



PART THREE:

Rocky Shores Management Strategy

A. INTRODUCTION

1. Why Manage Oregon's Rocky Shores

Oregon's rocky shores are integral to the unique landscape and marine environment of the Oregon coast. From massive Tillamook Head looming above the Clatsop Plains south to the crenellated cliff at Brookings, rocky shores are a trademark of the Oregon coast. These biologically rich and visually dramatic shores have high value to Oregonians as places to use, enjoy, and learn.

Like other shore areas around the world, Oregon's seemingly durable rocky shores harbor many uniquely adapted life-forms that are vulnerable to the activities of mankind. There is no one threat. Rather, a web of combined causes poses the potential for habitat loss or destruction. Population growth in Oregon and elsewhere and more coastal recreation and travel mean increased urbanization of Oregon's coast. Decline and loss of salmon stocks create pressures for new and exotic fisheries and recreational activities. These seemingly unrelated activities can combine to affect Oregon's rocky shores. Thus, Oregon's commitment to protect its rocky shore treasures must ultimately lead to managing these areas to minimize or prevent human impacts.

Oregon's rocky shores belong to the public. That much is simple. After that, their ownership, management, use, and protection is complicated. The Oregon Division of State Lands is the trustee for the state on behalf of the people, up to mean high tide. The Division shares this management responsibility with the Oregon Parks and Recreation Department for the part of the shore, whether rocky or sandy, covered and uncovered by the tide down to extreme low water. Most marine life is under the jurisdiction of the Oregon Department of Fish and Wildlife; a federal agency, the US Fish and Wildlife Service, manages the "dry" parts of offshore rocks and islands as part of a National Wildlife Refuge. Some rocky shore areas front the ocean at Oregon State Parks while others front federal lands and still others border private lands where uses are regulated by cities or counties. And there are a variety of other agencies that have some piece of the rocky-shore management puzzle.

Oregon's rocky-shores strategy is intended to provide clear policies and direction for strong, site-sensitive management and protection of these unique ecosystems along the entire Oregon coast.

2. What is the Rocky Shores Strategy?

This Rocky Shores Strategy is one of several elements of Oregon's ocean-resources management program. The strategy is a combination of policy intentions (a goal and a set of policies and

objectives), supported by scientific background information on rocky shores areas and resources, applied to on-the-ground areas and situations. The strategy relies on authorities and programs of state and federal agencies to carry out activities in the field; the Ocean Policy Advisory Council will not implement the strategy.

The Rocky Shores Strategy addresses both shoreline and associated features as well as offshore rocks and associated reefs.

X **Shoreline types** include rocky tidepool areas as well as associated cliffs, submerged rocks or reefs and nearby rocks that may be reached by foot from shore (regardless of hazard or inconvenience); and

X **Offshore types** include underwater reefs and rocky islands accessible only by water in a boat or other means. These rocks and reefs are all within Oregon's territorial sea.

Six planning principles guided the Ocean Policy Advisory Council in preparing the strategy.

a. A Coastwide Context

The strategy encompasses a broad view of the entire coast to provide a larger ecosystem context for meeting local management needs and setting priorities for action through site management plans. A coastwide ecosystem context is important because the management and use of one site can affect management and use of nearby sites (a spillover effect) and because of the diversity of sites and conditions along the coast.

The scientific basis for the strategy is an extensive inventory and analysis of all rocky shore sites on the coast. The inventory was conducted by aerial surveys and field study during the summers of 1993 and 1994 by the Oregon Department of Fish and Wildlife (this inventory is summarized in subsection F.1.).

b. Site Plans

The Council encourages local site-management plans for rocky shore sites, where needed, to carry out the overall management designation and prescriptions set by the strategy. Site-management plans will respond to complex site conditions, uses, biologic resources and agency management interests and should be prepared with the involvement and participation of affected agencies, citizens, and interested groups at a local level to make sure that local knowledge and interests in the site are accommodated as much as possible.

The Council is especially committed to site-by-site assessment and management solutions for offshore rocks and islands for which serious resource management or protection concerns have been identified. Among the thirty-some "sensitive sites" listed in the Ocean Plan, the Council has identified seven as "priority rock and reef" sites in this plan where special assessment of the situation and management actions may be needed.

c. Intergovernmental Coordination

Intergovernmental coordination and cooperation has been critical to preparing out the rocky shores strategy and will be essential to carrying it out. The membership and mission of the Ocean Policy Advisory Council reflects legislative intent to make sure that the many governmental interests of coastal cities and counties, state agencies and federal agencies, and coastal Indian tribes are coordinated. A collaborative, coordinated effort, based on a commitment to cooperate, increases the likelihood of success and decreases the need to add laws and authorities for any individual agency.

d. Education, Information, and Interpretation

The strategy recognizes that an informed public with an enhanced sense of personal stewardship is crucial to protecting rocky shores. The strategy seeks to educate and inform the public to increase awareness of marine resources as the most effective means of protecting and conserving a these resources. The Council will encourage educational and informational outreach programs at coastwide as well as the local levels. The Council encourages additional support for existing educational and informational programs and creation of new programs. Overall, the Council supports a coordinated coastwide communication and interpretation strategy to support and reinforce public information programs to meet growing usage and impacts on rocky-shore areas.

e. Research, Study, and Monitoring

The strategy is based on the need for sound information to prepare, carry out, and evaluate management programs for Oregon's rocky shores. The key to effective assessment and necessary adjustment (adaptive management) of management programs is an active, responsive research, study, and monitoring program.

f. Financial Realism

The Council recognizes that the solution to many management problems will require little or no additional funds, some solutions will require new or additional funds to carry out. The rocky shores strategy provides a coastwide context for determining funding needs and priorities. of Energy.



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B. ROCKY SHORES POLICY FRAMEWORK

PLAN POLICY: The Goal, Policies, and Objectives for rocky shores are mandatory and all actions by local, state, or federal agencies in relation to managing rocky shore areas and resources shall be consistent with them.

1. Goal, Objectives, Policies

a. Goal:

To protect the ecological values and coastal biodiversity within and among Oregon's rocky shores while allowing appropriate use.

b. Objectives:

1. To implement a management program that allows for enjoyment and use of Oregon's rocky shores while protecting them from overuse, degradation, and loss;
2. To enhance appreciation and foster personal stewardship of Oregon's rocky shores through education, interpretation, and information;
3. To maintain, enhance, or restore rocky-shore habitats and biological communities;
4. To foster cooperation and coordination among local, state, and federal resources management agencies to ensure that marine resources and habitats are fully protected.

c. Policies:

1. Encourage those who visit rocky shore areas to observe animals and plants in place, avoid unnecessary disturbance to marine life, and refrain from taking any plants or animals except under special circumstances.
2. Utilize regulations, permits, and agreements to control harvesting, gathering, or special collecting of marine plants and animals where appropriate.
3. Limit or restrict access to specific sites when and where necessary to protect marine habitats or marine wildlife resources or to avoid conflicts among users; access restrictions will generally be adopted as part of site management plans.

4. Use education, information, and awareness programs as preferred techniques to promote stewardship of rocky shores and resources.
5. Work in partnership with coastal Indian tribes to ensure that traditional and customary uses of rocky shores are consistent with this strategy; the Council will take no action to affect tribal interests that are the subject of hunting and fishing consent decrees or other agreements between the State of Oregon and any tribe.
6. Apply management strategies and techniques that distinguish among the unique resources, setting, and uses of a.) rocky shoreline areas and b.) offshore rocks and islands.



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C. CARRYING OUT THE ROCKY SHORE STRATEGY

The Rocky Shores Strategy will be carried out primarily by state agencies such as the Parks and Recreation Department (through site management of state parks and the ocean shore and park educational programs) and the Department of Fish and Wildlife (through regulations and informational programs). In some cases, local governments or federal agencies such as the Bureau of Land Management may be involved. The timing for carrying out this plan will vary with the management needs, conditions and resources of each site, with the available financial and technical resources available to agencies, and with the interests and involvement of local citizens and groups. This subsection outlines the major elements of this process for rocky shoreline sites and for offshore rocks and Islands.

1. Mandatory Policies for Site Management

a. Rocky Shoreline Areas

- 1.) Management Required to Follow Plan.** Management of rocky-shore areas shall be consistent with the site management designations, management objectives and management prescriptions in this plan.
- 2.) Ecological Units.** Rocky-shoreline sites and offshore rock/reef sites that are closely associated by location, biology, or use shall be planned and managed as an ecological unit;
- 3.) Planning and Management.** Site management or planning shall:
 - (a) utilize a team approach that involves all appropriate state agencies, federal agencies, city or county planning agencies, affected Indian tribes, and interested citizens and organizations;
 - (b) be based on scientific inventory information about the site, its resources and uses as contained in the ODFW rocky shores inventory, as obtained through more detailed site studies or as provided through comment and testimony by agencies and interested parties;
 - (c) include provisions for periodic monitoring of site use and condition of habitats and resources;
 - (d) include public educational, awareness, and outreach programs as integral parts of local site management plans.

b. Site Management of Offshore Rocks and Reefs

- 1.) **Priority Rock and Reef Areas.** The "priority" rock and reef areas listed in this plan shall be the basis for further planning and assessment of management needs for offshore rock and reef areas.
- 2.) **Planning and Management.** Further planning or management action by the Council or any agency with respect to priority offshore rocks and reefs shall:
 - (a) utilize a team approach that involves all appropriate state agencies, federal agencies, affected or interested citizens and organizations;
 - (b) be based on scientific inventory information about the site, its resources and uses as contained in the ODFW inventory, as obtained through in more detailed site surveys and studies or as presented through comment and testimony by agencies and interested parties;
 - (c) include provisions for periodic monitoring of site use and condition of habitats and resources;
 - (d) include public educational, awareness, and outreach programs shall be developed as integral parts of site management plans.

c. Consistency Between Territorial Sea Plan and Site Management

- 1.) **Report to Council.** Whenever a site management plan is completed for rocky shore areas, the responsible agency shall submit written report to the Ocean Policy Advisory Council finding that the management plan is consistent with the provisions of this plan.

2. Mandatory Policies for Amending the Rocky Shores Strategy

The Council expects that rocky shore site management may be adjusted over time for a variety of reasons and recognizes that site management designations of this plan may need to be changed.

a. Amendment Criteria

The Council shall consider amendments to the provisions of this Rocky Shores Strategy only:

- 1.) in response to more detailed site study and analysis;
- 2.) when a change in circumstances affecting a site requires management practices that are different from or can no longer be conformed to the management designation in this plan; or

- 3.) when sites identified as "Not Yet Designated" in this plan are proposed for management designation.

b. Amendment Procedure

The Council shall follow the provisions of Part I, Section F.2. and any rules adopted pursuant to that section when amending the rocky shores provisions of this plan.

3. Education and Public Awareness

The key to protecting rocky shore resources and carrying out the Goal, Policies, and Objectives of this Territorial Sea Plan is an informed and aware public. This means that the public--and its many subgroups--will need to learn about rocky shore resources, the importance of these to Oregon's coastal environment and economy, and ways in which they can take action as individuals and in groups to ensure protection and continuation of these valuable resources.

Public education, information, and awareness efforts will be needed on both coastwide and site-specific levels. Existing educational and informational programs need support and to be networked to achieve maximum effectiveness. Oregon needs a strategic approach to communicating with the public to foster stewardship of coastal resources.

New programs are needed to meet increased usage and impacts on rocky-shore areas. These are often most effective when locally-based but regional and statewide efforts are needed to support local programs and provide consistency coastwide.

Financial support is crucial to developing and implementing needed informational programs. Informational initiatives will include innovative telecommunication technologies of computer networks and information services.

The Council recognizes that the following actions are needed to build a public awareness component into rocky shores management:

- 1.) Emphasize public education, interpretation, and information programs as primary management techniques.
- 2.) Create a coastwide strategy of interpretation, information, and education that links private, local, state, and federal educational and interpretive and educational programs.
- 3.) Enlist the assistance and support of local educators, interest and user groups, and the general public in planning for and carrying out educational and informational awareness programs at the local level.
- 4.) Support formation, training, and outreach activities of volunteer organizations assisting agencies in rocky-shore areas.

- 5.) Apply computer-based information networks to coastal information needs, including schools, agencies, public facilities, local governments, and private establishments.
- 6.) Seek specific additional funding, through the Ocean Policy Advisory Council, to support the objectives of this plan through financial assistance to agencies and groups to provide education and information activities.



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D. EXISTING ROCKY SHORES MANAGEMENT

1. State Regulations

a. Marine Fish and Shellfish

NOTE: Extensive and detailed regulations for harvesting of fish and shellfish in Oregon's marine waters are contained in the annual "Oregon Sport Fishing Regulations" of the Oregon Fish and Wildlife Commission authorized by Oregon Administrative Rules Chapter 635, Division 39. This section is a brief summary of regulations pertinent to rocky shores management and is not a complete set of regulations. Consult the complete Fish And Wildlife Commission fishing regulations for details.

In summary, marine fishery regulations apply to the Pacific Ocean, coastal bays, and beaches. No license is required to take smelt, shellfish, or other marine invertebrates. An angling (fishing) license is required to take and land marine fish, including halibut, lingcod, rockfish, flounder, surfperch, greenling, cabezon, sole, and others and, in addition, special tags are required by ODFW for some species.

Shellfish are marine animals that may be harvested without a license but there are daily limits on the number taken and on the kind of equipment or harvest method used. Shellfish are defined in ORS 506.011 as abalone, clams, crabs (Dungeness, Red Rock), mussels, oysters, piddocks, scallops, and edible shrimp.

b. Invertebrates

Although shellfish are, in fact, invertebrates (they have no backbone), regulations distinguish between the more commonly harvested "shellfish," above, and "other marine invertebrates." ODFW regulations state:

"There is no limit on the number of sand crabs, kelp worms, mud and ghost shrimp or Turban snails that may be taken. The daily catch limit is ten intertidal animals in the aggregate of all other intertidal animals (starfish, urchins, snails, and similar animals)."

Several rocky-shore areas are closed to taking of marine invertebrates. These areas are described in Subsection F.3.

Areas Closed to Taking of Marine Invertebrates, Clams*, Mussels**

all sand beaches, rocks, and tidepools within:

- X Marine Gardens at Otter Rock
- X Marine Gardens at Cape Perpetua
- X Whale Cove (closed to taking of all fish, shellfish, and marine invertebrates)
- X Yaquina Head Natural Area
- X Marine Gardens at Haystack Rock

* *Razor clams may be taken at Cape Perpetua*

** *Single mussels may be taken for bait at all sites*

Areas Where Permits Are Required to Take "Other Marine Invertebrates"

all sand beaches, rocks, and tidepools within:

- X Shell Cove (Depoe Bay)
- X Boiler Bay
- X Neptune State Park (Strawberry Hill) Sunset Bay to Cape Arago Harris Beach

c. Commercial Shellfish Harvest

A permit from the Oregon Department of Fish and Wildlife is required for commercial harvest of shellfish including mussels, clams, and crabs. The permit specifies conditions on the species, area, and method of harvest. A logbook showing date, pounds, dealer, area, and other data must be kept and submitted to ODFW.

All areas of the coast are open to commercial harvest except the following (the following list does not include closed areas of estuaries or rivers):

Areas Closed For ALL Commercial Harvesting

- X Marine Gardens at Haystack Rock
- X Boiler Bay
- X Shell Cove
- X Whale Cove
- X Marine Gardens at Otter Rock
- X Marine Gardens at Yaquina Head
- X Marine Gardens at Cape Perpetua
- X Neptune State Park
- X Sunset Bay-Cape Arago
- X Harris Beach

Areas Closed to Commercial Mussel Harvest

- X Arch Cape
- X All offshore rocks
- X All state, federal and county parks or waysides are closed on all weekends and holidays.
Commercial harvesters are required to leave one layer of mussels on the rocks.

d. Scientific/Educational Collecting

A scientific collecting permit may be obtained from the Oregon Department of Fish and Wildlife to collect more than the regulations otherwise allow and to collect in "permit-only" rocky-shore areas for scientific or educational purposes. Scientific collecting permits specify the area where collecting is authorized and may not be used in other areas. A collection report is required.

e. Marine Plants

There are no specific regulations or permits required for the harvest of marine plants (except for commercial harvest or leasing for bull kelp, regulated under ORS 274, administered by the Division of State Lands). Individuals may harvest up to 2000 pounds of kelp per year for human consumption without a lease from the Division (ORS 274.895).

The removal of "marine growth" from the state recreation area (otherwise known as the "ocean shore," the area between extreme low tide and the line of vegetation) is prohibited by law except in compliance with regulations of the Parks and Recreation Department. The State Parks and Recreation Department has authority to adopt such rules "to protect the areas from any use, activity, or practice inimicable to the conservation natural resources or public recreation." To date, OPRD has not adopted rules governing the removal of "marine growth."

f. Boating/Closure Areas

The State Marine Board has authority to adopt regulations for boating activity in state waters. The Marine Board has adopted regulations (OAR 250-20-309) to establish a seasonal boating closure around Three Arch Rocks to protect wildlife.

g. Access

Although the ocean shore is, by law, a public recreation area, the State Parks and Recreation Department (OPRD) has authority to regulate uses and activities as well as "improvements" on the ocean shore (between extreme low tide and the line of vegetation). Such regulation of uses or activities may result in certain uses being prohibited from certain ocean shore areas. In addition, the OPRD may limit or close access to the beach or rocky shore area from an adjacent state park area in response to safety or habitat protection considerations. The OPRD also has authority to regulate beach access structures, like seawalls or stairways, in the ocean shore area. None of the authority of the OPRD to regulate or control the use of Oregon's ocean shore limits or degrades the public's overriding rights to the ocean shore area.

2. Federal Laws and Regulations

NOTE: The following are brief summary descriptions of some federal statutes as they may apply to managing Oregon's rocky shore areas. The United States Code (U.S.C.) should be consulted for a complete text of these statutes and the Code of Federal Regulations (CFR) should be consulted for the complete regulations adopted by the agency.

a. Threatened and Endangered Species

Endangered Species Act (16 USC 1531-1543)

A number of bird and mammals species that use Oregon's rocky shore areas, either as residents or when migrating, are protected as threatened or endangered species under federal law. These species include Aleutian Canada goose, brown pelican, bald eagle, peregrine falcon, marbled murrelet, Steller sea lion, and gray whale.

Federal regulations prohibit the unauthorized "taking" of any species listed by federal regulation as "threatened" or "endangered." The term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." These federal regulations determine the protection standards for these animals or plants even when they occur in state waters. Federal regulations authorize the designation of "critical habitat" for threatened or endangered species that can have consequences for human activities within or adjacent to such designated areas.

b. National Wildlife Refuge System/National Wilderness System

National Wildlife Refuge System Administration Act

(16 USC 668dd-668ee) and Oregon Islands National Wildlife Refuge;

Wilderness Act (16 USC 1131-1136)

Almost all the rocks and islands along the Oregon coast are in the Oregon Islands National Wildlife Refuge or Three Arch Rocks National Wildlife Refuge, which are administered by the U.S. Fish and Wildlife Service. There are extensive regulations for managing these rocks and islands under many different laws. The chief ones of interest for rocky shores relate to prohibiting trespass (no climbing or landing on) or harassing wildlife, whether intentional or unintentional. In addition, most rocks under National Wildlife Refuge System jurisdiction are also in the Oregon Islands Wilderness designated by Congress.

c. Migratory Species

Migratory Bird Conservation Act of 1929 (16 USC 715-715r)

and Migratory Bird Treaty Act of 1918 (16 USC 703-712)

Oregon's rocky shores are habitat for many migratory species that are covered under federal law, including the Migratory Bird Conservation Act of 1929 and the Migratory Bird Treaty Act of 1918. Thus, these habitat areas are of interest not just to the State of Oregon or the United States but to other nations, too. Federal regulations protecting migratory species are an important part

of Oregon's rocky shore management.

d. Marine Mammals

Marine Mammal Protection Act (16 USC 1361-1407)

Several species of marine mammals make Oregon's rocky shores their home for all or part of the year. All these mammals are protected under federal law, the Marine Mammal Protection Act. Under this law it is unlawful to "take" a marine mammal; this means that it is unlawful to harass, hunt, capture, or kill, or attempt to do these things to any marine mammal.

3. Special Use/Management Areas

Several different kinds of special-management areas have been designated over the years in response to various needs or opportunities. These special-management or special-use areas allow agencies to tailor management and regulations to address particular uses or resources of an individual area. Some of these areas, such as the Intertidal Permit-Only Areas, will be blended in to the rocky-shore management areas described in previous sections of this plan. Other areas, such as State Parks, and National Wildlife Refuges will remain distinct but will be central components of the rocky-shore strategy.

a. Intertidal Marine Gardens

Four Marine Gardens have been designated by the Oregon Fish and Wildlife Commission through regulations administered by the Department of Fish and Wildlife. These Marine Gardens are closed to the taking of marine invertebrates, clams (except razor clams at Cape Perpetua), and mussels (except single mussels for bait) and have little or no other site management activities.

X **Otter Rock:** the sand beaches, rocks, and tide pools between higher-high water and lower-low water lying between a line projected due west from the highest point of Cape Foulweather on the north and a line projected due west from the Devil's Punchbowl on the south;

X **Cape Perpetua:** the sand beaches, rocks, and tide pools between higher-high water and lower-low water from the northerly boundary of Neptune State Park to the north side of Devil's Churn;

X **Haystack Rock, Cannon Beach:** including Haystack Rock and an area within a 300-yard radius of the base of the rock.

X **Yaquina Head Natural Area:** all rocky areas and tide pools situated between higher high water and lower low water lying between the sand beach on the south to the sand beach on the north of Yaquina Head.

b. Intertidal Permit-only Areas

There are five areas where permits from the Oregon Department of Fish and Wildlife are required to take intertidal animals:

X **Shell Cove** (Depoe Bay): all sand beaches, rocks, and tide pools between higher-high water and lower-low water lying between a line projected due west from Shell Road in the south half of Section 8, Township 9 south, Range 11 west, on the north; and a line in the southeast quarter of Section 7 on a line projecting due west along the southern boundary of Section 7 in Township 9 south, Range 11 west;

X **Boiler Bay**: all sand beaches, rocks, and tide pools between higher-high water and lower-low water lying between a line projected due west from the mouth of Fogarty Creek, Lincoln County, on the north and a line projected due west from Bench Marker 53 at Boiler Bay State Park;

X **Neptune State Park**: all sand beaches, rocks, and tide pools between higher-high water and lower-low water between the park's southerly and northerly boundaries;

X **Sunset Bay - Cape Arago**: all sand beaches, rocks, and tide pools between higher-high water and lower-low water lying between a line projected due west from the Cape Arago light and a point 3/4 of a mile south of Cape Arago State Park;

X **Harris Beach**: all sand beaches, rocks, and tide pools between higher-high water and lower-low water and all intertidal areas lying between a point 1/2 mile north of the Harris Beach State Park on the north and the mouth of the Chetco River on the south.

c. Research Areas

There are numerous rocky shore areas where research is or has been conducted. Some of these are long-term study areas while others are the site for seasonal or special projects. The Oregon Department of Fish and Wildlife has research projects at several locations including Whale Cove, Pirate Cove, and Nellie's Cove.

Researchers at Oregon State University have historically used sites on the central coast such as Boiler Bay, Strawberry Hill, and Yaquina Head as field laboratories for study of ecosystem processes in intertidal areas. Researchers from the University of Oregon, especially the University's Institute for Marine Biology, have historically used south coast sites at Cape Arago, Shore Acres, Cape Blanco, and Hooskenagen Creek near Cape Ferrello. Other research has been conducted at Haystack Rock, Otter Crest, and other areas where scientific collecting is permitted.

d. State Parks

Many of Oregon's major, as well as smaller, rocky shore areas are adjacent to or within the boundaries of Oregon State Parks. Thus, the management of these parks can have a significant effect on habitat and resources of the rocky shores. Within a park, access can be controlled, educational or interpretive programs can be implemented, facilities can be installed, and other

measures taken to carry out the rocky shores strategy of this plan. In addition, these parks can serve as habitat buffers and protected areas by leaving some park areas undeveloped and inaccessible to the public.

e. Cape Meares

The Oregon Parks and Recreation Department and the U.S. Fish and Wildlife Service have signed an interagency cooperative agreement to manage state park facilities in conjunction with the Cape Meares National Wildlife Refuge. The sheer basalt cliffs and old-growth Sitka spruce forest of the cape are especially important habitat for several bird species.

f. Cascade Head

Cascade Head and the Salmon River estuary are owned and managed through joint efforts of The Nature Conservancy and the U.S. Forest Service as a research natural area. In addition, Cascade Head is listed as an International Biosphere Reserve.

g. Whale Cove

The Oregon Department of Fish and Wildlife has for a number of years closed Whale Cove south of Depoe Bay to all harvest of fish and shellfish to maintain a baseline research area. In addition, a long-term study of the success and growth of planted red abalone is being conducted in Whale Cove.

h. Yaquina Head

The upland area of Yaquina Head is administered by the U.S. Bureau of Land Management as an Outstanding Natural Area. The rocks associated with the head are managed as National Wildlife Refuge sites by the U.S. Fish and Wildlife Service. The State of Oregon has jurisdiction over the dry sand beach, rocky intertidal areas, and associated subtidal rocks and reefs. The intertidal area is designated a Marine Garden by the Oregon Fish and Wildlife Commission.

i. North Cove/Shell Island at Cape Arago

The north cove at Cape Arago is an especially rich and diverse habitat area for a wide variety of intertidal plant and animal species, seabirds and marine mammals. The entire cove is somewhat sheltered from the open ocean by Simpson Reef, a linear rock feature about one-half mile offshore. Near the center of the cove, Shell Island, a large rock with a sand beach on its landward side, and other large rocks provide ideal haulout and pupping sites for seals, sea lions, and elephant seals (the only such site for elephant seals in Oregon). However, these rocks are accessible by foot at low tide, especially the very low tides of late spring and early summer.

The park upland is owned and managed by the Oregon Parks and Recreation Department, the rocks and islands in and adjacent to north cove are part of the National Wildlife Refuge System managed by the U.S. Fish and Wildlife Service. These two agencies have an agreement to close

trail access to North Cove between March 1 to June 15 each year to protect seals and sea lions that bear and raise their pups on the rocks, reefs, and beach area.

j. Three Arch Rocks National Wildlife Refuge/state buffer area

The rocks of Three Arch Rocks National Wildlife Refuge offshore Oceanside in Tillamook County are very valuable and heavily used habitat for colonial nesting seabirds and for marine mammals. The Ocean Policy Advisory Council has adopted a 500-foot seasonal closure area for the waters around these rocks to buffer breeding seabirds and mammals from human disturbance caused by boats. The State Marine Board has enacted boating regulations to close the 500-foot wide area between May 1 and September 1 of each year.

k. Orford Reef Urchin Seasonal Closure Area

Orford Reef, approximately three miles southwest of Cape Blanco, contains a number of rocks that are critical habitat for the Steller sea lion, a species listed as "threatened" under federal law. The submerged reef areas within Orford Reef are the target of a red sea urchin dive fishery. In the late 1980s, observations suggested that Steller sea lion use of some rocks in the reef was being adversely affected by the presence of urchin dive activity. In 1990, the ODFW and the urchin industry instituted a 1,000 foot-wide urchin fishery closure area around Long Brown Rock and Seal Rock between May 1 and August 31. In 1993, the National Marine Fisheries Service designated a 3000-foot wide critical habitat area around these rocks but has not adopted any associated restrictions. The sea urchin industry provided additional protection by voluntarily instituting a moratorium on all harvest in and around Orford Reef during the summer months.

l. Rogue Reef Fishery Closure Area

Rogue Reef is located about two miles off the mouth of the Rogue River and the City of Gold Beach. Pyramid Rock in Rogue Reef is a critical habitat site for Steller sea lions and is the largest pupping site south of Alaska. This reef is also receiving increased fishery use, principally sport rock-fishing. As at Orford Reef, impact concerns from the urchin dive fishery led to a seasonal closure to that fishery to protect Steller sea lion reproduction. Beginning in 1994, a 1000-foot area around Pyramid Rock is closed to all fishing activity during the period May 1 to August 31. In addition, the National Marine Fisheries Service has designated an area 3000 feet wide around these important sites as critical habitat but has not adopted any associated restrictions.

4. Regulatory Improvements

a. Conformance with Rocky Shores Strategy

The ODFW regulations should be reviewed and updated as necessary to conform to the area management designations of the Rocky Shores Strategy.

The bag limits for marine invertebrates, including the "no limit" rule on taking sand crabs or Turban snails, should be reviewed and revised as necessary to conform to the Rocky Shores Strategy.

b. Permits

The ODFW should review its permit system to determine whether changes are needed such as:

- X criteria and conditions for scientific and commercial harvest permits;
- X fees for certain permits;
- X reporting requirements;
- X seasons for certain activities.

The Division of State Lands should review and clarify its criteria for requiring and approving a "right of entry" permit for submerged and submersible lands.

c. Legislative Changes

The Oregon Legislature should be asked to

- X provide an appropriate state agency with authority to regulate the harvest of marine algae (seaweeds) in intertidal and subtidal areas in conformance with this Territorial Sea Plan.

NOTE: ORS 274.895 requires a lease from the Division of State Lands for removing kelp or other marine algae from submerged lands (but not from submersible), except that 2000 pounds per person may be harvested for "human use" without a permit.

NOTE: ORS 390.725 authorizes the State Parks and Recreation Department to regulate the taking of "marine growth or other natural product" from the state recreation area, which extends to extreme low water and includes intertidal areas.



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E. THE CONTEXT FOR MANAGEMENT

1. Setting

a. Ocean Currents

Oregon's coastal ocean waters are but a small thin ribbon at the eastern edge of the vast Pacific Ocean. But it is at the edges of such environments where life is the most productive, the most used, and the most vulnerable to disruption from human activities. This edge is a transition zone between the land and sea. It is also situated in a transition zone between colder subarctic waters of the Gulf of Alaska and subtropical waters to the south off California.

The complex mix of ocean currents and other phenomena in the territorial sea is part of what scientists refer to as "boundary conditions." These conditions result from eastward-flowing ocean currents encountering the landmass of North America. Ocean currents are then forced to flow north or south, parallel to the coastline, over the relatively shallow waters of the continental margin where local topography such as capes and submerged banks, cause local complexities in the great moving water mass. These local, more detailed oceanographic conditions along the Oregon coast are not fully understood. In fact, with the advent of broad scale satellite-derived imagery of surface currents and the ability of extremely powerful computers to synthesize and visualize vast quantities of ocean data, scientists are just beginning to realize how little is known.

The broad outlines of ocean dynamics off Oregon, however, are known. Generally, the movement of ocean water over Oregon's continental margin is the broad, slow, southward flow of the California Current. This current is 500 to 1,000 miles wide and flows 2.5 to 5 miles per day, although strong northwest winds can reinforce the flow and double the speed. A narrow, relatively fast undercurrent, the Davidson Current, flows northward below 600 feet. In winter, southwesterly storms can reinforce the Davidson Current so that it flows 6 to 12 miles per day northward at all depths across the continental margin and pushes the California Current farther offshore.

Two other phenomena greatly affect ocean waters off Oregon. One is the freshwater discharge of the Columbia River, which pours vast amounts of fresh water onto the more dense, salty ocean water and creates a surface lens of lower salinity water traceable as a plume spreading west and south from the river's mouth as far south as Cape Mendocino. The river's water carries dissolved minerals and other nutrients from the watershed and acts as fertilizer at a time when daylight hours are greatest and ocean productivity highest. The boundary between the Columbia River Plume and surrounding ocean generates productive conditions that attract many species of fish, seabirds, and marine mammals.

The other major phenomenon is known as "upwelling." During the summer, when strong northwest winds blow, surface waters near the coast are actually driven west, away from shore. This offshore movement causes deep, cold, nutrient-rich waters to rise to the surface. Although the most active upwelling is restricted to a narrow band approximately 6 to 15 miles from shore, the upwelling has a great influence over currents across the entire continental shelf, including those within Oregon's territorial sea. Upwelling tends to be strongest south of Cape Blanco.

There are several aspects of ocean circulation and transport conditions near shore that are not well understood. One is the exchange of near coastal ocean waters with estuaries and how estuaries contribute to the productivity of ocean habitats, including rocky shores. Another is how local topographic features, such as Cape Blanco or Heceta Bank, affect ocean flow and subsequent movement of pollutants or dispersal of eggs and larvae of marine creatures.

The complex, dynamic marine environment that flows past Oregon's coast and supports the resources and uses of Oregon's rocky shores is understood only in the broadest terms. Extensive additional research is needed to better understand this environment and provide appropriate management of rocky-shore resources.

b. Geology

Oregon's rocky shores are artifacts of dynamic geologic processes; for thousands of years the Pacific Ocean has worked against the rocks of the land, exploiting variations of hardness and orientation in the rocks, seeking out the zones of weakness caused by fractures and faults, eroding deeper into the coastal mountains. In some places the ocean has eroded entirely around a particularly resistant rock formation, leaving it exposed on all sides to the waves, vulnerable to the inevitable reduction to rubble.

On the north coast, the steep cliffs of Cape Lookout, Yaquina Head, Seal Rocks and other headlands are composed mostly of dense basalt, a volcanic rock resistant to the relentless energy of the ocean. Likewise, the offshore rocks of Haystack Rock (both at Cannon Beach and Pacific City), Gull Rock at Arch Cape, and Otter Rock are remnants of basalt headlands that long ago succumbed to the sea.

South of Coos Bay, the coastal geology changes: the complex of cliffs, reefs, and rocks of Cape Arago are tilted layers of sedimentary rocks, once formed on the floor of the continental shelf, now uplifted and tilted at a resistant angle to the sea. South of the Coquille River headlands and rocks are primarily remnants of truly ancient metamorphic rocks, which have anchored this region against the sea for more than 200 million years. The resistance of this entire region is revealed in Oregon's coastal map profile, which shows a seaward bulge along the south coast culminating in the tip of Cape Blanco, Oregon's westernmost point.

Other geologic events have punctuated this endless erosive process and created additional opportunities for the sea; the rise of sea level after Earth's most recent ice age accelerated erosion against the land and drowned remnant rocks and islands before they could be completely

worn away; repeated episodes of gradual uplift and sudden down-drop of Oregon's coastline have varied the rate of erosion and submergence of coastal rocks. Rogue, Orford, and Blanco reefs are the largest of these drowned remnant rocky landscapes covering thousands of acres with only the tips of rocky spires now visible above water.

Because of this variety of geologic origins and processes, Oregon's rocky shores are mixtures of kinds, types and conditions. While there are some similarities among sites, each is unique. Many sites have a mixture of cliff face, rocky wave-cut platform and submerged and exposed rocks in or just beyond the surf. In some cases, a good low tide will enable foot access to rocks which are otherwise islands at high tide. In other cases, reefs, rocks, and islands are well beyond the surf and remain accessible only by boat or aircraft.

c. Marine Biology

Oregon's rocky shores provide many distinct habitats for plants and animals. These habitat opportunities arise from various factors such as substrate (the kind and shape of rock to which they are attached), exposure to wave energy and flowing ocean currents, height above or below various stages of the tide, freshwater inflow, proximity to an estuary, sunlight, and others. Once certain plants or animals become established, such as kelp or mussels, additional habitat opportunities are created and add to the complexity and productivity of marine life. The upper limit of distribution of these organisms is determined by physical factors such as temperature and duration of exposure to air, while lower limits are commonly determined by biological factors such as predation or competition for food, or overgrowth.

Some plants and animals are uniquely adapted to both sea and land as they are exposed to the air when sea level recedes at low tide; others live completely submerged, adapted to living at certain depths below the sea surface. Seabirds and marine mammals take advantage of rocky shores, attracted by isolated nesting or pupping sites and food in the surrounding waters. No community of plants or animals lives in isolation; all are interrelated in ways not yet fully understood.

Plants and animals that are covered by the ocean's waters for at least part of the tidal cycle and exposed to air during other times are referred to as "intertidal" and live on "submersible" land. Those plants and animals covered by ocean water during all stages of the tide are "subtidal" and live on (or above) "submerged" land.

Areas uncovered by the falling tide reveal plants and animals with remarkable adaptations and abilities to stay put in the pounding surf. Some plants and animals have adapted to various lengths of exposure to air; some can thrive in saltwater spray and splash a dozen or more feet above the low water line. Distinctive communities of plants and animals live in zones at different levels in relation to water depth. Mussels, barnacles, and limpets, all hard-shelled and capable of closing tightly, can survive relatively long periods of time out of the water in the high-tide zone. More delicate organisms --such as anemones; nudibranchs; sponges; and red, green, or brown algae-- cannot withstand drying or pounding and thus spend little or no time out of the water in the lower tide zone. Some creatures, such as seastars, range about the bottom in search of prey, but limit their vertical forays to avoid drying out.

