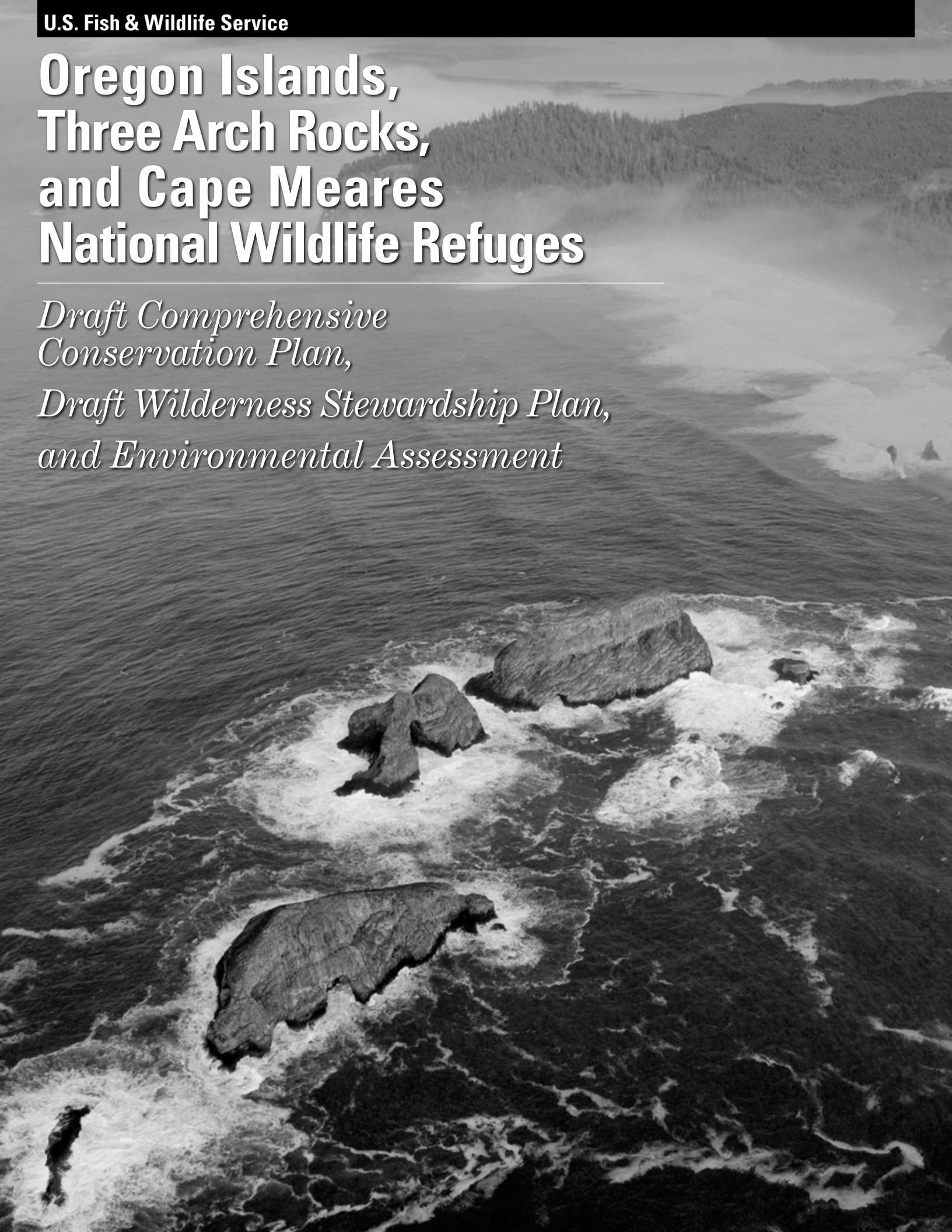
U.S. Fish & Wildlife Service

Oregon Islands, Three Arch Rocks, and Cape Meares National Wildlife Refuges

Draft Comprehensive Conservation Plan,

Draft Wilderness Stewardship Plan,

and Environmental Assessment



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Refuge Vision Statements

Oregon Islands National Wildlife Refuge

Spanning the Oregon coast, the wilderness islands and wind swept headlands of Oregon Islands National Wildlife Refuge are celebrated for their wildlife and rugged grandeur. Rocky islands and sheer cliffs provide critical breeding and resting habitat for diverse communities of birds, mammals, and plants along the wave-battered coastline. The isolated Crook Point headland continues to be reshaped by the geologic forces that fashioned it, while visitors are drawn to the Coquille Point headland by the exceptional opportunities to observe and learn about coastal wildlife and the National Wildlife Refuge System.

Together with our friends and partners, sound scientific principles will be applied to monitor, manage and protect the biological integrity of Pacific coastal wildlife and habitats. We envision the continued development and enhancement of inspiring viewing opportunities for hundreds of thousands of visitors, providing them with a window into this living heritage, while the island breeding grounds and Crook Point will continue to provide a secluded wildland haven for wildlife and plants, in sight of and just out of reach of human influence.

Three Arch Rocks National Wildlife Refuge

A testament to seabird conservation, Three Arch Rocks National Wildlife Refuge sustains the largest and most diverse seabird colony in Oregon and is an important breeding site for Steller sea lions. Early protection of the nine offshore rocks that define this remote wilderness habitat set a precedent for conservation along the resource-exploited Pacific coastline, symbolizing a change in the way the American public protects and views these marine species. Formed by pre-historic lava flows and shaped by continuous oceanic forces, this wildlife refuge will be managed as wilderness in perpetuity, for the benefit of wildlife and the American people.

Cape Meares National Wildlife Refuge

A remnant of once vast old growth Pacific Temperate Rainforest, the fog shrouded Sitka Spruce and Western Hemlock forests of Cape Meares National Wildlife Refuge loom over precipitous coastal cliffs providing seabirds, falcons and a wealth of endemic coastal wildlife with protected sanctuary. In cooperation with Oregon Parks and Recreation Department, we envision natural processes continuing to unfold in the most remote sections of the refuge while visitors are welcomed to the viewing decks and trails and invited to observe and learn about this rare, intact functioning coastal ecosystem.

Comprehensive Conservation Plans provide long-term guidance for management decisions and set forth goals, objectives, and strategies needed to accomplish refuge purposes and identify the U.S. Fish and Wildlife Service's best estimates of future needs. These plans detail program planning levels that are sometimes substantially above current budget allocations and, as such, are primarily used for strategic planning and program prioritization purposes. The plans do not constitute a commitment for staffing increases, operational and maintenance increases, or funding for future land acquisition.

Oregon Islands, Three Arch Rocks, and Cape Meares National Wildlife Refuges

Draft Comprehensive Conservation Plan,
Draft Wilderness Stewardship Plan,
and Environmental Assessment

Clatsop, Tillamook, Lincoln, Lane, Coos and Curry Counties, Oregon

Prepared by:
U.S. Fish and Wildlife Service
Oregon Coast National Wildlife Refuge Complex
2127 SE Marine Science Drive
Newport OR 97365

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Abstract

The U.S. Fish and Wildlife Service is developing a comprehensive conservation plan (CCP) for Oregon Islands, Three Arch Rocks, and Cape Meares National Wildlife Refuges. The CCP describes and assesses two alternatives, including a Preferred Alternative and a No Action Alternative, for these refuges. They are summarized below:

Alternative 1: No Action: Status Quo

This alternative assumes no change from past management programs and is considered the base from which to compare the other alternatives. There would be no changes to the Refuge boundary and no major changes in habitat management or public use programs.

Alternative 2: (Preferred Alternative) Enhance Wildlife, Habitat, and Maintain Public Use

Under the Preferred Alternative, the Service would place greater emphasis on establishing and working through partnerships to accomplish wildlife and habitat inventories, surveys, monitoring, research, and opportunities for public use. This alternative includes the same management activities described in the No Action Alternative and additional activities described below. The new activities would be accomplished by increasing cooperator involvement and refuge staff. Five new permanent FTEs are proposed in this alternative, and would be necessary for full implementation of the Preferred Alternative.

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Chapter 1. Introduction and Background

1.1 Introduction

The Oregon Coast National Wildlife Refuge Complex (Complex) is comprised of six individual National Wildlife Refuges (NWRs or refuges) that span the coast of Oregon and support a rich diversity of wildlife habitats including coastal rocks, reefs and islands, forested and grass covered headlands, estuaries and freshwater marshes. The six National Wildlife Refuges include: Cape Meares, Oregon Islands, Three Arch Rocks, Bandon Marsh, Nestucca Bay, and Siletz Bay. This Draft Comprehensive Conservation Plan and Environmental Assessment (CCP/EA) applies only to Oregon Islands, Three Arch Rocks, and Cape Meares NWRs. A Wilderness Stewardship Plan (WSP) is also part of this document; it applies to Oregon Islands and Three Arch Rocks Wilderness Areas only. We may refer to this document as the Draft CCP/WSP/EA. The CCPs for the Complex's other three NWRs will be developed under a separate planning effort.

1.1.1 Oregon Islands NWR

The scenic and rugged Oregon Islands NWR includes 1,854 rocks, reefs and islands, and two headland units, and spans 320 miles of the Oregon Coast, from Tillamook Head near Seaside south to the California border (Figures 1-1 North Coast Overview, 1-2 Central Coast Overview, and 1-3 South Coast Overview). With the exception of Tillamook Rock, all of the rocks, reefs, and islands within the refuge are included in the Oregon Islands Wilderness. The two headlands are not designated wilderness areas. Most of Oregon's estimated 1.2 million nesting seabirds are found on this refuge. A large percentage of Oregon's pinniped population use the refuge for haulout and/or pupping, including more than 5,000 harbor seals *(Phoca vitulina)*, 4,000 California sea lions *(Zalophus californianus)*, 4,000 threatened Steller sea lions (*Eumetopias jubatus*) and 100 northern elephant seals (*Mirounga angustirostris)*.

1.1.1.1 Islands Unit

Each of the 1,854 refuge islands that comprise the Islands Unit can be categorized as a reef, rock, or island. Reefs are defined as low elevation, essentially bare rocks that are awash during storms at higher tides. Rocks are taller, essentially bare rocks that may or may not be inundated. These usually have rather precipitous sides and are used by wildlife in the same way as reefs. Grassy islands are generally the highest islands. They usually have precipitous sides and are extensively used for nesting by seabirds. Some pinniped use occurs on the lower portions of islands. These reefs, rocks, and islands are used as breeding habitat for thirteen species of seabirds and as haul-out and pupping sites by four species of pinnipeds.

1.1.1.2 Coquille Point Unit

Nineteen-acre Coquille Point (see Figure 1-3), the first mainland addition to Oregon Islands NWR, was acquired from 1991 to 1992 and is located on the western edge of the City of Bandon. The intent of this mainland unit is to protect seabird nesting colonies on the adjacent rocks, restore native habitat, and provide a highly visible public use area for environmental education and interpretation. Coquille Point is the only unit of Oregon Islands NWR that is open to the public. Although Coquille Point has limited wildlife use, its primary values are providing a buffer zone between mainland development and the islands, and serving as an important interpretive site

for Oregon Islands NWR. The adjacent rocks contain substantial and observable populations of seabirds that are easily viewable from the headland.

Coquille Point Unit consists of a headland jutting toward the ocean and overlooking part of the Islands Unit of Oregon Islands NWR. A beach stretches to the north and another to the south from the point. The bluff portion of the headland is covered with native and non-native plants. The northern portion of the property is a low-lying stabilized dune with invasive European beachgrass (*Ammophila arenaria*) and a mixture of native plants. A one-acre emergent wetland, formed from groundwater seepage from the base of the bluff, exists between the bluff and the beach at the north end of the Coquille Point Unit.

