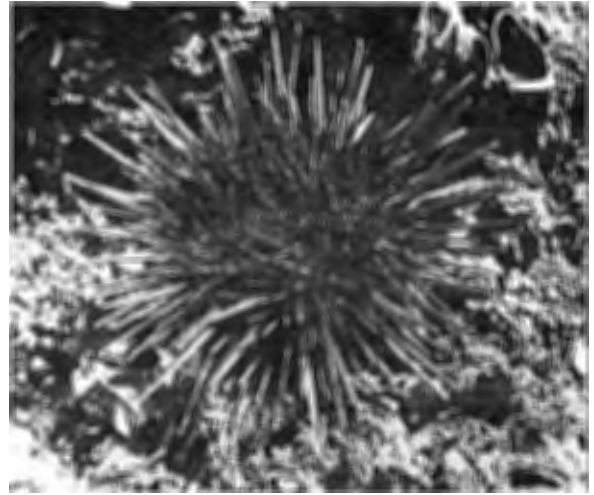
Left—Red sea cucumber, Cucumaria miniata. Size: Up to 10 inches.
The intertidal observer may sometimes notice a bright red feathery "plume" protruding out of a crack in the bedrock in a shallow pool. He is probably observing the feeding and respiratory "tree" of Cucumaria miniata, a red sea cucumber.

Right—White sea cucumber, Eupentacta quinquesemita. Size: Up to 3 inches.
Another quite common sea cucumber is a white, unpretentious species with the pretentious name Eupentacta quinquesemita.



Left—Purple sea urchin, Strongylocentrotus purpuratus. Size: Up to 3-1/2 inches in diameter. There are two common species of urchins in the Oregon intertidal area. The purple sea urchin is by far the commonest, completely lining the sides of tide pools in favorable areas. Often it lives in a shallow depression which it has hollowed out of the rock.

Right—Red sea urchin, Strongylocentrotus franciscanus. Size: Up to 8 inches. The red sea urchin is primarily a subtidal species but a few animals do enter the lower intertidal. This species may be colored either red or purple but its longer spines and generally larger size separates it from the purple urchin.



Left—Solitary ascidian, Styela montereyensis. Size: Up to 3-1/2 inches. Looking somewhat like a tall orange vase, Styela montereyensis is fairly common in exposed locations such as tide channels or in caves and ledges.

Right—Colonial ascidian, Amaroucium californicum. Size: Variable. This species is a common example of a colonial ascidian. Like sponges, which they resemble vaguely, colonial ascidians are found in exposed tide channels and caves.