Below the lowest of low tides the water provides a continuous but energetic environment. This subtidal zone, like the intertidal, has vertical differences in habitat and communities as it grades downward away from surface-wave energy toward the limits of light penetration. This zone extends down to a depth of about 150 meters on some submerged reefs in the territorial sea. One marine plant, the bull kelp, grows across much of this subtidal zone out to a depth of sixty to eighty feet, with its holdfast anchored to the rocky bottom and its long stalk extending upward to the fronds floating at the sunlit surface.

Rock cliffs on coastal headlands and offshore rocks and islands provide a variety of habitat possibilities for seabirds and marine mammals. Oregon's coast is rich in these rocky habitats, and thirteen species of seabirds take advantage of the vertical or isolated nature of these features to nest here. Some, such as the common murre, lay eggs on bare rock, while others, such as the storm petrel, burrow deep into the soil to escape predators. In addition, the lower ledges of many rocks and islands provide resting or pupping sites for marine mammals. A few sites have both significant bird and mammal populations. For both birds and mammals, these rocks and islands offer some measure of isolation and protection from humans and are launch sites for foraging in the surrounding ocean.

d. People and the Rocky Shores

Rocky shores have attracted people for a variety of reasons since the Oregon country was first reached by Indian people thousands of years ago. Excavation and analysis of camp and village sites commonly show ages of 6,000 to 7,000 years ago; some experts believe Indian people came to the Oregon coast 15,000 years ago. These original Oregonians found that rocky shores, like the mudflats of estuaries, were easily reached sites where food could be predictably and readily be gathered. The jumble of rocks washed by the surf provided a rich source of fish that could be speared or trapped among the rocks. Mounds of debris from hundreds or thousands of years of food gathering, called middens, provide a glimpse of the rich source of food provided by the ocean shore; broken and burnt shells of clams, crabs, chitons, limpets, mussels and other invertebrates, bones of ling cod, surf perch, sculpins and other fish, bones from sea lions, seals, and sea birds.

In contemporary times, rocky shores continue to be very attractive to people but for different reasons: tidepools provide a window into the sea for a glimpse of exotic marine life; submerged reefs attract divers and fishermen for recreation and food gathering; offshore rocks are picturesque silhouettes in the sunset and points of interest for aircraft pilots who fly along the coast.

Oregon's rocky shores are quite accessible, at least visually, along the entire coast and many areas may be easily reached by car and then on foot, because US 101, the Oregon Coast Highway, parallels the shore for much of its length. Other sites, especially offshore rocks and reefs and outer cliffs of headlands, can be reached by boat from coastal ports and, of course, by aircraft. Oregon's State Parks provide public access to most of the major rocky intertidal areas; visitor numbers in coastal parks fluctuate with the national economy and fuel prices but have

generally increased in recent years. Schools use intertidal areas as outdoor laboratories and groups of several hundred students during a single low tide cycle are common at some sites. An increasing number of ethnic groups find traditional foods in rocky shore plants and animals, particularly on the north coast within a day's drive of the Willamette Valley.

Uses of Oregon's rocky shore areas are heavily influenced by population growth well beyond coastal communities; it is estimated that over one million people who live in the Willamette Valley from Portland to Eugene are within a ninety-minute drive of the coast. Out-of-state visitors also have easy access to the coast and can readily combine visits to coastal rocky shore areas with trips to Cascade Mountain or Columbia Gorge sites. Sites between Yaquina Head near Newport and Ecola State Park near Cannon Beach are especially accessible from the state's major population centers. For instance, the rocks at Three Arch Rocks National Wildlife Refuge near Tillamook are a popular destination for fishermen, divers, and boaters. In this respect Oregon's rocky shores are part of the urban recreational landscape.

Studies at Yaquina Head, Haystack Rock, Cape Arago, and other sites reveal that significant damage is occurring in some rocky intertidal sites simply from human foot traffic. A study at Three Arch Rocks and evidence from other sites shows that the habitat values of some offshore rocks are being adversely affected by disturbance from boat and aircraft traffic. These and other human impacts are some of the issues Oregon seeks to address through this Territorial Sea Plan.

2. An Ecosystem Approach to Management

Oregon's Rocky Shores Strategy is distinguished by its emphasis on managing and protecting marine ecosystems. This approach is different from past management programs that have been oriented toward particular sites, certain resources, or a limited set of uses based on a case-by-case basis. Ecosystem management, on the other hand, attempts to work within an understanding of the complex and interrelated natural environment, how resources and areas change over time, and how certain uses of sites or resources may effect others at a distance or over time.

a. Introduction

The Rocky Shores Management Goal of this Territorial Sea Plan,

"To protect the ecological values and coastal biodiversity within and among Oregon's rocky shores while allowing appropriate use,"

is, in effect, an ecosystem management goal. For Oregon to successfully meet this goal, resource managers and the public must understand and apply the principles of ecosystem management. The purpose of this section is to explain some basic concepts of "ecosystem management" in the context of the Rocky Shores Strategy.

b. What Ecosystem Management Seeks to Do

Ecosystem management is the application of land and water management practices that support the goal of maintaining long-term ecosystem viability and sustainability. Conservation of biodiversity is central to the notion of sustaining ecosystems.

Ecosystem management relies on stewardship of ecosystem components, their processes and interactions, and their intrinsic values. This stewardship is often difficult to translate into practical on-the-ground management actions in the traditional sense. Like the ecosystems they attempt to conserve, ecosystem-management programs can be complex, variable, and interconnected.

Ecosystem management entails long-term goals that provide a vision for the landscape and its habitats. Achieving these ecosystem goals will require an understanding of the underlying structure, composition, and functions of ecosystems, as well as how they develop over time. This will require collecting new information and rethinking traditional ways of analyzing and presenting scientific data; a detailed understanding will require decades of work. However, there are steps that Oregon can take, in fact is taking, to begin the transition to an ecosystem management approach for its rocky-shore habitats. In the coming years Oregon can then work to refine and adapt its management in response to improved information and to new management needs.

c. Toward a Program of Ecosystem Management

Oregon's Rocky Shore goal "to protect ecological values and coastal biodiversity within and among Oregon's rocky shore areas while allowing appropriate use" provides the basis for all other management actions and creates the long-term ideal toward which the state will work. This clear expression of a desired future condition of the landscape and associated ecosystems is a prerequisite for building a management program. Five basic elements should be incorporated into Rocky Shores planning and management programs as initial steps toward meeting this overall goal. These five elements are:

1. Represent all native ecosystem types and stages across their natural range of variation.
2. Maintain viable populations of all native species in natural patterns of abundance and distribution.
3. Maintain ecological and evolutionary processes, such as disturbance regimes and biotic interactions.
4. Respond to short-term and long-term environmental change and maintain the evolutionary potential of lineages.
5. Accommodate human use and interaction with the environment.

Each of these elements, discussed below, has implications for studying, understanding, and managing Oregon's rocky shores.

d. Elements of Ecosystem Management

1.) Represent Ecosystem Types

Management programs must conserve ecosystems along their full range of variation instead of simply conserving the "best" examples of ecosystem types as in much contemporary land management. All native ecosystem types must be represented in the management program in order to maintain the full spectrum of biodiversity. However, incorporating these representative areas into a management program does not mean that they will automatically be off limits to outside uses; rather, a variety of management techniques tailored to the unique ecosystem type will be needed to maintain ecosystem functions and attributes.

Achieving this representation requires that all ecosystem types be defined and mapped. This, in turn, requires an inventory and mapping system that is consistent across a broad region and accounts for differences in the scale of resolution at which ecosystems can be considered. Oregon's entire rocky shoreline has been inventoried at a series of scales from large to small. This area-wide, multi-level approach provides an overarching framework for achieving this first step toward making sure that ecosystem types are represented. The Rocky Shores Classification System and the Rocky Shores Inventory provide Oregon with the ability to identify and represent all habitat types along the Oregon shoreline and territorial sea.

Ecosystems exist at many scales of reference. For example, an entire forest is a large complex ecosystem while a single decaying log within the forest harbors its own miniature ecosystem. The scale of reference selected for management influences how ecosystems are represented in management programs. Thus, even though site inventories can identify many representative samples of ecosystem types, these samples may not constitute the ecosystem itself. Rather, they are symbols of the represented ecosystem types.

As the natural-resource information base is increased and refined, so too will be the understanding of ecosystem representation and the need to adjust management programs to more nearly fit management needs.

2.) Maintain Species Populations

Maintaining healthy populations of various species is central to the conserving of biodiversity. Simply managing a series of areas to represent ecosystems will not necessarily ensure that all species will survive and be successful in those areas. A second objective of maintaining viable species populations must complement the first objective of including representative ecosystem types.

The job of maintaining healthy, viable populations is complex and uncertain. There are thousands of species to consider in Oregon's coastal area. In order to work with an optimal array of information, the state should initially direct management programs toward the most vulnerable species. Vulnerable species include those subject to human-impact pressure, species with small

populations or patchy distribution, species with low reproductive rates or poor dispersal mechanisms, and threatened or endangered species.

The rocky shores inventory provides a means of systematically identifying the key habitat locations and requirements of species that are vulnerable to effects of human activity. This mapping in relation to human activity provides an additional consideration for defining and addressing vulnerability. For instance, seabirds are particularly vulnerable because they nest in dense colonies on individual rocks. Similarly, marine mammals concentrate in large numbers on convenient rocks or beaches during pupping, rearing, and migration. In both instances, a single catastrophic event, such as an oil spill or chronic disturbances from boat or aircraft traffic, can effect large numbers of animals during a critical part of their reproductive cycle.

3.) Maintain Ecological Processes

Ecosystem management must also consider ecological processes that have resulted, over time, from the interactions of the various species of plants and animals and their habitat conditions. This process component has several complex, interrelated aspects. For rocky intertidal sites, for instance, these ecosystem processes include:

- natural disturbance and recovery
- invertebrate and algal dispersal and recruitment
- space competition and utilization
- predator-prey interactions
- physiological and other adaptations

All of these processes have implications for site management. Two of these--- natural (vs human) disturbance and predator-prey interactions---are discussed below.

Natural disturbance and recovery is an important process shaping most ecosystems. Evidence of this continual process is the "patchiness" of many ecosystems from the forest to the shore. Nowhere is this dynamic process more evident than in rocky intertidal areas where crashing waves, coupled with scouring sand and surging water, remove or destroy organisms and alter sections of established communities and allow new organisms to take their place. Once an area is disturbed--mussels torn away, seaweed ripped loose, etc.--the recovery process can take several different pathways depending on the nature and composition of the original community and the level of disturbance. Each patch is a community of organisms at a distinct stage of development. Together, these patches form a rich mosaic of species and related communities, one of the reasons that rocky intertidal environments support such a high species diversity.

Ecosystem management must account for the effects of time and the frequency of natural disturbances over time at a particular location. Some disturbances happen hourly or daily or

with the lunar cycle. Others are less predictable and may happen every decade or only once in a thousand years. For example, small-scale disturbances of rocky intertidal areas occur very frequently, literally with each crashing or surging wave. On the other end of the time scale are large-scale disturbances that are less frequent and somewhat less visibly dramatic. An El Nino climatic event, for instance, alters the baseline oceanographic conditions along the entire Pacific Coast; the average water level of the ocean rises and temperatures increase. To humans these changes are slight but to certain creatures they are very significant and can result in major changes in the ecosystem dynamics of vulnerable areas. Even a hard winter freeze during a low-tide cycle can kill plants and animals in the intertidal zone, thus disturbing--or stressing--the ecosystem and creating conditions that allow destruction and recovery or recolonization. Management must include large enough habitat units to ensure that disturbance regimes and recovery processes are represented.

Human disturbance patterns often differ significantly from natural disturbance and may, by their very nature, foreclose or prevent recovery. For example, heavy wave action and human trampling both can remove mussels and result in a bare patch that exposes the underlying rock and opens the area to recolonization and recovery. But while recovery from wave damage begins immediately as new algae and tiny invertebrates settle, recovery from human trampling may not occur because the disturbance continues many times a day over many successive days. Similarly, a predator or other intrusion into a seabird colony may occur infrequently while boat and aircraft disturbance can happen repeatedly in a day and then over many days, especially during summer.

Natural recovery of sites takes years even for natural disturbances and is compounded dramatically by human disturbance. An intertidal mussel bed takes an average of eight years to allow for a slow series of recovery stages, from new algae and tiny invertebrates to a full mussel cover, to be complete. A bird colony may take more than a dozen years to even reveal the effects of reproductive failures due to chronic disturbance; recovery time is unknown. Most human impacts occur during spring and summer just when the invertebrate larvae are attempting to become established on intertidal rocks and birds or mammals are in their single reproductive season. Continued human disturbance means that, at a minimum, the entire year of recovery is lost or, more likely, that recovery never occurs.

Because predator-prey interactions also have a profound influence on biodiversity, management of "keystone species" can have significant effect on the ecosystem. For instance, the ochre sea star (*Pisaster ochraceus*) is the principal predator on mussels which are a "competitive dominant" species that will fill nearly all space within the lower to middle tide range unless physically disturbed or removed. The sea star seeks and devours mussels as prey, thus providing a check on the mussel population and opening up patches in the mussel beds. A variety of organisms fill the available space, thus increasing diversity of the shore. The ochre star is a keystone species because of its key role in controlling the community of organisms and, in this case, contributing to high diversity. If management were to allow excessive collection of ochre stars, mussels might have little competition from other species.

4.) Respond to Change

Natural-resource management models have traditionally assumed that systems should be preserved as they are found, in a kind of steady state or static condition. However, change is being increasingly understood as an inherent and important part of ecosystems. Ecosystem management must incorporate recognition of and responsiveness to change by conserving large enough blocks of habitat to ensure a replacement source of organisms if any particular area is wiped out. In addition, linkages between habitat blocks must be maintained to provide pathways for organism movement and possible slow migration of communities in response to long-term conditions such as climatic change. Maintaining ecosystems in large connected blocks is important not only for natural change but also for recovery from a catastrophic human-caused event such as an oil spill.

5.) Accommodate Human Use

Ecosystem management recognizes that humans and the environment cannot be separated. Humans have always interacted with the environment and always will. Ecosystem-management programs must anticipate and make provisions for that interaction by modifying or directing the use where necessary to reduce adverse affects on the entire ecosystem, humans included, and to achieve ecosystem viability and sustainability.

e. Using Ecosystem Management

This plan contains no direct prescriptions for applying the five elements to the management of Oregon's rocky shores. Rather, they are woven into the fabric of the entire rocky shores strategy. Consequently, they will be applied at the local level in actions taken by agencies and individuals. To use these elements in the rocky shores management program, Oregon will need to:

- 1.) Complete and refine the coastwide rocky shores inventory at a level of detail that will allow representative ecosystem types to be identified at both small and large scales so that management actions at the site level account for the various ecosystem types. The state will need to work with California, Washington, British Columbia, and Alaska to develop a larger regional ecosystem view so that Oregon's management program can successfully address representative ecosystem types throughout the Northern California Current Ecoregion.
- 2.) Inventory and monitor populations of organisms to account for variations in population levels and shield them from the adverse effects of human disturbance. The state should also work with adjacent states and federal agencies to develop a regional view of species populations to better understand the significance of Oregon's marine habitats to overall population viability.
- 3.) Increase understanding of rocky shore ecosystem processes and interactions through scientific study, particularly those of rocky reef and shore line subtidal areas. The Cooperative Reef Ecosystem Study, coordinated by the Oregon Department of Fish and Wildlife, provides a comprehensive, interagency research framework for developing and carrying out these studies.
- 4.) Incorporate monitoring measures and activities to make sure that the management measures for sites and activities have the intended effect and that the health of the habitat and ecosystem

are maintained. Monitoring activities can take many forms depending on level of information, cost, and frequency of need.

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PART THREE:

Rocky Shores Management Strategy

F. SITE ANALYSIS & CATEGORIES

1. Site Designation Process

a. Inventory and Evaluation

The Oregon Department of Fish and Wildlife Marine Region, in cooperation with the Oregon Parks and Recreation Department and U.S. Fish and Wildlife Service, conducted a coastwide survey of resources and areas of Oregon's rocky shores. The inventory survey included field site visits to all sites, review of existing published studies and reports, aerial photographic surveys of all sites, and interviews with professional staff knowledgeable about sites and resources.

Data were collected on intertidal invertebrate and algal species composition, seabirds or marine mammals, the presence of Threatened or Endangered species, trail access, geologic characteristics, upland facilities, ownership or management of adjacent upland, uses of the area, and other site characteristics. Inventory data have been recorded in digital form and displayed on maps of each cell derived from base maps digitized by the State Geographic Information Service Center from U.S. Geological Survey Quad sheets. The rocky shores inventory provides information for evaluating the management needs and plan provisions for each shoreline site. This inventory, which will be updated and refined, is available from the Oregon Department of Fish and Wildlife, Marine Region.

The resources and uses of each rocky shoreline site were evaluated against a set of criteria to determine appropriate management recommendations for each site. This is the first time such a coastwide site evaluation has been conducted and allowed the Ocean Policy Council to determine appropriate management designation, areas needing further study, and other needed management measures such as regulations, seasonal closures, an educational or informational programs

Sites were evaluated with several considerations that are, paradoxically, both simple and complex. Simply put, the evaluation considered the environmental conditions and natural resources of a site and compared them against patterns and kinds of human use to yield an estimate of "areas of concern." However, these considerations were also quite complex.

Evaluation Considerations

1: Site Type

- a) Shoreline or Offshore type

- b) Current ODFW management designation

2: Environmental Considerations

- a) Intertidal habitat
 - X Habitat diversity
 - X Habitat size
- b) Animal concentrations
 - X Seabird colony size
 - X Pinniped haulout size
- c) Resource conflict concerns
 - X Intertidal overuse concerns
 - X Bird and mammal conflict concerns
 - X Presence of threatened or endangered species

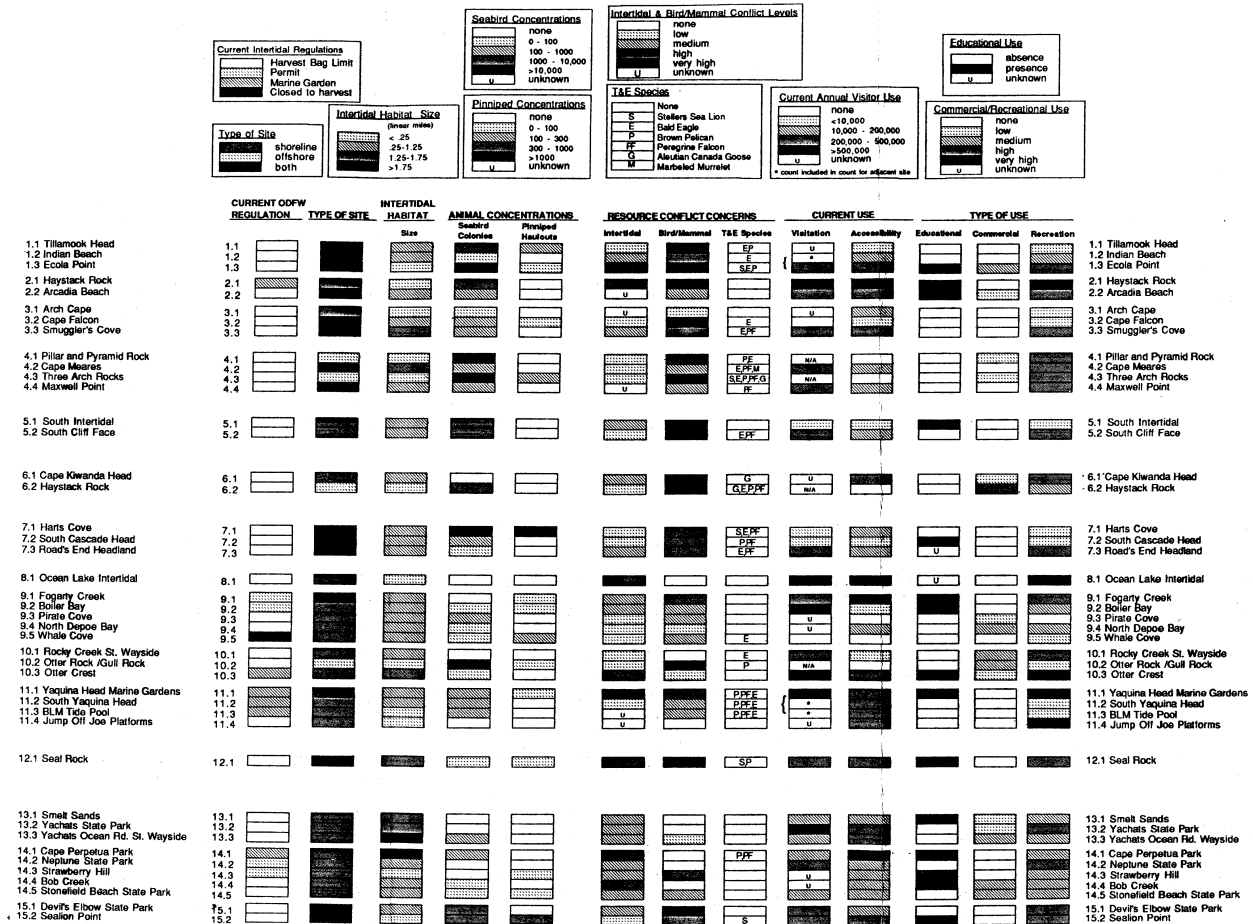
3: Site Use

- a) Current Use
 - X Visitation
 - X Accessibility
- b) Types of Use
 - X Educational/interpretive use (shoreline)
 - X Commercial use (collecting, harvesting, etc)
 - X Recreational use (collecting, sightseeing, etc)
- c) Source of Impact Concerns
 - X Intertidal overuse concerns
 - X Foot traffic
 - X Boating activity
 - X Aircraft activity
 - X Noise
 - X Water pollution

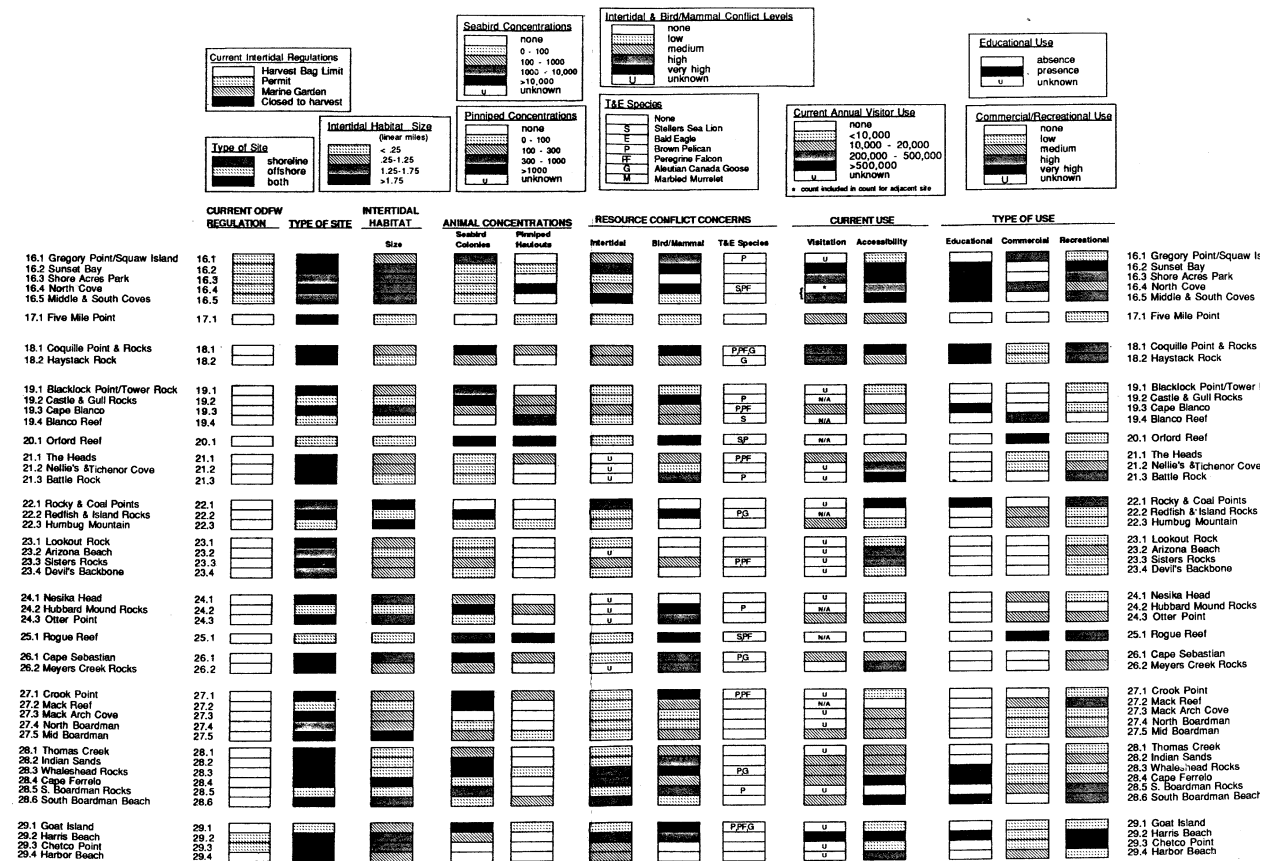
b. Graphic Summary: Inventory Information and Site Evaluation

Extensive, detailed site descriptions and other information in the rocky-shores resource inventory provide the basis for assessing the management situation of Oregon's rocky shores. Key information from the detailed site descriptions was summarized onto a single map (Figures 7a, 7b) for a coastwide comparison among sites. This summary map is a distillation of complex information into several primary considerations to support the site evaluation criteria. Used together, the detailed site descriptions, summary map, public input, and professional judgment of coastal resource experts provided the means to evaluate management needs of the rocky shores sites and designate specific areas into management categories. The summary maps are an important but not the sole source of information for site evaluation.

NOTE: The relative rankings expressed for each summarized element are comparable among sites along the coast (e.g. Animal Concentrations may be compared among all sites coastwide). However, these rankings are not comparable between different elements (e.g. "high" Animal Concentrations cannot be compared with "high" Current Use).



Summary: Resource Information for North Coast Rocky-Shore Sites



Summary: Resource Information for South Coast Rocky-Shore Sites

2. Management Categories

NOTE: Nothing in the descriptions of attributes, intended uses, or management characteristics of the following management categories is intended to negate or override any agreement between the State of Oregon and any coastal Indian tribe for the use of coastal sites for hunting, fishing, and gathering. (see also Rocky Shores Policy #5, page 69.

a. Marine Garden

Marine Gardens are primarily intertidal areas intended to be focal points for visitors seeking to enjoy or learn about intertidal resources. These areas will be specially promoted and managed for visitor use with special emphasis on marine education programs.

- 1.) **Justification:** Marine Garden designation is needed to provide the public, especially coastal travelers, sightseers, and school groups, with opportunities to enjoy and learn about marine ecosystems while protecting the marine life of popular, accessible sites.
- 2.) **Attributes:** Marine Garden designation will be applied to rocky intertidal areas and adjacent areas that are readily accessible to the public and exemplify the diverse or unique intertidal marine life of the Oregon coast.
- 3.) **Intended Uses:** The primary use of a Marine Garden will be as a quality marine intertidal recreational and interpretive experience for organized school groups, tours, and the general public while maintaining overall ecosystem health. These intertidal showcases are intended to be focal points for travel and recreation promotions by the state and local communities.
- 4.) **Management Characteristics:** Public access encouraged but managed where necessary; on-site educational and interpretive programs particularly during late spring and summer; close monitoring of use and effects, "rest and recovery" of areas within Gardens; public facilities and amenities provided; harvesting or collecting of marine life prohibited (except as may be provided for in the NOTE at the top of this page); close on-site coordination between relevant agencies; use of locally oriented volunteer groups and docents in visitor programs.

b. Habitat Refuge

Habitat Refuge are areas that are needed to maintain the health of the rocky shore ecosystem. While protection of habitat values of individual sites is important, protection of the aggregate of all sites is essential.

- 1.) **Justification:** Habitat Refuges are needed to ensure that various representative areas of marine life in Oregon's rocky shores will be managed to protect natural habitat values and to maintain viable populations of marine plants and animals, a condition essential to achieving the rocky shore management goal.

2.) Attributes: Habitat Refuges will be designated based on:

X the ecological significance of the area to maintaining ecosystem structure, biological productivity and/or diversity, and representative species assemblages;

X representation of natural ecosystem types along the range of variation;

X the importance of the area to life history stages of marine organisms;

X the ecological contribution of the area to maintaining populations of sensitive, threatened, or endangered species;

X the need to protect areas and biological communities from human disturbance.

3.) Intended Uses: The primary use of areas designated as Habitat Refuge will be as a natural habitat area undisturbed by or protected from human activities or presence during some or all of the year. Designation as a Habitat Refuge is not intended to exclude all human uses; those compatible with refuge status, such as fishing, sightseeing, research, or recreating, will be allowed at appropriate levels and times. Likewise, commercial harvest activities that are compatible with the specific refuge situation may be continued during some or all of the year.

4.) Management Characteristics: Habitat Refuges will be managed based on the resources and situation of each area, using such methods as seasonal or permanent area closures; maintaining poor or very limited physical access, especially from land; restricting certain uses where necessary to protect ecosystem functions and values; and providing public information or interpretive materials where appropriate. Habitat Refuge designation may also be applied to buffer areas around specific habitat sites.

c. Research Reserve

Research Reserves are needed to identify and manage areas suitable or being used for scientific study or research including baseline study, monitoring, or applied research. However, designation of Research Reserves is not intended to limit research or study exclusively to these areas.

1.) Justification: Research Reserves are needed to provide sites where information may be reliably obtained over time on natural variations and changes in the marine environment. This baseline and monitoring information is essential to on-going management of all marine resources. Scientific research on marine resources often requires long time periods. Designation of Research Reserves will be a means of ensuring that sites will not be jeopardized through the inadvertent action of an agency and that researchers may rely on relatively undisturbed conditions over time.

2.) Attributes: Research Reserves could embody a wide variety of characteristics depending upon the research topic. Research Reserves designation will be based on consideration of

X access by the general public; areas should not be readily accessible to the public or should be able to be closed where appropriate by site managers;

X access by researchers; in some cases, proximity to research institutions is needed to provide for efficient study; in other cases, remoteness and difficult access may be desirable.

X the presence of representative or typical assemblages of marine organisms; research should not be limited to the unique or exotic but should also include the typical;

X the presence of unique conditions or marine organisms; some sites may have special characteristics that make study of it and its marine life valuable to the managers and/or scientists;

X the suitability of an area to provide needed information; future decisions to designate a Research Reserve should be linked to the suitability of the area for the kind of research proposed.

3.) Intended Uses: Scientific research and study are intended to be the primary human use. Other compatible uses, such as fishing, recreational diving or recreational visitation, will be allowed unless detrimental to research in the area or otherwise prohibited.

4.) Management Characteristics: Management measures to protect integrity and continuity of research or studies will be based on situational needs and may include seasonal or permanent area closures, maintaining poor or limited physical access, prohibiting or restricting collecting or harvesting of invertebrates or algae except through permits, and providing public information or interpretive materials as appropriate.

d. Marine Shore

Marine Shores are areas of general biological, aesthetic, or geologic interest, open to the public for recreational, educational, or commercial use, including collecting or harvesting as allowed by general regulations. A Marine Shore designation is intended for all rocky shoreline sites not otherwise designated as Marine Garden, Habitat Refuge, Scientific Research Reserve, or listed as Not Yet Designated.

1.) Justification: Marine Shore designation is needed and appropriate for many rocky shore areas where other more restrictive or intensely managed categories are not appropriate or justified based on site access, area configuration, or natural resource characteristics.

2.) Attributes: Marine Shores, because of their general nature, will have no specific attributes. Rather, they will be areas of general public use with little or no on-site management and may encompass a mix of rocky types as well as sandy shores within an area. In some areas, rocks within the Oregon Islands National Wildlife Refuge may be included; federal regulations for these refuges will remain.

3.) Intended Uses: Public recreation and enjoyment, natural habitat, harvesting or collecting of

invertebrates and marine algae allowed by regulation, permit, or agreement.

- 4.) Management Characteristics:** Little or no on-site management except informational or interpretive signage; State Park or ODFW regulations for personal collecting of invertebrates or marine algae; US Fish and Wildlife Service regulations where applicable; special permits or agreements for educational, scientific, or other special collecting; sites may or may not have parking or improved access or visitor facilities; some Marine Shores areas may have additional site management concerns based on the presence of or proximity to habitat or other natural features where more restrictive management is applied.

d. Not Yet Designated

Some sites require further study and planning to affirmatively apply one or more of the four management designations, above. These sites will continue to be subject to applicable rules and regulations of state and federal agencies such as the ODFW, State Parks, the US Fish and Wildlife Service, etc. As additional site assessment and planning are completed, the Council will amend the Territorial Sea Plan to add new site designations pursuant to procedures in subsection C.2.a of this section.

e. Priority Rock and Reef Sites

Priority rock and reef sites are those offshore rocks, islands, or reefs determined to be most likely to need study and possible management action. Nine offshore rock and reef sites, grouped into seven habitat areas, are identified in this plan as the highest priority sites for future study and possible management action. These sites were identified after analyzing sites listed as "sensitive marine bird and mammal habitat" in the Oregon Ocean Resources Management Plan.

No management category is designated or management action prescribed for these priority sites except at Shell Island/Simpson Reef, part of a larger rocky-shore management area in the north cove of Cape Arago where information and analysis was sufficient to make overall resource management decisions.

3. Sites by Management Designations

Sites are described and mapped in subsection F.4., below). **Any shoreline site not listed here is to be managed as Marine Shore.** Offshore rocks will continue to be managed as National Wildlife Refuges.

1.) Marine Garden

- p.106 Haystack Rock (Cannon Beach)
- p.122 Otter Crest
- p.125 Yaquina Head
- p.130 part of Yachats State Park
- p.132 Cape Perpetua
- p.140 Sunset Bay
- p.145 South Cove, Cape Arago
- p.172 part of Harris Beach

2.) Habitat Refuge

- p.103 Tillamook Head
- p.110 Three Arch Rocks NWR
- p.112 Cape Lookout (south side)
- p.114 Cascade Head/Cliff Cr. Cove
- p.120 Whale Cove
- p.142 Simpson Reef/Shell Island
- p.147 Coquille Point & Rocks

- p.164 Crook Point/Mack Reef
- p.165 Hooskanaden Creek
- p.167 Cape Ferrelo

3.) Research Reserve

- p.116 Boiler Bay
- p.118 Pirate Cove
- p.135 Strawberry Hill
- p.139 Gregory Point/Squaw Island
- p.144 Middle Cove, Cape Arago
- p.150 Cape Blanco
- p.155 Humbug Mountain/Lookout Rock

4.) Marine Shore (NOT SHOWN ON MAPS)

- parts of Tillamook Head not in other category
- Silver Point to Cape Falcon
- Cape Mears/Maxwell Point
- Cape Lookout (north side)
- Cape Kiwanda
- parts of Cascade Head not in other categories
- Headland at Roads End
- Lincoln City to Fogarty Creek
- Depoe Bay
- parts of C. Foulweather not in other categories
- Yachats oceanfront (excl. Marine Garden area)
- Bob Creek to Heceta Head
- Yoakam Point
- Shore Acres
- tip of Cape Arago not in other categories

4.) Marine Shore (continued)

- base of cliff south of Cape Arago South Cove
- Five Mile Point
- The Heads (Port Orford)
- Nellies Cove/Tichenor Cove (Port Orford)
- Rocky and Coal points
- Arizona Beach to Sisters Rock
- Cape Sebastian
- Deer Point/Natural Bridges
- Thomas Creek/Indian Sands/Whaleshead
- Lone Ranch (south end)
- Parts of Harris Beach not in other categories
- Chetco Point
- Harbor oceanfront
- **any other rocky shoreline area not listed on this page is Marine Shore.**

5.) Not Yet Designated

- p.104 Ecola Point
- p.108 part of the tip of Cape Falcon
- p.128 Seal Rock
- p.134 Neptune State Park
- p.137 part of Heceta Head
- p.149 Blacklock Point
- p.158 Sisters Rk to Devil's Backbone
- p.160 Nesika Head to Otter Point

- p.168 south Sam Boardman State Park

6.) Priority Offshore Rocks/Reefs (for future study as necessary)

- p.104 Sea Lion Rock at Ecola Point
- p.123 Gull Rock near Otter Crest
- p.142 Shell Island/Simpson Reef
- p.152 Orford Reef
- p.154 Redfish Rocks/Island Rock
- p.162 Rogue Reef
- p.170 Twin Rocks/Goat Island

NOTE: except for those few rocks in non-refuge ownership, all rocks and islands remain in National Wildlife Refuge status subject to all applicable federal laws.