1.1.1.3 Crook Point Unit

The 134-acre Crook Point Unit (see Figure 1-3), a second mainland addition, was acquired in 2000 and is located along the southern Oregon coast approximately 12 miles south of Gold Beach. Crook Point contains rare plant species, undisturbed cultural resource sites, unique geological formations and one mile of pristine beach with interspersed rocky intertidal habitat, and serves to protect major seabird colonies. It is immediately adjacent to the Mack Reef archipelago, which supports the second-largest concentration of nesting seabirds in Oregon.

Crook Point consists of a mosaic of habitats including grassland, meadows, coniferous forest, rock formations, and barren ground; it is also one of the windiest locations on the Pacific Coast. Geologic formations and the presence of numerous landslides indicate that the area is highly unstable, and much of the area is naturally unvegetated. The extreme western tip of Crook Point consists of a rock outcrop that forms a large rock pinnacle. Numerous seeps and springs can be found throughout.

1.1.2 Three Arch Rocks NWR

Three Arch Rocks NWR is located in the Pacific Ocean ½ mile west of the town of Oceanside in Tillamook County, Oregon (see Figure 1-1). The refuge is comprised of nine rocks and islands with a total land area of 15-acres and supports one of the largest colonies of breeding seabirds—mainly tufted puffins (*Fratercula cirrhata*) and common murre (*Uria aalge*)—in Oregon. The refuge is also a designated wilderness area known as Three Arch Rocks Wilderness. The three largest rocks have various amounts of soil accumulation, and vegetative growth is limited due to extreme rockiness, steep cliffs, and harsh weather. The six smaller rocks are devoid of soil and vegetation, and some are awash when high tides and large swells coincide. This is the only breeding site for the threatened Steller sea lion on the north coast of Oregon.

1.1.3 Cape Meares NWR

Cape Meares is located on Oregon's Pacific Coast between Tillamook Bay and Netarts Bay, approximately 1.75 miles north of Oceanside and 6 miles west of Tillamook. The Refuge is comprised of two units separated by Cape Meares State Scenic Viewpoint (see Figure 1-1). Cape Meares NWR consists of vertical coastal cliffs, rock outcroppings, and rolling headlands with old-growth forest dominated by Sitka spruce (*Picea sitchensis)* and western hemlock (*Tsuga heterophylla*). A 20-acre section east of the Three Capes Scenic Route consists of early seral stage forest adjacent to a clearcut. This section is undergoing natural regeneration following a complete

blowdown of the old-growth. This small Refuge protects one of the last stands of old-growth coastal forest in Oregon and serves, in effect, as an "island" ecosystem. The vertical seacliffs around this headland support nesting seabird populations including tufted puffins, common murres, pigeon guillemots, pelagic cormorants and others. Peregrine falcon (*Falco peregrinus*) nest on the cliffs, and the recently delisted bald eagle (*Haliaeetus leucocephalus*) forages on the headland.

1.2 Proposed Action

The U.S. Fish and Wildlife Service (Service) proposes to adopt and implement CCPs for Cape Meares, Oregon Islands, and Three Arch Rocks NWRs. As part of a single planning process, the draft CCPs covering these three refuges and the updated WSP for Oregon Islands and Three Arch Rocks Wilderness Areas are combined with an EA into a single planning document. This CCP/WSP/EA sets forth management guidance for the NWRs over the next 15 years as required by the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 688 dd-688ee, as amended by the National Wildlife Refuge System Improvement Act of 1997). A CCP is required by the Refuge Administration Act to address ". . .significant problems that may adversely affect the populations and habitats of fish, wildlife and plants and the actions necessary to correct or mitigate such problems." A WSP is required by Service Policy (610 FW 3) to guide the preservation, stewardship and use of a particular wilderness area. The combined CCP/WSP/EA will frequently be referred to simply as the CCP throughout this document.

The proposed action in the Draft CCP is to implement Alternative 2, which has been identified as the Service's Preferred Alternative. This Draft CCP explores one other option (alternative) for the CCP and discloses anticipated effects for both alternatives, pursuant to the National Environmental Policy Act of 1969 (NEPA), as amended (42 U.S.C. 4321-4347). Both alternatives address the major issues and relevant mandates identified in the CCP process, and are presented in Chapter 2. Effects are analyzed in Chapters 3, 4, and 5, and appendices provide supporting information. The Complex planning team believes the draft preferred alternative represents the best approach for achieving the refuges' purposes, vision, and goals, consistent with sound principles of fish and wildlife management. Alternative 2 is consistent with the mission of the National Wildlife Refuge System and the goals of the National Wilderness Preservation System.

1.3 Purpose and Need for the CCP

The purpose of the proposed CCP is to provide the Complex, the National Wildlife Refuge System (NWRS or System), partners and citizens with a management plan for improving fish and wildlife habitat conditions and Refuge infrastructure, for wildlife and public use on Cape Meares, Oregon Islands, and Three Arch Rocks NWRs over the next 15 years. An approved CCP will ensure that the Complex manages these Refuges to achieve the individual Refuge purposes, vision, goals, and objectives, to help fulfill the mission of the NWRS. The CCP updates management direction so that it is consistent with the Improvement Act and with the Oregon Islands and Three Arch Rocks Wilderness designations.

The CCP will provide reasonable, scientifically grounded guidance for managing and improving the refuges' coastal rocks, reefs and islands, cliffs, and forested and grass covered headlands, for the long-term conservation of native plants and animals and migratory birds. Appropriate actions will be identified for protecting and sustaining the cultural, biological and wilderness features of

the coastal rocks, reefs and islands; protecting major nearshore seabird breeding colonies and pinniped pupping and haulout sites; and preserving the existing cliff and old-growth forest habitat in an unaltered, natural condition. The CCP will also evaluate the priority public use activities on the refuges, including wildlife observation, photography, environmental education and interpretation.

The CCP is needed for a variety of reasons. Primary among these is the need to reduce disturbance to wildlife using the refuges. Equally as important is the need to determine biological data gaps for the refuges, methods for acquiring this data, and strategies for incorporating findings into refuge management. The CCP also recognizes and identifies threats to coastal wildlife and habitats due to rapid development along the Oregon coast, invasive species, global climate change, and catastrophic human induced events such as oil spills.

In an effort to improve Refuge law enforcement, citizen involvement, and coordination with other agencies, and to better accomplish the refuges' and Service goals and objectives, there is a need to identify future actions and partnerships. There is also a need to analyze public use programs for wildlife-dependent priority public uses and to determine what improvements or alterations should be made in the pursuit of higher quality programs and opportunities. Finally, there is a need to describe the steps that should be taken to better protect the habitats and wildlife through strategies to accomplish our goals.

1.4 Content and Scope of the CCP

This CCP provides guidance for management of the refuges habitats and wildlife, and administration of public uses on refuge lands. Information in the CCP includes:

- An overall vision for the refuges, their establishment history and purposes, and their role in the local ecosystem (Chapter 1).
- Goals and objectives for specific conservation targets and public use programs, as well as strategies for achieving the objectives (Chapter 2).
- A description of the physical environment of the refuges (Chapter 3).
- A description of the conservation targets, their condition and trends on the refuges and within the local ecosystem, a presentation of the key desired ecological conditions for sustaining the targets, and a short analysis of the threats to each conservation target (Chapter 4).
- An overview of the Refuges' public use programs and facilities, a list of desired future conditions for each program, and other management considerations (Chapter 5).
- An analysis of the environmental effects associated with implementing the management actions prescribed under the alternatives described in Chapter 2 (Chapters 3, 4, and 5).
- Evaluations of existing and proposed appropriate public and economic uses for compatibility with each Refuge's purposes (Appendix E).
- An outline of the updated Wilderness Stewardship Plan detailing where the plan components can be found within the CCP (Appendix F).
- An outline of the projects, staff and facilities needed to support the alternatives considered (Appendix G).
- A comprehensive list of species known to occur on the refuges and mentioned within the CCP (Appendix B).

1.5 Planning and Management Guidance

The U.S. Fish and Wildlife Service (Service), an agency within the Department of the Interior, is the principal Federal agency responsible for conserving, protecting and enhancing fish, wildlife and plants and their habitats for the continuing benefit of the American people. The Service manages the 96-million acre National Wildlife Refuge System, which encompasses 548 NWRs, thousands of small wetlands and other special management areas.

Refuges are guided by various federal laws and executive orders, Service policies, and international treaties. Fundamental are the mission and goals of the NWRS and the designated purposes of the refuge unit as described in establishing legislation, executive orders, or other documents establishing, authorizing, or expanding a refuge.

Key concepts and guidance of the Refuge System derive from the National Wildlife Refuge System Act of 1966 as amended (16 U.S.C. 668dd-668ee), the Refuge Recreation Act of 1962 (16 U.S.C. 460k-460k-4), as amended, Title 50 of the Code of Federal Regulations, and the Fish and Wildlife Service Manual. The NWRS Administration Act is implemented through regulations covering the NWRS, published in Title 50, subchapter C of the *Code of Federal Regulations*. These regulations govern general administration of units of the Refuge System. This CCP/EA is intended to comply with both the Refuge Administration Act and the National Environmental Policy Act (NEPA), as amended (42 U.S.C. 4321-4347).

1.5.1 U.S. Fish and Wildlife Service Mission

The mission of the Service is *"working with others, to conserve, protect and enhance fish and wildlife and their habitats for the continuing benefit of the American people."* National natural resources entrusted to the Service for conservation and protection include migratory birds, endangered and threatened species, inter-jurisdictional fish, wetlands, and certain marine mammals. The Service also manages national fish hatcheries, enforces federal wildlife laws and international treaties governing importing and exporting wildlife, assists with state fish and wildlife programs, and helps other countries develop wildlife conservation programs.

1.5.2 National Wildlife Refuge System

The NWRS is the world's largest network of public lands and waters set aside specifically for conserving wildlife and protecting ecosystems. From its inception in 1903, the NWRS has grown to encompass 548 national wildlife refuges and 10 waterfowl production areas located across the nation in all 50 states, covering more than 96 million acres of public lands. More than 36 million visitors annually fish, hunt, observe and photograph wildlife, or participate in environmental education and interpretive activities on these National Wildlife Refuges.

1.5.2.1 National Wildlife Refuge System Mission and Goals

The mission of the Refuge System *is:*

"to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within

the United States for the benefit of present and future generations of Americans" (National Wildlife Refuge System Administration Act of 1966, as amended)(16 U.S.C. 668dd).

Wildlife conservation is the fundamental mission of the Refuge System. The goals of the National Wildlife Refuge System, as articulated in the Mission Goals and Purposes Policy (601 FW1) are:

- Conserve a diversity of fish, wildlife, and plants and their habitats, including species that are endangered or threatened with becoming endangered.
- Develop and maintain a network of habitats for migratory birds, anadromous and inter-jurisdictional fish, and pinniped populations that is strategically distributed and carefully managed to meet important life history needs of these species across their ranges.
- Conserve those ecosystems, plant communities, wetlands of national or international significance and landscapes and seascapes that are unique, rare declining, or underrepresented in existing protection efforts.
- Provide and enhance opportunities to participate in compatible wildlife-dependent recreation (hunting, fishing, wildlife observation and photography, and environmental education and interpretation).
- Foster understanding and instill appreciation of the diversity and interconnectedness of fish, wildlife, and plants and their habitats.

1.5.3 National Wildlife Refuge System Administration Act

Of all the laws governing activities on National Wildlife Refuges, the Refuge Administration Act undoubtedly exerts the greatest influence. The Improvement Act amended the Refuge System Administration Act in 1997 by including a unifying mission for all National Wildlife Refuges to be managed as a System, a new process for determining compatible uses on refuges, and a requirement that each refuge will be managed under a Comprehensive Conservation Plan, developed in an open public process.