PART THREE:

Rocky Shores Management Strategy

G. SITE DESIGNATIONS

NOTE: All management designations applied to sites are mandatory. Sites shall be managed consistent with the management objectives and management prescriptions indicated on the following pages.

This section contains management summaries and maps for rocky-shoreline areas that have been designated as

- Marine Garden;
- Habitat Refuge;
- Research Reserve;

or are identified as

- Not Yet Designated;
- Priority Rock/Reef Site.

If an area is not listed or mapped in one of the above five categories, it is designated as Marine Shore.

These summaries are arranged in geographic order beginning at Tillamook Head on the north coast and ending with Harris Beach State Park on the south.

Refer to subsection F.2., above, for description of all management categories and subsection F.3, above, for a list of all area designations other than Marine Shore.)

MAP NOTE: Map boundaries of management areas are for planning purposes only. More accurate mapping and boundary delineation will be necessary to indicate precise boundaries for on-site management purposes. In addition, the seaward extent of boundaries is not meant to accurately portray any specific distance from shore or depth of water unless specified in the accompanying text.

Maps are simplified and do not show many on-shore features. The map data bases of all rocky shore areas, resources, uses, and adjacent landward features was derived from information provided by the state Parks and Recreation Department, Department of Fish and Wildlife, U.S. Fish and Wildlife Service, and Oregon GIS (Geographic Information System) Service Center in the Oregon Department of Energy.

Rocky Shore Management Areas

1. Area Name: Tillamook Head

Designation: *Habitat Refuge* (Map 1)

Area Included: 3.6 miles of cliffs, rocky intertidal, and nearshore rocks at tip of Tillamook Head.

Description

The area is one of the few inaccessible, undisturbed shorelines on the north coast and provides an excellent representation of several north coast ecosystem types. Marine bird and mammal usage is significant. The area has one of the larger Brandt's cormorant colonies in the state. There are large rocky intertidal bedrock and boulder habitats that have had very little human influence and can provide a baseline for documenting undisturbed habitat conditions. The adjacent upland has pristine coastal forest communities and is managed for protection of natural resource values.

Access: The site is virtually inaccessible to foot traffic.

Ownership: Submerged and intertidal lands: Division of State Lands; offshore rocks above Mean High Water (MHW): U.S. Fish and Wildlife Service; upland: Oregon Park and Recreation Department.

Key Resources: Nine seabird colony sites with over 1000 birds total (Brandt's cormorant; common murre; pigeon guillemot; western gull); use by bald eagle and peregrine falcon (threatened and endangered species); harbor seal haulouts and pupping area (approx. 150 animals); large (approx. 12 acres), nearly inaccessible rocky intertidal platform between Bird Point and Indian Point.

Use and Management

Current Use: None or extremely low because of inaccessibility.

Current Management: Oregon State Park management for public access and recreation to beach and ocean shore.

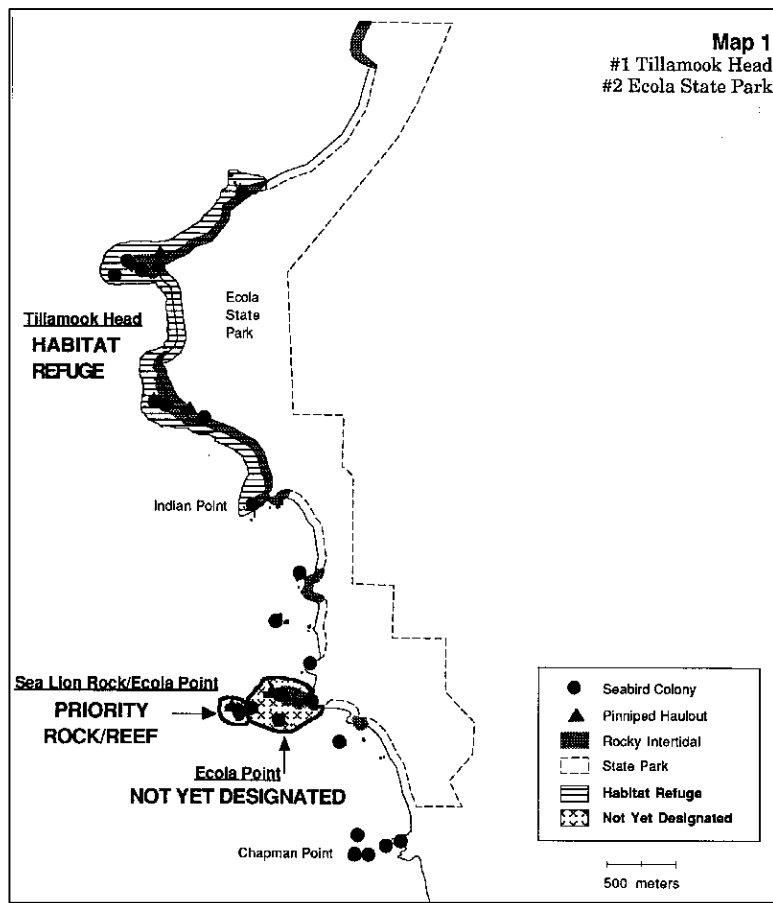
Impact Concerns: Boat and low flying aircraft disturbance to birds and mammals

Management Objective: Maintain current undisturbed nature of the area while allowing appropriate use of adjacent ocean waters.

Management Prescriptions: Continue existing management; in addition:

- discourage trail improvements and prohibit new trail access to shore sites in refuge area;
- prohibit commercial or recreational harvest of intertidal algae (seaweed) and invertebrates.

Informational Needs: Post informational signs that describe marine wildlife and disturbance concerns.



2. Area Name: Ecola Point/Sea Lion Rock

Designation: Not Yet Designated/Priority Rock (Map 1)

Area Included: 0.5 mile of cliff, rocky intertidal, and nearshore rocks south of Tillamook Head.

Description: This site is part of the rocky shores complex at Ecola State Park that includes cliffs, intertidal areas, associated rocks and submerged reefs, and offshore rocks. In addition to its rich biological resources, Ecola Point has exceptional scenic qualities that make it very attractive for day visitors. These biological and scenic values, coupled with its proximity to the Portland metropolitan area, result in high visitor usage (540,800 day visitors, 1991-92).

Access: The entire site is easily accessed by road into a large parking area. Access to the rocky shore areas is relatively easy on improved trails leading to the beach on the south side of Ecola Point.

Ownership: Submerged and submersible lands (intertidal area): Division of State Lands; rocks above Mean High Water: U.S. Fish and Wildlife Service; upland is all owned by Oregon State

Parks and Recreation Department.

Key Resources: Intertidal areas have typical assemblages of marine invertebrates including exceptionally large colonies of aggregating anemones. Sea Lion Rock, associated unnamed small rocks, and cliff face are breeding habitat for five species of seabirds including approximately 2,700 common murrelets. This site was formerly one of the three largest haulout sites on the north Oregon coast for Steller sea lions but has now been abandoned for unknown reasons. However, other threatened or endangered species use this site including bald eagles and brown pelicans.

Use and Management

Current Use: Heavy visitor use of the upland park area for picnicking and sightseeing. Some unknown percentage of users explore tidepool areas and beachcomb.

Current Management: Oregon State Park.

Impact Concerns: Trampling from people exploring the intertidal zone, climbing (illegally) on National Wildlife Refuge rocks, and noise from low flying aircraft.

Management Objectives: Maintain habitat values while accommodating high visitor use.

Management Prescription: None at present.

NOTE: Because the site contains a complex mixture of resources and high usage, this entire area needs more detailed study and assessment before designation into one or more rocky shore management categories.

NOTE: Sea Lion Rock is designated as a "priority rock" site for possible study and future management measures.

3. Area Name: Haystack Rock

Designation: *Marine Garden* (Map 2)

Area Included: 0.4 miles of intertidal habitat and offshore rocks at Cannon Beach.

Description

Haystack Rock is a large basalt monolith at on the sandy beach at the City of Cannon Beach. The rock itself is a breeding site for seabirds but it is the rocky intertidal area at the base of the rock that is of most management concern. Cannon Beach is a principal destination for coastal visitor from the Willamette Valley. The broad beach receives heavy recreational use, especially in late spring, summer, and fall. Heavy visitor use that seriously degraded the intertidal area prompted

formation of the Haystack Rock Awareness Program, a community-based organization that provides interpretive programs for visitors to try to reduce adverse impacts to intertidal resources. The area is designated a Marine Garden by the Oregon Department of Fish and Wildlife. No change in status is proposed.

Access: Multiple, open access from the beachfront in the City of Cannon Beach.

Ownership: Submerged and intertidal lands: Division of State Lands; offshore rocks above Mean High Water (MHW): U.S. Fish and Wildlife Service; dry sands beach is a state recreation area under jurisdiction of Oregon Park and Recreation Department; upland beyond the statutory line of vegetation is privately owned.

Key Resources: Very accessible intertidal habitat; 3 seabird colonies with over 2,000 birds total (second largest tufted puffin nesting colony in the state).

Uses and Management

Current Use: Tidepooling, sightseeing, and sport fishing from shore. Haystack Rock is an educational resource for school groups. The Haystack Rock Awareness Program provides interpretive and educational activities. The area is closed to the taking of any marine invertebrates (except single mussels may be taken for bait).

Current Management: The rock above MHW is managed by the USFWS as a National Wildlife Refuge and the beach and intertidal area are managed by the Oregon Parks and Recreation Department as part of the ocean shore (neither has active on-site management). Some law enforcement is provided by city police (certain violations).

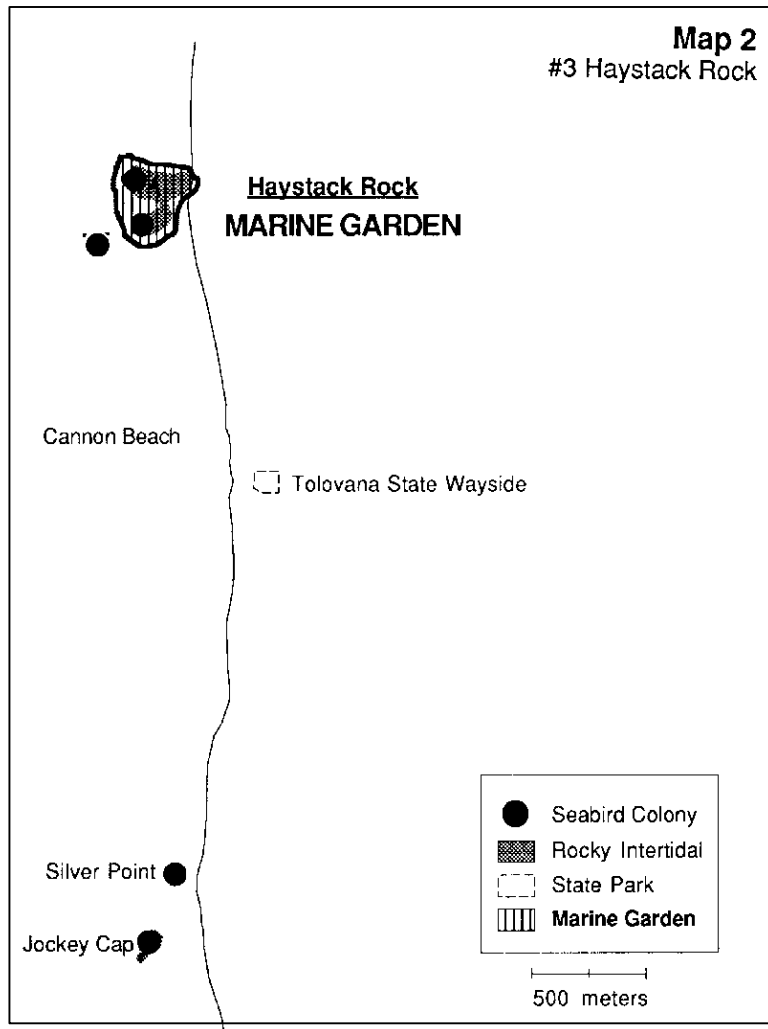
Impact Concerns: Overuse of intertidal areas and depletion of some species; disturbance to seabird colonies from people illegally climbing on the rock.

Management Objective: To enhance enjoyment and appreciation of intertidal resources while protecting these areas from effects of overuse.

Management Prescriptions: Continue use as a Marine Garden; in addition

- prohibit harvest of intertidal algae (seaweeds).

Educational Opportunities: Continue, support and expand Haystack Rock Awareness Program.



4. Area Name: Cape Falcon

Designation: Not Yet Designated (Map 3)

Area Included: 1.2 miles of cliff, associated rocks, and intertidal areas in two sections separated by Short Sand Beach in Smuggler's Cove at the tip of Cape Falcon.

Description

Cape Falcon is a rugged, densely-forested headland with steep cliffs up to 300 feet high of sedimentary rock on a resistant basalt base. The upland area is heavily used Oswald West State Park (366,000, 1991-92) but use is confined primarily to a forest campground and Short Sand Beach. Virtually all of the rocky headland at water level is inaccessible from land although some intertidal areas along the south side of the cove can be reached at low tide. The Oregon Coast Trail provides view access only to other cliff and rock areas on the north side of the Cove.

Access: Very limited or inaccessible.

Ownership: Submerged and intertidal lands: Division of State Lands; offshore rocks above Mean High Water (MHW): USFWS (National Wildlife Refuge); the beach and upland are owned by Oregon Park and Recreation Department as Oswald West State Park.

Key Resources: Limited intertidal habitat; 6 seabird colonies of about 1,000 birds total (Brandt's cormorant, pelagic cormorant, western gull, pigeon guillemot); harbor seals use rocks as haulout; Bald eagles live in the adjacent forest.

Uses and Management

Current Use: Very limited use of intertidal area except rock-fishing and some tidepooling, sightseeing. No access to associated offshore rocks. Most park use is confined to Short Sand Beach or Oregon Coast Trail on the clifftop.

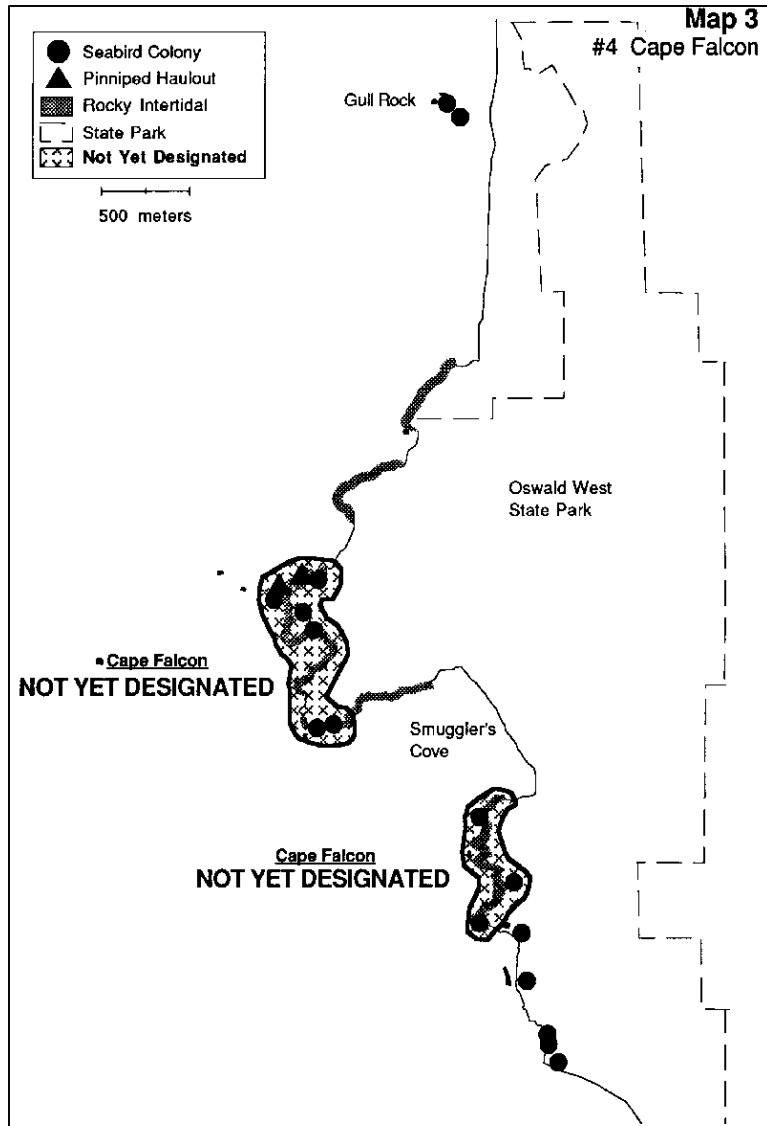
Current Management: No on-site management of rocky shores; upland area is managed by Oregon State Parks.

Impact Concerns: Limited concerns from aircraft overflight; access from a trail spur in the south section leading to seabird nesting site.

Management Objective: Maintain isolated habitat values of the area.

Management Prescriptions: None at present.

NOTE: This area needs more detailed study and assessment before designation into one or more rocky shores management categories.



Map 3
#4 Cape Falcon

5. Area Name: Three Arch Rocks

Designation: *Habitat Refuge (National Wildlife Refuge)* (Map 4)

Area Included: Three large rocks and six smaller ones totaling about 17 acres, 1/2 to 1 mile off Maxwell Point at Oceanside eight miles south of Tillamook Bay.

Description

Three Arch Rocks National Wildlife Refuge, established in 1907, is the oldest National Wildlife Refuge in the West. It has extremely valuable wildlife and habitat resources important to the northeastern Pacific region. This rock and reef complex is the center of very heavy recreational boating and aircraft activity especially during summer.

Access: The rocks are reached only by boat, chiefly from Tillamook Bay although some boats launch at Netarts Bay in good weather and a few small craft from the beach at Oceanside. The cliffs of the large rocks are inaccessible but several smaller rocks can be boarded from the water although it is illegal to do so.

Ownership: Submerged rocks and reefs: Division of State Lands; rocks above Mean High Water owned by U.S. Fish and Wildlife Service managed as a National Wildlife Refuge and Wilderness area; the water area around the rocks is subject to a 500-foot seasonal boating closure implemented by the State Marine Board.

Key Resources: Thirteen species of seabirds including 220,000 common murre, the largest colony south of Alaska, and the largest Tufted puffin colony on the Oregon coast. Four species of threatened or endangered birds frequently use the rocks and three species of marine mammals, including the threatened Steller sea lion use the rocks for haulout or pupping. Gray whales migrate close to these rocks.

Uses and Management

Current Use: High levels of boating activity around the rocks; recreational and charter fishing, SCUBA diving, sea kayaking, and occasional jet-skis. Frequent overflight of civilian and military fixed-wing aircraft and helicopters.

Current Management: The entire rock complex above Mean High Water is managed by the US Fish and Wildlife Service as a National Wildlife Refuge. The Oregon State Marine Board has enacted a 500-foot wide boating closure area around the main rocks from May 1 to September 1 to protect nesting and rearing of wildlife. Informational signs about the refuge and the boating closure are located off-site at the Garibaldi boat ramp on Tillamook Bay and at the Netarts Bay boat ramp.

Impact Concerns: Disturbance to seabirds from boats and low-flying aircraft.

Management Objective: Protect habitat refuge values of the complex while allowing compatible uses of adjacent ocean waters.

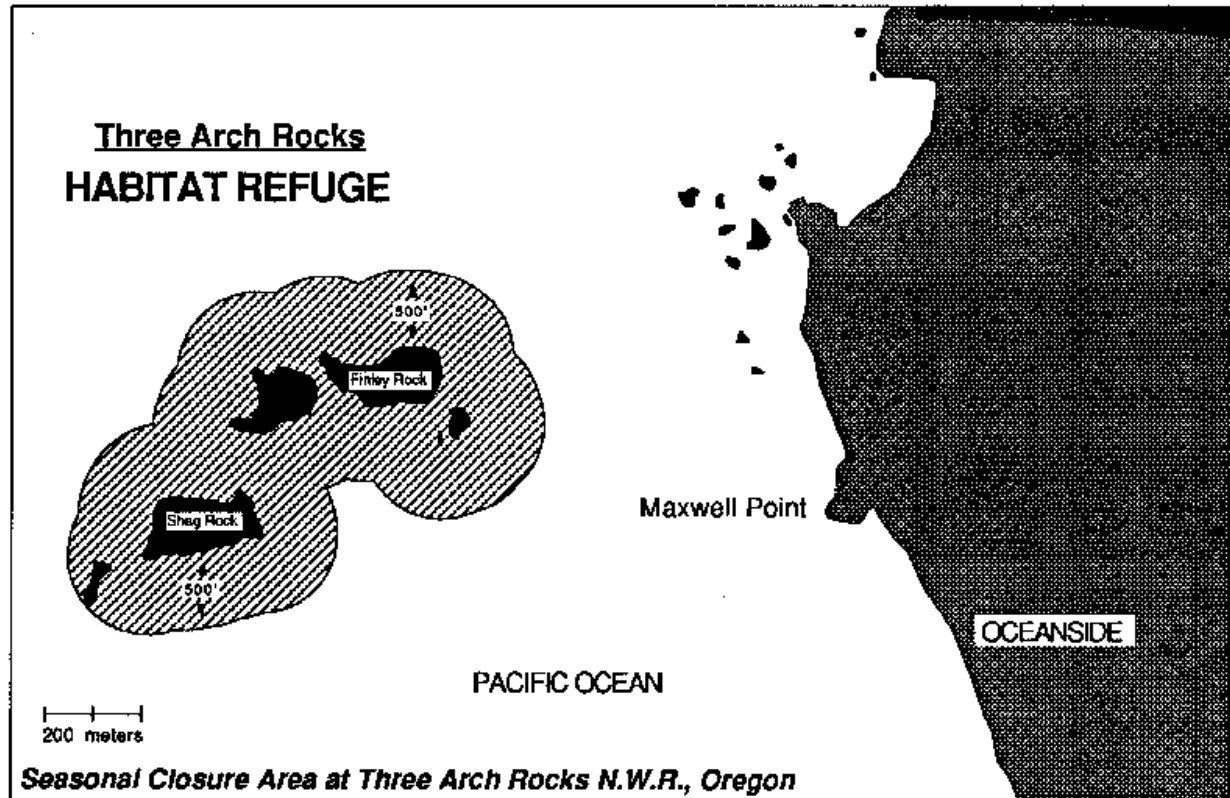
Management Prescriptions:

- prohibit boating activity within 500-feet of major rocks between May 1 to Sept. 1 and prohibit aircraft from flying below 2000 feet over the rocks (see Appendix I).
- conduct informational programs to inform boaters, divers, pilots, and others of wildlife values, seasonal boating-closure area, and minimum aircraft ceiling.
- monitor effectiveness of boating closure and informational efforts.

Informational Needs: Informational and interpretive materials and displays about Three Arch Rocks and its resources at

- Area boat ramps;
- Oceanside and Cape Lookout State Parks;
- local motels, restaurants, campgrounds, and RV parks;
- local and regional dive shops;
- local and regional Fixed Base Operators;
- other locations as appropriate.

Map 4
#5 Three Arch Rocks



6. Area Name: Cape Lookout (south side)

Designation: *Habitat Refuge* (Map 5)

Area Included: 2 miles of cliffs, rocky intertidal, and subtidal reef on the south side and tip of Cape Lookout.

Description

Cape Lookout projects nearly a mile and a half into the ocean and provides an excellent representation of several types of north-coast marine ecosystems including cliff nesting sites for marine birds, large rocky intertidal area at the base of the south face cliff, subtidal bull kelp (*Nereocystis*) beds on the south side, and climax coastal forest communities on the top and flanks of the cape. The westerly tip of the Cape is a popular gray whale-watching site during migration.

Access: Intertidal area: private access from Camp Clark (Boy Scout camp) to the south; public access via long, steep trail from Cape Lookout State Park. A trail traverses the entire length of the cape and in places is at the top of the south cliff face. There is no access down the face of the cliff.

Ownership: Submerged and intertidal lands: Division of State Lands; the beach and upland are owned by Oregon Park and Recreation Department as Cape Lookout State Park.

Key Resources: Two seabird colony sites on the south cliff face with over 10,000 birds total (Oregon's largest mainland common murre colony; double-crested, pelagic, and Brandt's cormorant; pigeon guillemot; western gull; tufted puffin; black oystercatcher); used by bald eagle and peregrine falcon (threatened or endangered species); productive and diverse rocky intertidal habitat; one of the only bull kelp (*Nereocystis*) beds on the north coast.

Uses and Management

Current Use: Trail hiking through the forest to the tip of the cape for whale watching and general scenic views is primary use of cape. Actual use of the rocky shore areas is low because few visitors hike to the intertidal area from the cape trail. Surfers, SCUBA divers and boats seeking protection from the wind use the ocean waters below the south cliff face. Camp Clark uses the rocky intertidal area for outdoor education.

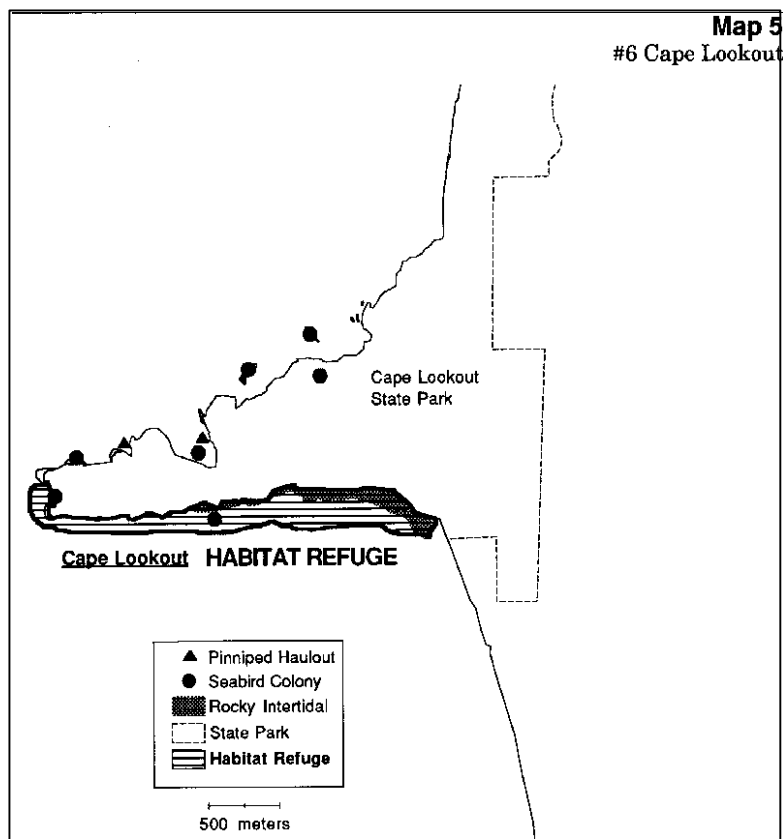
Current Management: The entire cape is managed by State Parks for general recreation and natural resource use.

Impact Concerns: Disturbance to seabirds from boats and low flying aircraft and from hikers climbing on the cliffs at the tip of the cape; potential overuse of rocky intertidal habitat if use significantly increases in the future.

Management Objective: Protect habitats and living resources of the shoreline and cliff on the south side of the cape while continuing traditional uses of the park and adjacent ocean waters.

Management Prescriptions: Continue existing management; in addition:

- discourage significant improvements to south side beach trail and build no new trails to intertidal area (maintenance of existing trails to continue);
- prohibit use of informal trail down the cliff at the west end of cape;
- allow no commercial kelp (*Nereocystis*) harvest in the area;
- require a permit to collect intertidal invertebrates or algae.
- monitor aircraft and boat disturbance to marine birds and mammals to determine if additional educational or management measures are needed.



6. Area Name: Cascade Head (Cliff Creek Cove)

Designation: *Habitat Refuge* (Map 6)

Area Included: 2.4 miles of cliffs, rocky intertidal, and offshore rocks at Harts Cove, Cliff Creek Cove, and some surrounding areas on Cascade Head in northern Lincoln County.

Description

The Cliff Creek Cove and adjacent Harts Cove has the most significant shoreline marine bird and mammal usage on the central Oregon coastline. The large sea lion haulout area is virtually undisturbed by humans from land because the cliffs are high, steep, and isolated. The adjacent upland is the Cascade Head Scenic Research Area with undisturbed coastal forest managed by the U.S. Forest Service for human use and enjoyment, protection of resources, and scientific research. Two Arches Rock and other small rocks lie just offshore from the base of the cliffs.

Access: Access trail to Harts Cove; no improved access into Cliff Creek Cove.

Ownership: Submerged and intertidal lands: Division of State Lands; beach: Oregon Park and Recreation Department; offshore rocks above MHW: the US Fish and Wildlife Service; upland adjacent to the coves: U.S. Forest Service; Nature Conservancy lands abut to the south.

Key Resources: Nine seabird colony sites with over 15,000 birds total (common murre; double-

crested, pelagic, and Brandt's cormorant; pigeon guillemot; western gull; tufted puffin; rhinoceros auklet; black oystercatcher); large mammal haulout area on the beach of the two coves for Steller and California sea lions and harbor seals; threatened and endangered species (Steller sea lion, brown pelican, bald eagle, and peregrine falcon). The isolation of the area is itself a valuable resource.

Uses and Management

Current Use: Human use of the area is primarily the surrounding uplands with some hikers into Harts Cove to fish or sightsee; use of Cliff Creek Cove is minimal due to poor access.

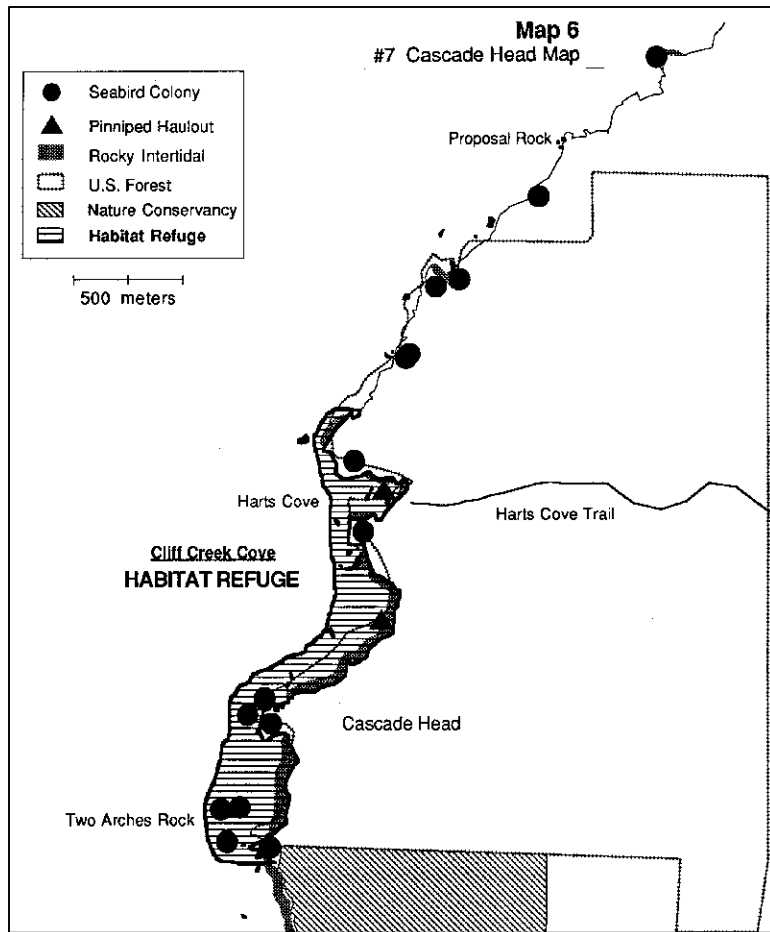
Current Management: The adjacent upland is managed by the US Forest Service.

Impact Concerns: Boat and low flying aircraft disturbance to seabird colonies on nearby Two Arches Rock and Cliff Creek Cove; possible disturbance to seals and endangered bird species from hikers in Harts Cove; disturbance to sea lions should trails ever be built into Cliff Creek Cove.

Management Objective: Maintain current undisturbed nature of refuge area while allowing appropriate use of adjacent ocean waters.

Management Prescription: Continue existing management; in addition:

- ensure that no trail access is built into Cliff Creek Cove or the rocky point near Two Arches Rock;
- post signs that describe marine wildlife and disturbance concerns.



7. Area Name: Boiler Bay

Designation: *Research Reserve* (Map 7)

Area Included: 2.7 miles of intertidal habitat located about 2 miles north of Depoe Bay in Lincoln County.

Description

The rocky intertidal area between Boiler Bay and Fogarty Creek State Park provides a variety of intertidal habitat types that are ideal for various types of marine scientific research. The area has traditionally been used for research, especially by staff and students at OSU. This area is currently an area where scientific research/educational collection permits are required.

Access: Steep, unimproved trails to Boiler Bay; access through private property at the north end of area. No direct access to intertidal area from Boiler Bay Wayside.

Ownership: Submerged and intertidal lands: Division of State Lands; the upland on the south side of Boiler Bay is owned by Oregon Park and Recreation Department; the US Fish and Wildlife Service owns offshore rocks above MHW that are not connected to land at high tide.

Most of the land adjacent to the research reserve is in private ownership.

Key Resources: Diverse intertidal habitat.

Uses and Management

Current use: Scientific research, educational activities, sport fishing from shore, and tidepooling.

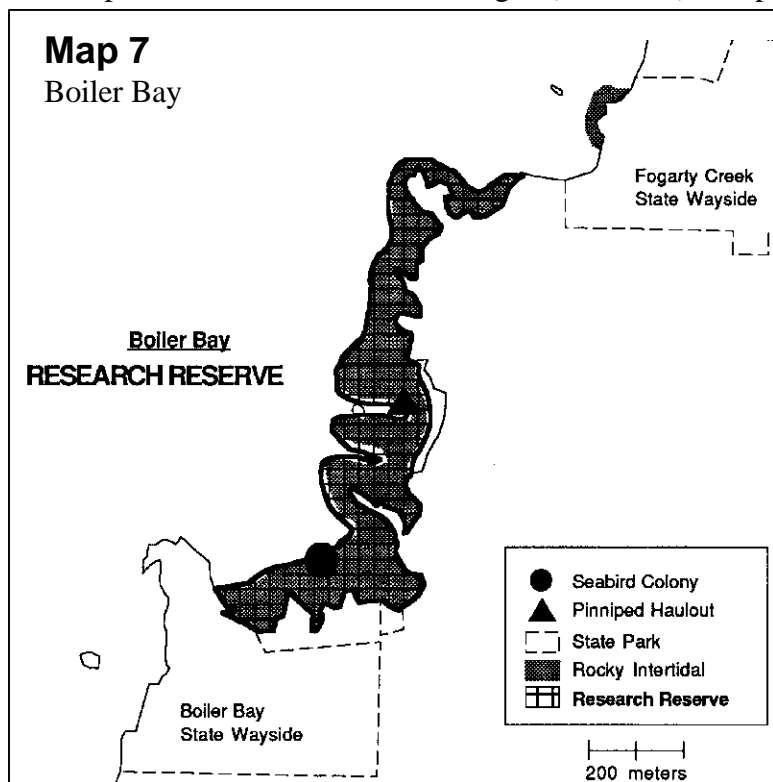
Current Management: Permits from the Department of Fish and Wildlife are required to take invertebrates in an area from Fogarty Creek to Boiler Bay State Wayside; State Parks manages Boiler Bay State Wayside on the bluff above on the south side of the bay.

Impact Concerns: Potential trampling impact to rocky intertidal habitat; possible disturbance to harbor seal haulout.

Management Objectives: To maintain the ecological integrity of the site for long-term research projects; allow continued level of use that does not interfere with research objectives.

Management Prescription: Continue current use and management (no collecting except through scientific/educational permit); in addition

- discourage improvement of existing trail to the site;
- direct school groups to other sites for general educational activities;
- prohibit harvest of intertidal algae (seaweeds) except by permit.



9. Area Name: **Pirate Cove**

Designation: *Research Reserve* (Map 8)

Area Included: 5.2 acres of intertidal and 3.3 acres of subtidal habitat just north of Depoe Bay.

Description

Pirate Cove is a very small semi-enclosed shallow embayment directly open to the ocean that provides an excellent area for both basic and applied subtidal research.

Access: Public access is from the ocean only.

Ownership: Submerged and intertidal lands are owned by the Division of State Lands. All adjacent uplands are in private ownership.

Key Resources: Subtidal habitat

Uses and Management

Current Use: Scientific research, SCUBA diving, and some commercial urchin harvest. Boaters occasionally fish in the cove. ODFW and the Urchin Commodity Commission are jointly conducting a red sea urchin outplanting experiment. Adjacent upland use is residential and a recreational vehicle campground.

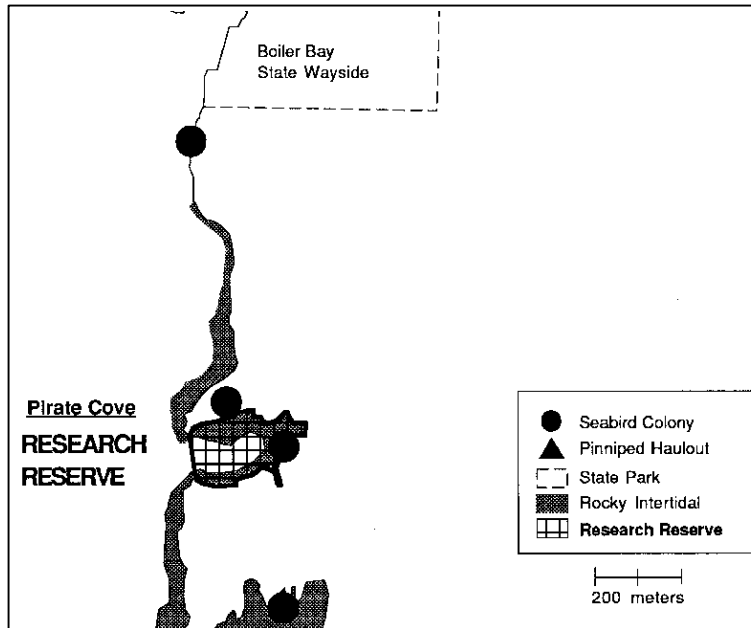
Current Management: No on-site management in the cove.

Impact Concerns: None.

Management Objective: To maintain the ecological integrity of the site for long-term research projects; allow continued level of use that does not interfere with research objectives.

Management Prescriptions: Allow all existing uses except

- prohibit all commercial and recreational invertebrate harvest including red urchins unless specifically allowed through an agreement between the ODFW and the harvest industry;
- prohibit harvest of intertidal and subtidal algae (seaweed);
- allow scientific or research collecting of intertidal invertebrates and algae by permit from ODFW.



Map 8
#9 Pirate Cove

10. Area Name: Whale Cove

Designation: *Habitat Refuge* (Map 9)

Area Included: 0.9 miles of cliffs, rocky intertidal habitat, and subtidal habitat located about a mile south of Depoe Bay in Lincoln County.

Description

This small cove is currently closed to all harvest of marine fish and shellfish.

Access: Access is through private property and is restricted to the residents and guests of the adjacent housing subdivision. There is no access to the rocky shore area from the Rocky Creek State Wayside on the bluff above.

Ownership: Submerged and intertidal lands: Division of State Lands; beaches: Oregon State Parks. All adjacent upland properties are in private ownership.

Key Resources: Rich and diverse intertidal habitat; harbor seal haulout; Use by bald eagle (threatened or endangered species); 2 small seabird nesting colony sites (pigeon guillemot).

Uses and Management

Current Use: Use of the area from shore is relatively low and restricted to the nearby residents and guests on the adjacent private property. Oregon Department of Fish and Wildlife has on-going monitoring studies in the cove.

Current Management: The area is closed to harvest of all marine finfish and invertebrates and

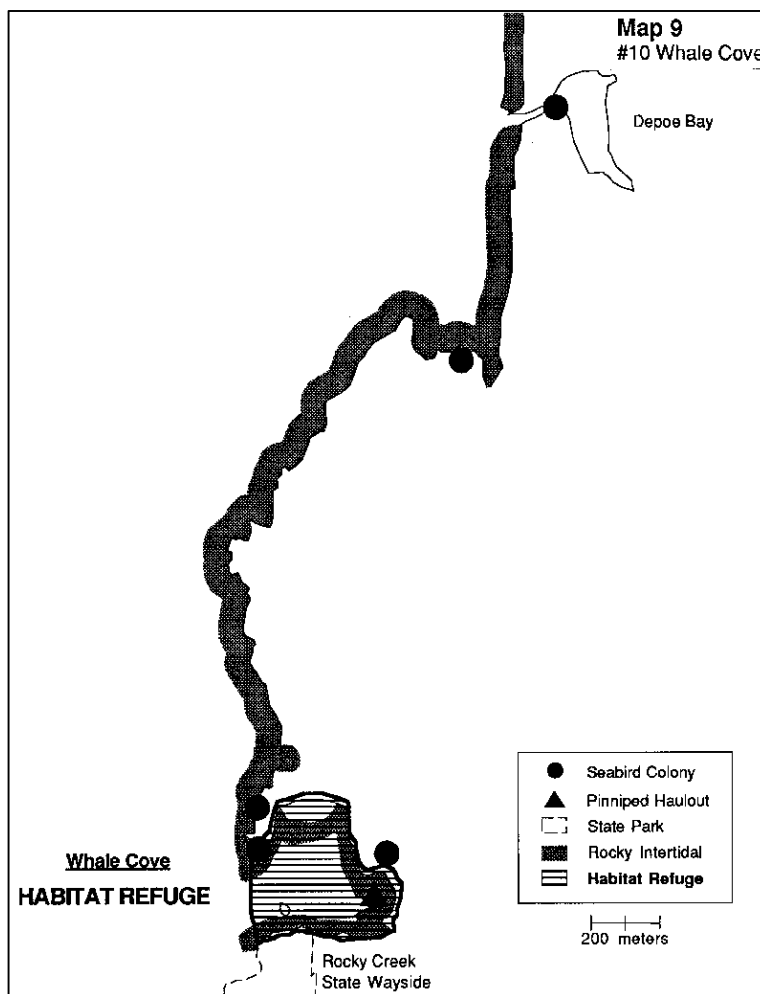
is managed as a habitat refuge and research natural area by the Oregon Department of Fish and Wildlife.

Impact Concerns: Possible future development may impact harbor seals

Management Objective: Maintain current undisturbed intertidal and subtidal habitats and resource values while allowing appropriate use of adjacent ocean waters.

Management Prescription: Continue current management; in addition:

- prohibit all marine algae collection except by permit.



Map 9
#10 Whale Cove

11. Area Name: Otter Crest

Designation: *Marine Garden* (Map 10)

Area Included: 1 mile of intertidal habitat approx. 5 miles south of Depoe Bay.

Description

This area is a popular, easily reached intertidal area that is currently managed as a marine garden. No change in status is proposed.

Access: Public access at Devil's Punch Bowl State Park; private access from the Inn at Otter Crest.

Ownership: Submerged and intertidal lands: Division of State Lands; beaches: Oregon Park and Recreation Department which also owns the adjacent section of park. All other adjacent upland is in private ownership.

Key Resources: High public-use intertidal habitat; 3 small seabird colonies; harbor seal haulout; opportunities for natural resource interpretation.

Uses and Management

Current Use: Very popular and heavily used area for tidepooling, sightseeing, and sport fishing from shore. Otter Crest is used as an educational resource by school groups. Oregon Park and Recreation Department provides some interpretive services on site.

Current Management: Currently managed as a Marine Garden by ODFW (taking of marine invertebrates, except single mussels for bait, prohibited). Some on-site interpretive programs by State Parks.

Impact Concerns: Overuse of the intertidal; disturbance to harbor seals

Management Objective: To enhance enjoyment and appreciation of intertidal resources while protecting intertidal area from effects of overuse.

Management Prescription:

- implement rotational area closures as necessary to allow recovery of intertidal
- areas receiving greatest use;
- prohibit harvest of intertidal algae (seaweeds).

Educational Opportunities: Expand informational and interpretive programs in state parks to accommodate increased visitor usage, including educational groups; coordinated informational programs with those at Yaquina Head Outstanding Natural Area.

12. Area Name: Gull Rock

Designation: *Priority Rock* (Map 10)

Area Included: 0.4 miles offshore about six miles north of Yaquina Head.

Description

Gull Rock is a small rock that is breeding and nesting habitat for six species of marine birds and a haulout area for harbor seals.

Access: The rock is accessible only by boat.

Ownership: Submerged and submersible parts of the rock: Division of State Lands; rock area above Mean High Water: U.S. Fish and Wildlife Service.

Key Resources: Six species of seabirds breed here including approximately 23,000 common murrelets and 550 Brandt's cormorants. Over 100 harbor seals use this site. Bald eagles and brown pelicans (threatened and endangered species) use this site.

Uses and Management

Current Use: No human use of the rock.

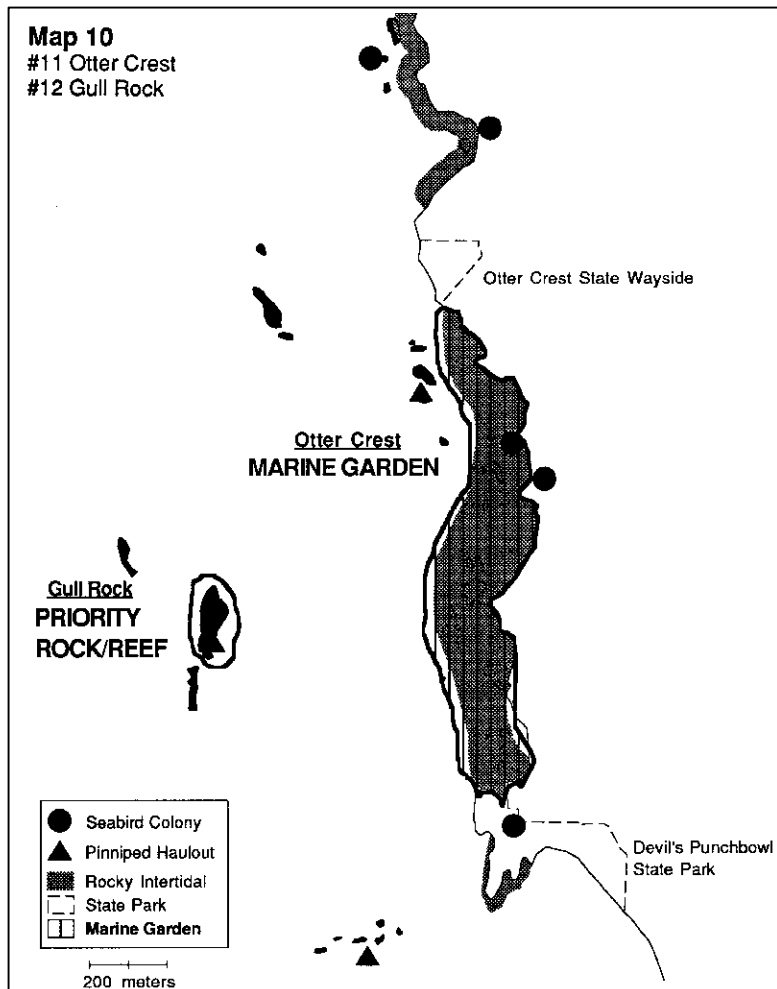
Current Management: National Wildlife Refuge (no on-site management).

Impact Concerns: The rock is located between two nearby ports, Yaquina Bay and Depoe Bay, and adjacent waters have substantial commercial and recreational nearshore fisheries. Low flying aircraft are common in the area and an airport is located nearby.

Management Objective: Protect wildlife habitat values of the rock while allowing appropriate use of adjacent ocean waters.

Management Prescription: None at present;

NOTE: Gull Rock is designated as a "priority rock" site for possible study leading to future management measures, if warranted.



Map 10
#11 Otter Crest
#12 Gull Rock

13. Area Name: Yaquina Head

Designation: *Marine Garden* (Map 11)

Area Included: 1.8 miles of intertidal habitat, intermixed with sand or cobble beaches, and associated submerged and submersible rocks on Yaquina Head.

Description

Yaquina Head has many rocky shore types including intertidal, cliff, and offshore rock habitats. It is part of a headland that was purchased pursuant to Congressional action and is managed by the Bureau of Land Management for public enjoyment as well as protection of habitat and scenic values. This is a popular and heavily used site by school groups. The intertidal area is currently a Marine Garden; no change is proposed. In addition to natural habitats, the BLM has constructed tide pools in an old quarry at sea level and provided extensive public access into this area. A major visitor center is scheduled for construction on the headland.

Access: A staircase from Yaquina Lighthouse parking area provides steep but safe access to the natural intertidal area. A road has been constructed to a parking area near the base of the south cliff face where paved trails lead to and through the newly constructed tidepool area. These trails

will accommodate wheel chairs. There is outstanding visual access to major seabird breeding colonies on rocks just offshore the tip of the Head.

Ownership: Submerged and submersible (intertidal) lands: Division of State Lands; offshore rocks above Mean High Water: U.S. Fish and Wildlife Service; upland above MHW: Bureau of Land Management; dry sands beach areas: Oregon Department of Parks and Recreation.

Key Resources: High use intertidal habitat; 12 seabird colony sites with over 16,000 birds total (common murre; pelagic and Brandt's cormorant; pigeon guillemot; western gull; tufted puffin; rhinoceros auklet; black oystercatcher); use by peregrine falcon and brown pelican (threatened or endangered species); harbor seal haulout and pupping area.

Use and Management

Current Use: Use of the entire Head is high (500,000+ visitors 1993) and use of the intertidal area is very high during peak late spring and early summer low tides. Uses include tidepooling, sight seeing, and sport fishing from shore. Yaquina Head intertidal area receives more use by school groups than any other intertidal area in the state. BLM provides interpretive services on site and supervision of users.

Current Management: Management is fragmented among several agencies. The intertidal area is managed by the Oregon Department of Fish and Wildlife as a Marine Garden (no taking of intertidal invertebrates except single mussels for bait). The BLM manages the upland as an Outstanding Natural Area that attempts to protect natural resource and scenic qualities while providing high visitor use. The U.S. Fish and Wildlife Service manages offshore rocks above MHW as National Wildlife Refuge. The BLM operates a volunteer docent program to assist in providing educational and interpretive services.

Impact Concerns: Overuse of the natural intertidal area; disturbance to seabirds and harbor seals on some rocks from illegal climbing at low tide.

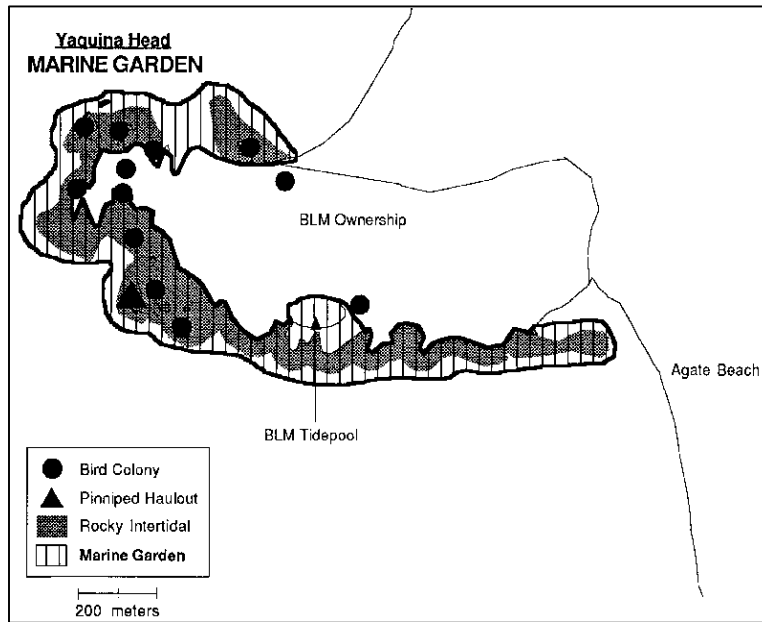
Management Objectives: To enhance enjoyment and appreciation of intertidal resources while protecting intertidal area from effects of overuse; coordinate management of intertidal area with management of nearby sites at Otter Crest and Seal Rocks.

Management Prescriptions: Develop strategies to control impacts including

- prohibit harvest of intertidal marine algae (seaweeds);
- close monitoring of intertidal ecosystem health;
- rotational closures of intertidal areas as necessary to allow recovery from use;
- seasonal access restrictions to cliff areas as necessary to protect bird and mammal reproduction.

Educational Opportunities: The existing BLM educational programs plus the recently created tidepools and the proposed new interpretive center provide high potential for improved educational and information programs both on-site and as a focal point for the region.

Map 11
#13 Yaquina Head



14. Area Name: Seal Rock

Designation: Not Yet Designated (Map 12)

Area Included: 0.6 mile of intertidal area and associated rocks, about twelve miles south of Yaquina Head.

Description

Seal Rock is composed of a large basalt rock formation with many smaller associated rocks that abut a sandstone bluff along the shore. The intertidal area is protected from the open ocean by Seal Rock and other offshore rocks.

Access: The area is immediately adjacent to Highway 101 and Seal Rock State Wayside and has easy access from several points.

Ownership: Submerged and submersible (intertidal) lands: Division of State Lands; rock area above Mean High Water: U.S. Fish and Wildlife Service; beach and upland wayside: State Parks and Recreation Department; highway right-of-way and pullouts: State Department of Transportation Highway Division; remaining upland: private ownership.

Key Resources: Diverse intertidal communities because of mix of substrate types and wave exposure regimes. Limited seabird nesting and some roosting on offshore rocks by brown pelicans. Rocks throughout the site are used as haulout sites for harbor seals while Steller sea lions haulout on offshore rocks.

Use and Management

Current Use: High use of the area by the general public for recreational sightseeing, beachcombing, tide-pooling, bird-watching, clamming, and rock fishing. One of the best sites on the open coast for littleneck clams. Some use by school groups for educational field trips.

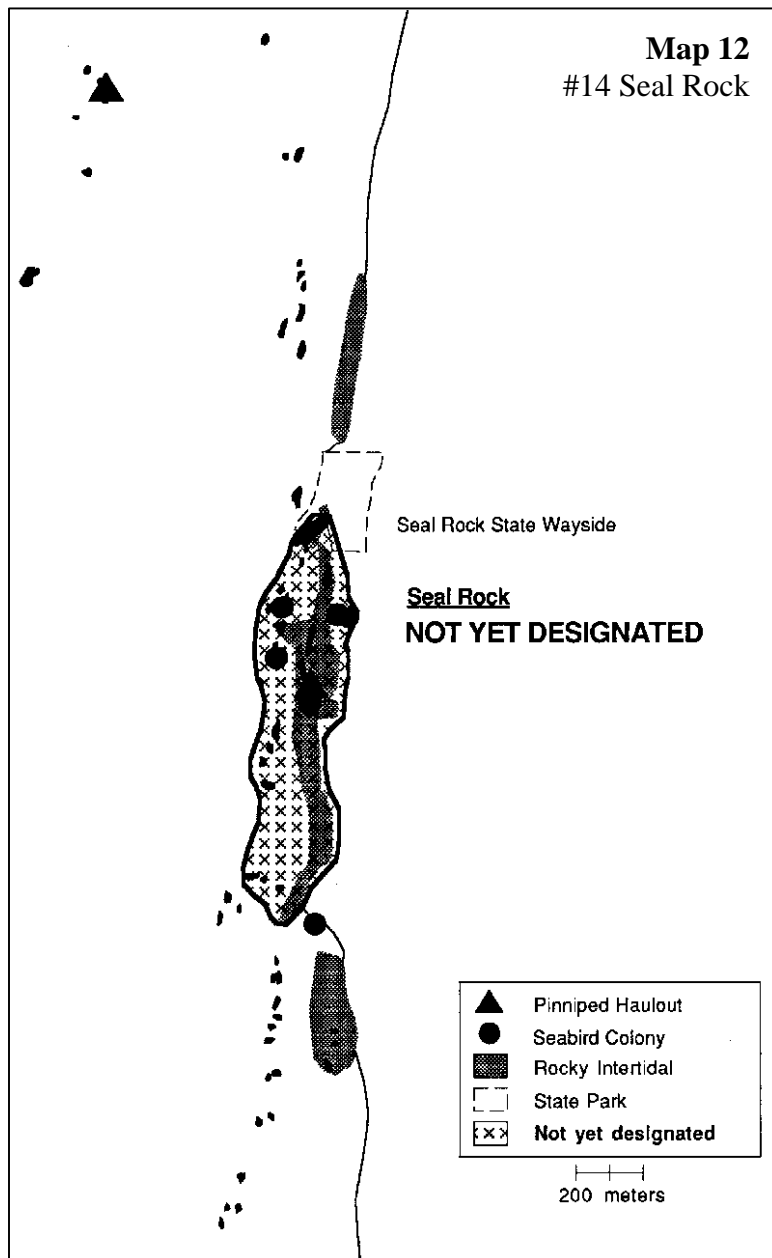
Current Management: Shoreline and onshore areas are managed as an ocean shore recreation area by State Parks and Recreation Department; offshore rocks are managed by the USFWS as a National Wildlife Refuge (no on-site management) .

Impact Concerns: Overuse of intertidal area, especially trampling in very accessible spots; effects from turning over rocks during clam harvest, some disturbance to seabirds and mammals from rock climbers.

Management Objective: Protect variety of habitat values of the site while accommodating public access and use.

Management Prescription: none at present.

NOTE: Because the site is relatively small but contains a complex mixture of resources and high usage, this entire area needs more detailed study and assessment before designation into one or more rocky shores management categories.



15. Area Name: Part of Yachats State Park

Designation: *Marine Garden* (Map 13)

Area Included: 0.8 miles of intertidal habitat north of the Yachats River

Description

The entire intertidal area fronting the City of Yachats has extensive mussel beds and supports highest commercial mussel harvest in the state as well as educational and general recreational use. The area designated as Marine Garden is near the mouth of the Yachats river and fronts Yachats State Park. It represents about 12% of the total intertidal habitat along the Yachats

oceanfront.

Access: Short trail from Yachats State Park and adjacent city streets.

Ownership: Submerged and submersible (intertidal) lands: Division of State Lands; beach and part of adjacent uplands: Oregon Park and Recreation Department as Yachats State Park; balance of uplands are adjacent City of Yachats streets or private ownership.

Key Resources: Rich intertidal habitat with extensive mature mussel beds.

Use and Management

Current Use: Use of the area is relatively high and include commercial mussel harvest, recreational mussel harvest, tidepooling, sight seeing, and sport fishing from shore.

Current Management: No on-site management; commercial mussel harvest regulations by Oregon Department of Fish and Wildlife.

Impact Concerns: Overuse of the intertidal areas.

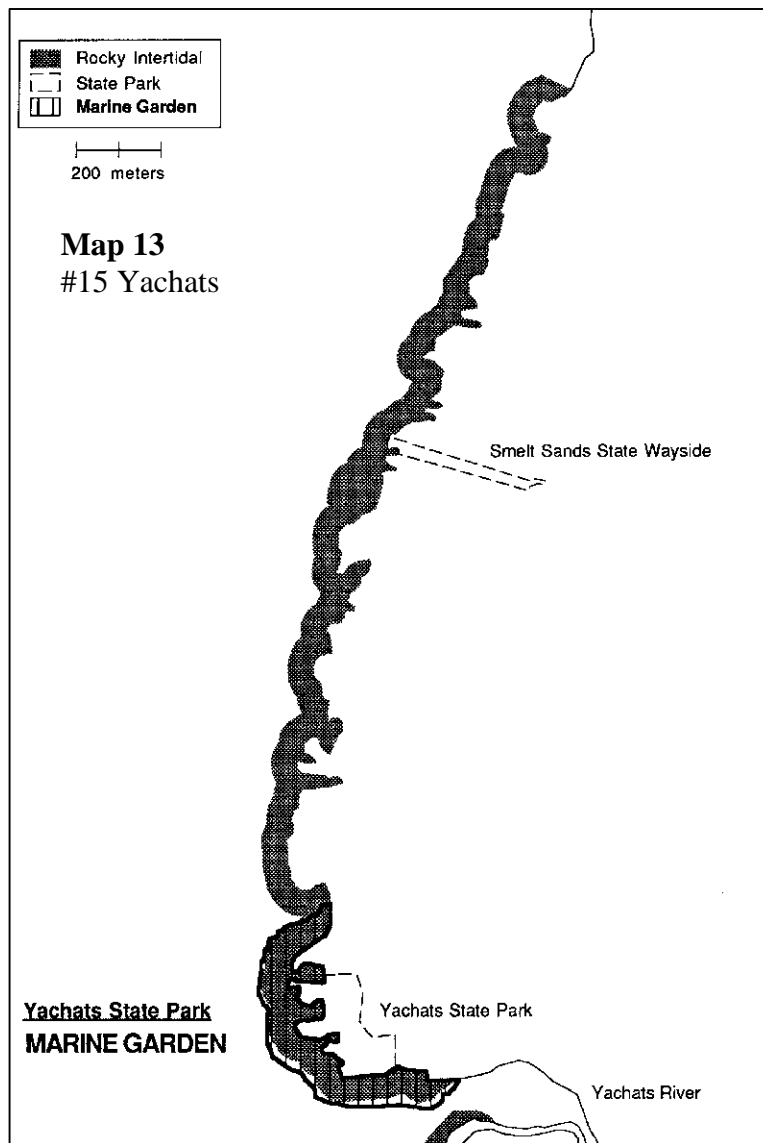
Management Objectives: To enhance enjoyment and appreciation of intertidal resources while protecting intertidal area from effects of overuse; to provide an educational resource for the public.

Management Prescriptions: Continue public use of the entire area; in addition:

- prohibit collection or harvest of intertidal invertebrates of all kinds (except single mussels for bait);
- prohibit harvest of intertidal algae (seaweed).

NOTE: The balance of the Yachats intertidal area (to the north) and south of the Yachats River is Marine Shore where collection or harvest is allowed within general ODFW regulations.

Educational Opportunities: The Yachats State Park abutting the Marine Garden area is an ideal location for public education and interpretive programs about rocky-shore and other coastal resources.



16. Area Name: Part of Cape Perpetua

Designation: *Marine Garden* (Map 14)

Area Included: 1.3 miles of intertidal habitat near the Cape Perpetua Visitor Center

Description

This area is part of an extensive basalt rock bench and intertidal habitat area along the foot of Cape Perpetua. It is part of the Cape Perpetua Visitor Center complex and is currently designated as a Marine Garden by the Oregon Department of Fish and Wildlife. No change in status is proposed.

Access: Several well-developed access trails in Cape Perpetua Park, including one from the visitor center, and from Devil's Churn State Wayside.

Ownership: Submerged and submersible (intertidal) lands: Division of State Lands; beach areas: Department of Parks and Recreation; upland: U.S. Forest Service and Oregon Park and Recreation Department.

Key Resources: Publicly accessible intertidal habitat, including mature mussel beds.

Human Uses and Management

Current Use: Visitor use of the proposed area is relatively high and includes tidepooling, sightseeing, and sport fishing from shore. School groups use Cape Perpetua as an outdoor educational resource.

Current Management: Designated by ODFW as Marine Garden (intertidal area); Cape Perpetua Visitor's Center (U.S. Forest Service) provides information and interpretive services.

Impact Concerns: Potential overuse of the intertidal area.

Management Objectives: To enhance enjoyment and appreciation of intertidal resources while protecting intertidal area from effects of overuse; to provide an educational resource for the public.

Management Prescriptions: Continue existing Marine Garden status. In addition

- prohibit intertidal algae (seaweed) harvest or collection.

Educational Opportunities: Continue public information and interpretive programs at Cape Perpetua Visitor Center; link these programs to other sites in the Cape Perpetua area.

17. Area Name: Neptune State Park

Designation: Not Yet Designated (Map 14)

Area Included: Intertidal habitat south of the Cape Perpetua Visitor Center fronting Neptune State Park.

Description

This area is part of an extensive a basalt rock bench and intertidal habitat area along the foot of Cape Perpetua that gradually tapers out to the south. The rocky intertidal area and associated rocks are interspersed with or backed by sand beaches that grow more extensive from north to south.

Access: Highway 101 runs very close to the shore along this stretch of coast. There is a short access trails to the shore from Neptune State Park and from a highway pullout area. A narrow and winding highway and seasonally heavy traffic create safety concerns at entrances to pullouts

and waysides.

Ownership: Submerged and submersible (intertidal) lands: Division of State Lands; beach and upland areas: Department of Parks and Recreation.

Key Resources: Intertidal communities; some seabird nesting on nearby cliff sites.

Use and Management

Current Use: Primarily sightseeing and fishing from shore.

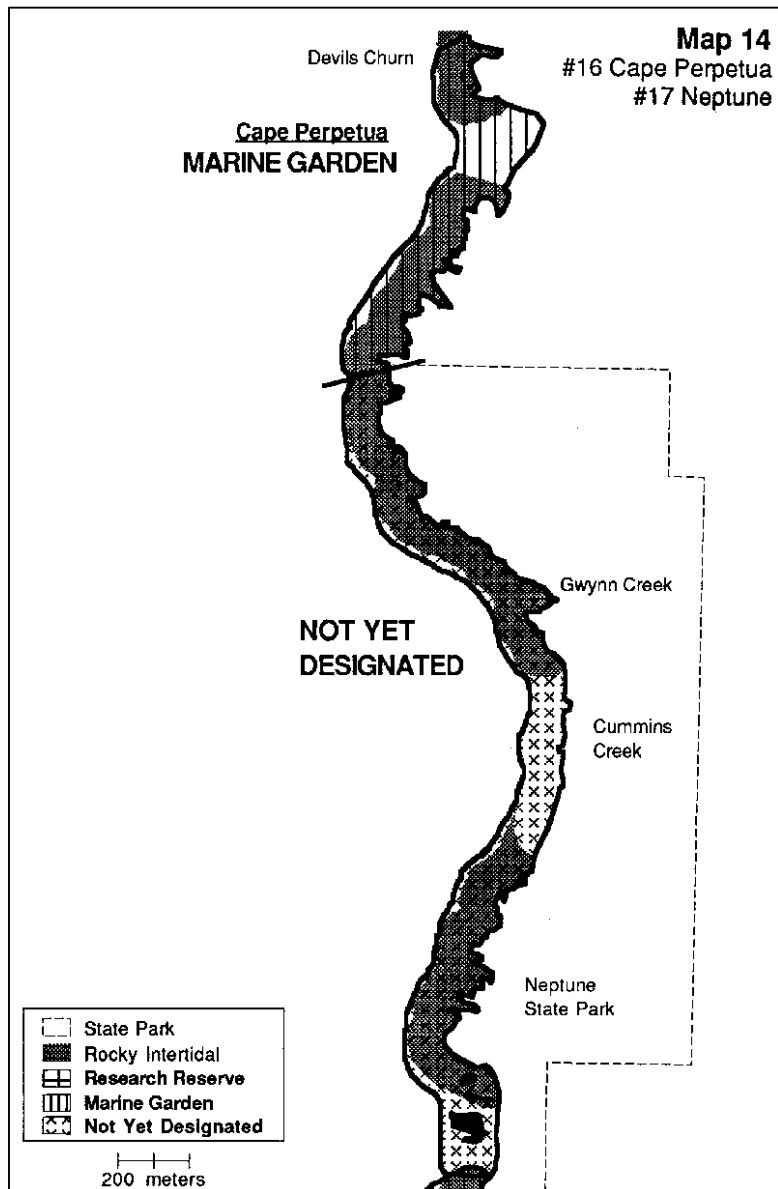
Current Management: Neptune Oregon State Park.

Impact Concerns: None

Management Objectives: Allow continued level of visitation and educational opportunities.

Management Prescriptions: None at present.

NOTE: More detailed study and assessment is needed before designation into one or more rocky shores management categories because this area includes several sites each with different management needs.



Map 14
#16 Cape Perpetua
#17 Neptune

18. Area Name: Strawberry Hill

Designation: *Research Reserve* (Map 15)

Area Included: 0.8 miles of intertidal habitat approx. 5 miles south of Yachats.

Description

The Strawberry Hill area, part of a series of rocky outcroppings along the base of Cape Perpetua, provides a variety of intertidal habitat types that make it ideal for various types of scientific research. The area has traditionally been used for research, especially by staff and students at OSU. This area is currently managed as a research/educational permit collection area.

Access: Unimproved trail from Strawberry Hill parking overlook area.

Ownership: Submerged and submersible (intertidal) lands: Division of State Lands; beach and upland areas: Department of Parks and Recreation.

Key Resources: Diverse intertidal habitat; Harbor seal haulout and pupping areas

Use and Management

Current Use: Human use of the proposed research area includes scientific research, sightseeing, sport fishing from shore, and tidepooling. This is one of the best areas on the coast to view harbor seals close up.

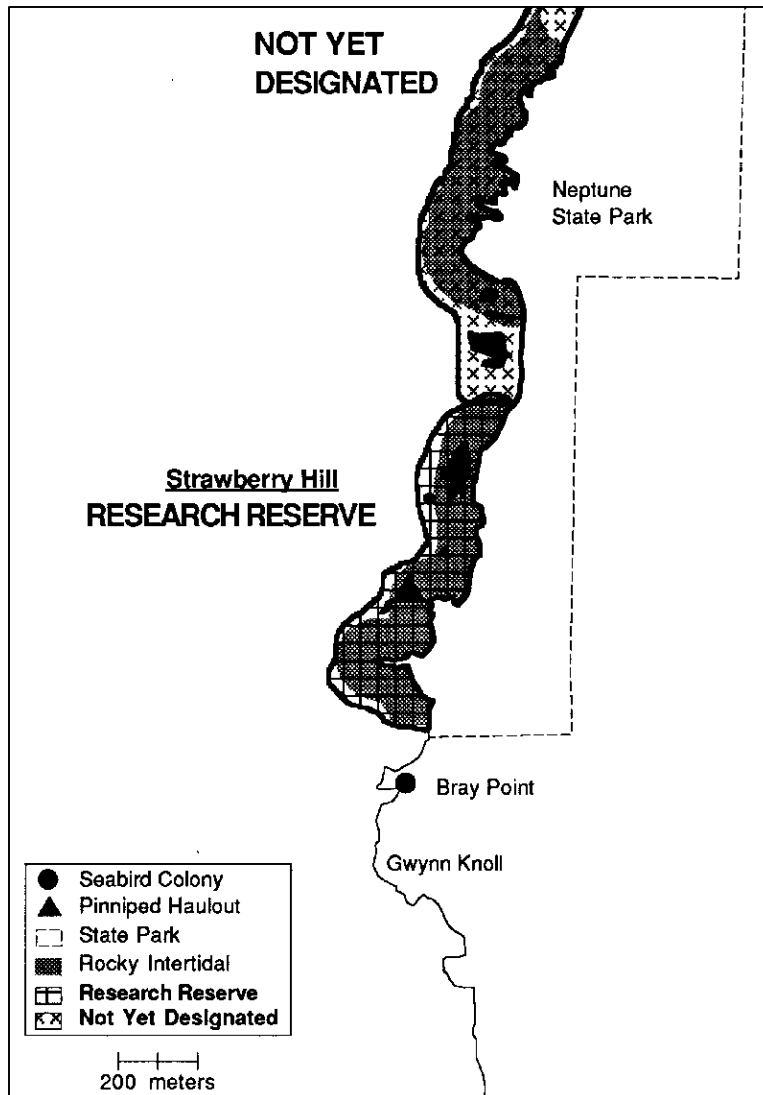
Current Management: Currently managed as a scientific/education permit area.

Impact Concerns: Potential trampling impact to rocky intertidal habitat; possible disturbance to harbor seal haulouts.

Management Objectives: Ensure that overall non-research use of the area does not significantly increase in the future, while protecting the values of the area as a harbor seal viewing site.

Management Prescriptions: Continue existing site management (no collecting except through scientific/educational permit) except for the following:

- the capacity of the existing parking area at the site should not be increased;
- school groups should be encouraged to use other nearby sites for intertidal educational activities;
- prohibit harvest of intertidal algae (seaweeds);
- prohibit mussel harvest (except single mussels as bait);
- monitor disturbance impacts on harbor seal haulout area



Map 15
#18 Strawberry Hill

19. Area Name: Heceta Head

Designation: Not Yet Designated (Map 16)

Area Included: .75 miles of cliff and associated rocks 10 miles north of Florence.

Description

Heceta Head is the southernmost of a series of basalt headlands on the Oregon coast. The cliffs are extremely steep and virtually inaccessible. Heceta Head is renowned for its scenic beauty. There are a number of small offshore rocks associated with the headland. Together, the rocks and ledge at the toe of the cliff provide isolated haulout opportunities for marine mammals and nesting locations for several small colonies of seabirds.