The Refuge Administration Act states that the Secretary shall provide for the conservation of fish, wildlife and plants, and their habitats within the System, and ensure that the biological integrity, diversity, and environmental health of the System are maintained. House Report 105–106 accompanying the Improvement Act states ". . .the fundamental mission of our System is wildlife conservation: wildlife and wildlife conservation must come first." Biological integrity, diversity, and environmental health are critical components of wildlife conservation. As later made clear in the Biological Integrity, Diversity and Environmental Health Policy, "the highest measure of biological integrity, diversity, and environmental health is viewed as those intact and self-sustaining habitats and wildlife populations that existed during historic conditions."

Under the Refuge Administration Act, each refuge must be managed to fulfill the Refuge System mission and the specific purposes for which it was established. The Refuge Administration Act requires the Service to monitor the status and trends of fish, wildlife, and plants on each refuge.

Additionally, the Refuge Administration Act identifies six priority wildlife-dependent recreational uses–hunting, fishing, wildlife observation and photography, and environmental education and interpretation. Under the Refuge Administration Act, the Service is to grant these six wildlife-dependent public uses special consideration in planning, managing, establishing, and expanding units of the NWRS. The overarching goal is to enhance wildlife-dependent recreation opportunities and access to quality visitor experiences on refuges while managing refuges to conserve fish, wildlife, plants, and their habitats. New and ongoing recreational uses should help visitors focus on wildlife and other natural resources. These uses should provide an opportunity to make visitors aware of resource issues, management plans, and how the refuge contributes to the Refuge System and Service mission. When determined compatible on a refuge-specific basis, these six uses assume priority status among all uses of the refuge in question. The Service is directed to make extra efforts to facilitate priority wildlife-dependent public use opportunities.

When preparing a CCP, refuge managers must re-evaluate all general public, recreational, and economic uses (even those occurring to further refuge habitat management goals) proposed or occurring on a refuge for appropriateness and compatibility. No refuge use may be allowed or continued unless it is determined to be appropriate and compatible. Generally, an appropriate use is one that contributes to fulfilling the refuge purpose(s), the Refuge System mission, or goals or objectives described in a refuge management plan. A compatible use is a use that, in the sound professional judgment of the refuge manager, will not materially interfere with or detract from the fulfillment of the mission of the Refuge System or the purposes of the refuge. Updated Appropriateness Findings and Compatibility Determinations for existing and proposed uses for Oregon Islands, Three Arch Rocks, and Cape Meares NWRs are in Appendices D and E.

The Refuge Administration Act also requires that, in addition to formally established guidance, the CCP must be developed with the participation of the public. Issues and concerns articulated by the public play a role in guiding alternatives considered during the development of the CCP, and together with the formal guidance, can play a role in selection of the preferred alternative. It is Service policy to invite public participation in CCP development, to carry out an open public CCP process, and secure public input throughout the process.

1.6 Relationship to Previous and Future Refuge Plans

Planning has been part of refuge operations since refuges were established. A number of plans have been completed over the years to guide managers. In recent history, additional smaller step down plans and or management agreements (plans addressing one program or resource) have been developed for Oregon Islands, Three Arch Rocks and Cape Meares NWRs individually or as a group. Current (completed since 2000) management plans include:

- Oregon Coast National Wildlife Refuge Complex HPAI (Highly Pathogenic Avian Influenza) and Wildlife Disease Contingency Plan (2006)
- Fire Management Plans (2004)
- Station Safety Plan (2002, revised 2008)
- Mammalian Predator Damage Management To Protect Seabird Colonies on Oregon Islands National Wildlife Refuge, Three Arch Rocks National Wildlife Refuge, and Adjacent Mainland Areas (2005)
- Fire Dispatch Plans (Updated annually)
- Oregon Coast NWRC IPM Plan (2009)

A Wilderness Management Plan was completed in 1980 (Service, 1980). This CCP addresses all the current required elements of a Wilderness Stewardship Plan (610 FW 3) and serves as an updated Wilderness Plan for Oregon Islands and Three Arch Rocks designated wilderness areas.

1.7 Future Planning

The CCP will be revised every 15 years or sooner if monitoring and evaluation determine that changes are needed to achieve the Refuge purposes, vision, goals, or objectives. The CCP provides guidance in the form of goals, objectives, and strategies for Refuge program areas but may lack some of the specifics needed for implementation. Step-down management plans may be developed for individual program areas, as needed, following completion and approval of the CCP. Step-down plans may require additional NEPA and other compliance.

1.8 Refuge Establishment and Refuge Purposes

The purpose for which a Refuge was established or acquired is of key importance in Refuge planning. Purposes must form the foundation for planning and management decisions. The purposes of a refuge are specified in or derived from the law, proclamation, executive order, agreement, public land order, donation document, or administrative memorandum establishing, authorizing, or expanding a refuge, refuge unit, or refuge subunit.

Unless the establishing law, order, or document indicates otherwise, purposes dealing with the conservation, management, and restoration of fish, wildlife, and plants, and the habitats on which they depend take precedence over other purposes in the management and administration of any unit. Where a refuge has multiple purposes related to fish, wildlife, and plant conservation, the more specific purpose will take precedence in instances of conflict. When an additional unit is acquired under an authority different from the authority used to establish the original unit, the addition takes on the purpose(s) of the original unit, but the original unit does not take on the purpose(s) of the newer addition.

By law, Refuges are to be managed to achieve their purposes. When a conflict exists between the Refuge System mission and the purpose of an individual refuge, the refuge purpose may supersede the Refuge System mission. Refuge purposes are also the driving force in the development of the refuge vision statements, goals, objectives, and strategies in the CCP and are critical to determining the compatibility of all existing and proposed refuge uses. The purposes for the Oregon Islands, Three Arch Rocks, and Cape Meares NWRs follow.

1.8.1 Oregon Islands National Wildlife Refuge Purposes (*purposes are bold and italicized)*

1.8.1.1 Rocks, reefs and Islands

Oregon Islands National Wildlife Refuge was established by E.O. 7035, dated May 6, 1935, with the designation of Goat Island Migratory Bird Refuge ***"…as a refuge and breeding ground for wild birds and animals."*** This original purpose applies to all lands and waters within this refuge. Additional islands were added to the refuge from 1968-1996 through various Executive Orders,

Public Laws and Public Land Orders ***". . .for use as an inviolate sanctuary, or for any other management purpose, for migratory birds."*** The rocks constituting Port Orford, Blanco, and Rogue River Reefs, when added to the existing Oregon Islands NWR, maintained an additional purpose as a ***"refuge for the protection of sea lions. . ."*** The Tillamook Rock Lighthouse Unit was added to the refuge in 1992 through a Grant of Easement, which states that this addition is ***". . .suitable for seabird nesting and habitat, and the recognized theme and spirit of this Indenture is to offer nesting protection for these seabirds that annually nest here while not affecting the sensitivity of the current and projected ongoing usage as a non-visiting columbarium cemetery and historic lighthouse, which must remain the primary purpose of the land for which this Indenture is granted."***

Scenic and rugged rocks, reefs, and islands. (Dave Ledig/USFWS)

1.8.1.2 Mainland units

The Coquille Point Unit was purchased in 1991 to ***"provide a buffer zone between mainland development and the coastal rocks and islands; protect the bluff zone for wildlife species; and provide one of the best opportunities along the Oregon coast for wildlife observation and environmental education."*** The Crook Point Unit was added in 1999 to ***"provide permanent protection to one of the few remaining undisturbed headlands on the Oregon coast, resulting in increased protection to major nearshore seabird breeding colonies and pinniped pupping and haulout sites within the Oregon Islands Refuge, unique geological formations, rare plants and cultural resource sites on the mainland, and a relatively undisturbed intertidal zone."***

Steller sea lions on Rogue Reef. (Roy W. Lowe/USFWS)

Oregon Islands NWR and Wilderness is located along 320 miles of the coast of Oregon and includes 1,854 rocks, reefs and islands and two headlands. The original purpose for federal withdrawal of certain rocks, reefs and islands along the Oregon coast was to protect them from "settlement, location, sale or entry, for classification and in aid of proposed legislation." Goat Island was the first unit of Oregon Islands NWR designated as a refuge, and all of the administratively withdrawn rocks, reefs and islands were eventually added. Wilderness designation was conferred on this refuge in 1970, 1978 and 1996 and applies to all rocks, reefs and islands within Oregon Islands NWR, with the exception of Tillamook Rock. With the exception of Coquille Point Unit's recreation purpose, Oregon Islands NWR lands were acquired to serve as a

refuge and breeding ground for seabirds and pinnipeds, and wilderness designation was intended to complement and strengthen existing protections for wildlife.

Goat Island Migratory Bird Refuge was established by Executive Order (E.O.) 7035 on November 26, 1934. The establishment was intended to effectuate further the purposes of the Migratory Bird Conservation Act (ch. 257, 45 Stat. 1222). Goat Island was withdrawn from settlement, location, sale, entry, or other form of appropriation under the public-land laws and reserved and set apart for the use of the Department of Agriculture as a refuge and breeding ground for wild birds and animals. It was declared unlawful within this reservation to "take or disturb any wild animal or bird, or their nests or eggs; to destroy any natural growth; or to burn it." The refuge was also closed to all public entry. In 1940, Presidential Proclamation 2416 changed the name from Goat Island Migratory Bird Refuge to Oregon Islands NWR. At that time Goat Island was still the only land within the refuge.

Beginning in 1968, a series of Public Land Orders, Public Laws, and Acts largely revoking earlier pre-Goat Island withdrawals, added numerous rocks, reefs, and islands to Oregon Islands NWR. Prior to Goat Island/Oregon Islands NWR establishment, numerous rocks and islands were withdrawn from settlement but not placed into any system. The Executive Order that withdrew Proposal Rock (E.O. 4082, 1924) and "all unreserved rocks and pinnacles situated in the Pacific Ocean off the coast of Oregon" (E.O. 4774, 1927) did not state a wildlife purpose.

Executive Order 4364 (1926) withdrew numerous named and unnamed islands and rocks "pending the passage of legislation to provide for the permanent reservation of the islands and rocks, in whole or in part, for recreational purposes or for the creation of permanent reservations of such rocks or islands as have long been occupied by breeding waterfowl and other native birds." Port Orford, Blanco, and Rogue River Reefs were withdrawn in 1931 (E.O. 5702) specifically as a refuge for the protection of sea lions. In 1968 Public Land Order (P.L.O.) 4395 added a total of 346.06 acres of rocks, reefs and islands to Oregon Islands NWR. A 1976 amendment to P.L.O. 4395 revoked or partially revoked the earlier withdrawals, and all the islands that had not been already made a part of the refuge were added through the P.L.O. amendment.

Common murre colony. (Roy W. Lowe/USFWS)

On October 23, 1970, certain lands within Oregon Islands NWR were accorded wilderness status through Public Law 91-504. The Wilderness Act of 1964 had directed the Secretary of the Interior, within 10 years, to review every roadless area of 5,000 acres or more and every roadless island (regardless of size), and recommend to the President the suitability of each such area or island for inclusion in the National Wilderness Preservation System. Twenty-one acres within Oregon Islands NWR were found to be

suitable and were accorded Wilderness designation through P.L. 91-504. The purposes of Oregon Islands NWR were not altered with this designation, as recorded in the public hearing records on the wilderness proposal: "the Wilderness Act provides that the establishment of a refuge wilderness area is 'supplemental' to the purpose for which a unit of the wildlife refuge system was established in the first place, so that protection of wildlife would only be strengthened."

The Wilderness Management Plan completed in 1980 (Service, 1980) includes this statement regarding the relationship of wilderness to refuge objectives: "The Wilderness Act of 1964 (PL 88-577) defines a wilderness as '…an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain. An area. . .without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions. . .' This definition of wilderness is compatible with refuge objectives. It has little, if any, effect on refuge programs since the original intent was to preserve these islands in a near natural state with only minimal human intrusions. Authorized entry under specific conditions is detailed in the Wilderness Management Plan. Public use is not allowed as it is incompatible with the primary objectives." Wilderness designation provides an additional level of protection for the wilderness portions of this refuge, but does not open the area to public access or use, nor does it change or supersede the original purposes for establishing the refuge.

Public Land Orders and Public Laws from 1978 through 1996 completed the Oregon Islands NWR and Wilderness. On October 11, 1978, Public Law 95-450 added additional islands to the refuge, and 459 acres already within Oregon Islands NWR were added to the Oregon Islands Wilderness. Public Land Order 6287 of June 16, 1982, withdrew additional "rocks, reefs, islets and islands lying within three geographical miles off the coast of Oregon and above mean high tide," and designated these as Oregon Islands NWR. On November 12, 1996, Public Law 104-333 transferred additional islands under Bureau of Land Management (BLM) jurisdiction, to Oregon Islands NWR, and designated all "federally owned named, unnamed, surveyed and unsurveyed rocks, reefs, islets and islands lying within three geographic miles of the coast of Oregon and above mean high tide" as Oregon Islands NWR and Wilderness.

The 1991 *Environmental Assessment for a Proposed Addition to Oregon Islands NWR, Coos County, Oregon* covered the acquisition of the Coquille Point Unit. The purposes of this acquisition were to provide a buffer zone between mainland development and Oregon Islands NWR's offshore islands, protect the bluff zone for wildlife species dependent on it, and provide one of the best opportunities along the Oregon coast for wildlife observation. Authority for this acquisition was through the Fish and Wildlife Act of

String of islands accorded wilderness status. (Roy W. Lowe/USFWS)

1956 (16 U.S.C. 742f-a-5), using funds made available through the Land and Water Conservation Fund Act of 1965, and through the Recreational Use of Conservation Areas Act of 1962, as amended (16 USC 460k-1). The Coquille Point Unit is the only unit of Oregon Islands NWR with a specific on-site public recreation purpose, and is not included in the Oregon Islands Wilderness.

On July 7, 1992, a Grant of Easement was signed which granted an easement and right of use to the Service of privately owned Tillamook Rock to be maintained as a seabird nesting and habitat area in perpetuity as part of Oregon Islands NWR. The Grant states that "the land… is wholly suitable for seabird nesting and habitat and the recognized theme and spirit of this Indenture is to offer nesting protection for these seabirds that annually nest here while not affecting the sensitivity of the current and projected ongoing usage as a non-visiting columbarium/cemetery and historic lighthouse, which must remain the primary purpose of the land for which this Indenture is granted." The Grantors of this easement are permitted to utilize Tillamook Rock as a columbarium between September 1 and March 15, while "maintaining the spirit and theme of this Indenture." Tillamook Rock does not qualify for Wilderness designation due to the human alterations of the rock, which includes the presence of buildings.

The Crook Point Unit of Oregon Islands NWR was acquired in 2000 with Land and Water Conservation Fund monies to protect sensitive seabird nesting colonies and pinniped haulout sites located within Oregon Islands NWR from human disturbance and trespass. The purposes of acquisition were to provide permanent protection to one of the few remaining undisturbed headlands on the Oregon coast, resulting in increased protection to major nearshore seabird breeding colonies and pinniped pupping and haulout sites within the Oregon Islands NWR, and to protect a relatively undisturbed intertidal zone, unique geological formations, rare plants and cultural resource sites. This acquisition was accomplished through a Categorical Exclusion because it involved a willing seller and there were no proposed changes to the existing uses of Oregon Islands NWR. Wildlife observation and photography, environmental education and interpretation were determined compatible uses for this unit during the interim period between acquisition and CCP development, but only in the form of extremely limited, guided tours by Refuge staff, and dependent on available funding. Crook Point did not contain the necessary wilderness features to qualify for wilderness study after acquisition.

A statement of overall goals for the Oregon Coast NWR Complex refuges was drafted in 1997. These broad goals will continue to be used as general guidance for the Complex's biological and public use programs; however, the goals articulated within the CCP will supersede the 1997 goals. The 1997 goals are as follows: (1) Protect, restore, and develop habitats for and otherwise support recovery of federally listed endangered and threatened species and help prevent the listing of candidate species and species of management concern; (2) Provide a diversity of habitats and maintain sanctuary status on coastal rocks, islands and reefs along the Oregon coast sufficient to support nesting seabird populations and breeding and loafing pinniped populations; (3) Protect, restore and develop a diversity of habitats for migratory birds such as shorebirds, wading birds, and neotropical songbirds, with special emphasis on waterfowl; (4) Protect, restore, and develop a diversity of native habitats for indigenous fish, wildlife, invertebrate, and plant species of the Oregon coastal ecosystem; and (5) Provide high quality opportunities for wildlife-dependent recreation to enhance public appreciation, understanding, and enjoyment of fish, wildlife, habitat, and cultural resources. Figures 1-1, 1-2 and 1-3 show the existing refuge boundaries.

1.8.2 Three Arch Rocks National Wildlife Refuge Purposes
(*purposes are bold and italicized)*

Three Arch Rocks was established in 1907 ***". . .as a preserve and breeding ground for native birds and animals."*** On October 14, 1907, President T. Roosevelt signed E.O. 699 establishing the Three Arch Rocks Reservation to protect existing habitat for colonial nesting seabirds. The name and land status, but not the purpose, were changed to the Three Arch Rocks NWR by E.O. 2416 signed July 25, 1940.

Three Arch Rocks NWR. (Betsy Rosenbaum/USFWS)

On October 23, 1970, Three Arch Rocks NWR was accorded wilderness status through Public Law 91-504. At 15 acres, Three Arch Rocks Wilderness is one of the smallest designated wilderness areas in the country. The Wilderness Act of 1964 had directed the Secretary of the Interior, within 10 years, to review every roadless area of 5,000 acres or more and every roadless island (regardless of size) and to recommend to the President the suitability of each such area or island for inclusion in the National Wilderness Preservation System. All rocks and islands within Three Arch Rocks NWR were found to be suitable and were accorded Wilderness designation through P.L. 91-504. The purposes of Three Arch Rocks NWR were not altered with this designation, as recorded in the public hearing records on the wilderness proposal: "the Wilderness Act provides that the establishment of a refuge wilderness area is 'supplemental' to the purpose for which a unit of the wildlife refuge system was established in the first place, so that protection of wildlife would only be strengthened." Figure 1-1 shows the existing refuge boundary.

1.8.3 Cape Meares National Wildlife Refuge Purposes
(*purposes are bold and italicized)*

Originally named Cape Meares Migratory Bird Refuge, Cape Meares NWR was established in 1938 ***"as a refuge and breeding ground for migratory birds and other wildlife"*** by Executive Order 7957, dated August 19, 1938 and signed by President Franklin Roosevelt. The name and land status, but not the purpose, was changed to Cape Meares National Wildlife Refuge by Executive Order 2416, signed July 25, 1940. Cape Meares NWR has been managed in cooperation with Oregon Parks and Recreation Department (OPRD) since its establishment. A Special Use Permit dated November 9, 1938 granted permission to the Oregon State Parks Commission to "use Cape Meares Migratory Bird Refuge for the purpose of cooperating with the Bureau of Biological Survey in administering the area as a joint National Wildlife Refuge and

(Robert Reed/USFWS)

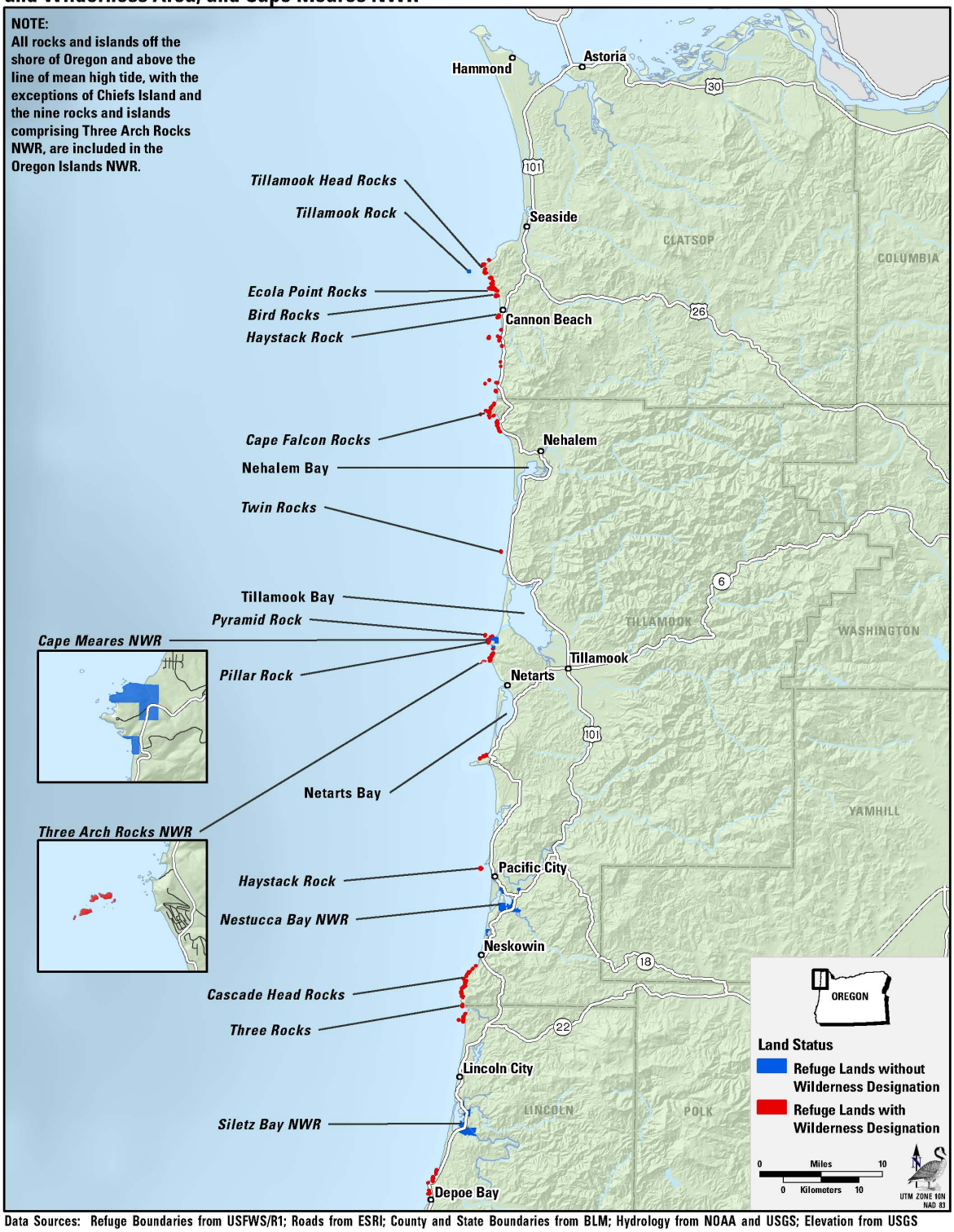
State Park Project," subject to supervision and "dominant use" by the Bureau of Biological Survey. This agreement was superseded by a Memorandum of Agreement (MOA) dated February 21, 1986, through which Cape Meares NWR is managed cooperatively with OPRD as a joint NWR and State Scenic Viewpoint. Specifically, the MOA is for "the Use of Cape Meares National Wildlife Refuge for State Park Purposes." Forest resource management is administered by the Service, except that State Parks pays the annual fire patrol assessment to Oregon Department of Forestry.