Access: Very difficult access by trail to some points on the cliff; others inaccessible.

Ownership: Submerged and submersible (intertidal) lands: Division of State Lands; adjacent beach at the mouth of Cape Creek and some upland areas: Department of Parks and Recreation; other upland ownership: U.S. Coast Guard (Heceta Head Lighthouse).

Key Resources: Six seabird nesting sites; one marine mammal haulout site.

Use and Management

Current Use: Primarily sightseeing on cliff above and general recreation on beach nearby; some shore fishing for rock fish from locally-known access points.

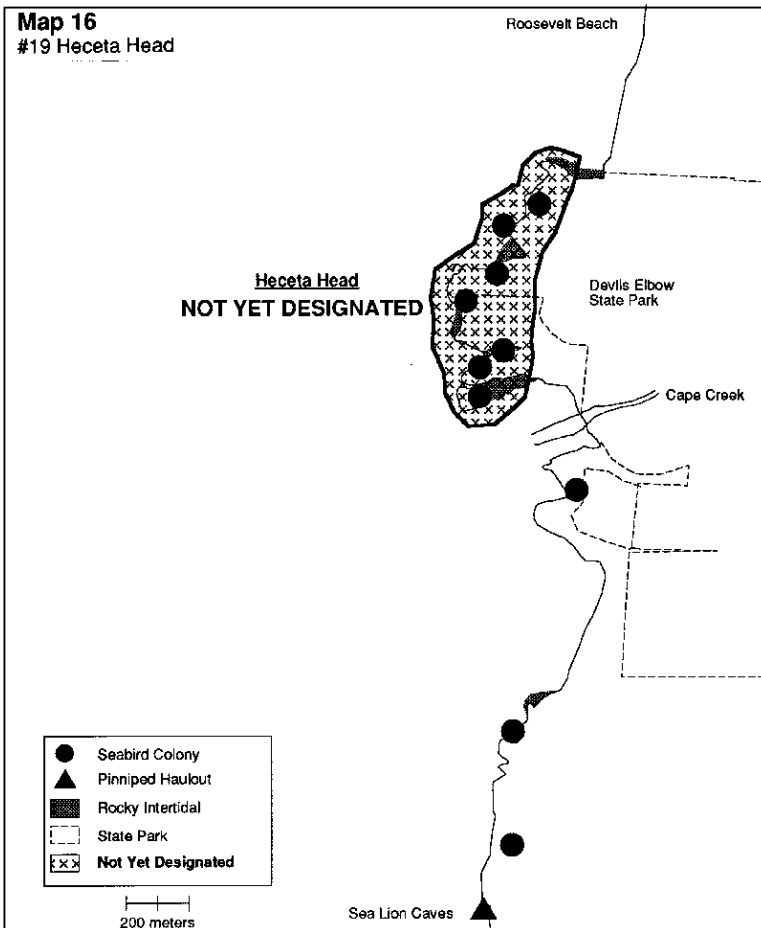
Current Management: Devil's Elbow State Park.

Impact Concerns: Disturbance to seabird colonies from people climbing on cliff; possible disturbance from aircraft.

Management Objectives: Allow continued level of visitation while protecting isolated habitat values.

Management Prescriptions: None at present.

NOTE: More detailed study and assessment is needed before designation into one or more rocky shores management categories.



Map 16
#19 Heceta head

20. Area Name: Gregory Point

Designation: *Research Reserve* (Map 17)

Area Included: 57 acres of subtidal, 3.5 acres of intertidal area with associated rocks northwest of the mouth of Sunset Bay.

Description

Gregory Point, Lighthouse Island, and nearby Squaw Island are remnants of steeply upturned sedimentary rock formations that underlie all of the Cape Arago region. The area is adjacent to one of the most popular public recreation sites on the coast, is difficult to reach, and thus receives relatively little use. Because of its isolation, the area has been used for many years for study and research by staff and students at the nearby University of Oregon Institute of Marine Biology.

Access: Shore level is reached with difficulty via hiking trails through coastal forest from Sunset Bay, from parking area at the old Coast Guard housing site off Lighthouse Way, by climbing over rocks at low tide from Sunset Bay, or by boat.

Ownership: Submerged and submersible (intertidal) lands: Division of State Lands; beach and most upland area: Department of Parks and Recreation; other upland: U.S. Bureau of Land Management (former U.S. Coast Guard sites).

Key Resources: Seabird nesting sites on Lighthouse Island; extensive intertidal and subtidal rocky habitat between Lighthouse Island and Squaw Island.

Use and Management

Current Use: Primarily sightseeing from cliff above and general recreation at Sunset Beach nearby; some fishing from shore for rockfish at locally known access points; recreational fishing and SCUBA diving from boats launched at Sunset Bay during good weather; some commercial harvest of red urchin.

Current Management: Adjacent to Sunset Bay State Park; intertidal area managed by ODFW as a scientific/educational collecting permit area.

Impact Concerns: Disturbance to seabird colonies on Lighthouse Island from future development on mainland cliff; potential changes in composition of subtidal invertebrate communities from commercial harvest of invertebrates.

Management Objectives: To maintain the ecological integrity of the site for long-term research projects; allow continued level of use that does not interfere with research objectives.

Management Prescriptions: Continue existing on-site measures (permit required for scientific/educational collecting); in addition:

- discourage new or improved access to water area (not to affect trail maintenance or

- improvement on cliff above);
- discourage any public access to Lighthouse Island;
- prohibit commercial and recreational shellfish harvest, including red urchins;
- prohibit harvest of intertidal marine algae (seaweeds);
- allow no commercial kelp (*Nereocystis*) harvest within the area.

21. Area Name: Sunset Bay

Designation: *Marine Garden* (Map 17)

Area Included: 1.0 miles of intertidal habitat located about 2 miles north of the tip of Cape Arago.

Description

Like other Cape Arago intertidal areas, Sunset Bay has a very productive intertidal environment. Both habitat diversity and the diversity of flora and fauna are high. Sunset Bay is a very attractive, popular, and accessible site for a wide variety of recreational activities. The intertidal area on the north side of Sunset Bay is a level platform of sedimentary rock that receive a great deal of use from both the general public and school groups.

Access: Very easily reached with short, level walk on sand from parking lot on north side of Sunset Bay; south side intertidal area is reached with some difficulty over rocks and promontory at low tide from Sunset Bay or via steep trail at Norton Gulch trail 1/2 mile south off Coast Trail and Cape Arago Highway.

Ownership: Submerged and submersible (intertidal) lands: Division of State Lands; beach and upland area: Department of Parks and Recreation.

Key Resources: Rich, high-use intertidal habitat that is very accessible to the public.

Uses and Management

Current Use: Recreational use of the park area is very high (839,400 visitors in 1991-92). The intertidal area receives high use for outdoor educational activities, tidepool exploration, and general exploration of the ocean shore.

Current Management: The intertidal area is managed as a scientific/educational permit area by the ODFW; the upland and beaches are managed as Sunset Bay State Park.

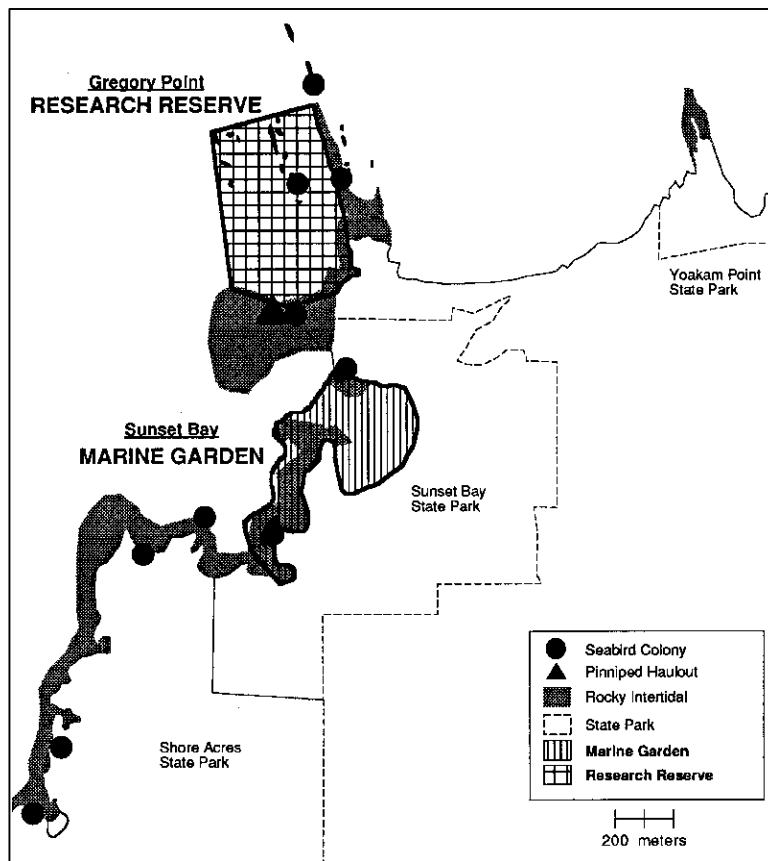
Impact Concerns: Overuse of the intertidal from trampling.

Management Objective: To enhance enjoyment and appreciation of intertidal resources while protecting intertidal area from effects of overuse.

Management Prescriptions: Continue public use of entire area;

- monitor impacts to intertidal area and implement rotational area closures as
- necessary to allow recovery of habitat;
- prohibit harvest of intertidal algae (seaweeds);
- prohibit mussel harvest (except single mussels as bait).

Educational Opportunities: Sunset Bay State Park and campground offer an excellent opportunity for a natural resource interpretive and other educational programs.



Map 17
#20 Gregory Point
#21 Sunset Bay

22. Area Name: Simpson Reef/North Cove Cape Arago

Designation: *Habitat Refuge (also Priority Rock/Reef)* (Map 18)

Area Included: 0.8 miles of cliffs, rocky intertidal, and subtidal reef/kelp beds, and offshore rocks in and near North Cove of Cape Arago

Description

The north cove at Cape Arago is an especially rich and diverse habitat area for a wide variety of intertidal plant and animal species, seabirds and marine mammals. The entire cove is somewhat sheltered from the open ocean by Simpson Reef, a linear rock feature about one-half mile

offshore. The area provides an excellent representation of several south coast ecosystem types. The semi-protected rocky intertidal habitat has a high diversity of marine plants and animals more typical of areas farther south. The rich habitat is also reflected in the subtidal reef/kelp bed ecosystem.

Near the center of the cove is Shell Island, a large rock with a sand beach on its landward side that, with other large rocks and shallow water, provides ideal haulout and pupping sites for marine mammals. It is the largest haulout site in Oregon for California sea lions (>2,000), the largest pupping site for harbor seals outside of the Columbia River (>1,000) and is the largest haulout/pupping site for northern elephant seals in Oregon. Over 100 Steller sea lions also use this site and small numbers of northern fur seals and sea otters have been seen here in recent years. However, these rocks are accessible by foot at low tide, especially the very low tides of late spring and early summer.

This site is within an area of diverse uses, activities, and resources; Shell Island and surrounding intertidal rocks are easily accessible on foot through North Cove at Cape Arago State Park. The reef is a popular fishing and diving area readily reached from the nearby Port of Charleston. Low flying aircraft are common in the area and the largest coastal airport in Oregon is located nearby in North Bend. This is an extremely popular wildlife viewing area from a visitor overlook at the top of the bluff off the Cape Arago Highway. Shell Island and Simpson Reef are part of the Cape Arago/Sunset Bay Rocky Shore cell that has been identified for more detailed planning.

Access: Trail from Cape Arago State Park to the cove beach, low tide foot access through tidepools and sand spit to Shell Island; visual access from scenic overlook on Cape Arago Highway; boat access from launch at Sunset Bay in good weather and from mouth of Coos Bay.

Ownership: Submerged and submersible (intertidal) lands: Division of State Lands; rocks above Mean High Water (Shell Island, Simpson Reef, other smaller rocks) U.S. Fish and Wildlife Service; beach and adjacent uplands: Oregon Parks and Recreation Department.

Key Resources: Large seal and sea-lion haulouts and pupping areas (Steller sea lion, harbor seal, California sea lion, elephant seal); largest and among the richest rocky intertidal habitats in the state; kelp beds with both *Nereocystis* and *Macrocystis* (giant kelp, the largest such bed in the state); rich subtidal reef habitat; three small seabird colony sites; use by brown pelican (threatened species), gray whale feeding area.

Uses and Management

Current Use: During good weather there is a relatively high level of use including boat fishing, sport fishing from shore, commercial urchin harvest, recreational SCUBA diving, surfing, nature watching, tidepooling, educational activities, and scientific research.

Current Management: The upland is managed as Cape Arago State Park; the intertidal area is managed by ODFW as a scientific/educational permit area; rocks and reefs in the cove are

managed as National Wildlife Refuge; the only access trail to North Cove is closed by State Parks from March 1 to June 1 to protect marine mammals pupping and rearing from human disturbance.

Impact Concerns: Boat and low flying aircraft disturbance to seals and sea lions; foot traffic disturbance to seals and sea lions and to the rocky intertidal habitat during low tides of late spring and summer, the pupping and rearing season.

Management Objectives: preserve the habitat values of the area and protect them from degradation or destruction while allowing appropriate use of adjacent ocean waters.

Management Prescriptions: Continue existing uses and management with the following additions:

- monitor effectiveness of seasonal trail closure;
- discourage trail improvements (except routine maintenance);
- provide no new physical access;
- expand and develop public educational and informational opportunities and services at the scenic overlook site ;
- encourage intertidal users to use other locations in the area;
- allow no commercial kelp (*Nereocystis*) harvest within the area;
- monitor impacts to marine mammals from boat and aircraft activity;
- closely coordinate management of this site with other parts of Cape Arago/Sunset Bay area.

Educational Opportunities: The Simpson Reef overlook off Cape Arago State Highway and sites within Cape Arago State Park offer excellent opportunities for educational and interpretive materials, displays, or facilities about the natural resources of the North Cove/Simpson Reef area; these educational and interpretive programs could be part of a program for the entire Sunset Bay/Cape Arago region.

23. Area Name: Middle Cove

Designation: *Research Reserve* (Map 18)

Area Included: 0.3 miles of intertidal habitat at the tip of Cape Arago

Description

Middle Cove provides a rich intertidal habitat that has relatively low use and is near a marine research facility (Univ. of Oregon Institute for Marine Biology). The area has traditionally been used for research, especially by staff and students at OIMB.

Access: steep, unimproved trail from Cape Arago State Park

Ownership: Submerged and submersible (intertidal) lands: Division of State Lands; adjacent upland: Oregon Department of Parks and Recreation.

Key Resources: Rich, undisturbed intertidal habitat.

Human Uses and Management

Current Use: Low level of use, includes scientific research, sport fishing from shore, and tidepooling.

Current Management: Intertidal: Scientific/education permit area; upland: Cape Arago State Park.

Impact Concerns: none

Management Objectives: protect the research values of the site by ensuring that overall non-research use of the site does not increase significantly.

Management Prescriptions: Continue existing uses and management with the addition that

- discourage any improvements to the existing trail;
- prohibit collection or harvest of intertidal algae (seaweeds);
- prohibit recreational mussel harvest (except single mussels as bait).

24. Area Name: South Cove Cape Arago

Designation: *Marine Garden* (Map 18)

Area Included: 0.42 miles of intertidal habitat just south of the tip of Cape Arago.

Description

South Cove, like other intertidal areas on Cape Arago, has a very productive intertidal environment. The diversity of intertidal habitats and the diversity of flora and fauna are high. Although the trail to the cove is steep and long, the cove attracts a fair number of visitors, both general public and school groups because of the intertidal marine life, fishing opportunities, scenic views, and shelter from northwest winds in the south-facing cove.

Access: Steep but improved trail from Cape Arago State Park.

Ownership: Submerged and submersible (intertidal) lands: Division of State Lands; adjacent upland: Oregon Department of Parks and Recreation.

Key Resources: Rich, diverse, accessible intertidal habitat; scenic views to the south.

Uses and Management

Current Use: Relatively high level of use including educational activities, tidepooling, sightseeing, and sport fishing from shore.

Current Management: The intertidal area is currently managed as a scientific/educational permit area by the ODFW; the uplands are managed as Cape Arago State Park.

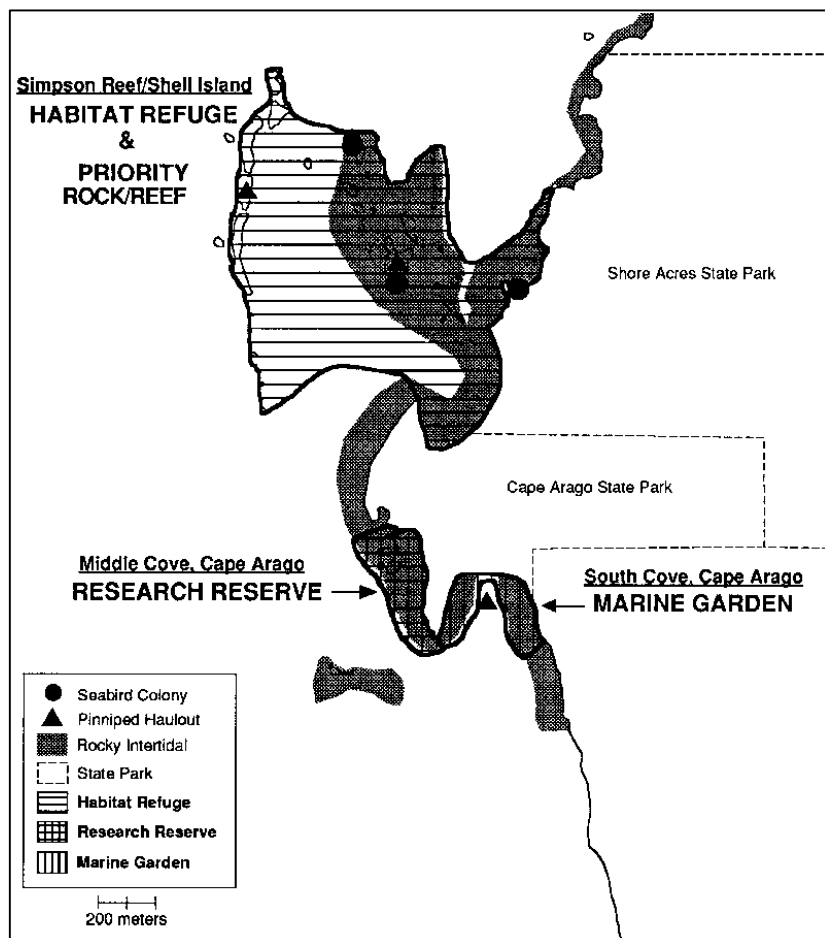
Impact Concerns: Overuse of intertidal areas through trampling and collecting.

Management Objectives: To enhance enjoyment and appreciation of intertidal resources while protecting intertidal area from effects of overuse.

Management Prescriptions: continue public use of entire area;

- monitor impacts to intertidal area and implement rotational area closures if
- necessary to allow recovery of habitat;
- prohibit harvest of intertidal algae (seaweeds);
- prohibit intertidal invertebrate harvest (except single mussels as bait).

Educational Opportunities: Cape Arago offers an excellent site to provide fixed interpretive displays that complement those at Sunset Bay and Simpson Reef overlook.



Map 18

#22 North Cove

#23 Middle Cove

#24 South Cove Cape Arago

25. Area Name: Rocks off of Coquille Point

Habitat Refuge

Designation: (Map 19)

Area Included: 1.1 miles of shoreline and offshore rocks adjacent to Coquille Point (including Table Rock, Coquille Point Rocks, Cat and Kittens Rock, Face Rock, and several unnamed rocks).

Description

The rocks in this area provide the only major seabird nesting habitat in the 30-mile stretch of coast from Cape Arago to Cape Blanco. The diversity of nesting seabirds is high. Land at the tip of Coquille Point was recently acquired by U.S. Fish and

Wildlife Service and is being managed as a refuge and educational resource. The Bandon/Coquille Point area provides an excellent opportunity to develop a marine/estuarine/terrestrial refuge complex within an area of high human use.

Access: Some rocks in the refuge area are adjacent to the ocean beach at Bandon and are

accessible from the beach at low tide. Most rocks, however, are beyond the surf and accessible only by boat.

Ownership: Submerged and submersible (intertidal) lands: Division of State Lands; rocks above MHW not connected to land at high tide: US Fish and Wildlife Service; adjacent beach: Oregon Parks and Recreation Department; adjacent upland: mix of private, county, city, State Parks, and US Fish and Wildlife Service.

Key Resources: Nine species of seabirds use some 13 colony sites with over 30,000 birds total (common murre, pelagic and Brandt's cormorant, pigeon guillemot, western gull, tufted puffin, rhinoceros auklet, Leaches storm petrel, black oystercatcher); Aleutian Canada goose and brown pelican (threatened and endangered species); harbor seal haulouts and pupping areas; rocky intertidal habitat.

Uses and Management

Current Use: Recreational use of the adjacent beach is very high. With the exception of Cat and Kittens rocks, there is little boat traffic near the offshore rocks because they are either in or very near the surf most of the time. Boats sometimes approach Cat and Kittens rocks during calm weather. Low-flying aircraft frequently fly over the rocks.

Current Management: Rocks are managed as National Wildlife Refuge; beach is managed as ocean shore recreational area.

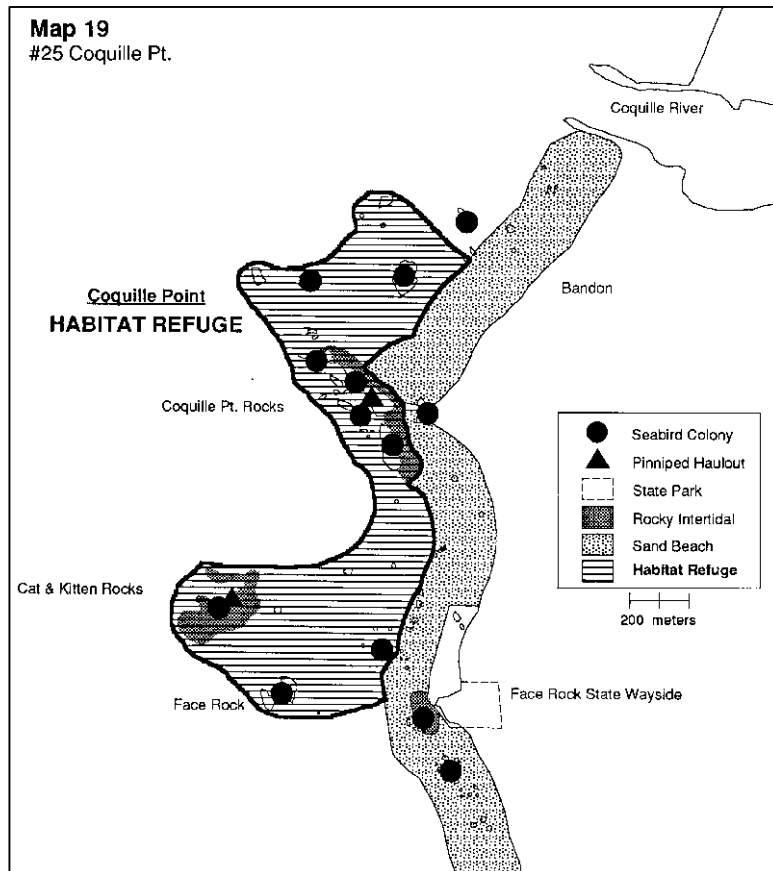
Impact Concerns: Disturbance to seabirds from boat traffic, low-flying aircraft, and illegal climbing on rocks; disturbance to harbor seals in haulout area from illegal climbing on the rocks.

Management Objectives: Protect and maintain the diversity and productivity of seabird marine mammal habitats while allowing appropriate use of adjacent ocean waters.

Management Prescriptions: Continue recreational uses and opportunities on nearby beaches; in addition:

- address problems of climbers on shoreline-accessible rocks through education rather than regulation;
- expand and support educational and informational programs of local volunteer groups and state and federal agencies.

Educational Opportunities: The Coquille Point site is well-suited to providing interpretive and informational materials and programs to increase public awareness of wildlife resources and values of the area. The existing Shoreline Education for Awareness organization could provide a nucleus for a strong community-based, on-site informational program to protect resources.



Map 19
#25 Coquille Point

26. Area Name: Blacklock Point

Designation: Not Yet Designated (Map 20)

Area Included: 1 mile of intertidal habitat at Blacklock Point 2.5 miles north of Cape Blanco.

Description

Blacklock Point is composed of ancient, resistant metamorphic rocks that were once quarried for use in San Francisco. Sedimentary rock layers on top of the point slope gradually to the north. The intertidal area on the south side of the point is composed of high-relief broken bedrock and very large boulders (remnants of the quarrying operation) with smaller sedimentary rocks and ledges on the north side.

Access: A mile-long trail through forest from Cape Blanco airport to the point, then a climb down a steep slope to the intertidal area.

Ownership: Submerged and submersible (intertidal) lands: Division of State Lands; offshore rocks above Mean High Water: U.S. Fish and Wildlife Service; upland above MHW and dry sands beach areas and uplands: Oregon Department of Parks and Recreation.

Key Resources: Rocky intertidal communities.

Uses and Management

Current Use: Use of the area is low due to remoteness and includes sightseeing, sport fishing from shore, and tidepooling.

Current Management: Uplands are part of Floras Lake State Park;

Impact Concerns: None

Management Objectives: None at present

Management Prescriptions: None at present

NOTE: Blacklock Point requires more information and assessment before assigning a management designation and prescriptions.

27. Area Name: Cape Blanco

Designation: *Research Reserve* (Map 20)

Area Included: 1.4 miles of intertidal and subtidal habitat at the tip of Cape Blanco.

Description

Excellent representation of several south coast marine ecosystem types are present at Cape Blanco. The rocky intertidal habitat has a very high diversity of plants and animals. Several species that are normally subtidal can be found in the intertidal area at Cape Blanco. The proximity of rich intertidal habitat and the dense kelp bed indicates that the subtidal reef habitat is very rich. Cape Blanco is subject to upwelling of ocean waters that brings important nutrients into marine food webs and probably contributes to the importance of the area for larval recruitment. The area is still relatively undisturbed due to low human use. The diversity of habitats and Cape Blanco's unique upwelling regime make it an ideal area for examining larval recruitment processes as well as conducting other types of scientific research.

Access: Trail from Cape Blanco State Park on north side; beach on south side.

Ownership: Submerged and submersible (intertidal) lands: Division of State Lands; offshore rocks above Mean High Water: U.S. Fish and Wildlife Service; upland above MHW: Bureau of Land Management; dry sands beach areas and nearby uplands: Oregon Department of Parks and Recreation.

Key Resources: Diverse, rich intertidal habitat; Harbor seal haulout and pupping areas; rocky subtidal habitat and kelp bed.

Uses and Management

Current Use: Uses of the area include scientific research, sightseeing, sport fishing from shore, clamming, and tidepooling. Use is relatively low due to difficult access and the remoteness of the area.

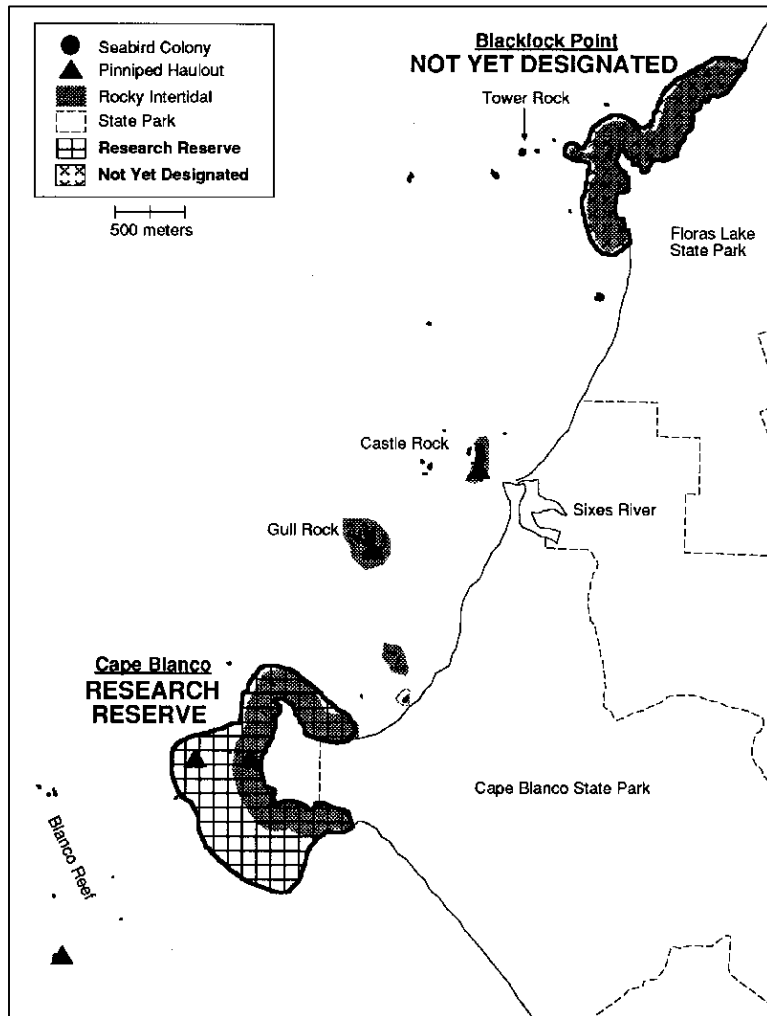
Current Management: Uplands managed as Cape Blanco State Park; BLM has recently acquired the lands to the Coast Guard lighthouse at the tip of cape.

Impact Concerns: Potential trampling impact to rocky intertidal habitat if use increases in the future; possible disturbance to harbor seal haulouts.

Management Objectives: To maintain the ecological integrity of the site for long-term research projects; allow continued level of use that does not interfere with research objectives.

Management Prescriptions: Continue low-level of uses; in addition:

- discourage improvements to trails to the rocky intertidal (other than routine maintenance);
- prohibit recreational and commercial collecting of intertidal invertebrates (except single mussels as bait);
- prohibit harvesting of intertidal marine algae (seaweeds);
- allow scientific research and educational collecting by permit.



Map 20
 #26 Blacklock Point
 #27 Cape Blanco

28. Area Name: Orford Reef

Designation: *Priority Rock/Reef Area* (Map 21)

Area Included: 3 miles southwest of Cape Blanco.

Description

This reef complex includes eight larger rocks and numerous smaller rocks over an area of about one and one-half square miles. The reef, its rocks, and the extensive bull kelp beds (*Nereocystis*) attached to the rocky bottom, provide diverse, rich habitat for marine life of all kinds, including marine mammals, seabirds, and reef communities. Although this area is located well offshore, its rich and varied resources are attracting increased numbers of users.

Access: Only by boat.

Ownership: Submerged and submersible rocks: Division of State Lands; offshore rocks above Mean High Water: U.S. Fish and Wildlife Service.

Key Resources: Seven species of seabirds breed here including approximately 38,000 common murrelets and 1,000 cormorants. Three species of pinnipeds use this area including 1,000 threatened Steller sea lions (25% of state total). This is the second largest pupping site for this threatened species in the U.S., south of Alaska. Orford Reef is especially rich in marine life because of the extensive beds of bull kelp that provide cover and upwelling that brings nutrients for marine life. The reef abounds in rockfish (Sebastes), many species of invertebrates including commercially valuable red sea urchins.

Uses and Management

Current Use: Recreational and commercial rock fishing, commercial sea urchin harvest.

Current Management: Rocks are managed as National Wildlife Refuge; ODFW has instituted a 1,000-foot-wide seasonal urchin fishery closure around Long Brown Rock and Seal Rock that has been supplanted by a voluntary seasonal closure of the urchin fishery for the entire reef during marine mammal pupping season. The National Marine Fisheries Service has designated a 3000-foot wide area around Orford Reef as critical habitat but has enacted no additional regulations. The reef complex is the site of small-scale experimental kelp harvest sponsored by the Division of State Lands.

Impact Concerns: Disturbance to marine mammal habitat and Steller sea lion reproductive success.

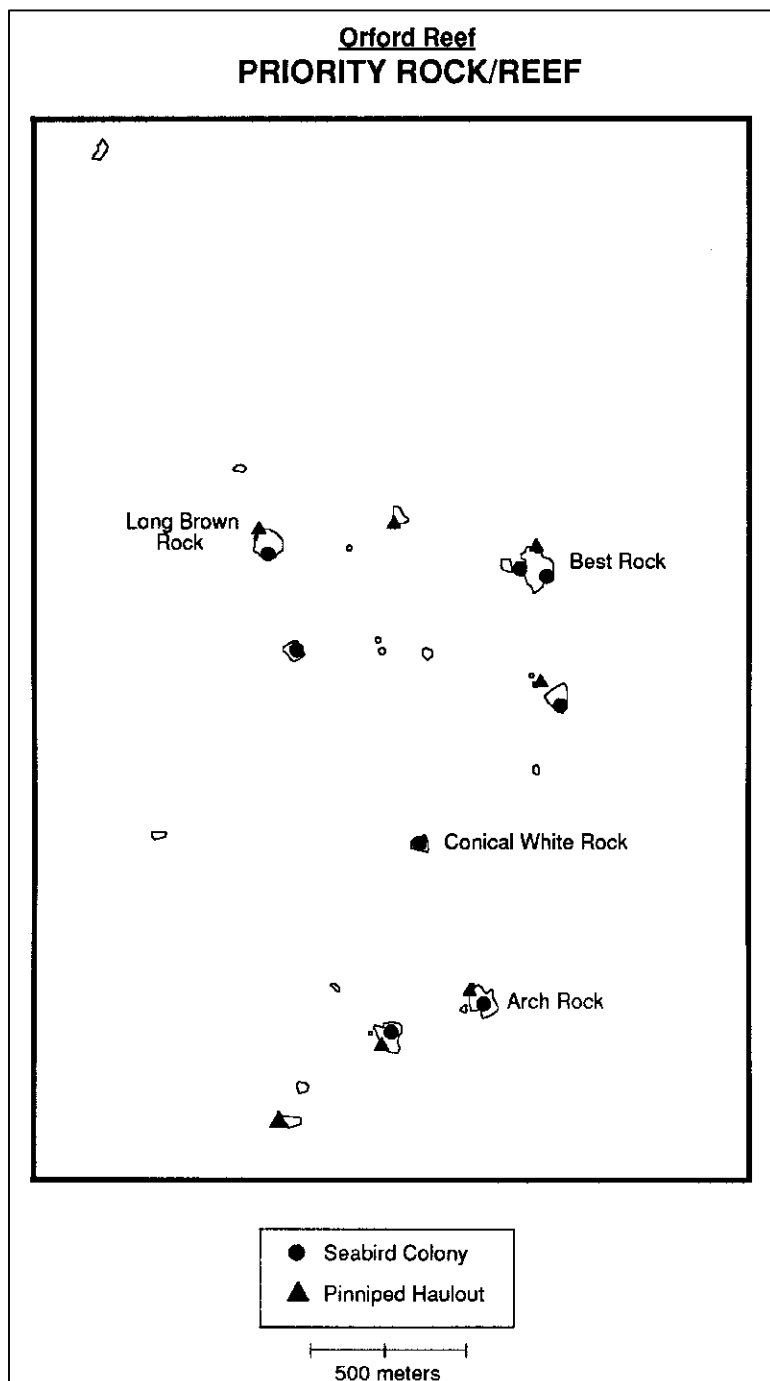
Management Objectives: Protect habitat values for marine mammals while allowing appropriate uses in adjacent ocean waters.

Management Prescriptions: No additional management measures at present;

NOTE: Orford Reef is designated as a "priority rock/reef" site for monitoring and possible study leading to additional management measures, if warranted.

Orford Reef
PRIORITY ROCK/REEF

Map 21
#28 Orford Reef



29. Area Name: Redfish Rocks/Island Rock

Designation: *Priority Rock/Reef* (Map 22)

Area Included: South of Port Orford: group of six Redfish Rocks are approximately 2 miles northwest of Humbug Mountain; Island Rock is about 1.5 mile west of Humbug Mountain.

Description)

These two sites, both with significant seabird breeding habitat, were combined into one since they are located near each other, have similar problems, and could probably be studied at the same time. Boat and aircraft traffic are potential sources of disturbance to seabird colonies on these rocks.

Access: By boat only.

Ownership: Submerged and submersible (intertidal) lands: Division of State Lands; rocks above Mean High Water: U.S. Fish and Wildlife Service.