On June 11, 1987, the Service designated the NWR (excluding the hiking trail) a Research Natural Area (RNA) to further protect its unique vegetation, geology, and wildlife habitat in a naturally functioning ecosystem. Authority to designate RNAs on NWRs is delegated to the Service director by the National Wildlife Refuge Administration Act of 1966. RNA's are areas where natural processes are allowed to predominate without human intervention. Activities on RNAs are limited to research, study, observation, monitoring, and educational activities that are non-destructive, non-manipulative, and maintain unmodified conditions. The RNA designation for Cape Meares NWR was supported as an example of Sitka spruce forest communities and coastal headland shrublands on the north Oregon coast, and was considered an important site for inclusion into the RNA program as it is one of the few remaining stands of old-growth Sitka spruce along the northern Oregon coast.

A Refuge Management Plan was completed for Cape Meares in 1987 (Service, 1987). In this plan, overall Refuge goals and objectives for Cape Meares NWR were articulated as: (1) to protect and preserve the existing cliff habitat and the Cape Meares old-growth forest in an unaltered, natural condition to support migratory bird and other wildlife populations; (2) to maintain the integrity of the refuge as a Research Natural Area, allowing natural processes to continue without interference from humans; (3) to provide monitoring and to cooperate with other agencies, institutions of higher education, private organizations, and individuals in providing research opportunities; and (4) to provide, in cooperation with Oregon State Parks and Recreation, opportunities for quality wildlife-dependent recreation, interpretation, and outreach to enhance public appreciation, understanding, and enjoyment of Refuge resources. These broad goals will continue to be used as general guidance for Cape Meares biological and public use programs; however, the goals articulated within the CCP will supersede the 1987 Management Plan goals.

The goals and objectives for Cape Meares NWR as a Research Natural Area are in addition to the 1987 Refuge Management Plan goals and objectives and are as follows: (1) to preserve an example of a significant natural ecosystem for comparison with those influenced by humans; (2) to provide an educational and research area for ecological and environmental studies; and (3) to preserve gene pools of typical and endangered plants and animals. RNA goals have been incorporated into the CCP goals. Figure 1-1 shows the existing refuge boundary.

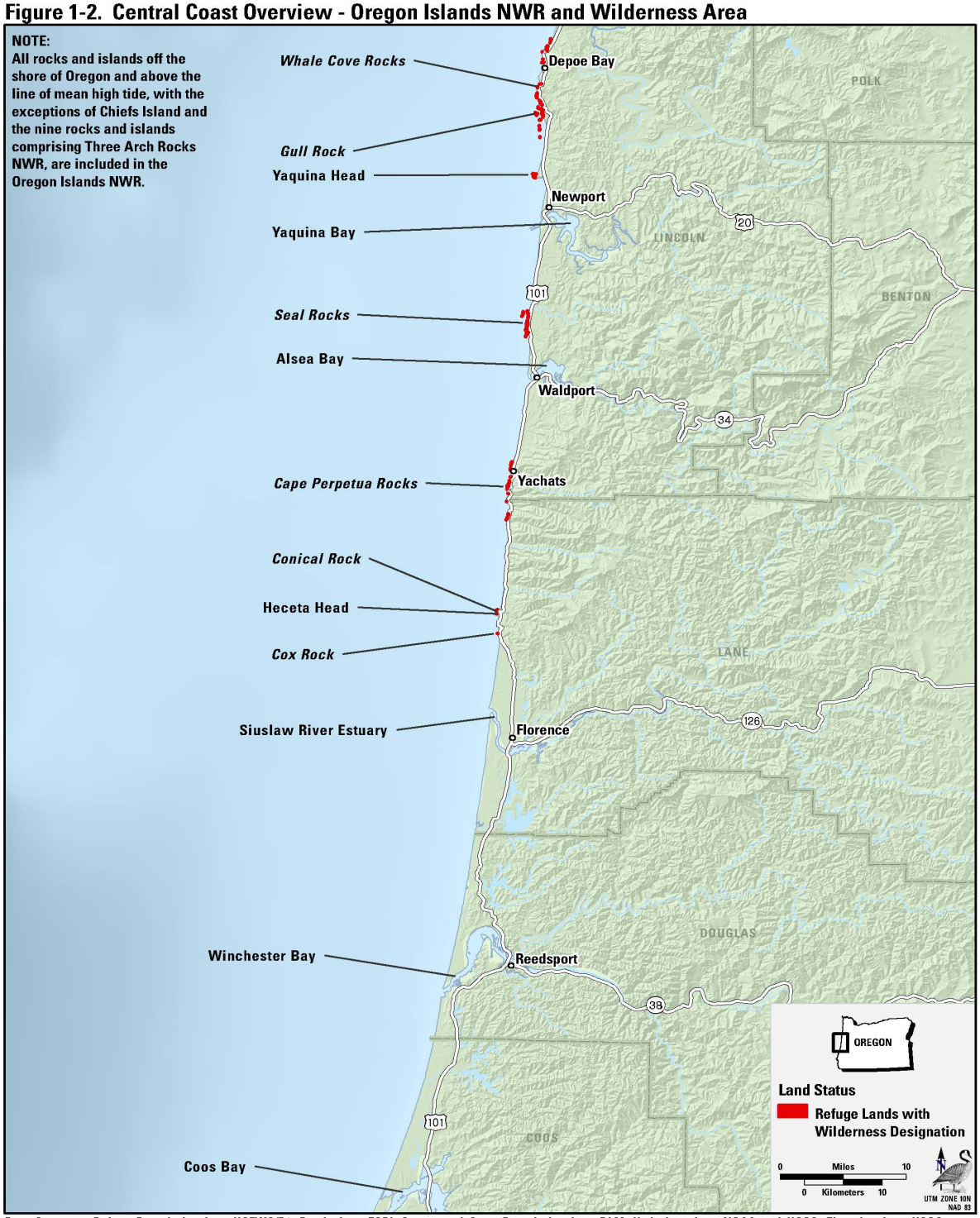
Figure 1-1. North Coast Overview - Oregon Islands NWR and Wilderness Area; Three Arch Rocks NWR and Wilderness Area; and Cape Meares NWR



Data Sources: Refuge Boundaries from USFWS/R1; Roads from ESRI; County and State Boundaries from BLM; Hydrology from NOAA and USGS; Elevation from USGS

The back sides of maps are blank to improve readability.

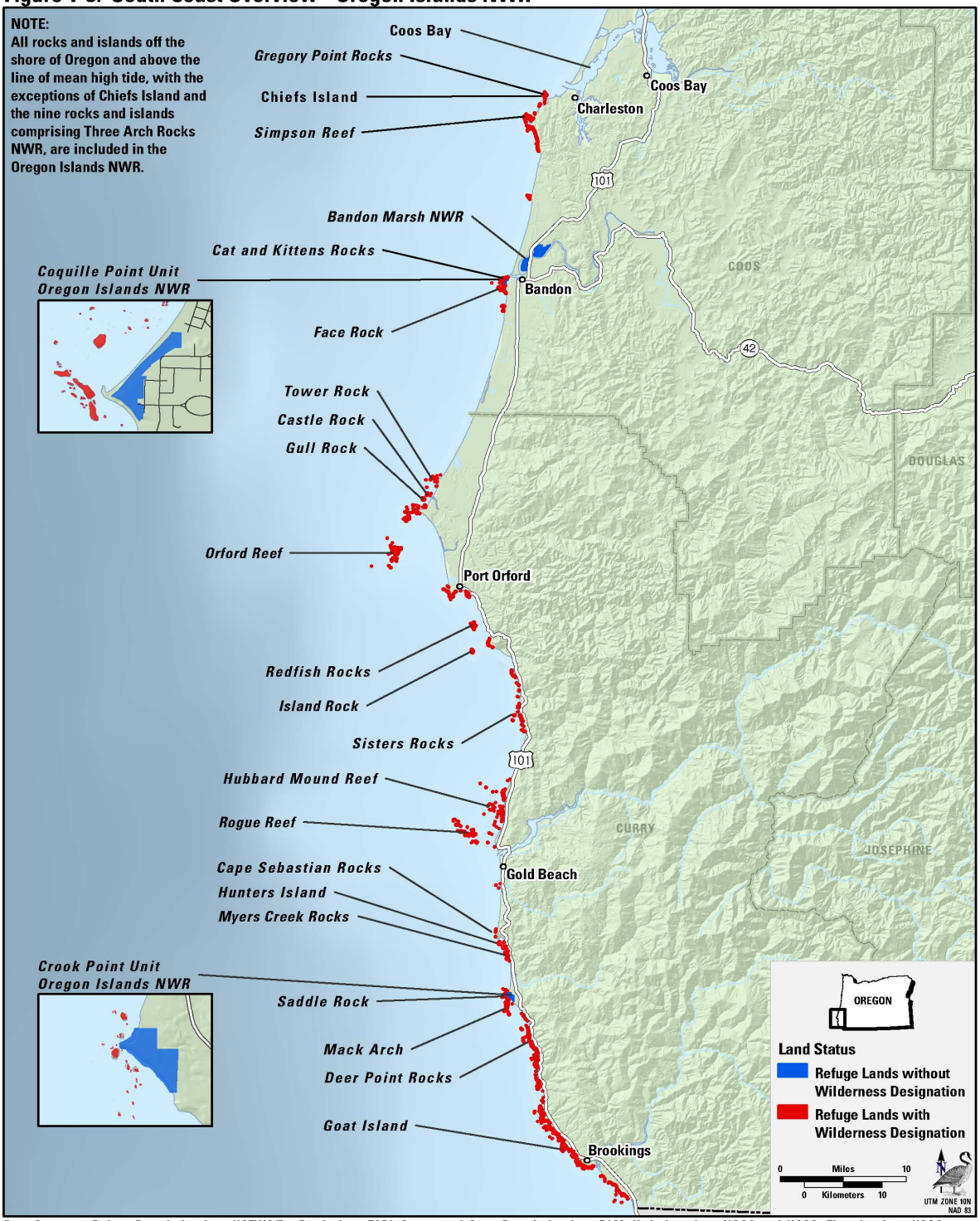
Figure 1-2. Central Coast Overview - Oregon Islands NWR and Wilderness Area



Data Sources: Refuge Boundaries from USFWS/R1; Roads from ESRI; County and State Boundaries from BLM; Hydrology from NOAA and USGS; Elevation from USGS

The back sides of maps are blank to improve readability.

Figure 1-3. South Coast Overview - Oregon Islands NWR



Data Sources: Refuge Boundaries from USFWS/R1; Roads from ESRI; County and State Boundaries from BLM; Hydrology from NOAA and USGS; Elevation from USGS

The back sides of maps are blank to improve readability.

1.9 Relationship to Ecosystem Management Goals or Plans

One of the major purposes of this CCP is to ensure that refuge management is focused on achieving not only the refuge purposes, but also national, regional, and state goals for the preservation and enhancement of wildlife and habitats. These goals are stated in various plans that pertain to the Pacific Northwest and especially the Oregon coast and the California current system. The following is a list of the major plans that were considered in the development of the CCP goals and objective.