Key Resources: There are seven species of seabirds breeding at Redfish Rocks including approximately 22,300 common murrelets and more than 600 cormorants. On Island Rock there are 11 species of seabirds breeding including more than 21,600 common murrelets, 1,000 cormorants, 1,500 western gulls, and 300 tufted puffins.

Uses and Management

Current Use: Submerged rocks are targeted for commercial urchin harvest; some commercial and recreational fishing (lingcod, Sebastes, etc.) in the waters adjacent to rocks.

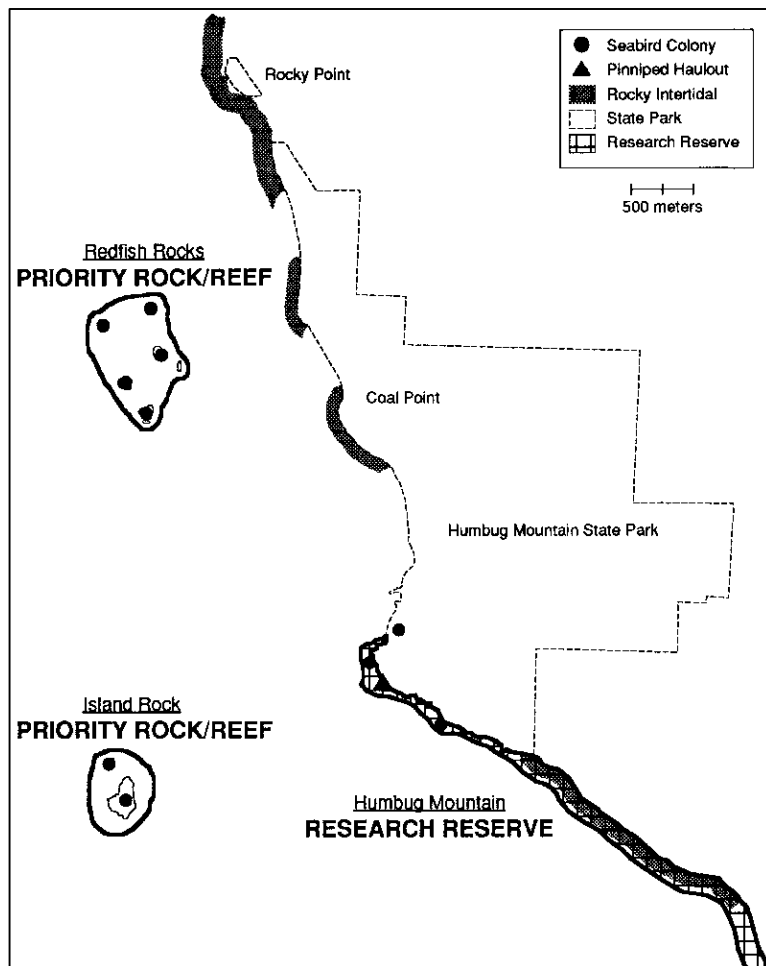
Current Management: Rocks are part of the Oregon Islands National Wildlife Refuge managed by the U.S. Fish and Wildlife Service.

Impact Concerns: Boat and aircraft traffic, particularly during late spring and summer seabird nesting and rearing season.

Management Objectives: Protect wildlife habitat values of the rocks while allowing appropriate use of adjacent ocean waters.

Management Prescriptions: No additional management measures at present;

NOTE: Redfish Rocks and Island Rock are designated as a "priority rock/reef" site for monitoring and possible study leading to additional management measures, if warranted.



Map 22
#29 Redfish Rocks &
Island Rock
#30 Humbug Mountain

30. Area Name: Humbug Mountain/Lookout Rock

Designation: *Research Reserve* (Maps 22 & 23)

Area Included: 5.4 miles of intertidal habitat located south of the westerly tip of Humbug Mountain.

Description

The area provides an excellent representation of several south coast ecosystem types. The rocky intertidal habitat has a very high diversity of marine plants and animals. The area is still relatively undisturbed due to low human use; this makes it an excellent area for conducting various types of scientific research.

Access: Several informal and somewhat difficult trails from Highway 101

Ownership: Submerged and submersible (intertidal) lands: Division of State Lands; several small offshore rocks above Mean High Water: U.S. Fish and Wildlife Service; dry sands beach areas and portions of adjacent uplands: Oregon Department of Parks and Recreation; other

adjacent uplands: private ownership.

Key Resources: Extensive, undisturbed, productive intertidal habitats; extensive kelp bed offshore.

Uses and Management

Current Use: Use of the intertidal area is very low, primarily hiking, tidepooling, and sport fishing from shore. There is significant commercial urchin harvest in the adjacent offshore kelp/reef area.

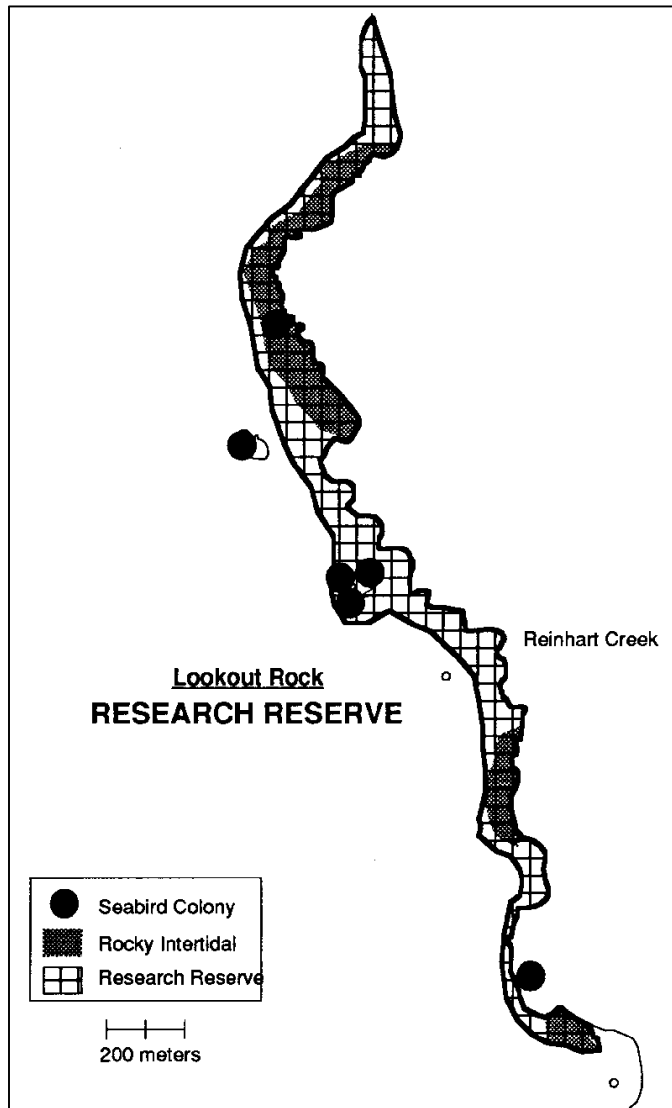
Current Management: None

Impact Concerns: None at present

Management Objectives: To maintain the ecological integrity of the site for long-term research projects; allow continued level of use that does not interfere with research objectives.

Management Prescriptions: Continue low-level of use of the area; in addition:

- make no improvements to access trails or parking on public lands;
- work with private landowners to discourage access improvements;
- prohibit recreational and commercial harvest of intertidal plants and invertebrates (except single mussels as bait);
- allow research collection of intertidal invertebrates and marine algae (seaweeds) by permits.



Map 23

#30 Humbug Mountain/Lookout Rock

31. Area Name: Sisters Rock/Devil's Backbone

Designation: Not Yet Designated (Map 24)

Area Included: 2.7 miles of cliffs, offshore rocks, and rocky intertidal habitat located about midway between Port Orford and Gold Beach.

Description

The area includes a cluster of large sea stacks that form Sisters Rocks and a series of rocky intertidal areas separated by sandy beaches and small headlands. The area is still relatively undisturbed due to limited access and low use.

Access: Access to the Sisters Rocks area is from a short gravel road off of Highway 101. Most of the area south of Sisters Rocks to Devils Backbone is private and has restricted access.

Ownership: Submerged and submersible (intertidal) lands: Division of State Lands; several small offshore rocks above Mean High Water: U.S. Fish and Wildlife Service; dry sands beach areas: Oregon Department of Parks and Recreation; North Sisters Rock on adjacent uplands: Bureau of Land Management; other adjacent uplands: private ownership.

Key Resources: Rocky intertidal habitat; six seabird colony sites.

Uses and Management

Current Use: Activities include beachcombing, tidepooling, sport fishing, bird watching, SCUBA diving, and sea kayaking. The beach at Sisters Rocks is easily accessible to vehicles but receives only low to moderate use due to the relatively undeveloped nature of this site. Devil's Backbone and the rocky shoreline to the north receive little use due to difficult or restricted access.

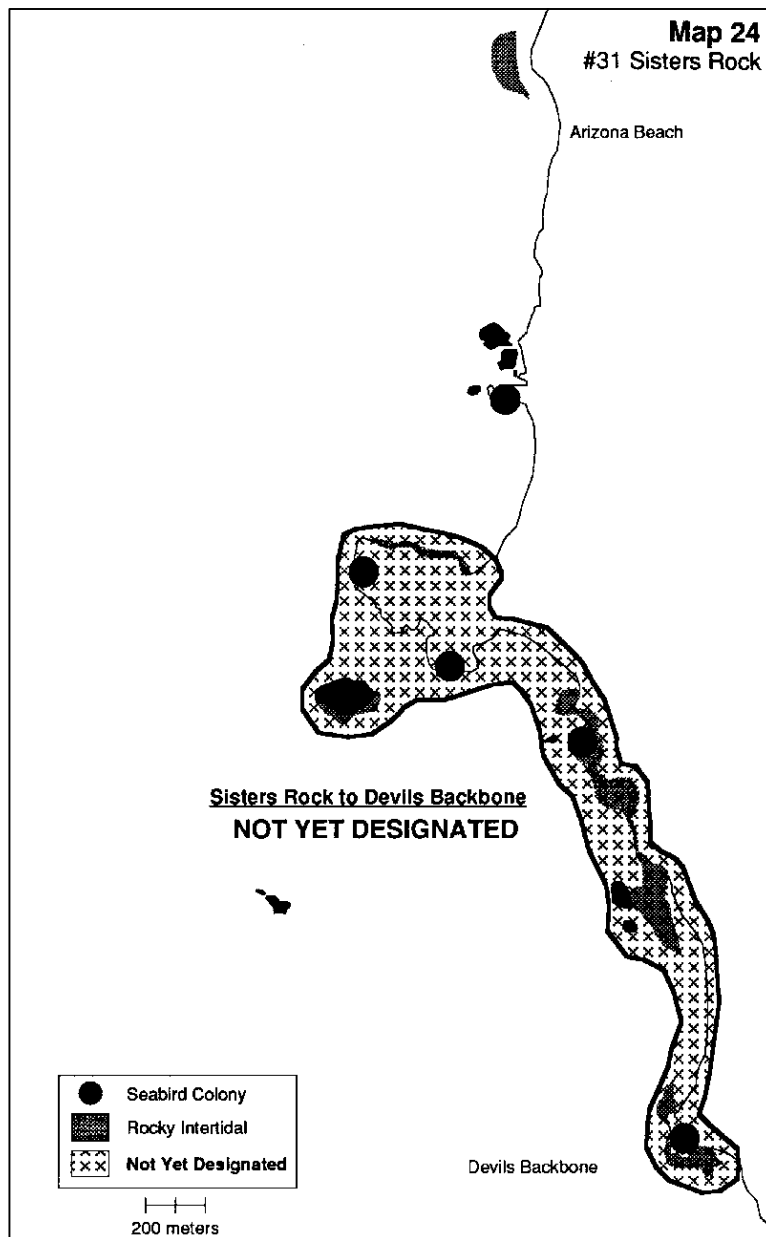
Current Management: General wildlife regulations.

Impact Concerns: Possible disturbance to seabirds by boaters and kayakers at Sisters Rocks; possible increase in disturbance if BLM develops day-use facilities at Sisters Rocks.

Management Objectives: None at present

Management Prescriptions: None at present

NOTE: This area needs more detailed study and assessment before designation into one or more rocky shore management categories.



Map 24
#31 Sisters Rock

32. Area Name: Nesika Head to Otter Pt.

Designation: Not Yet Designated (Map 25)

Area Included: 4.1 miles of cliffs and rocky intertidal habitat located just north of the Rogue River in Curry County.

Description

This area includes extensive rocky intertidal areas, steep cliffs, sand and gravel beaches, and numerous low-elevation offshore rocks. Otter Point State Wayside provides public access

facilities at the south end of the area.

Access: Access to the Otter Point and the beach to the north is from the Otter Point Wayside. Most of the area to the north is private and has restricted access.

Ownership: Submerged and submersible (intertidal) lands: Division of State Lands; several small offshore rocks above Mean High Water: U.S. Fish and Wildlife Service; dry sands beach areas and adjacent uplands at Otter Point: Oregon Department of Parks and Recreation; other adjacent uplands: private ownership.

Key Resources: Extensive rocky intertidal habitat; six seabird colony sites

Uses and Management

Current Use: Uses include picnicking, beachcombing, tidepooling, sport fishing, bird watching and whale watching. Rocky intertidal areas at each site receive low to moderate human use, primarily by local residents. Use of Otter Point State Wayside is currently low. Beach access to areas near Hubbard Mound and Nesika Beach is limited by private land ownership.

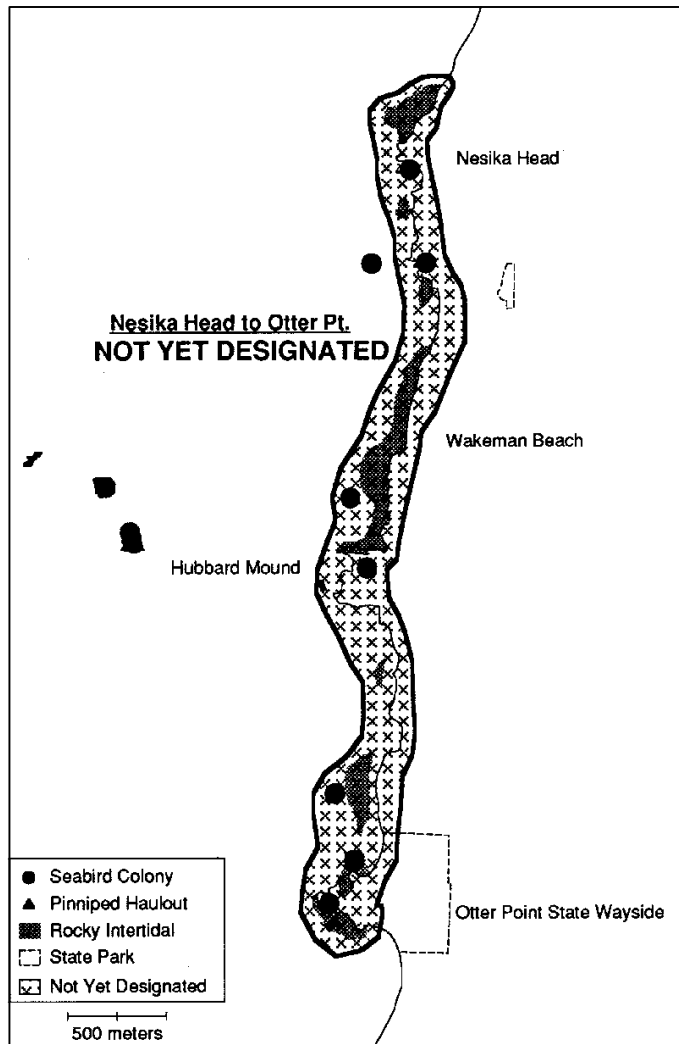
Current Management: General wildlife regulations.

Impact Concerns: Possible disturbance to seabirds and other nesting birds at Otter Point due to foot traffic.

Management Objectives: None at present.

Management Prescriptions: None at present.

NOTE: This area needs more detailed study and assessment before designation into one or more rocky shore management categories.



Map 25

#32 Nesika Head/Otter Point

33. Area Name: Rogue Reef

Designation: *Priority Rock/Reef* (Map 26)

Area Included: Approximately 2 miles northwest of the mouth of the Rogue River.

Description

Rogue Reef complex includes three large rocks and many smaller ones over one and one-quarter square miles. Seven species of seabirds and three species of pinnipeds, including Steller sea lions, use this area. The rocky reef substrate, bull kelp (*Nereocystis*), and strong summer upwelling result in a very productive reef ecosystem that includes commercially valuable red sea urchins, several species of rockfish, and kelp. The reef is a destination for commercial and recreational fisheries.

Access: By boat only

Ownership: Submerged and submersible portions of rocks and reef: Division of State Lands; rocks above Mean High Water: U.S. Fish and Wildlife Service.

Key Resources: Approximately 4,000 common murre and more than 500 Brandt's cormorants nest here. More than 1,800 threatened Steller sea lions (45% of state total) use this reef, forming the largest pupping site for this species in the U.S., south of Alaska. Over 300 harbor seals are also found here. There is significant harvest of red sea urchins from the reef. There are large kelp beds (*Nereocystis*) in the reef complex.

Uses and Management

Current Use: Commercial harvest of red sea urchins; commercial and recreational fishing for Sebastes, lingcod, and other fish; some sport SCUBA diving.

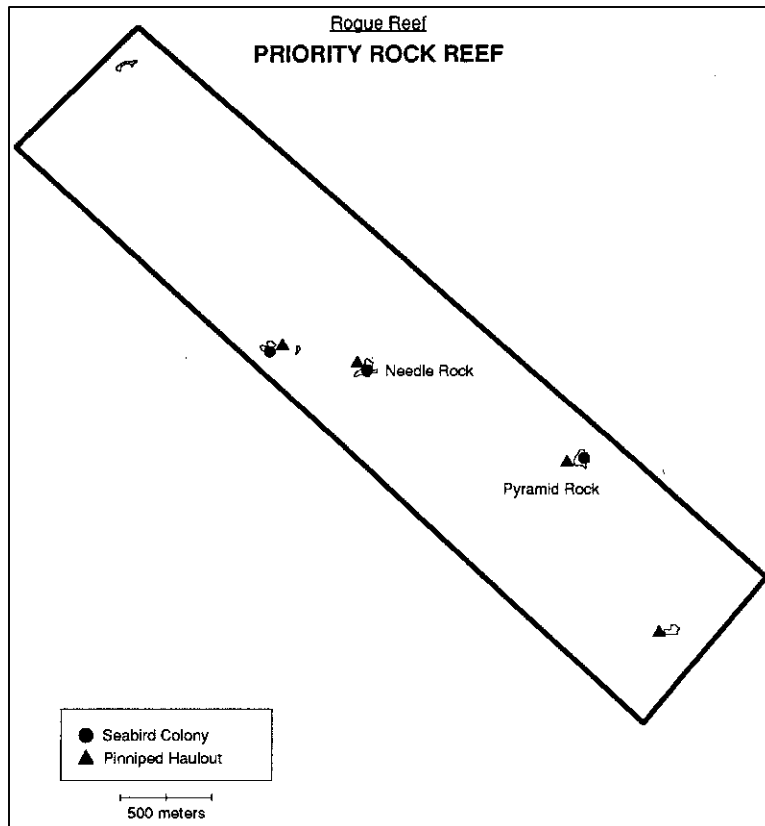
Current Management: Rocks are managed as Oregon Islands National Wildlife Refuge. The ODFW has established a 1000-foot seasonal closure to all fishing around Pyramid Rock from May 1 to August 31. The National Marine Fisheries Service has designated a 3000-foot wide area around Pyramid Rock as critical habitat but has enacted no additional regulations.

Impact Concerns: Commercial and recreational boat activity from Gold Beach is the main concern that has prompted the seasonal fishery closure around Pyramid Rock. Low-flying aircraft from nearby Gold Beach airport pose an additional concern.

Management Objectives: Protect wildlife habitat values of the reef while allowing appropriate use of adjacent ocean waters.

Management Prescriptions: No additional management measures at present;

NOTE: Rogue Reef is designated as a "priority rock" site for monitoring and possible study leading to additional management measures, if warranted.



Map 26
#33 Rogue Reef

34. Area Name: Crook Point/Mack Reef

Designation: *Habitat Refuge* (Map 27)

Area Included: 1.4 miles of offshore rocks, cliffs, rocky intertidal, and subtidal reef/kelp beds on Mack Reef and near Crook and Mack Points in Curry County.

Description

The area provides an excellent representation of several south-coast ecosystem types, including sea cliffs, rocky intertidal and associated subtidal rocks, and offshore rocks and reefs. The larger rocky intertidal area to the south is one of the most diverse in Oregon (see also Hooskanaden Creek).

Access: Access to the Crook Point area is a two-mile walk along the beach from Pistol River State Park.

Ownership: Submerged and submersible (intertidal) lands: Division of State Lands; offshore rocks above Mean High Water: U.S. Fish and Wildlife Service; dry sands beach area and portions of adjacent uplands: Oregon Department of Parks and Recreation; other adjacent uplands: private ownership.

Key Resources: Rocks off Crook Point and within the Mack Reef complex support the second

largest seabird nesting area in Oregon (the largest is at Three Arch Rocks); 11 of the 13 seabird species that nest in Oregon use the area at 14 colony sites with over 200,000 birds total; peregrine falcon and brown pelican (threatened species); harbor seal haulout and pupping area; small rocky intertidal habitats that support a diverse array of invertebrates and algae; a large (300-acre) bed of bull kelp (*Nereocystis*) indicates rich subtidal reef habitat on Mack Reef.

Uses and Management

Current Uses: Little use of the shoreline due to the poor access; use of Mack Reef includes commercial hook-and-line fishing and some commercial urchin harvest.

Current Management: National Wildlife Refuge (offshore rocks).

Impact Concerns: Disturbance to seabirds from boats and low flying aircraft; possible disturbance to upland seabird colonies at Crook Point if site is developed.

Management Objectives: Protect habitat values of the rock/reef complex while allowing compatible uses of adjacent ocean waters.

Management Prescriptions: Maintain current ocean and shore uses; in addition:

- discourage improvements to public access at Crook Point;
- allow no commercial kelp (*Nereocystis*) harvest in the area;
- monitor status of seabird colonies and any effects from uses of the area;
- if development is proposed, work with landowners at Crook Point to address needs for habitat protection.

35. Area Name: Hooskanaden Creek

Designation: *Habitat Refuge* (Map 27)

Area Included: 0.7 miles of intertidal habitat located about 3 miles south of Crook Point in Curry County.

Description

The intertidal habitat has one of the most diverse assemblages of marine invertebrates on the entire coast. The habitat is still relatively intact and undisturbed because of difficult access and low use.

Access: trail from a small turnout off Highway 101.

Ownership: Submerged and submersible (intertidal) lands: Division of State Lands; adjacent beaches and upland: Oregon Park and Recreation Department.

Key Resources: Productive and diverse intertidal habitat; two small seabird nesting colonies.

Uses and Management

Current Use: Relatively low level of use due to remote location and lack of well-marked access and parking. Uses include hiking, scientific research, tidepooling, and sport fishing from shore.

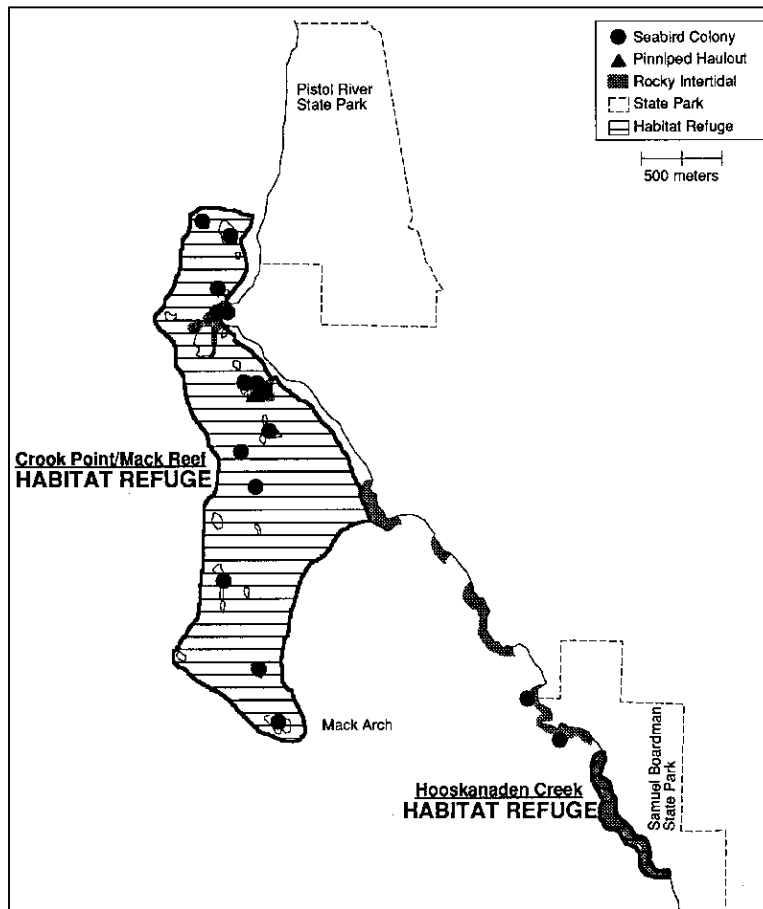
Current Management: Sam Boardman State Park (upland).

Impact Concerns: Degradation of unique intertidal habitat if use increases in the future.

Management Objectives: Maintain undisturbed intertidal habitat.

Management Prescriptions: Continue existing management; in addition:

- discourage additional use of intertidal area by not improving or adding new access or parking;
- prohibit collection or harvest of intertidal organisms, including marine invertebrates and marine algae (seaweeds), except single mussels for bait;
- allow research-related collection by permit only.



Map 27
#34 Mack Reef
#35 Hooskanaden Cr

36. Area Name: Cape Ferrelo

Designation: *Habitat Refuge* (Map 28)

Area Included: 2.8 miles of cliff and intertidal habitat at Cape Ferrelo in Curry County.

Description

The intertidal habitat has a very diverse collection of marine invertebrates and algae. The habitat and marine biologic communities are relatively intact and undisturbed.

Access: There is no access to most of the shore in the area. The wayside at Lone Ranch Beach provides shore access at the south end of the area. Steep, unimproved, locally known trails provide access to some other segments of beach within the area.

Ownership: Submerged and submersible (intertidal) lands: Division of State Lands; offshore rocks above Mean High Water: US Fish and Wildlife Service; adjacent beaches and upland: Oregon Park and Recreation Department.

Key Resources: Rich and diverse undisturbed intertidal habitat; three small seabird colony sites; harbor seal haulout.

Uses and Management

Current Use: Low use due to remote location, the lack of access and limited parking, especially the north end. Most use is restricted to the area near Lone Ranch Beach and includes hiking, tidepooling, sport fishing from shore, and educational uses.

Current Management: Upland managed as Sam Boardman State Park.

Impact Concerns: Degradation of productive and undisturbed intertidal habitat if use increases in the future.

Management Objectives: Maintain undisturbed intertidal and associated subtidal habitat.

Management Prescriptions: Continue existing management; in addition:

- discourage additional use of intertidal area by not improving or adding new access or parking except at Lone Ranch where public facilities are provided;
- prohibit collection or harvest of intertidal organisms, including marine invertebrates and marine algae (seaweeds), except single mussels for bait;
- allow research-related collection by permit only.

37. Area Name: South Sam Boardman State Park

Designation: Not Yet Designated (Map 28)

Area Included: 1.6 miles of intertidal habitat located just north of Brookings.

Description

This area has extensive intertidal habitat composed of bedrock, boulders, and cobbles, partly protected from the open sea by numerous offshore rocks. The intertidal communities are probably very diverse due to the many types of substrate and wave exposure.

Access: Access is a short walk along Lone Ranch Beach starting from Lone Ranch State Wayside.

Ownership: Submerged and submersible (intertidal) lands: Division of State Lands; offshore rocks above Mean High Water: US Fish and Wildlife Service; adjacent beaches and upland: Oregon Park and Recreation Department.

Key Resources: Rich and diverse intertidal habitat

Uses and Management

Current Use: Activities include sightseeing, beachcombing, tidepooling, bird watching, sport fishing, SCUBA diving, and sea kayaking. Lone Ranch Beach has a large parking lot and day-use facilities and receives heavy use from local residents and tourists traveling along Highway 101.

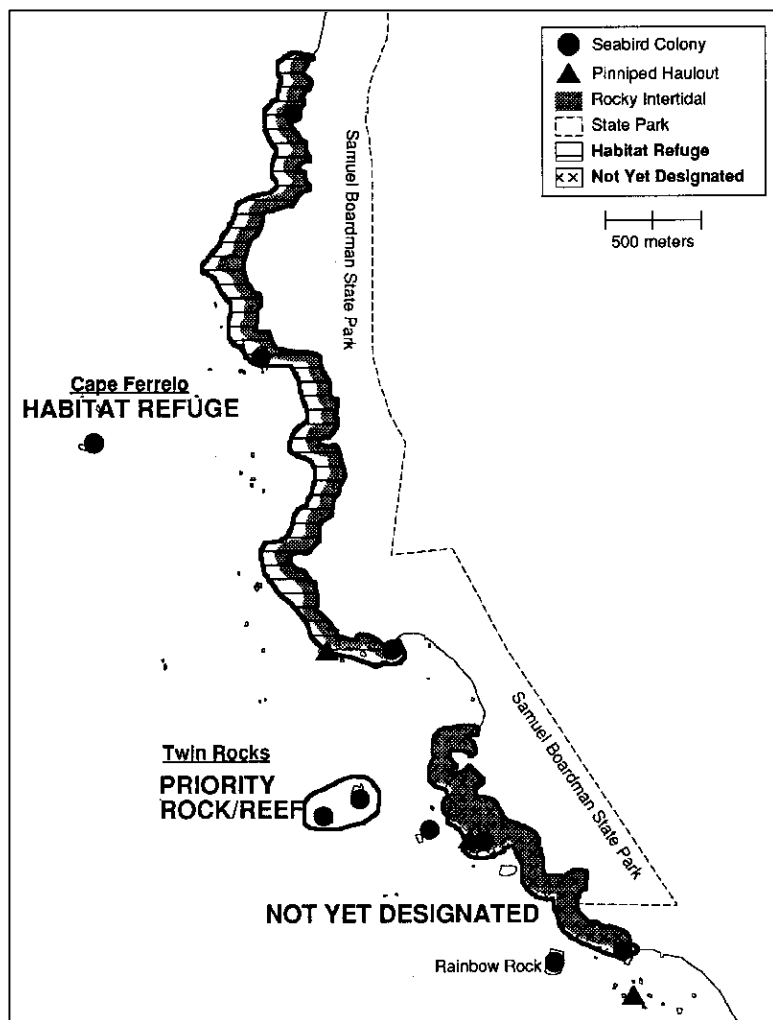
Current Management: Sam Boardman State Park.

Impact Concerns: Degradation of productive and undisturbed intertidal habitat if use increases in the future.

Management Objectives: None at present

Management Prescriptions: None at present

NOTE: This area needs more detailed study and assessment before designation into one or more rocky shore management categories.



Map 28
 #36 Cape Ferrelo
 #37 South Sam Boardman

38. Area Name: Twin Rocks/Goat Island

Designation: *Priority Rock/Reefs* (Maps 28 & 29)

Area Included: Twin Rocks is 500 yards offshore Lone Ranch Beach, Goat Island is approximately four miles to the south about 500 yards offshore Harris Beach State Park just north of Brookings. These two sites and the area in between them were combined into one since they are located near each other, having similar problems, and could be studied at the same time as a unit.

Description

These two offshore sites have significant seabird breeding colonies on them and are located in an area of high recreational boating traffic.

Access: By boat only from Chetco River entrance at Brookings.

Ownership: Submerged and submersible (intertidal) lands: Division of State Lands; offshore

rocks above Mean High Water: US Fish and Wildlife Service; adjacent beaches and upland: Oregon Park and Recreation Department.

Key Resources: There are six species of seabirds breeding at Twin Rocks including more than 10,000 common murre. On Goat Island there are 11 species of seabirds breeding including more than 4,800 common murre, 400 Brandt's cormorants and 1,300 western gulls. Threatened or endangered species using the area include peregrine falcons, brown pelicans, and Aleutian Canada geese. Small groups of harbor seals occur throughout the area.

Uses and Management

Current Use: Recreational and commercial fisheries in surrounding ocean waters, including red sea urchins.

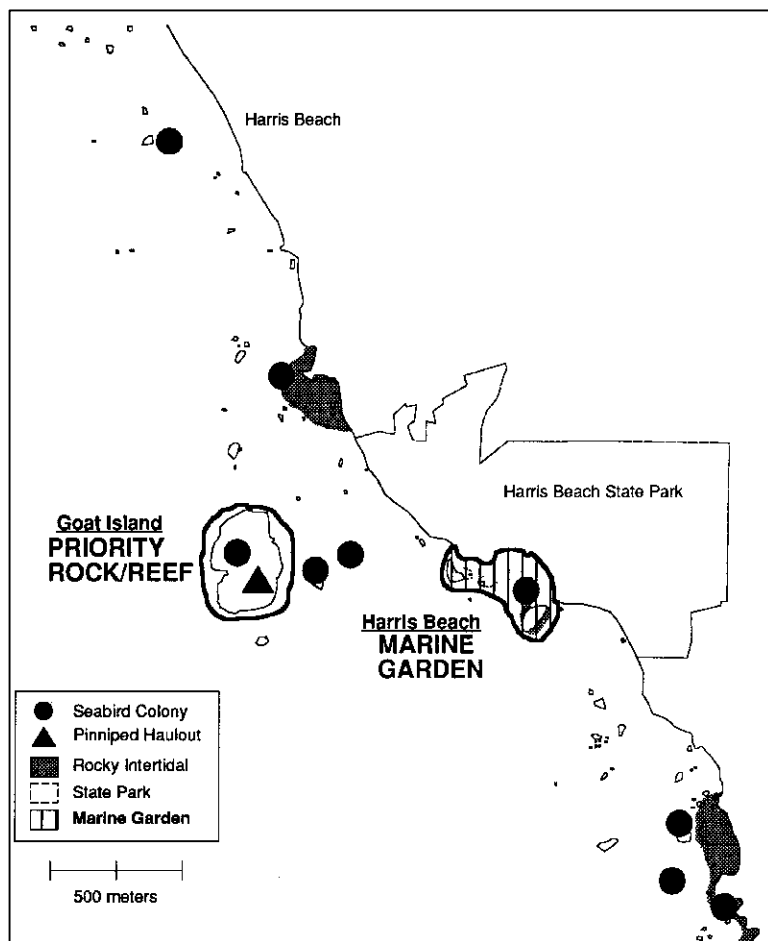
Current Management: Rocks managed as National Wildlife Refuge; upland managed as Sam Boardman State Park.

Impact Concerns: Disruption of seabird breeding colonies and degradation of seabird populations.

Management Objectives: Protect wildlife habitat values of the reef while allowing appropriate use of adjacent ocean waters.

Management Prescriptions: No additional management measures at present.

NOTE: Twin Rocks and Goat Island are designated as "priority rock and reef" sites for monitoring and possible study leading to additional management measures if warranted.



Map 29
 #38 Goat Island
 #39 Harris Beach

39. Area Name: Harris Beach

Designation: *Marine Garden* (Map 29)

Area Included: 0.4 miles of intertidal habitat at north end of City of Brookings.

Description

Harris Beach has a substantial intertidal environment that is one of the highest use intertidal area on the south coast.

Access: Well-marked, easy trail from Harris Beach State Park.

Ownership: Submerged and submersible (intertidal) lands: Division of State Lands; offshore rocks above Mean High Water: US Fish and Wildlife Service; adjacent beaches and upland: Oregon Park and Recreation Department.

Key Resources: Easily accessible intertidal habitat; Goat Island is just offshore.

Uses and Management

Current Use: Relatively high use from adjacent state park; uses include educational activities, tidepooling, sightseeing, and sport fishing from shore. State Park provides interpretive services on site.

Current Management: The intertidal area is currently managed by the ODFW as an area where collecting or harvesting of invertebrates except by scientific/educational permit. The upland is managed as Harris Beach State Park.

Impact Concerns: Overuse of the intertidal area from visitor trampling.

Management Objectives: To enhance enjoyment and appreciation of intertidal resources while protecting intertidal area from effects of overuse.

Management Prescriptions: Continue public use of entire area;

- monitor impacts to intertidal area and implement rotational area closures as necessary to allow recovery of habitat;
- prohibit harvest of intertidal algae (seaweeds);
- prohibit harvest of intertidal invertebrates (except single mussels as bait).