1.19.1 Habitat

- Oregon Natural Heritage Plan (Oregon Natural Heritage Program 2003). The Oregon Natural Heritage Plan is a product of the Oregon Natural Heritage Program, whose mission is to conserve the full range of Oregon's native plants, animals and ecosystems through voluntary and cooperative action. The Program uses science to identify high quality and representative examples of native Oregon habitats and species and works to protect these natural treasures through voluntary and cooperative habitat conservation agreements. The Oregon Natural Heritage Plan has three roles: (1) Describe the components of Oregon's natural heritage; (2) Identify natural areas of exceptional value for conservation; and (3) Provide opportunities for voluntary conservation on both public and private lands.

- Pacific Northwest Coast Ecoregion Assessment (Vander Schaaf et al. 2006). This Assessment is a resource to help conservation agencies, planners and organizations direct their resources to the most important places for supporting the ecoregion's biodiversity. It describes a portfolio of priority conservation areas that are of exceptional biological value and are the most likely places for conservation to succeed based on their current condition, land use, and other factors.

- Oregon Nearshore Strategy (ODFW 2005). The Nearshore Strategy, prepared by ODFW's Marine Resources Program, complements the statewide *Comprehensive Wildlife Conservation Strategy* by providing additional information on nearshore marine fish and wildlife, and their habitats. The Nearshore Strategy identifies a broad spectrum of resource management concerns and issues in order to ensure all issues that may affect fish and wildlife have been considered. Many of these issues cut across the jurisdiction of multiple agencies; however, this Strategy is focused on providing recommendations for action within ODFW's jurisdiction. The mission of Oregon's Nearshore Strategy is to promote actions that will conserve ecological functions and nearshore marine resources to provide long-term ecological, economic, and social benefits for current and future generations of Oregonians.

- Oregon Territorial Sea Plan (OPAC 1994). This Plan was developed by the Ocean Policy Advisory Council (OPAC). During development of the Plan OPAC held statewide public input meetings, worked with federal partners, and used the earlier Ocean Plan as a framework. This Plan focuses on state waters out to three nautical miles. It established policies and procedures, coordination between state agencies, and provided a strategy for protecting rocky shores. The Plan was approved as part of Oregon's Coastal Management Plan in 1994, and was amended in May 2001.

- Oregon's Comprehensive Wildlife Conservation Strategy (ODFW 2005). The Oregon Department of Fish and Wildlife prepared a Comprehensive Wildlife Conservation Strategy (CWCS) in response to two federal programs—the Wildlife Conservation and Restoration Program and the State Wildlife Grant Program. The CWCS includes information on the distribution and abundance of priority wildlife and habitats; provides strategies for conserving and monitoring wildlife and habitat; and provides for coordination with federal, state, tribal, and local agencies and the public. The CWCS emphasizes proactive measures to conserve declining species and habitats, and to "keep common species common."

1.9.2 Birds

- Birds of Conservation Concern 2002 (Service 2002). Based on the efforts and assessment scores of three major bird conservation efforts (Partners in Flight, the U.S. Shorebird Conservation Plan, and the North American Waterbird Conservation Plan), this report identifies, by Service Region and by Bird Conservation Region (BCR), the bird species most in need of conservation attention. The refuges of the Complex are located within BCR Region 5.

- Recovery Plan for the threatened Marbled Murrelet (*Brachyramphus marmoratus*) in Washington, Oregon, and California (Service 1997). The interim objective of the Recovery Plan is to set strategies for stabilizing population size at or near current levels by maintaining and/or increasing productivity and removing and/or minimizing threats to the species survival.

- A Conservation Strategy for the Northern Spotted Owl (Interagency Scientific Committee 1990). The Conservation Strategy for the Northern Spotted Owl (*Strix occidentalis caurina*) proposes a two-part conservation strategy. The first stage prescribes and implements the steps needed to protect habitat in amounts and distribution that will adequately ensure the owl's long-term survival. The second stage calls for research and monitoring to test the adequacy of the strategy and to seek ways to produce and sustain suitable owl habitat in managed forests.

- California Brown Pelican Recovery Plan (Service 1983). This Recovery Plan describes the biology of the California brown pelican, the reasons for its decline, and the actions needed to recover and delist the species.

- Pacific Bald Eagle Recovery Plan. (Service 1986). This recovery plan, one of five such plans, outlines the steps needed for recovery and maintenance of bald eagle populations in the 7-state Pacific recovery area.

- Aleutian Canada Goose Recovery Plan – Second Revision (Service 1991). This Recovery Plan, prepared in 1979 with a first revision in 1982, described the biology of the Aleutian Canada Goose (*Branta hutchinsii leucopareia*) (now Aleutian Cackling Goose, delisted in 2001) and the habitat requirements and limiting factors, and the actions needed to recover and delist the species.

- Regional Seabird Conservation Plan (Service 2005). This Plan identifies the Service's priorities for seabird management, monitoring, research, outreach, planning and coordination. It serves as a guide to coordinate Service activities for seabird conservation at the Regional scale. The Plan includes a review of seabird resources and habitats, a description of issues and threats, and a summary of current management, monitoring and outreach efforts. All species are prioritized by conservation concern at the regional scale and recommendations for conservation actions are identified and prioritized. Brief profiles for each breeding species provide a summary of current information on population size, status, ecology, distribution, habitats, threats, and recommended conservation actions.

- U.S. Shorebird Conservation Plan: Northern Pacific Coast Regional Shorebird Management Plan (Drut and Buchanan 2000). The national Shorebird Plan, which provides a scientific framework to determine species, sites, and habitats that most urgently need conservation action, includes 11 regional plans reflecting major shorebird flyways and habitats within the United States. This regional plan addresses shorebird management needs on a regional basis while considering Pacific Flyway and National levels of need.

- Waterbird Conservation for the Americas: North America Waterbird Conservation Plan, Version 1 (Kushlan *et al.* 2002). The North America Waterbird Conservation Plan provides a continental scale framework for the conservation and management of 210 species of waterbirds, including seabirds, coastal waterbirds, wading birds and marshbirds utilizing aquatic habitats in 29 areas throughout North America, Central America, the islands and pelagic waters of the Caribbean Sea, and western Atlantic and U.S.-associated Pacific Islands and pelagic waters of the Pacific Ocean.

- Partners in Flight North American Landbird Conservation Plan. (Rich *et al.* 2004). Partners in Flight (PIF) is an international coalition of government agencies, conservation groups, academic institutions, private organizations, and citizens dedicated to the long-term maintenance of healthy populations of native landbirds. PIF's goal is to focus resources on the improvement of monitoring and inventory, research, management, and education programs involving birds and their habitats. The PIF strategy is to stimulate cooperative public and private sector efforts in North America and the Neotropics to meet these goals. Specific strategies for accomplishing the goals are contained in regional landbird conservation plans. These plans describe priority habitats and species, and provide recommended management actions to conserve those habitats and species.

- Partners in Flight Continental Priorities and Objectives defined at the State and Bird Conservation Regional Levels; Oregon (Rosenberg 2004). The Oregon regional and state Partners in Flight plans identify priority species and habitats, set goals and objectives, discuss local issues and opportunities, and outline strategies for local or regional partners to implement bird conservation objectives.

- The California Current Marine Bird Conservation Plan version 1 (Mills *et al.* (Eds.) 2005). This Plan addresses seabird conservation from an ecosystem perspective, synthesizing information on multiple species, multiple habitats, ecological interactions, and the issues and threats that affect the health of seabirds, their prey and their environments.

1.9.3 Mammals

- Recovery Plan for the Steller sea lion (*Eumetopias jubatus*) (National Marine Fisheries Service 2008). The Recovery Plan serves as the blueprint for recovery and eventual de-listing of the Steller sea lion from the list of threatened and endangered species under the Federal Endangered Species Act.

1.9.4 Global climate change

- Strategic Habitat Conservation (Service and U.S. Geological Survey, 2006). Strategic Habitat Conservation will involve working collaboratively with partners to develop and implement a landscape approach to habitat conservation. The program employs strategic habitat conservation principles to provide landscape level conservation and planning assistance to abate the impacts of growth and development related to climate change and/or sea-level rise. Activities focus on ensuring habitat connectivity; mitigating the effects of climate change, such as flooding or storm surge; and coastal land protection and conservation.

1.10 Planning and Issue Identification

The public scoping period for preparation of the Draft CCP for Oregon Islands, Three Arch Rocks, and Cape Meares NWRs opened in October 2006 when the Complex mailed approximately 300 copies of Planning Update #1 to local conservation and interest groups, conservation and research organizations, government agencies, Tribes, and others who expressed an interest in the planning process. The planning update was posted on the Complex website. Planning Update #1 described the CCP process, explained Refuge purposes, identified preliminary issues, and helped us expand our mailing list.

Five public meetings were held in coastal Oregon communities during November 2006 where Complex staff explained the CCP process; Refuge purposes, vision, and management; and preliminary management issues, concerns and opportunities that had been identified early in the planning process. Public comments were documented during these meetings. Issues and concerns articulated by the public were considered while we formulated alternatives during development of the CCP, and together with the formal guidance, played a role in the selection of the preferred alternative.

The second planning update was mailed on April 18, 2007. This update summarized the issues, concerns, and opportunities identified by the Service, its partners, and the public during initial public scoping. A summary of public involvement to date is in Appendix C.

1.10.1 Issues to be addressed in the CCP

The core planning team evaluated the issues and topics documented during the scoping process. Issues are defined as matters of controversy, dispute, or general concern over resource management activities, the environment, land uses, or public use activities. Issues are important to the planning process because they identify topics to be addressed in the CCP, pinpoint the types of information to gather, and help define CCP alternatives. Numerous issues, concerns and opportunities were raised, and all are addressed in some manner in the CCP. It is the Service's

responsibility to focus CCP planning and the EA analysis on the major issues. Major issues typically suggest different actions or alternative solutions and are those within the Complex's jurisdiction which have a positive or negative effect on the resource. Major issues will influence the decisions proposed in the CCP. The major issues, concerns, and opportunities identified by the CCP planning team and the public are presented in the sections that follow.

1.10.1.1 Issue 1. Disturbance of wildlife

- *What actions should the Service take to reduce low flying aircraft disturbance events impacting highly vulnerable seabirds and marine mammals?*

Reports of low-flying aircraft disturbing seabird colonies and pinniped haulouts continue along locations on the coast, and at Oregon Islands and Three Arch Rocks NWRs. The Complex is actively managing low-level aircraft disturbance through guidelines published on Federal Aviation and Aeronautics (FAA) pilot maps, educational posters and material distributed to airports and pilots associations, and through educational pilot training opportunities. The Draft and Final CCP/EA alternatives will compare different strategies and levels of effort to reduce wildlife disturbance by aircraft.

- *What actions should the Service take to reduce boating disturbance events impacting seabirds and marine mammals? Is the existing seasonal buffer zone closure around Three Arch Rocks NWR effective in protecting breeding seabirds and marine mammals and if so, could and should the buffer zone be replicated around other rocks and islands to protect valuable habitat?*

Boats, both motorized and non-motorized, are reported regularly disturbing wildlife on rocks and islands along the coast. To reduce or eliminate watercraft disturbance events to wildlife, the refuge manages watercraft at Three Arch Rocks NWR with a seasonal buffer zone closure. For Oregon Islands NWR the refuge posts public boat ramps at coastal locations with informational and warning placards. The Draft and Final CCP/WSP/EA alternatives will compare different strategies and levels of effort, including replication of buffer zones, to reduce disturbance to wildlife by motorized and non-motorized watercraft.