Educational Opportunities: Harris Beach, the southernmost Marine Garden, is ideally situated as a site for public interpretive and informational displays about Oregon's rocky-shore resources and areas. Such a program could include material on all kinds of rocky shores, including intertidal and offshore rocks and reefs.



PART THREE:

Rocky Shores Management Strategy

H. ROCKY SHORE MANAGEMENT AT CAPE ARAGO

Amendment of May 4, 2001

Note: The policies in this section were adopted by the Land Conservation and Development Commission May 4, 2001, and were thereby added to the Oregon Territorial Sea Plan. Management prescriptions for Cape Arago adopted in 1994 and listed in Part Three, Sections F and G, above, are superseded.

Background

In 1997, the Ocean Policy Advisory Council (OPAC) heard testimony on the need to amend provisions of the Rocky Shores Management Strategy in the Oregon Territorial Sea Plan that pertain to intertidal areas of the Cape Arago headland. The OPAC established a community-based planning project in the Coos Bay area that was conducted during 1997-1998. The community working group presented its report and recommendations to OPAC in September, 1998. On June 4, 1999, the OPAC adopted the report and recommendations of the Cape Arago Working Group and now requests that the Land Conservation and Development Commission amend the Territorial Sea Plan as necessary to incorporate the specific recommendations.

The OPAC realizes that some re-formatting and organizing of Part Three, Rocky Shores Management Strategy, may be necessary because the Cape Arago Working Group considered the uses, resources, and management of the entire headland, a rocky shore “cell” that includes several sites. Its perspective and recommendations thus apply to the entire headland and are not limited to specific sites or areas as is the organization of Part Three.

OPAC staff suggests that this provides an opportunity to re-format the entire rocky shore section to reflect the organization of rocky shore sites into larger cells as shown on the maps in the Appendix of the Territorial Sea Plan, pp 225-226. Such re-formatting will set the stage for future amendments based on assessments of entire cells that encompass related sites, which the OPAC is actively considering, and can be accomplished without changing the existing substantive management requirements now contained in the officially adopted plan.

Amendments to Territorial Sea Plan

The Land Conservation and Development Commission amends the Rocky Shores Strategy (pp. 65-192) to incorporate the following management policies:

For the entire Cape Arago headland,

1. The Oregon Parks and Recreation Department shall:

A.) identify, through signage and educational and promotional materials, the intertidal area around the entire headland, from Gregory Point to south of South Cove, as an **Intertidal Marine Protected Area**. This designation is for public awareness value only; it neither

creates nor requires new regulatory or enforcement authority. OPRD shall use this identity to promote responsible visitation and stewardship to intertidal areas.

B.) continue to prohibit collection or harvest of intertidal marine plants of the Cape Arago headland, except by special ODFW permit for educational or scientific purposes.

C.) continue to close the trail to North Cove during spring marine mammal pupping seasons as a precaution against human disturbance to harbor seal pups and to elephant seals and Steller sea lions.

D.) continue to work with the community and other agencies to protect the tidepools on Cape Arago from overuse by school groups and other visitors.

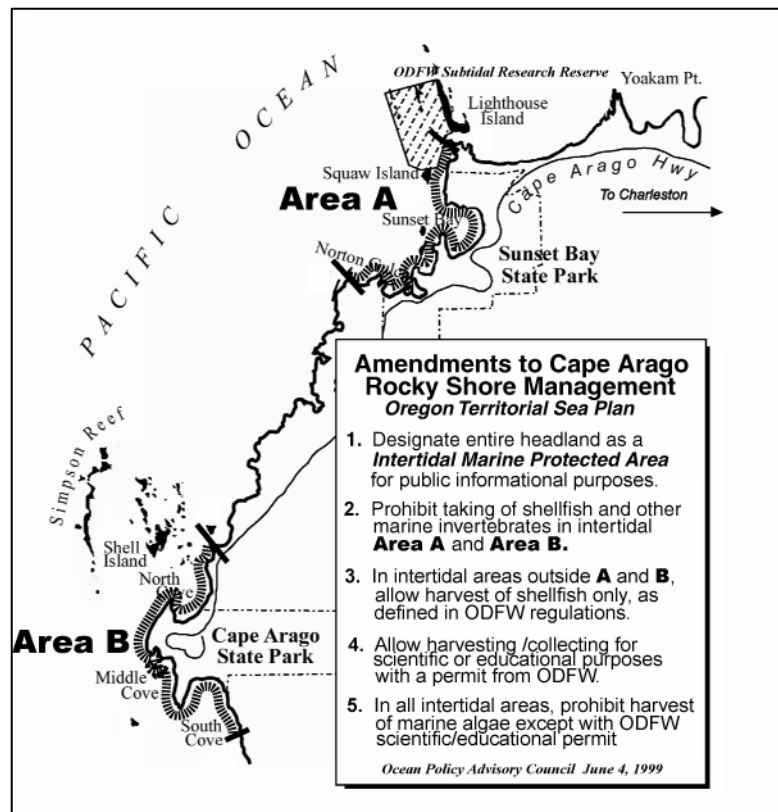
2. The Oregon Department of Fish and Wildlife shall:

A.) adopt new regulations to prohibit the taking of all shellfish and marine invertebrates, except by scientific research and education permit, in two intertidal areas (see map): **Area A**, which extends from Squaw Island on the north side of Sunset Bay to the most westerly point along the south side of Norton Gulch area; and **Area B**, which extends from the point of land below the Simpson Reef overlook to the southerly extent of the present Research Reserve south of South Cove.

B.) retain current regulations in intertidal areas outside Area A and Area B that allow harvest of shellfish, defined in regulations as abalone, clams, Dungeness crab, red rock crab, mussels, piddocks, scallops, shrimp, and kelp worms **ONLY**, and prohibit the harvest of other marine invertebrates as defined.

C.) continue to issue permits for collecting intertidal marine invertebrates for scientific research and educational purposes for all areas of the headland.

D.) make improvements to its permit program, such as issuing a visible permit that is required to be displayed on-site.



Outline Map of the Cape Arago Headland
Showing Intertidal Management Areas and List of Key Recommendations

1994 Territorial Sea Plan

Appendix H:

Classifying Oregon's Rocky Shores

1. Overview of Oregon's Rocky Shores

Oregon has developed a system of classifying its shoreline as a framework for managing various shoreline areas. Quite simply, this system is built so that the coast may be viewed in its entirety as part of a larger coastal environment or as smaller and smaller areas until at last the coast is seen as individual rocks and beaches with crevices and pools. The shoreline-classification system fits the work of the Ocean Policy Advisory Council in building management measures for Oregon's rocky shores. But the system also fits the work of other elements of Oregon's Coastal Management Program to address the emerging problems of beach sand supply, dune dynamics, and coastal erosion along Oregon's sandy beaches. The system thus reflects the Oregon coast: sandy beaches (or littoral cells) enclosed by rocky headlands (rocky cells). Cells, whether littoral or rocky, are the central unit of scale in this system.

Oregon's shoreline-classification system is structured to reflect and accommodate the unique properties of scale, linkage, and dynamics in the marine environment. These three conditions were previously acknowledged in the Oregon Ocean Resources Management Plan (1991) by designating a broad Ocean Stewardship Area, adopting a habitat-based approach to management, and designating specific resource sites for further planning to resolve management needs.

This is not a marine-habitat-classification system. It is, rather, a framework for describing and locating the various geomorphic units and their habitats along the coast. Other work will be needed to describe and classify Oregon's marine habitats that can then be located, referenced, or characterized at a variety of scales within the system below.

2. Environmental Considerations

a. Scale (Sizes)

The scale of the marine environment is vast; yet the scale of definable habitats and human use can be much smaller, often at a very precise location. The marine environment thus requires that management account for the tremendous differences in scales of reference. The concept of Large Marine Ecosystems, based on broad regional distinctions and characteristics, is the basis for Oregon's shoreline classification system, which also allows for increasingly fine scales of geographic and ecological resolution and for choosing appropriate scales of research and management.

b. Linkage (Connectivity)

Areas or locations in the ocean are linked by the continuously flowing masses of water and by migrating, roaming, or drifting marine plants and animals. Marine life in any given area is

sustained by nutrients suspended in the flowing water column; the phytoplankton, which fix the sun's energy, are effectively part of the water mass, and eggs and larvae from animals at one site are borne to habitat sites some distance away. There are virtually no points within the marine environment, off Oregon or anywhere else, that are isolated. Similar habitat conditions at distantly separated sites in a given region will have the same or very similar biotic communities. Likewise, pollutants from one source can effect marine areas far away. This linkage is modified by time. While some species take full advantage of the water flow and reproduce widely, the reproductive mode of other species is quite localized, which means that colonization to distant sites may take many, many years until the right conditions prevail.

c. Dynamics (Changes)

The dynamic conditions of the marine environment continuously change with a host of variables: tidal height, seasonal sunlight, storms waves, water depth, upwelling, riverine runoff, seafloor type or topography, etc. Oregon's marine environment is particularly influenced by the seasonal outflow of fresh water from the Columbia River and other coastal streams, and by upwelling created by summer winds. Large-scale events, such as an El Nino, punctuate these routine dynamics and increase complexity. These dynamic variables influence rocky shore areas and their management.

3. Kinds of Rocky Shores

a. Overview

For management purposes Oregon's rocky shores are grouped into two major categories:

- **Shoreline types** include rocky tidepool areas as well as associated submerged rocks or reefs and nearby rocks, which may be reached by foot from shore (regardless of hazard or convenience).
- **Offshore types** include underwater reefs or rocky islands accessible only by boat. Aircraft overflight and associated wildlife impacts are common to both nearshore and offshore sites.

These categories are based on a fundamental distinction in management related to human access. Access by foot to shoreline sites and related rocks or reefs at low tide creates a different set of management issues from access by boat to reefs or rocks farther from shore.

Oregon's rocky-shore types are described primarily on geomorphology and, to a lesser extent, on habitat type.

b. Shoreline Types

1.) Cliffs

As used here, cliffs are the steep seaward facing slopes of rocky headlands composed primarily of basalt (north coast) and metamorphic or highly resistant sedimentary rock (south coast) where wave action and other weathering agents have eroded a vertical or nearly vertical rocky slope with little or sparse vegetation which plunges directly into the ocean; the exposed slope is either inaccessible or very dangerous to human trespass. Cliffs provide isolated nesting and resting habitat for seabirds, but can also enclose and thereby protect marine mammal or intertidal habitat along the toe of the cliff.

Many cliff sites are in public ownership: State Parks and Recreation, U.S. Forest Service, Bureau of Land Management or U.S. Fish and Wildlife Service. Others, such as the Sea Lion Caves area or cliffs south of Cape Arago are in private hands. Most are planned and zoned as part of the respective coastal county land use plan. Cliffs are included as coastal shorelands under Statewide Planning Goal 17.

2.) Rocky Intertidal

Rocky intertidal areas encompass a variety of hard, rocky sites covered and uncovered daily by the tide and areas subject to splash and spray many feet above water level. Most are wave-eroded bedrock platforms with associated remnant rocks and boulders. At some sites, boulder fields at the base of a rocky cliff predominate. Exposure to the ocean varies from site to site: most are exposed or semi-exposed; a few are partially protected.

All rocky intertidal sites are held in trust by the State Land Board for the owners: the people of Oregon. Management is complex; the areas are administered jointly by the Division of State Lands exercising ownership responsibilities on behalf of the State Land Board and by the Department of Parks and Recreation for public recreation under the Beach Bill. The Department of Fish and Wildlife regulates harvesting, collecting, or taking of animals.

Because use of associated reefs and rocks is often directly related to attractiveness and activities of a rocky intertidal site, rocky intertidal areas are the central element of coordinated management efforts along the entire rocky shoreline.

3.) Associated Reefs

At some rocky-shore sites, submerged bedrock or boulders form reefs in direct association with rocky intertidal areas. These associated reefs, below Extreme Low Water, are generally geologic extensions of rocky intertidal or cliff areas along the shore. Reefs may also be associated with rocks, which are exposed above the water at high tide.

These Associated Reefs within the Territorial Sea are held in trust by the State Land Board for the people of Oregon. The Department of Fish and Wildlife controls harvest of fish and shellfish through general regulations. The Department of Parks and Recreation has no management authority or responsibility for submerged reefs.

4.) Associated Rocks

Rocks projecting above Mean High Water occur in association with many rocky intertidal sites. Some are large and significant, as at Yaquina Head or Cape Arago, while others are small and have no name or designation.

Almost all rocks above Mean High Water within Oregon's territorial sea are designated as part of the Oregon Islands National Wildlife Refuge. The Division of State Lands has jurisdiction below Mean High Water.

c. Offshore Rocky Types

These sites are generally accessible only by boat or aircraft. These reefs and rocks have valuable habitat that may be similar to those nearer shore, but physical isolation at sea generates a unique set of management requirements and opportunities.

1.) Offshore Reefs

The reefs in Oregon's Territorial Sea are submerged rock formations (but may also include individual rocks that project above the surface) with a variety of compositions: bedrock with pinnacles reaching toward the surface, boulders, cobbles, and, in some cases, intermixed gravel or sandy patches. All are exposed to high-energy ocean currents and wave mixing. These reefs provide diverse, valuable habitat for marine life.

Offshore reefs within three miles of shore are under the jurisdiction of the Division of State Lands as submerged lands. The Division has general authority to lease submerged lands and specific authority to lease for the commercial harvest of kelp, which grows only on a rocky substrate. Sport and commercial harvest of fish and shellfish is regulated by the Department of Fish and Wildlife.

Oregon has not historically managed offshore reefs as distinct or unique habitats. However, Oregon is establishing a planning framework to provide a basis for future management of uses and resources of reef areas because of four factors:

- increasing use of these areas for commercial and sport fin fishing, commercial and sport diving, and invertebrate harvest;
- interest in leasing portions of reef areas for kelp harvest and mariculture;
- lack of in-depth information about living resources, habitats, and ecological relationships among and within reef complexes;
- high biological productivity and habitat important to threatened and endangered species.

2.) Offshore Rocks or Islands

Offshore rocks (or islands, as they may be named) occur singly (Tillamook Rock), in small clusters (Redfish Rocks), or in association with many other rocks and submerged reefs (Orford

Reef). Many of these rocks are identified in the Oregon Ocean Resources Management Plan as sensitive habitat for marine mammals and seabirds. Birds and mammals use these rocks for breeding and rearing of young, resting, and feeding. The degree of use and habitat value to a species or mix of species varies from rock to rock depending on differences in geologic composition, soil cover, vegetation, slope angle or orientation, relationship to other habitat areas, distance from shore, proximity to human use, etc. These rocks are center points for a wider range of feeding, foraging, and reproductive activities, which may take animals hundreds, if not thousands, of miles from the site. In some cases, these rocks are nesting sites for birds, which migrate from South America or New Zealand and are thus of international importance in species protection.

Above Mean High Water, almost all offshore rocks are designated as wilderness and managed as part of the National Wildlife Refuge system administered by the U.S. Fish and Wildlife Service (a few are under jurisdiction of the Bureau of Land Management; one is privately owned). Below Mean High Water, the Oregon Division of State Lands has jurisdiction over the seabed while the Department of Fish and Wildlife regulates fish and shellfish harvest.

Outline of the Oregon Shoreline Classification System (scales of reference in descending size)

OVERALL SHORELINE ELEMENTS

Ecoregion: > 200,000 km²

Domain: depth zones from shore: 0-50m deep, 50-200m deep, over 200m deep

Region: north-south subsets of domains based on oceanography/productivity

Province: 100 - 500 km; large-scale geographic grouping of shore segments

Segment: 10 - 50 km; coastal length with a group of similar shoreline cells (both rocky cells and intervening littoral cells), which may be associated with travel patterns or visitation from urban areas.

ROCKY-SHORE ELEMENTS

Rocky Cell: 1 - 5 km; an identifiable landscape area that may have several clustered and/or interrelated sites (a headland, a beach); a "cell" will allow for the inventory, classification, and evaluation of habitats and natural resources on the ground. Rocky cells are defined as either shoreline or offshore types.

Site: 10 - 500 m; a relatively flexible term indicating a location with dominant geologic, geomorphic, and/or biological features (a cove, a rock, a beach, a cliff) usually identified by the public as a "geographic place."

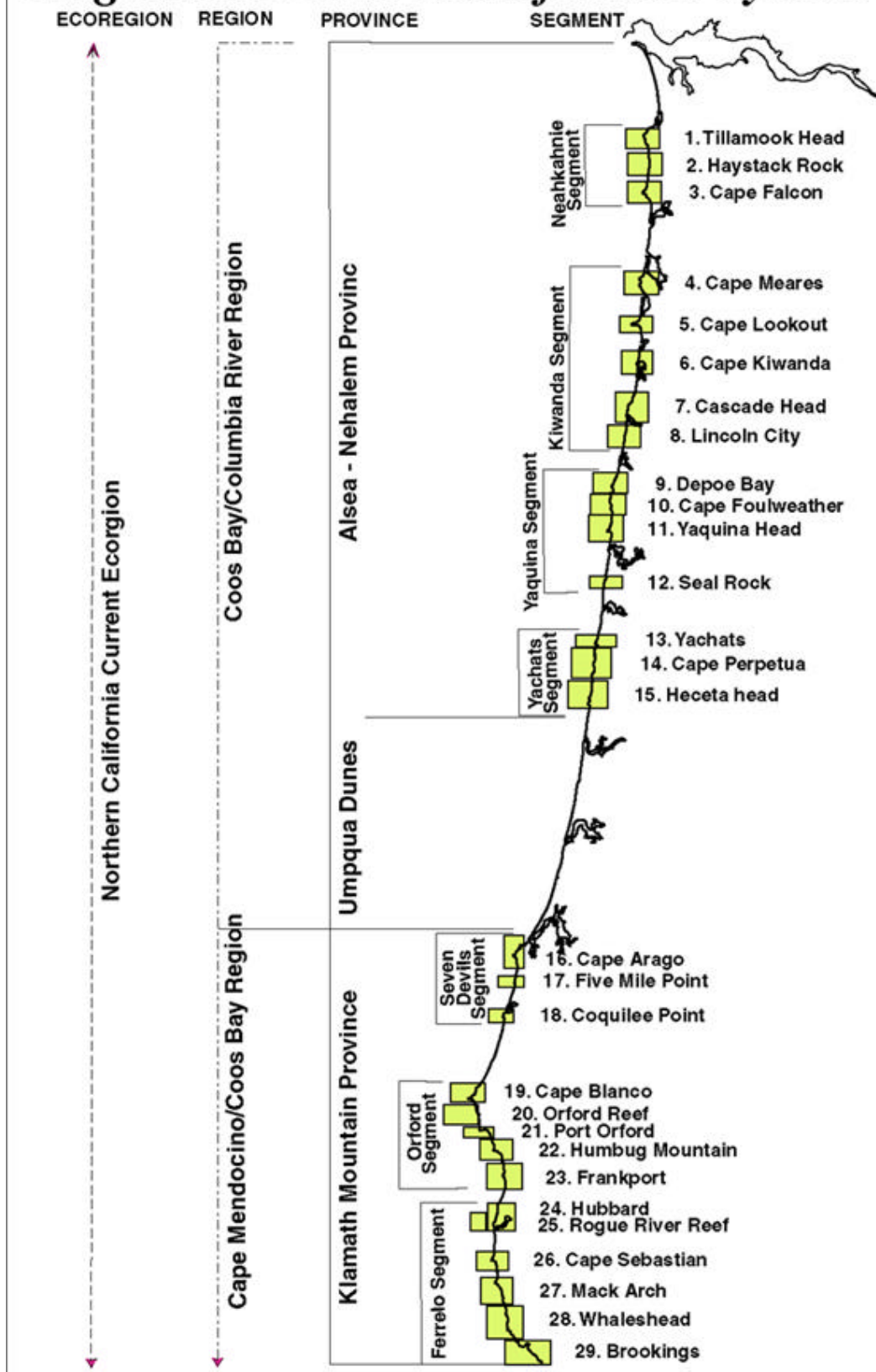
Features/Surfaces: <10 m (micro-scale); specific habitats on or within sites; this is the scale at which habitats will be inventoried and classified.

SANDY-SHORE ELEMENTS (to be completed through future work)

Littoral Cell: 1 - 50 km; lengths of coastline bounded by headlands (rocky cells), within which water and sediments circulate in a somewhat closed system.

NOTE: the Oregon Natural Heritage Plan uses the term "cell" in approximately the same manner: "Cells are artificial constructs to allow for the inventory, classification, and evaluation of natural areas in Oregon."

Oregon Shoreline Classification System



4. Oregon's Shoreline Classification System

a. Ecoregion: Northern California Current Ecoregion

Large marine eco-regions are characterized by distinct hydrography, submarine topography, biological productivity, and interrelated food webs. They are increasingly recognized as the level at which nations must frame their marine-resource management programs, including research. The Northern California Current Ecoregion encompasses the majority of the region included in the scope of the Pacific Northwest Marine Research Program, a coordinated program established by Congress in 1991 to "improve marine research on water quality and ecosystem health.

Oregon's entire coastline lies within this region, which extends from Cape Mendocino, California to Vancouver Island, British Columbia, and which extends seaward from the shoreline approximately 500 to 1000 kilometers across the broad, slowly southward-flowing California Current. This is a recognized Large Marine Ecosystem, one of 28 that have been identified around the world as of 1991.

b. Domains

A domain subdivides an ecoregion, such as the Northern California Current Ecoregion, into cross-shelf zones based on oceanographic characteristics influenced primarily by depth of water. Oregon's Ocean Stewardship Area, described in the Oregon Ocean Resources Management Plan, extends from the shoreline seaward to the toe of the continental margin. Three domains (modified from Bottom et al. 1989) can be described for this ocean area:

1.) Nearshore Domain

The ocean environment from shore to about 50 meters deep. This domain is significantly affected by wave energies that reach the bottom, vertical mixing, and seasonal along-shore and cross-slope sediment movement. This nearshore domain is influenced by discharge from coastal rivers and estuaries, and is shallow enough to permit kelp-reef habitats. In winter this domain is affected by the northward flowing Davidson Current, which displaces the California Current seaward. Oregon's territorial sea and rocky shores are within the Nearshore Domain.

2.) Shelf Domain

The area over the continental shelf and upper slope where waters are more than 50 but less than 200 meters deep.

3.) Oceanic Domain

The marine environment principally beyond the depth of the continental shelf and upper slope, more than 200 meters deep.

c. Regions:

The Northern California Current Ecoregion and Nearshore Domain are divided into three regions (modified from Bottom et al. 1989). Two regions lie off Oregon:

1.) Columbia River to Coos Bay, OR

Between the Columbia River and Coos Bay, ocean conditions are dominated by interaction between the warmer, low-salinity waters of the Columbia River Plume and seasonal upwelling of cold, nutrient-rich waters nearer the coast. For purposes of shelf and oceanic domains, this region may be more appropriately divided at Cascade Head. For purposes of classifying Oregon's shoreline areas, this region may be further divided into two provinces (described in next section).

2.) Coos Bay, OR to Cape Mendocino, CA

This southern region has been described as reaching between Cape Blanco, OR, and Cape Mendocino, CA, based on distinctive ocean current conditions apparently set up by deflection of southward-flowing currents around Cape Blanco. This dividing line is probably appropriate for shelf and oceanic domain-management considerations. However, for purposes of classifying Oregon's rocky-shore areas, the dividing line is most appropriate at the mouth of Coos Bay just north of Cape Arago. Oregon will need to coordinate its management of rocky shores in this region with the State of California.

d. Provinces:

Within regions are coastal provinces, shore lengths identified primarily by homogeneity (similarity of characteristics) of geographic or geologic features. Along the Oregon coast are three provinces but only two have rocky shores.

1.) Alsea-Nehalem

This region extends from the north side of Tillamook Head to the south side of Heceta Head near Florence. The shoreline is dominated by relatively recent uplifted marine sedimentary rock formations punctuated by resistant basalt formed as offshore volcanoes, underwater lava flows, or tongues of the great Columbia River basalt flows that reached the sea. Rocky shores tend to be clustered at these resistant headlands or other features with stretches of sandy beaches up to 15 miles long between.

2.) Umpqua Dunes

This province extends almost 60 miles between Sea Lion Point at Heceta Head north of the Siuslaw River and the mouth of Coos Bay. The shore is dominated by a long sandy beach backed by dune sheets one to three miles wide. The Umpqua River estuary divides this province. Most of the dunes along this stretch of coast are within the Oregon Dunes National Recreation Area administered by the U.S. Forest Service. This is not a rocky-shore province but is included in this overall categorization of Oregon's shoreline.

3.) Klamath Mountain

This province reaches from the mouth of Coos Bay to the Oregon-California border. The shoreline is dominated by geological features distinctive of the Klamath Mountain metamorphic province. From Cape Arago and Cape Blanco, an uplifted marine terrace forms most of the cliff except where punctuated by resistant rock at a few places such as Coquille Point. Between Port Orford and the Chetco River, rocky-shore types (major and minor headlands, rocky cliffs, offshore stacks and rocks, and submerged rocky reefs) are dispersed widely and somewhat uniformly. Other than the Coquille River, coastal streams have relatively steep gradients and few or small estuaries or sand spits.

e. Rocky-Shore Segments: 10 - 50 km

Segments are lengths of coastline (subdivisions of provinces) within which rocky-shore cells are grouped based primarily on geographic proximity and on human use pressures and patterns of development, travel, and access. Within a segment are a mix of rocky-shore types and other shore types such as sandy beaches and estuary mouths.

1.) Segments within the Alsea-Nehalem Province

a.) Neahkahnie Segment

Tillamook Head (north side near Seaside) to south face of Neahkahnie Mountain: This segment includes rocky-shore areas clustered at two major headlands --Cape Falcon/Neahkahnie Mountain and Tillamook Head. US 101 is located on the inland side of these rocky headlands due to rugged topography that limits access to rocky-shore sites. The entire segment is easily reached from the Portland metropolitan area via Ore 6 to Tillamook and the more heavily used US 26 to Cannon Beach/Seaside. This segment has high visitor usage.

b.) Kiwanda Segment

Cape Meares (north side) to Road's End at Lincoln City: This segment includes rocky-shore areas clustered at four major headlands. Except at its southern end at Lincoln City, US 101 is inland of the shore through most of the segment so access to rocky-shore sites is via county or secondary roads. Access to the southern end of the segment is via Ore 18 from Portland/Salem to Lincoln City and to its northern end via Ore 6 from Portland to Tillamook. The segment is between population centers.

c.) Yaquina Segment

Fogarty Creek State Park to Seal Rock: The shores of this segment include long sandy beaches punctuated by headlands or other rocky-shore features. US 101 runs adjacent to the shore along most of the segment. Rocky shores in this segment are well known, popular,

and heavily used by visitors. There is also significant growth in development and population in the area. The segment is accessible from the Willamette Valley via US 20 directly to Newport and Ore 18 from Portland/Salem to Lincoln City.

d.) Yachats Segment

North side of Yachats at Smelt Sands Beach to Sea Lion Rock (south side of Heceta Head): This segment has steep mountains and rugged shores with limited access opportunities from US 101 which runs along the shore. Overall access to the segment is via OR 126 from Eugene to US 101 at Florence or via US 20 from Corvallis to Hwy 101 at Newport. The segment has limited population and limited developed recreation, centered primarily around Yachats.

2.) Segments within Klamath Mountain Province

a.) Seven Devils Segment

Yoakum Point (mouth Coos Bay) to Devil's Kitchen (south of Coquille Point): This segment includes rocky shores of the most northerly outcroppings of true Klamath Mountain geologic types, as well as rocky shores of uplifted and tilted marine sediments. Although US 101 is inland of rocky shores in this segment, it is relatively accessible from the major travel corridor of I-5 via Ore 42 from Roseburg and the more heavily used Ore 38 from Eugene. The area has a large population center in Coos Bay/North Bend, and is a popular recreation destination.

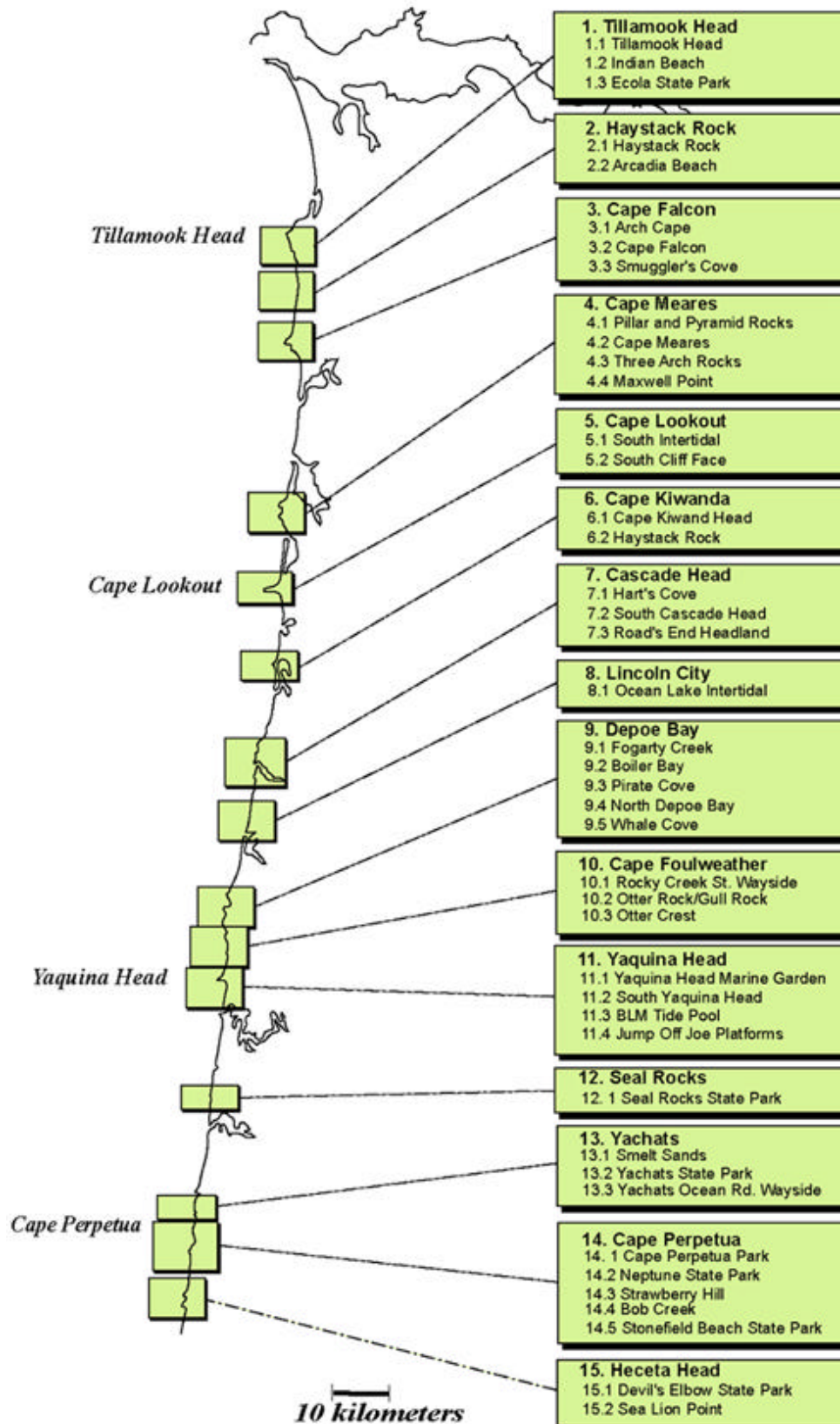
b.) Port Orford Segment

Blacklock Point (north of Cape Blanco) to Sisters Rocks (south of Port Orford): This segment contains a mix of shore types reflecting a transition from Klamath Mountain geology/shoreline to more recent sediments in uplifted marine terraces from Port Orford north. Access to this segment is via US 101 from the south or north; there is no direct east-west access.

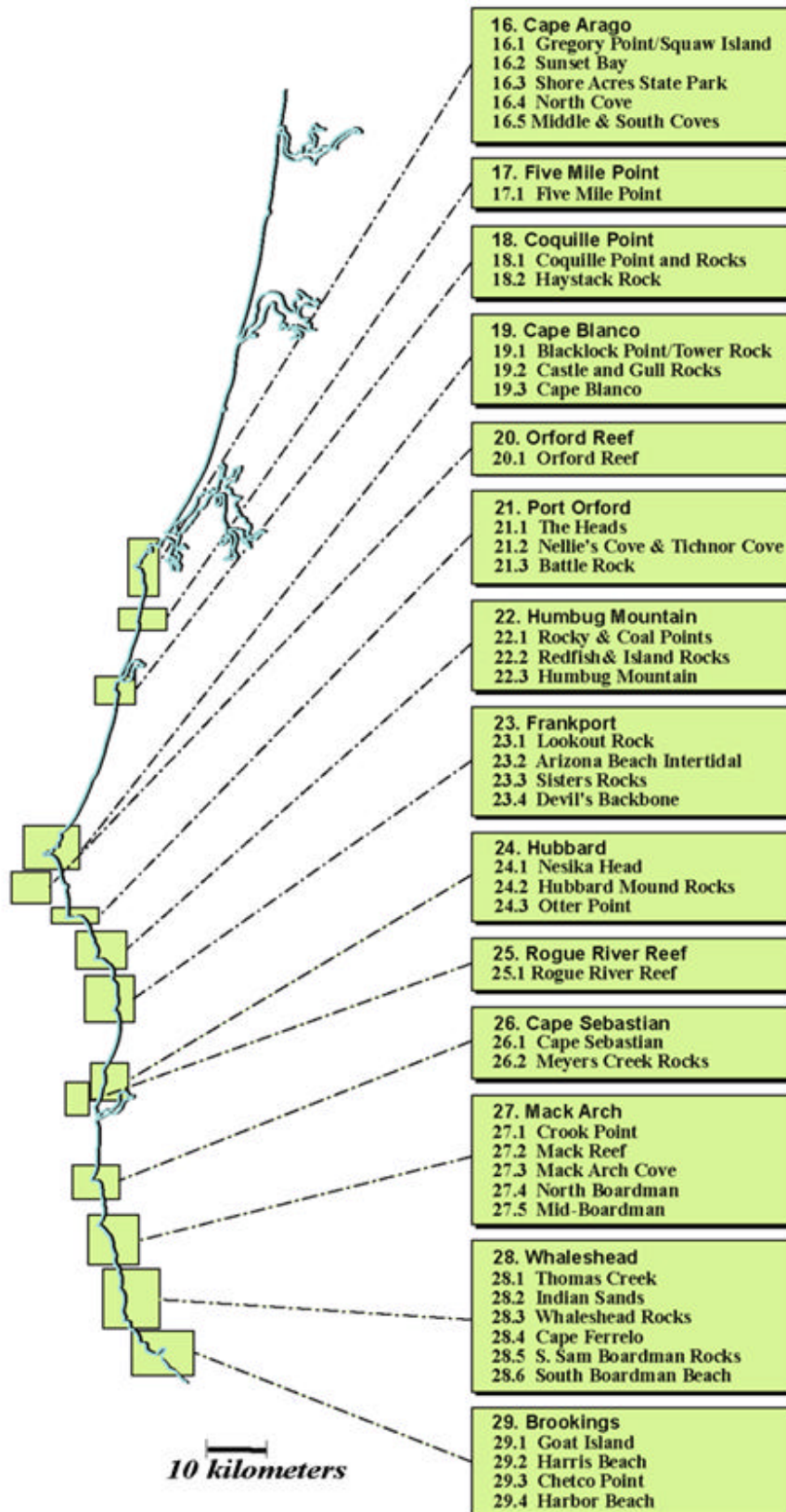
c.) Ferrelo Segment

Hubbard Mound (north of Rogue River) to Winchuck River (Oregon/California border): This segment typifies the geologic and rocky shoreline features of the Klamath Mountain Province. Major communities and development centers are Brookings and Gold Beach. Access to sites in this segment is from US 101 which runs directly along the shore; east-west access from I-5 is somewhat indirect; via US 199 from Grants Pass to US 101 at Smith River, CA; and via Ore 42 from Roseburg to Bandon. The area is relatively remote from major population centers in Oregon.

North Oregon Coast Rocky Shore Cells and Site Names



South Oregon Coast Rocky Shore Cells and Site Names



f. Rocky-Shore Cells (1 - 5 km) and Sites (10 - 500 m)

1.) Cells

Cells are major shore features with a predominant set of similar shore types. On the Oregon coast, there are two types of cells: littoral (sandy shore) cells, where nearshore circulation is enclosed between headlands; and rocky cells composed of headlands, capes, and associated reefs or rocks.

Within rocky-shore cells, there may be a mix of cliffs, rocky intertidal areas, associated reefs, associated rocks, offshore reefs, and offshore rocks and islands. Some sandy or cobble shores may be present but not enough to alter the overall classification of the area as a rocky-shore cell. In the Alsea-Nehalem Province on the northern coast, these cells tend to be distinctive headlands or capes with several associated sites. In the Klamath Mountain Province on the south coast, these cells tend to be less topographically pronounced in the overall landscape. Cells are at the human scale of geographic identity and usage.

2.) Sites

Sites are specific geographic features or locations within a cell. They may be a rock or cluster of rocks, a particular cove or cliff, or other specific feature. These sites may also have a mix of rocky-shore types and even have sandy or cobbled beaches when mapped at this scale.

Within a site will be habitat features and surfaces at a very fine scale of less than 10 meters.

g. Features and Surfaces < 10 m (Habitat Scale)

For every rocky-shore site there are unique habitat features and surfaces. Prior to this Territorial Sea Plan, Oregon had no systematic inventory of rocky-shore features by which to classify habitats. A reconnaissance-scale inventory has been completed for this plan which will serve as a basis for more detailed habitat studies in the future. Rocky-shore habitats will eventually be classified within an overall marine-habitat-classification system to be developed by the Oregon Department of Fish and Wildlife in coordination with the Ocean Policy Advisory Council.

5. Sources

The following were used to generate Oregon's shoreline-classification system:

Management of Living Marine Resources: A Research Plan for the Washington and Oregon Continental Margin (Bottom, Jones, Rodgers, and Brown, 1989) provides the scientific and conceptual framework for describing, researching, and managing Oregon's ocean area in terms of its larger marine ecosystem setting.

Terminology for geomorphic units and habitats along the tropical coast of Western Australia (Semeniuk, 1986) provided a conceptual model for systematically describing and naming

geomorphic features (land forms) in decreasing scales of reference from a broad "regional" level to large, medium, small, and fine scale.

Regional Sediment Dynamics and Shoreline Instability in Littoral Cells of the Pacific Northwest (Peterson et al. 1992) delimited the extent of littoral cells along the Oregon coast within which sand is more or less trapped and recirculated between rocky headlands.

Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al. 1979) is the basis for many coastal-habitat-classification systems in the U.S., including Oregon's estuarine-habitat-classification system, which is now part of the Oregon Coastal Management Program.

Oregon Marine and Estuarine Classification Systems (Starr, 1979), proposed to modify Cowardin et al. to the Oregon situation.

A Marine and Estuarine Habitat Classification System for Washington State (Dethier, 1990) added several considerations to Cowardin et al. to accommodate the added complexity of the open ocean environment.

1994 Territorial Sea Plan Appendix I:

Report and Recommendations Management Measures for Three Arch Rocks

The Oregon Ocean Policy Advisory Council adopted this report on December 10, 1993, and subsequently requested that the State Marine Board implement a 500-foot seasonal boating closure area around Three Arch Rocks National Wildlife Refuge.

Setting

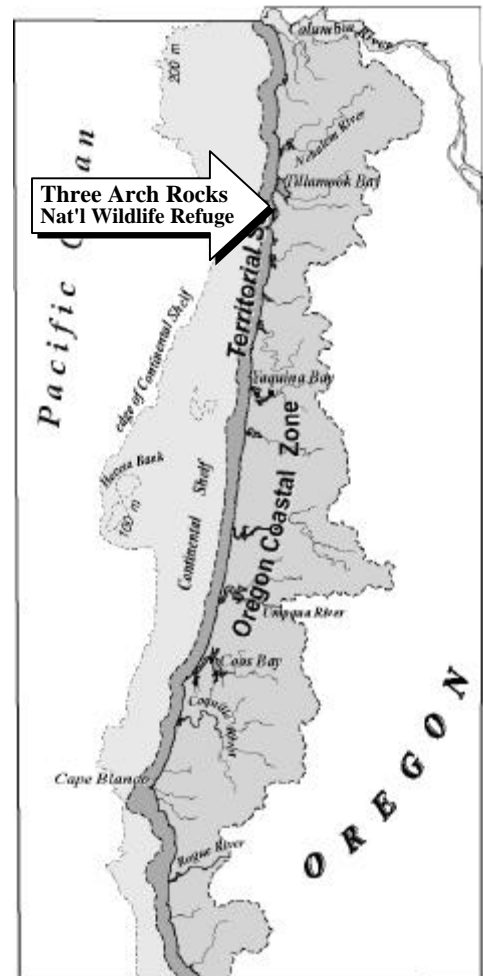
- **Location**

Three Arch Rocks National Wildlife Refuge is located about one-half mile offshore of Oceanside in Tillamook County, Oregon. It is approximately eight miles south of the mouth of Tillamook Bay, the nearest major port, and approximately two and one-half miles north of the mouth of Netarts Bay. The refuge, comprised of three large rocks and six smaller ones, totals about 17 acres.

- **Wildlife Resources**

Three Arch Rocks holds tremendous wildlife resources of importance throughout the northeastern Pacific region. Thirteen species of seabirds nest there, including some 220,000 common murrelets, the largest such colony south of Alaska, and some 2,000 to 4,000 Tufted puffins, the largest colony on the Oregon coast. Also among these bird species are three species of cormorants, two species of auklets, oystercatchers and pigeon guillemots. Federally-listed threatened and endangered birds use the rocks: Aleutian Canada geese and bald eagles are threatened species; California brown pelicans and peregrine falcons are endangered species.

Three species of marine mammals use the rocks for resting, breeding, or pupping. As many as four hundred Steller sea lions, a threatened species, use Three Arch Rocks and generally produce three to six pups at this location each summer.



This is one of Oregon's three breeding sites for Steller sea lions and the only such site on the northern Oregon coast. Because these animals have suffered tremendous population declines in the majority of their range in Alaska, the pupping and rearing habitat areas in the southern portion of their range through Oregon assume a much higher importance in maintaining overall populations than was previously the case. Some California sea lions are present from August through May and harbor seals find refuge here with pups that are born in nearby Netarts Bay and Tillamook Bay.

- **Human Use**

Three Arch Rocks is particularly attractive for a wide range of human activities because of its location, physical characteristics and biological resources. It is easily reached by boat from Tillamook Bay, the nearest principal marine boating center to the Portland metropolitan area. In good weather it is also accessible by boat, kayak, jet-ski, or sailboard launched from the beach or Netarts Bay. The rocks attract many boats for commercial and recreational fishing and diving activities targeting rockfish inhabiting the associated submerged rocky reef habitat. The area has considerable aircraft traffic, including low-altitude private, military, and Coast Guard aircraft, and high-altitude commercial flights. All types of aircraft are seen including fixed-wing propeller and jet planes, helicopters, and even hang gliders.

Several trends point to an increase in certain kinds of boating activity at Three Arch Rocks. Because of its location and biologic richness, Three Arch Rocks has the potential to become a major wildlife watching or "eco-tourism" destination. As commercial and recreational salmon fishing declines, more recreational fishing interest will focus on rock fishing near the rocks and on wildlife or bird-watching trips. In order to protect the very resources that are at the heart of this attraction, this potential increase in boat traffic, especially close to the rocks, must be addressed in a positive, pro-active way that encourages responsible boating behavior, promotes marine wildlife conservation and learning, and sets a positive example for other users of the area.

- **Administration and Jurisdiction**

Three Arch Rocks National Wildlife Refuge was established in 1907 and is the oldest such refuge in the western U.S. It is administered by the U.S. Fish and Wildlife Service as both a National Wildlife Refuge and a designated Wilderness area. This federal management applies only to the rock areas above mean high water; surrounding ocean waters and portions of the rock below mean high water are under the jurisdiction of several agencies of the State of Oregon. Human trespass on Three Arch Rocks is prohibited.

Several federal laws apply to the birds and mammals of Three Arch Rocks: the Endangered Species Act, the Marine Mammal Protection Act, the Migratory Bird Treaty Act, and the Wildlife Refuge Administration Act. Under the Endangered Species Act, the National Marine Fisheries Service has proposed to designate a critical habitat zone around "all Steller sea lion rookeries in state and Federally managed waters off Washington, Oregon, and California, including the zone that extends 3,000 feet (0.9 km) vertical and seaward from each rookery." Designation of critical habitat does not, in itself, restrict human activities within the area or mandate any specific management action but does identify critically important areas that are

essential to the species thus alerting the public to the area's importance. The Marine Mammal Protection Act prohibits the "take" of marine mammals under almost all circumstances and "take" is defined to include harassment no matter how inadvertent.

The State of Oregon has jurisdiction over the water and submerged lands around the rocks. The Oregon Division of State Lands has proprietary jurisdiction on behalf of the State Land Board for submerged rocks and reefs. The Department of Fish and Wildlife has authority to regulate fishing activity in ocean waters and has responsibility to protect marine habitat and wildlife. The State Marine Board has authority to regulate boating activity in waters of the state, including the territorial sea. The Ocean Policy Advisory Council has responsibility to prepare and adopt a plan for managing Oregon's territorial sea which must be then implemented by state agencies.

Wildlife Disturbance Concerns

During preparation of the Oregon Ocean Resources Management Plan 1988-1990, citizens and state and the U.S. Fish and Wildlife Service expressed concern over wildlife disturbance from human activities at Three Arch Rocks and a number of other sites along the coast. These concerns were vigorously repeated at workshops in the fall of 1992 conducted by the Ocean Policy Advisory Council. Concerns covered a wide range of disturbance events affecting both seabirds and marine mammals.

- **Biological Basis for Concern**

Common murres, Steller sea lions and other animals live and reproduce in dense colonies on the rocks. This life history strategy combined with disturbance problems can cause concern for population health. A single major disturbance event has the potential to disrupt or destroy the reproductive effort of a significant number of animals. Common murres lay eggs in exposed nests and continually occupy the nest until fledging to protect egg and chick. When frightened adult murres stampede from their nest, eggs or chicks can be easily dislodged to fall to the water below or become easy prey for gulls or crows. Likewise, large adult Steller sea lions, which weigh a half-ton or more, can crush small young pups during a panic rush to the water.

Even chronic, low-level disturbances can have an effect when animals constantly respond to stimuli that may or may not prove threatening. Eventually, they may abandon a site altogether. A human analogy might be tent camping in the landscape shrubbery at the entrance to a major shopping mall; not directly life-threatening but not a first choice when there are quieter, more remote alternatives. In this case, however, there are no alternative sites for these wildlife species.

The reproductive characteristics --the "strategy"-- of murres and many other seabirds make their populations vulnerable to human disturbance but make the consequences of disturbance difficult to detect immediately.. These birds lay only one egg per year. If that egg hatches and the chick survives to adulthood, the bird will likely live twenty or more years. With large numbers of birds all subject to this strategy, the entire population can thus "afford" to lose a high number of individual chicks in a reproductive year in response to fluctuating ocean conditions and other

environmental factors. The long life of adult murre and large numbers of the overall population will make up the loss over time and keep the population stable.

In fact, a high percentage of murre chicks naturally do not survive to become breeding adults. But when disturbance-related mortality is added to natural mortality rates each year over several years, the loss of the reproductive potential of these year-classes of young adults will be masked by the large overall size of the colony for perhaps six to ten years. At that time, as older birds die and fewer young adults are available to take their place, the gap in the age curve and loss of overall reproductive capacity of the colony will become apparent. Management strategies to recover bird populations are not easily developed or implemented. Prevention of population decline is thus the preferable alternative.

Five species listed by the U.S. Fish and Wildlife Service and National Marine Fisheries Service as threatened or endangered species use Three Arch Rocks. Bald eagle, Aleutian Canada goose, and Steller sea lion are listed as threatened; peregrine falcon and California brown pelican are listed as endangered under federal law. The presence of these species places additional considerations on management measures that ensure protection of habitat and populations of these animals.

The Steller sea lion, in particular, is of concern to international, federal and state wildlife managers throughout the North Pacific region. A 3000-foot-wide critical habitat zone has been proposed by the National Marine Fisheries Service around Three Arch Rocks. Seal Rock, the haulout site at Three Arch Rocks, is extremely valuable because of its low profile above the water, which facilitates entering and exiting the water, and its wide platform that can accommodate both adults and pups learning necessary survival skills. This rock serves as a focal point for widespread foraging by adults who may range up to 30 kilometers in search of food. Boat and aircraft traffic around the haulout area can prevent animals returning from a long feeding trip from reaching the rock in a timely way and can interfere with normal learning activities of pups during a critical period.

- **Historical Context**

The problems of human interaction with marine birds and mammals on the Oregon coast must also be viewed in an historical context. Archaeological and biologic evidence indicates that many of the birds and mammals inhabiting Three Arch Rocks were once more widespread and have, in a sense, "retreated" to the relatively few isolated refuge sites in the face of increased development and human presence on the coast over the past one hundred years. Thus, from an historical habitat distribution perspective, these animals have no other alternative than Three Arch Rocks and similar rocks and islands along the coast. Oregon's coast is continuing to be developed making it highly unlikely that birds or mammals will find new or return to former shoreline habitats.

- **Regional Importance**

One other consideration relates to Oregon's offshore rocks and islands in a regional ecosystem context. Oregon's coastal habitat sites are regionally vital because neither the California coast

nor the Washington coast offer the extent and kinds of habitat as Oregon. Birds migrate long distances (some from South America, others from Alaska) to reproduce on the Oregon coast. Steller sea lions have historically occupied a range from central California around the Pacific coastline through Alaska, the Aleutian Islands, to the Kurile Islands of Russia. Because of major declines in Steller populations throughout the heart of their range, likely related to major changes in sea lion prey base, the success of Steller sea lions on the Oregon coast takes on increased importance. Viewed in this context, there is an added responsibility for Oregon to protect offshore rock and island habitats.

Council Process

The Ocean Policy Advisory Council began to address rock and island protection concerns based on policies and recommendations in the 1990 Oregon Ocean Resources Management Plan and a specific directive of the 1991 Oregon Legislature.

The Council made an initial decision to resolve wildlife interaction problems through a process that assessed and responded to the unique circumstances of each area or site and that involved all affected parties. Three Arch Rocks is the first area to be examined and is a "case-study" for the Council.

The Council began work on Three Arch Rocks with a public meeting in January, 1993, in Tillamook to discuss the resource and use issues involved at Three Arch Rocks and to obtain comment from the public. The meeting was well attended and a diversity of comments and opinions were heard related to the severity and nature of the problems.

Also in January, 1993, the Council discussed the situation and decided that more comprehensive and thorough documentation of the activities around Three Arch Rocks was necessary to identify the nature of the problem and develop specific management measures to solve problems. The Oregon Department of Fish and Wildlife, in cooperation with the U.S. Fish and Wildlife Service, subsequently conducted a four month field program in the summer of 1993 to observe and document human activities and to collect biological information on seabirds and marine mammals.

Upon completion of this study in mid-September, 1993, a working group was convened to review the results of the ODFW/USFWS study and provide the Ocean Policy Advisory Council with recommendations to reduce disturbance and protect wildlife resources at Three Arch Rocks National Wildlife Refuge.

- **Three Arch Rocks Working Group**

A working group met October 4, 1993, in Tillamook. Those present included

Greg McMurray, Ore. Dept. Environmental Quality
Doug Davis, Owner, D & D Charters, Garibaldi
Neal Coenen, OPAC/Ore. Dept. Fish and Wildlife

Bob Bacon, Ore. Shores Conservation Coalition
Dave Haas, SCUBA diver/charterboat owner
John Markham, Tideriders SCUBA Club
Jan Mulholland, Tideriders SCUBA Club
Ray Baggarley, Oregon Pilots Association
Roy Lowe, U.S. Fish and Wildlife Service
Bob Bailey, OPAC/Ocean Program Coordinator
Tom McAllister, outdoor writer
Jerry Dove, OPAC/Tillamook County Commissioner
James Bond, City of Manzanita
Paul Donheffner, Director, State Marine Board
Don Christiensen, State Marine Board member
Gary Viehdorfer, State Aeronautics Division
Robin Brown, Ore. Dept. Fish and Wildlife
Susan Riemer, Ore. Dept. Fish and Wildlife
Dave Pitkin, U.S. Fish and Wildlife Service
Capt. Chris Kisvardy, US Coast Guard Air Group

The working group heard and discussed a detailed report on the summer, 1993, observational study at Three Arch Rocks (summary below). The working group concluded that a 500-foot seasonal closure area, implemented through regulation and supported with an educational and informational effort, is needed, generally acceptable, and probably workable. The group did not resolve concerns about buoy markers and enforcement. The working group, through a staff paper, subsequently recommended to the Council the actions taken on December 10, 1993.

Three Arch Rocks Study, Summary

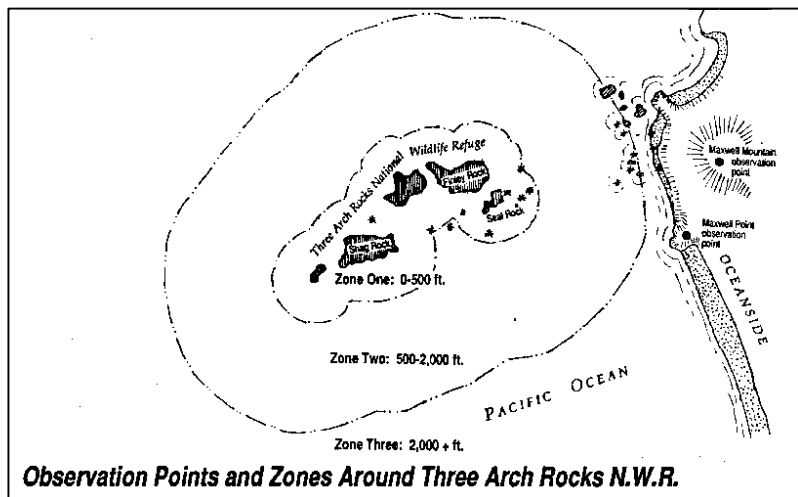
- **Study Methods**

Study was conducted for an average of 7.5 hours per day on 104 days from early May, 1993, to mid-September, 1993. A detailed observational protocol was used including establishing three concentric observation zones around the rocks: Zone One (0 to 500'), Zone Two (500' to 2000'), and Zone Three (beyond 2000').

To help determine the location of a boat within a zone, observers used a notebook of reference photographs of a Coast Guard vessel positioned 500 feet from the rocks at a series of stations around the rocks. Data were collected on type of vessel, activity, location, weather and sea conditions, visibility, aircraft type, aircraft lateral distance, altitude and flight direction, and wildlife disturbance events. Counts of seabirds and mammals were made. Disturbance events were recorded in one of three states:

Type 1:	Alert	(animals aware of disturbance & stop normal activity)
Type 2:	Agitated	(animals vocalize, make some movement)
Type 3:	Threatened	(animals leave the area).

Photographs and videotapes were made of representative activity in the area.



- **Boating activity and effects**

Private Boats

In general, private recreational vessels, whether fishing, diving, or sightseeing, accounted for the most activity within Zone One and generated the greatest number of wildlife disturbances (57, Types 1-3) across all zones. Included in this category are dive boats and sport fishing boats which together accounted for 34 of 39 (88%) of the most serious Type 3 disturbance events, all of which occurred in Zone One. The amount of time private fishing boats were observed in Zone One represents only 6.8% of their total time spent fishing in all zones.

Charter Boats

Very little charter boat activity took place in Zone One and was instead conducted almost entirely in Zone Two, between 500 and 2,000 feet. However, charter boats were judged responsible for five disturbance events, including four Type 3 events, all within Zone One.

Commercial Fishing

With one exception, commercial fishing vessels did not enter into Zone One. These vessels did not trigger any disturbance events from any zone.

Other Craft

Other kinds of boats were present around the rocks. Kayaks were observed sixteen times during eight days and triggered four disturbance events in Zone One, one Type 1 and three Type 2. Three jet skis were observed on one observation day and were responsible for one Type 2 disturbance event.

Summary

Out of sixty-eight Type 1, 2, or 3 disturbance events caused by vessels, all but one resulted from vessels within Zone One (within 500 feet of the rocks). Thirty-four involved birds only, twenty-four mammals only, and ten involved both birds and mammals. These disturbances were

triggered by boats moving close to the rocks, boats at high speed, activity around and on the boats, loud noises, and various combinations of different activities.

- **Aircraft activity and effects**

Private Aircraft

Private aircraft accounted for the most aircraft activity and greatest number of disturbances at Three Arch Rocks. One-hundred-fifty private aircraft were observed flying under 1000' and were responsible for forty-nine disturbances, including five Type 3 events. Two-hundred-fifty-five private aircraft flew above 1000' and generated fourteen disturbance events. Of the one-hundred total aircraft-caused disturbance events, 63% were caused by private aircraft of which 52% were Type 1 disturbances.

Coast Guard

Coast Guard aircraft, primarily helicopters, were observed twenty-one times primarily at less than 1000' and caused thirteen disturbances: eight Type 1 and five Type 2.

Military

Seventeen military aircraft were recorded and caused fourteen disturbances, including four Type 3 events.

Other

Other aircraft included twenty two commercial aircraft, which generated four disturbance events and thirteen unknown aircraft which were heard but not seen. These unknown aircraft were responsible for six Type 1 disturbances.

Summary

Of the one-hundred total aircraft disturbance events, ninety involved marine mammals. The majority of Type 1 events were sea lions looking skyward for the source of noise. Sixty-three of these disturbances resulted from private aircraft.

Statistical results of the project are attached.

Management Considerations

- **Seasonal factors**

Although seabirds and marine mammals occupy Three Arch Rocks year round, breeding and rearing of young occurs between late April and mid-September. Thus regulations on boating activity could be applied seasonally during the critical reproductive season.

- **Existing Policies and Authorities**

Ocean Plan

The Oregon Ocean Resources Management Plan discusses the issues of protecting seabirds and marine mammals and includes a number of policies that provide a point of beginning for Three Arch Rocks. These policies include:

- promoting public awareness and appreciation of marine birds, marine mammals and their habitats; developing public education and interpretation programs; and preparing targeted information to specific ocean user groups, especially the fishing industry and recreational boaters.
- providing state protection to marine birds and mammals and to habitats critical to maintaining viable marine bird and mammal populations.
- adopting provisions in the Territorial Sea Plan to protect sensitive marine bird and mammal populations and provide for site-specific management programs.
- prohibiting activities around nearshore rocks and islands that threaten the continued viability of marine bird and mammal populations, especially threatened, endangered, and sensitive species in thirty-three sensitive habitat areas listed.
- supporting the use of nearshore rocks and islands for safe passage and anchorage where necessary to protect human lives.
- supporting both regulatory and non-regulatory approaches to resource management and protection.

State Law

The 1991 Oregon Legislature enacted ORS 196.408(3):

"State agencies which have jurisdiction over water areas, the seabed and resources adjacent to offshore rocks and islands shall coordinate with adjacent states and federal agencies to develop programs and regulations to manage uses and activities of ocean areas adjacent to coastal cliffs and offshore rocks and islands managed within the National Wildlife Refuge System."

Goal 19/Territorial Sea Plan

The Ocean Policy Advisory Council has previously adopted draft provisions of a Territorial Sea Plan that include policies and recommendations in a strategy for managing Oregon's rocky shores. Rocky shores are defined as including offshore rocks and islands because of their ecological association and connections to shoreline headlands and intertidal areas with associated rocks and submerged reefs. Management policies and measures for Three Arch Rocks and other offshore rocks and islands will become a subset of the rocky shores management strategy. The goal of this strategy is

"To protect the ecological values and coastal biodiversity within and among Oregon's rocky shores while allowing appropriate use."

Together, these policy directives provide a clear basis for the Council to take action with regard to Three Arch Rocks.

- **The Role of Information and Education**

Information and education is a necessary component of any program to solve wildlife disturbance problems at Three Arch Rocks and elsewhere. Education and information efforts will need to be targeted at a number of audiences, including:

- recreational boaters and fishermen, charter boat operators, commercial fishermen, divers, kayakers, private aircraft pilots and fixed-base operators through various specific communication efforts;
- the U.S. Coast Guard and military bases through more formalized, institutional communication and agreements;
- the general public through a variety of media and outreach pathways.

Information and education efforts should provide information about Oregon's seabirds and marine mammals, promote wildlife values, encourage personal responsibility and stewardship toward these resources and communicate specific regulations such as seasonal area restrictions.

These informational efforts should also be seen as a way to stimulate interest in and encourage demand for wildlife watching opportunities and should therefore be coordinated with tourism and travel promotion for the Oregon coast and the Tillamook area.

- **The Role of Regulation**

Regulations are an essential element in managing wildlife resources. They articulate the limits of personal behavior or activities, support and further associated educational efforts, and are a specific expression of the public's interest in the resource. Regulations, however, must have a clear purpose, be simply expressed and readily explained through information and education to the public and affected parties.

At Three Arch Rocks there is a need to reduce or eliminate boating activity and aircraft overflight within certain distances of the rocks during a specific time period. The ODFW/USFWS study clearly shows that boats within 500 feet and aircraft activity in the area can cause disturbance to wildlife. The critical time period is May 1 through Labor Day in early September, the reproductive season. The State Marine Board is the agency most appropriate to regulate boating activity; by contrast, the Fish and Wildlife Commission can only regulate fishing activity. Regulations for aircraft are more problematic and will involve the Federal Aeronautics Administration in the U.S. Department of Transportation. There is currently a 2,000-foot minimum altitude recommendation over all National Wildlife Refuges.

- **Protective Measures in Other Locations**

Wildlife protective buffer areas have been established in other rock and island situations and provide a frame of reference for Three Arch Rocks.

Rogue and Orford reefs, Oregon. In 1990 the Oregon Fish and Wildlife Commission enacted a 1000-foot commercial sea urchin fishery closure between May 1 and August 31 for Steller sea lion pupping sites on Pyramid Rock in Rogue Reef and Long Brown and Seal rocks in Orford Reef on the southern Oregon coast. These were instituted in cooperation with the sea urchin dive fishery. This closure has been marked with buoys placed during the season by the Oregon Department of Fish and Wildlife and is monitored and regulated in a cooperative arrangement with the urchin industry. Decreased disturbance and stabilized Steller sea lion populations appear to be a positive result of the closure. In summer, 1993, the OFWC instituted a 1000' sport fishing closure area around Pyramid Rock in Rogue Reef. No such closure was made at Orford Reef because of apparently low sport boat activity there.

Farallon National Wildlife Refuge. The Farallon Islands are some eighteen miles south-southwest of Point Reyes and about 28 miles west of the mouth of San Francisco Bay, and are part of the Gulf of the Farallones National Marine Sanctuary. The State of California has designated a 1 mile-wide area around the islands as a State Ecological Area. Specific regulations to protect common murres and Steller sea lions have been adopted for boats: a 300-foot seasonal closure March 15 to August 15, a 5-mph speed limit within 1000 feet, and noise restrictions for commercial dive boat engines and compressors. For aircraft: a 1000-foot minimum altitude within one nautical mile of the islands. The water boundaries are not marked with buoys. Wildlife observers are present on the islands continually in spring and summer and communicate via radio with vessels that approach too closely to advise them of the 300-foot wildlife restriction. There is no focused effort to contact boaters at marinas and inform them of the closure because of the relatively few who venture offshore.

Alaskan Steller sea lion habitat. In the Gulf of Alaska, Bering Sea, and Aleutian Islands, the National Marine Fisheries Service has established 3 nautical mile (nm) vessel no-entry zones around specific Steller sea lion rookeries and a 1/2 mile no-approach zone by land. The zones were established to reduce disturbance, accidents and incidental take of sea lions and to facilitate enforcement of prohibitions against shooting Steller sea lions. A temporary exemption is made for vessels transiting through the 3 nm no-entry zone for two rookeries but vessels are still required to stay at least 1 nm from the rookeries and they may not fish or set anchor within the 3 nm area.

No-trawl zones have been designated by NMFS within 10 nm of 37 Steller sea lion rookeries in the Gulf of Alaska, Bering Sea and Aleutian Islands as amendments to groundfish fishery management plans to reduce the risk of depletion of Steller sea lion prey near the rookeries. For 5 rookeries, seasonal 20 nm no-trawl zones have been established during winter and early spring when feeding by juveniles is crucial.

Protection Island National Wildlife Refuge, Washington. The State of Washington Department of Natural Resources has entered into a twenty-year no-fee lease agreement with the U.S. Fish and Wildlife Service to protect a 200-meter (600 feet) area around Protection Island near the mouth of Discovery Bay in the Strait of Juan de Fuca to protect harbor seal pupping areas and

seabird colonies. The state has withdrawn the tidelands within this area to all public access except that approved by the USFWS. Waters in the area is not yet closed to all boating traffic which will need to be done through the U.S. Coast Guard.

- **Technical and Operational Considerations**

Spatial regulation of boat and aircraft traffic raises issues of whether and how to mark the desired boundaries or areas. Because there are difficulties and expenses involved in setting buoys or other markers, the following options are presented:

No markers or buoys. This option minimizes the physical fact of a boundary and instead relies on promoting responsible operating practices that reduce disturbance or avoid adverse effects on wildlife, one of which is staying back the prescribed distance. Enforcement would not be emphasized except for clear violations as when a boater runs through an arch or anchors next to a rock; these clear violations of the boundary would be easy to detect and, if desired, prosecute. The absence of buoys may present a problem of uncertainty to boaters and make enforcement of any boundary difficult. However, it is highly unlikely that Oregon or federal agencies are in a position to extensively patrol or vigorously enforce any boundary even if marked.

Buoys. One or more buoys, especially in key locations, would provide a sense of certainty to boaters about the location of any "buffer" or protective boundary. They would also provide clear boundaries for enforcement purposes and would be tangible evidence of the need to protect wildlife. However, buoys are expensive to purchase, place, and maintain. In addition, buoys can create the impression for an operator that once outside the boundary, any behavior is acceptable. Buoys would be most effective as part of a package that includes information and education keyed to the need for and location of the buoys.

Findings

Based on this report of the Three Arch Rocks Working Group, the Ocean Policy Advisory Council finds that at Three Arch Rocks:

1. There are significant wildlife disturbance problems from human activities.
2. Wildlife disturbance from human activities have negative effects on the reproduction of seabirds and marine mammals, including threatened or endangered species, and thereby reduce population stability.
3. The period of highest human activity levels are coincident with marine wildlife critical reproductive period from early May to mid-September.
4. Disturbance of wildlife results almost exclusively from noise and motion generated by boating and aircraft activity of various kinds.
5. Disturbance of wildlife from vessels is related, among other factors, to the distance of the vessel from the rocks. Disturbance is most predictable and severe when vessels are within 500

feet; some disturbance occurs in certain situations when vessels are between 500 and 2000 feet from the rocks; little or minor disturbance occurs when vessels are beyond 2000 feet.

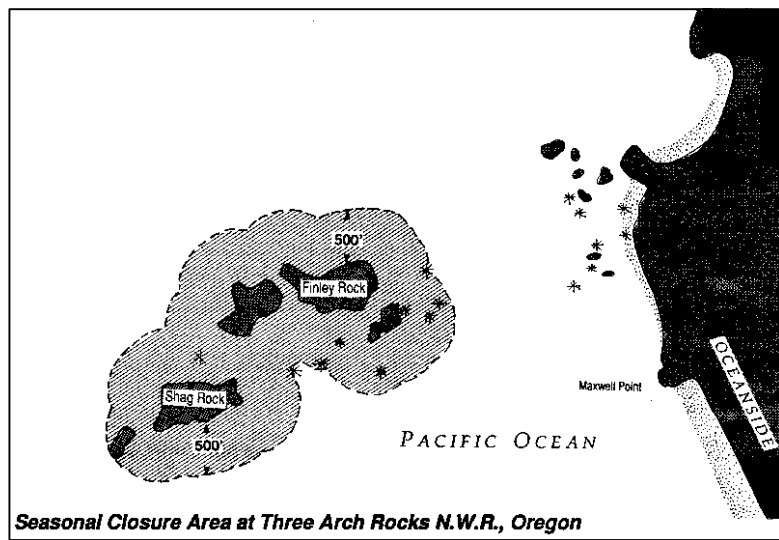
6. Few commercial or charter fishing vessels approach within 500 feet of the major habitat rocks.
7. Almost all vessel-related disturbance to wildlife is generated by privately operated vessels engaged in fishing, diving, or general recreation activities within 500 feet of habitat rocks.
8. The State of Oregon has authority to regulate vessel traffic and fishing activities in ocean waters of the state adjacent to the rocks of Three Arch Rocks and other federal refuges along the coast.
9. Disturbance of wildlife from aircraft is related to several factors including vertical and horizontal distance from the rocks, aircraft speed, noise level and pitch, and frequency of repetition of disturbance.
10. Aircraft traffic over Three Arch Rocks includes many aircraft types originating from several sources from different directions.
11. The federal government, rather than the State of Oregon, has authority to regulate air traffic over or near Three Arch Rocks.
12. The Oregon Ocean Resources Management Plan contains specific policies to protect marine birds, marine mammals, and their habitats from disruption and harassment from human activities and lists thirty-three sensitive marine bird and mammal habitat areas needing protection from human disturbance.
13. The 1991 Oregon Legislature requires state agencies to take action to manage uses and activities of ocean areas around offshore rocks and islands in the National Wildlife Refuge.
14. There are several actions that the Ocean Policy Advisory Council and state agencies can take to reduce disturbance to wildlife at Three Arch Rocks as well as other offshore rocks and islands.

Action:

The Ocean Policy Advisory Council hereby take the following actions to reduce or eliminate disturbance to marine wildlife from human uses and activities at Three Arch Rocks:

- 1. An area 500 feet wide around the principal rocks at Three Arch Rocks National Wildlife Refuge is designated for closure to boats from May 1 to September 15. The Council requests implementation by the State Marine Board. This buffer shall also prohibit transit through the closed area including the arches of the rocks.**

Note: On the west end of the refuge the 500-foot line shall be drawn from the westerly tip of Shag Rock so as to allow dive boats and charter fishing boats to continue to use the outside edge of a wash rock (Storm Rock) that is approximately 500 feet west-southwest of Shag Rock.



Rationale: Based on the 1993 ODFW study, it is anticipated that prohibiting boats within 500 feet of the refuge during the reproductive season will eliminate the majority of disturbance situations outright without adversely affecting charter boat or commercial fishing operators. If the buffer line on the west end is drawn as suggested, the effect on dive boats and charter boats will be lessened. A distance of 500 feet should also allow leeward anchorage of vessels when necessary. A seasonal prohibition is sufficient to address the seasonal nature of the problem and will convey an unambiguous message as to the seriousness of the situation and the intent of the State of Oregon to address disturbance problems. A specific distance is required to be designated as a clear standard against which to measure behavior. The State Marine Board is the appropriate agency to adopt this regulation and to place appropriate buoys.

2. A permanent 2000-foot minimum altitude is designated for aircraft within one-half mile of Three Arch Rocks. The Council requests implementation by the Federal Aeronautics Administration and assistance from area Fixed Base Operators.

Rationale: A permanent 2000-foot minimum altitude is recommended to simplify communication with a diverse audience of aircraft operators. This recommendation would strengthen the 2,000-foot minimum altitude currently recommended by the FAA over all National Wildlife Refuges. This minimum altitude restriction obviously will not apply to U.S. Coast Guard search and rescue missions, oil spill or other environmental response situations, military emergencies, or "federally permitted aerial census flights to monitor wildlife populations.

3. The Council will work with affected agencies and parties to develop and implement a coordinated program to educate and inform boaters, aircraft pilots, and others of marine wildlife values on and near Three Arch Rocks and other sites and the need to exercise

caution and responsibility to protect wildlife from disturbance on the rocks as well as in the surrounding water.

Rationale: An educational and informational program is crucial to gaining understanding of and compliance with any seasonal closure. In addition, education and information is essential encourage responsible behavior beyond regulation such as reducing noise from engines, generators, and the like, and reducing speed within a quarter-mile of the rocks. Information will promote understanding of and personal stewardship toward marine wildlife which, in turn, may be an increasingly important economic resource for Oregon.

Education and information should not be targeted exclusively on Three Arch Rocks. While this should be an initial focus, an overall coastal effort is needed to coordinate efforts along the entire coast. Education efforts should be coordinated by the Council but implemented by various state and federal agencies, businesses, and citizen groups.

In addition to more general public information materials, specific and regular communication is needed with the U.S. Coast Guard air stations in Astoria and North Bend and with military air operations that base aircraft transiting or using the Oregon coast. Likewise a regular program of contact with private airport Fixed Base Operators is needed to continually inform pilots about coastal wildlife issues and operational constraints.