1.10.1.2 Issue 2. Law enforcement

- *What actions and partnerships can the Service pursue to improve law enforcement on the Refuges?*

Local citizens often notify the refuge of trespass and wildlife disturbance. Due to limited staff, past and current enforcement coverage has by necessity relied on informal arrangements and coordination with other law enforcement agencies. The Draft and Final CCP/WSP/EA alternatives will compare different strategies and levels of effort for pursuing law enforcement capabilities and partnerships with other agencies.

1.10.1.3 Issue 3. Management of public access and use

- *What types and level of recreational opportunities should be provided? Are existing public use opportunities adequate and appropriate?*

Interest in public recreation on the Refuges is increasing. This interest involves priority wildlife–dependent public uses (hunting, fishing, wildlife observation, photography, environmental education and interpretation) that have priority over other public uses as mandated by the National Wildlife Refuge System Administration Act of 1966, as amended. Specifically, the Draft and Final CCP/WSP/EA alternatives will consider how to best meet those priority public use needs while also protecting the habitat/wildlife the Service is mandated to protect.

1.10.1.4 Issue 4. Research and monitoring

- *Based on Refuge System, ecosystem, and refuge goals, what management-oriented research is needed and what partnerships and methods for accomplishing high priority research are feasible?*

Existing baseline data and inventory of plant and animal species found on Oregon Islands, Three Arch Rocks, and Cape Meares NWR's habitats are currently inadequate for monitoring trends in these communities. Emphasis of research should focus on understanding the cause of reduced or declining wildlife populations and development of tools and techniques to aid recovery of threatened or endangered species. The Draft and Final CCP/WSP/EA alternatives will propose various strategies and levels of effort for identifying and fulfilling inventory, monitoring, and research needs as well as research partnership opportunities, and will consider how this information can be incorporated into management of the refuges.

1.10.1.5 Issue 5. Climate change

- *What is known about global climate change and how it affects the species and ecosystems that depend on the refuges? Which of these issues can be further studied at the refuge and ecosystem level, and how can this information be incorporated into wildlife management on the refuges?*

Over the coming years, effects of climate change, such as flooding, storm surge, and coastal erosion due to sea-level rise will impact the refuges. Through the CCP/WSP/EA process we will assess what is known about global climate change and how it affects the species and ecosystems that depend on the refuge, determine which issues can be further studied at the refuge and ecosystem level, and identify how this information can be incorporated into management alternatives.

1.10.1.6 Issue 6. Invasive species

- *What invasive plant and animal species are present on the refuges, how are they impacting seabird and other important wildlife habitats, and how can the refuges deal with them?*

Negative impacts of invasive species on wildlife populations and habitat continue to be a major factor in the management of the refuges. The Draft and Final CCP/WSP/EA alternatives will consider different strategies and levels of effort to determine the presence of invasive plant and animal species, and establish management strategies to reduce or eliminate them.

1.10.1.7 Issue 7. Human-caused catastrophic events

- *What actions can the Complex take to initiate or improve contingency planning for catastrophic events such as shipwrecks, oil spills, and rat spills; concentrations of marine debris; diseases such as West Nile virus and avian flu; and wildfire?*

Public concerns over the impacts of wildland fires, wildlife diseases, and oil spills and other human induced wildlife catastrophic events have increased in recent years. The Draft and Final CCP/WSP/EA will incorporate existing Contingency Plans and will address contingency planning for other potential disasters.

1.10.1.8 Issue 8. Cooperative efforts

- *What jurisdictions and management responsibilities overlap within the refuges' administrative boundaries and in Marine Protected Areas and how can the Complex's resources and management benefit from multiple-agency involvement in resource protection?*

There are many community groups, federal and state agencies, and other entities that assist the refuges in accomplishing their mission. The Draft and Final CCP/WSP/EA alternatives will propose strategies for improving the refuges' resource management capabilities through partnerships with other agencies, organizations, groups and media.

1.10.2 Issues outside the scope of the CCP

The CCP is not an appropriate forum for discussion of all issues. The following issues will not be analyzed in this CCP because they are not under the jurisdiction of these refuges.

- Regarding future specific plans for Oil Spill Mitigation funds, refuge staff will engage in Natural Resource Damage Assessment programs when applicable and will provide input, including strategies and priorities for restoration projects.

- The issue of land acquisition, such as the establishment of new refuges to offset impacts of coastal development or the acquisition of forest habitat for marbled murrelets is not feasible at this time.

- Snowy plover management on beaches, the potential for sea otter reintroduction along the Oregon coast, and management of other listed species not occurring on refuge lands are not within the scope of this CCP/WSP/EA because they fall under the jurisdiction of other Service programs.

- Wildlife disturbance on lands and waters not included within the refuges' boundaries will be part of cooperative management discussions with other resource agencies but are not a target for analysis within the CCP/WSP/EA.

1.11 Refuge Vision Statements

1.11.1 Oregon Islands National Wildlife Refuge

Spanning the Oregon coast, the wilderness islands and wind swept headlands of Oregon Islands National Wildlife Refuge are celebrated for their wildlife and rugged grandeur. Rocky islands and sheer cliffs provide critical breeding and resting habitat for diverse communities of birds, mammals, and plants along the wave-battered coastline. The isolated Crook Point headland continues to be reshaped by the geologic forces that fashioned it, while visitors are drawn to the Coquille Point headland by the exceptional opportunities to observe and learn about coastal wildlife and the National Wildlife Refuge System.

With our friends and partners, we will apply sound scientific principles for monitoring, managing, and protecting the biological integrity of Pacific coastal wildlife and habitats. We envision the continued development and enhancement of inspiring viewing opportunities for hundreds of thousands of visitors, providing them with a window into this living heritage, while the island breeding grounds and Crook Point will continue to provide a secluded wildland haven for wildlife and plants, in sight of and just out of reach of human influence.

1.11.2 Three Arch Rocks National Wildlife Refuge

A testament to seabird conservation, Three Arch Rocks National Wildlife Refuge sustains the largest and most diverse seabird colony in Oregon and is an important breeding site for Steller sea lions. Early protection of the nine offshore rocks that define this remote wilderness habitat set a precedent for conservation along the resource-exploited Pacific coastline, symbolizing a change in the way the American public protects and views these marine species. Formed by pre-historic lava flows and shaped by continuous oceanic forces, this wildlife refuge will be managed as wilderness in perpetuity, for the benefit of wildlife and the American people.

1.11.3 Cape Meares National Wildlife Refuge

A remnant of once vast old growth Pacific Temperate Rainforest, the fog shrouded Sitka Spruce and Western Hemlock forests of Cape Meares National Wildlife Refuge loom over precipitous coastal cliffs providing seabirds, falcons and a wealth of endemic coastal wildlife with protected sanctuary. In cooperation with Oregon Parks and Recreation Department, we envision natural processes continuing to unfold in the most remote sections of the refuge while visitors are welcomed to the viewing decks and trails and invited to observe and learn about this rare, intact functioning coastal ecosystem.

1.12 Refuge Goals

Goal 1: Preserve and protect all rocks, reefs and islands within Oregon Islands and Three Arch Rocks NWRs for the benefit of seabirds, shorebirds, waterfowl, other migratory birds, pinnipeds and native plants.

Goal 2: Maintain and protect native coastal habitats within the Crook Point Unit of Oregon Islands NWR for the benefit of rare plants, migratory birds and other native wildlife.

Goal 3: Protect rocks and islands within Oregon Islands NWR by maintaining a mainland buffer zone at Coquille Point Unit for the benefit of seabirds, shorebirds, waterfowl, other migratory birds, pinnipeds and native plants.

Goal 4: Collect scientific information (inventories, monitoring, feasibility studies, assessments, and research) to support adaptive management decisions (Goals 1-3) on Oregon Islands and Three Arch Rocks NWRs.

Goal 5. Oregon Islands NWR: Promote protection, stewardship and enjoyment of Oregon's seabirds and pinnipeds and their wilderness habitats by providing opportunities for wildlife observation, photography, interpretation and environmental education on appropriate mainland areas.

Goal 6. Three Arch Rocks NWR: Promote protection, stewardship and enjoyment of Oregon's seabirds and pinnipeds and their wilderness habitats, and the historical significance of the refuge to marine wildlife conservation.

Goal 7: Preserve and protect the wilderness character of Oregon Islands Wilderness and Three Arch Rocks Wilderness including its untrammeled nature, naturalness, and undeveloped condition.

Goal 8: At Cape Meares NWR, protect and maintain coastal habitats characteristic of Pacific Northwest old-growth Sitka spruce forest to allow natural succession to occur consistent with Research Natural Area designation, for the benefit of these habitat types and the plant and animal species associated with them.

Goal 9: Collect scientific information (inventories, monitoring, feasibility studies, assessments, and research) to support adaptive management decisions (Goal 8) on Cape Meares NWR and RNA.

Goal 10: In cooperation with OPRD, provide on and offsite opportunities for visitors to enjoy wildlife observation, photography, and environmental education and interpretation while limiting disturbance to wildlife. Visitors will be able to gain an understanding of the basic ecological concepts of the Coastal Cliffs and Old-growth Sitka Spruce and Western Hemlock Forests of Cape Meares and appreciate wildlife and wildlands which are being protected.

Goal 11: Promote conservation of cultural resources on Refuge lands through effective coordination and cooperation with Tribes having adjoining ownership or management responsibilities.

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Chapter 2. Alternatives, Goals, Objectives, and Strategies

2.1 Considerations in Alternative Design

In drafting the alternatives for this long term conservation plan, Refuge Complex staff members reviewed and considered a variety of resource, social, economic, and organizational aspects important for managing these refuges. As is appropriate for a national wildlife refuge, resource considerations were fundamental in formulating alternatives. House Report 105-106 accompanying the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57) amending the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee) states "…the fundamental mission of our System is wildlife conservation: wildlife and wildlife conservation must come first."

The planning team for the Complex reviewed available scientific reports and studies to better understand ecosystem trends and the latest scientific recommendations for managing and conserving species and their habitats.

Local, State, and Federal agencies and elected officials were contacted by the refuge planning team to ascertain priorities and problems as perceived by others. The team also contacted refuge users, nonprofit groups, and community organizations to ensure that their comments and ideas were considered during the development of alternatives. Details of public participation can be found within Chapter 1, section 1.10 Planning and Issue Identification.

2.2 Alternatives Considered but Not Developed for the Plan

During the alternatives development process, the planning team considered the issues detailed below. All of these issues were ultimately eliminated from further consideration for the reasons provided.

2.2.1 Alternative considered but not developed for further analysis: external focus

This potential alternative included extending or increasing refuge involvement in issues beyond refuge boundaries and outside refuge jurisdictions, at the expense of wildlife and habitat protection on refuge lands. These issues include, but are not limited to, the following: establishment of marine reserves, sea otter reintroduction, and Measure 37 claims and other land use planning. These issues were identified through our initial public scoping process for this CCP.

2.2.1.1 Marine reserves

Marine Reserves are being studied by the state of Oregon as a protection measure for Oregon's ocean resources. Based on public comment, the planning team considered including Marine Reserves in the list of issues to be explored during this CCP process. The Complex staff is responsible for managing and protecting all of the islands, rocks and reefs that are above the surface of the water at mean high tide and separated from the mainland. As with other units of the National Wildlife Refuge System, the Complex staff is responsible for fish, wildlife, plants, and their habitats within Oregon Islands and Three Arch Rocks NWRs. These species are seasonal or permanent residents including seabirds, shorebirds, and pinnipeds (seals and sea lions) using refuge rocks, reefs and islands. The Complex staff member's responsibilities cover terrestrial

environments, but the refuges and their wild inhabitants are also vitally linked with the surrounding marine environment and its resources. The marine waters surrounding these refuges are within the State Territorial Sea and are under the jurisdiction and administration of the State of Oregon; however, establishment of marine reserves could add another layer of protection to refuge rocks, reefs and islands. The Complex staff has been asked to contribute data and information to the planning process and to make recommendations regarding the location of potential marine reserves. Because the reserves would not be managed by Complex staff members and the Service's jurisdiction ends at the mean high tide line, establishment of marine reserves will not be addressed as part of this CCP.

2.2.1.2 Sea otter reintroduction

Several public commenters requested us to address the issue of reintroduction of sea otters (*Enhydra lutris*) into Oregon waters. Sea otters are one of five species of marine mammals that are under jurisdiction of the Service. By the end of the 19th century, sea otters were hunted to the brink of extinction from most of their historic range for the fur trade. During the mid-1960s the Alaska Department of Fish and Game began translocating sea otters to sites where the species had occurred before the fur-trade period. The first translocations were restricted to Alaska, but beginning in 1969 and continuing through 1972, the effort expanded beyond Alaska (Jameson et al, 1982). During this period, 241 sea otters were translocated to sites in British Columbia, Washington, and Oregon. Efforts to reintroduce sea otters to Oregon failed, but sea otter reintroduction in Washington is considered a success. From 1989 to 1999, the Washington population grew at an average annual rate of about 11%, and the most recent survey, in July 1999, found 605 individuals (Richardson and Allen, 2000). Destruction Island is believed to be roughly the southern limit of the Washington population, but occasionally an otter travels south, and single individuals have been observed in Oregon on occasion since 1993. There is also a slight chance that California sea otters could move north into Oregon of their own accord. Regardless, any discussion, research, or planning related to sea otter reintroduction would be undertaken by the Service's Ecological Services Division and is outside the scope of this CCP.

2.2.1.3 Measure 37 and 49 claims and other land use planning issues

The law enacted by State Measure 37 in 2004 allowed property owners whose property value was reduced by environmental or other land use regulations to claim compensation from state or local governments. If the government failed to compensate a claimant within two years of the claim, the law allowed the claimant to use the property under only the regulations in place at the time he/she purchased the property. Measure 49 placed on the November 6, 2007 special election ballot, passed with 62% in favor it. It overturned and modified many of the provisions of Measure 37, in an attempt to restrict the measure's damaging effects by limiting some of the development that Measure 37 permitted. As stated below under section 2.3.1 Features Common to Both Alternatives, the Complex will continue to actively participate in and contribute to planning and studies for ongoing and future industrial and urban development, focusing on contaminants and other potential concerns that may adversely affect refuge wildlife and habitats. However, it would be inappropriate for the Complex to attempt to influence or to contribute comments officially representing the Service regarding developments or land use planning not posing direct adverse effects to refuge wildlife or habitats. Therefore, with the exception of specific land use concerns adjacent to refuge lands, land use planning in general will not be further analyzed in this CCP.

The planning team considered the appropriateness of providing opportunities for various non-wildlife dependent recreational activities and refuge uses suggested during scoping including research and dog walking. Based on policy guidance in the Service Appropriate Refuge Uses Policy 603 FW 1 (2006), these uses were determined appropriate, and are documented on FWS Form 3-2319 in Appendix D.

2.3 Introduction to the Alternatives

A table summarizing the key differences between the alternatives for each refuge is presented on the following pages. Detailed descriptions of the goals, objectives, and strategies for each alternative are presented following the summary tables. Alternatives are displayed in maps labeled Figure 2-1 (North Coast); Figure 2-2 (Central Coast); Figure 2-3 (South Coast); Figure 2-4 (Cape Meares detail); Figure 2-5 (Three Arch Rocks detail); and Figure 2-6 (Oregon Islands Coquille Point Unit detail).

2.3.1 Features common to both alternatives

Both alternatives contain common features. To reduce the length and redundancy of the individual alternative descriptions, common features are presented below. Refuge names have been listed within the text as appropriate when the highlighted item is applicable only to that specific refuge.

2.3.1.1 Implementation subject to funding availability

Under each alternative, actions (strategies) would be implemented over the life of the CCP after approval, contingent upon available funding. It is the intent of the planning team that annual priorities would follow the final CCP guidelines, although funding initiatives, unforeseeable management challenges, and varying budgets may impact feasibility of actions from year to year. The CCP will be reviewed every five years and updated as necessary throughout its life.

2.3.1.2 Fire Management Plans

The 2004 Wildland Fire Management Plans for Cape Meares and Oregon Islands Refuges detail response to the threat of wildfire and under what circumstances the refuges will use wildland fire as a tool on refuge lands. Three Arch Rocks Refuge is covered under a signed exemption from the requirement for a fire management plan. The fire management plans and the exemption are incorporated through reference in the CCP.

2.3.1.3 Invasive species control

The greatest threats to most habitat types on these refuges are invasive plant and animal species. Therefore, control/eradication of invasive species that negatively impact refuge wildlife populations or habitats will be a strategy that is common to both alternatives. The top priorities for control are sea fig (aka ice plant, *Carpobrotus chilensis*), Himalayan blackberry (*Rubus discolor*), Tansy ragwort (*Senecio jacobaea*) and introduced mammalian predators including rats (*Rattus norvegicus*), feral cats (*Felis catus*), and red fox (*Vulpes vulpes*). Invasive plants and animals will be treated with integrated pest management techniques and tools.

2.3.1.4 Integrated pest management (IPM)

In accordance with 517 DM 1 and 7 RM 14, an integrated pest management (IPM) approach would be utilized, where practicable, to eradicate, control, or contain pest and invasive species (herein collectively referred to as pests) on the refuges. Integrated pest management would involve using methods based upon effectiveness, cost, and minimal ecological disruption, which considers minimum potential effects to non-target species and the refuge environment. Pesticides may be used where physical, cultural, and biological methods or combinations thereof, are impractical or incapable of providing adequate control, eradication, or containment. Furthermore, pesticides would be used primarily to supplement, rather than as a substitute for, practical and effective control measures of other types. If a pesticide would be needed on a refuge, the most specific (selective) chemical available for the target species would be used unless considerations of persistence or other environmental and/or biotic hazards would preclude it. In accordance with 517 DM 1, pesticide usage would be further restricted because only pesticides registered with the U.S. Environmental Protection Agency (USEPA) in full compliance with the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and as provided in regulations, orders, or permits issued by USEPA may be applied on lands and waters under the Complex's jurisdiction.

Environmental harm by pest species would refer to a biologically substantial decrease in environmental quality as indicated by a variety of potential factors including declines in native species populations or communities, degraded habitat quality or long-term habitat loss, and/or altered ecological processes. Environmental harm may be a result of direct effects of pests on native species including preying and feeding on them; causing or vectoring diseases; preventing them from reproducing or killing their young; out-competing them for food, nutrients, light, nest sites or other vital resources; or hybridizing with them so frequently that within a few generations, few if any truly native individuals remain. In contrast, environmental harm can be the result of an indirect effect of pest species. For example, invasive sea fig (ice plant) is present on the mainland and on a number of other nearshore rocks and is spreading. This introduced plant species forms vast monospecific zones, lowering biodiversity, outcompeting native plants, and eliminating habitat for burrow-nesting seabird species.

Environmental harm may also include detrimental changes in ecological processes, and may cause or be associated with economic losses and damage to human, plant, and animal health. For example, invasions by highly flammable European gorse, which alters entire plant and animal communities by eliminating or sharply reducing populations of many native plant and animal species, can also greatly increase fire prevention and fire-fighting costs.

Along with a more detailed discussion of IPM techniques, the Complex's IPM Plan (2009) describes the selective use of pesticides for pest management on the Complex refuges, where necessary. Throughout the life of the CCP, most proposed pesticide uses on the Complex would be evaluated for potential effects to the particular refuge's biological resources and environmental quality. These potential effects would be documented in "Chemical Profiles" within the IPM plan. Pesticide uses with appropriate and practical best management practices (BMPs) for habitat management as well as cropland/facilities maintenance would be approved for use on a refuge where there likely would be only minor, temporary, and localized effects to species and environmental quality based upon non-exceedance of threshold values in Chemical Profiles. However, pesticides may be used on a refuge where substantial effects to species and the

environment are possible (exceed threshold values) in order to protect human health and safety (e.g., mosquito-borne disease).

2.3.1.5 Mammalian predator control

As needed, implement actions as described in Mammalian Predator Damage Management to Protect Seabird Colonies on Oregon Islands NWR, Three Arch Rocks NWR, and Adjacent Mainland Areas (2005).

2.3.1.6 Maintaining/upgrading of existing facilities

Periodic maintenance and upgrading of refuge buildings and facilities will be necessary regardless of the alternative selected. Periodic maintenance and upgrading of facilities is necessary for safety and accessibility and to support management and visitor needs, and is incorporated in the Service's Asset Management System.

2.3.1.7 Participation in planning and review of regional development activities

The Complex staff would actively participate in and contribute to planning and studies for ongoing and future industrial, urban, housing and energy development, contamination, and other potential concerns that may adversely affect refuge wildlife resources and habitats. Working with the Service's Ecological Services Division, the Complex would cultivate working relationships with pertinent local, county, State, and Federal agencies to stay abreast of current and potential developments; and would utilize outreach, education and information as needed to raise awareness of refuge resources and dependence on the local environment.

2.3.1.8 Permanent full time staffing additions

This CCP proposes adding four new permanent full time (PFT) positions to the staff of the Oregon Coast NWR Complex: a Wildlife Biologist, Environmental Education Specialist, Volunteer Coordinator, and Wage Grade Maintenance Worker for the South Coast office. All staffing additions are subject to Regional approval and allocation of additional base funding.

2.3.1.9 Regulatory compliance

All activities requiring review, permits and clearances (e.g., Section 106 of the National Historic Preservation Act, Section 7 endangered species consultation, and 401 water quality permit) will undergo appropriate review and obtain necessary permits and/or clearances as needed.

2.3.1.10 Requests for public uses on refuge lands

Regardless of the alternative selected, non-wildlife dependent recreational activities will be subjected to the Service's Appropriate Use Policy criteria, and if found appropriate, will be further analyzed through a compatibility determination. Priority public uses will be reevaluated through compatibility determinations as well. Appropriateness determinations will be made based on policy guidance in the Service's Appropriate Refuge Uses Policy 603 FW 1 (2006), and will be documented on FWS Form 3-2319 in a CCP appendix. Draft Compatibility Determinations made in the course of CCP development are included in Appendix E.

2.3.1.11 State coordination

The Complex would continue to maintain regular discussions with the Oregon Department of Fish and Wildlife (ODFW) and Oregon Parks and Recreation Department (OPRD). Key topics for discussion with ODFW would be wildlife monitoring, pinniped monitoring and management, threatened and endangered species management, marine wildlife mortality and disease monitoring, seabird management and protection strategies, and mammalian predator management. Public use opportunities, as well as protection of refuge wildlife and habitat, would be the primary topics of discussion with OPRD.

2.3.1.12 Tribal coordination

Regular communication with Native American Tribes with interest in the refuges would continue under both alternatives. The Coquille Indian Tribe; Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians; Confederated Tribes of the Siletz Indians; and Confederated Tribes of the Grand Ronde are the major Oregon coast Tribes the Complex will coordinate and consult with regarding issues of shared interest. Currently, the Complex seeks assistance from Tribes in issues related to the National Historic Preservation Act (NHPA) as well as cultural resources education and interpretation.

2.3.1.13 Volunteer opportunities and partnerships

Volunteer opportunities and partnerships would occur in both alternatives. These are recognized as key components of the successful management of public lands and vital to implementation of refuge programs, plans, and projects, especially in times of declining budgets.

2.3.2 Alternative descriptions summary

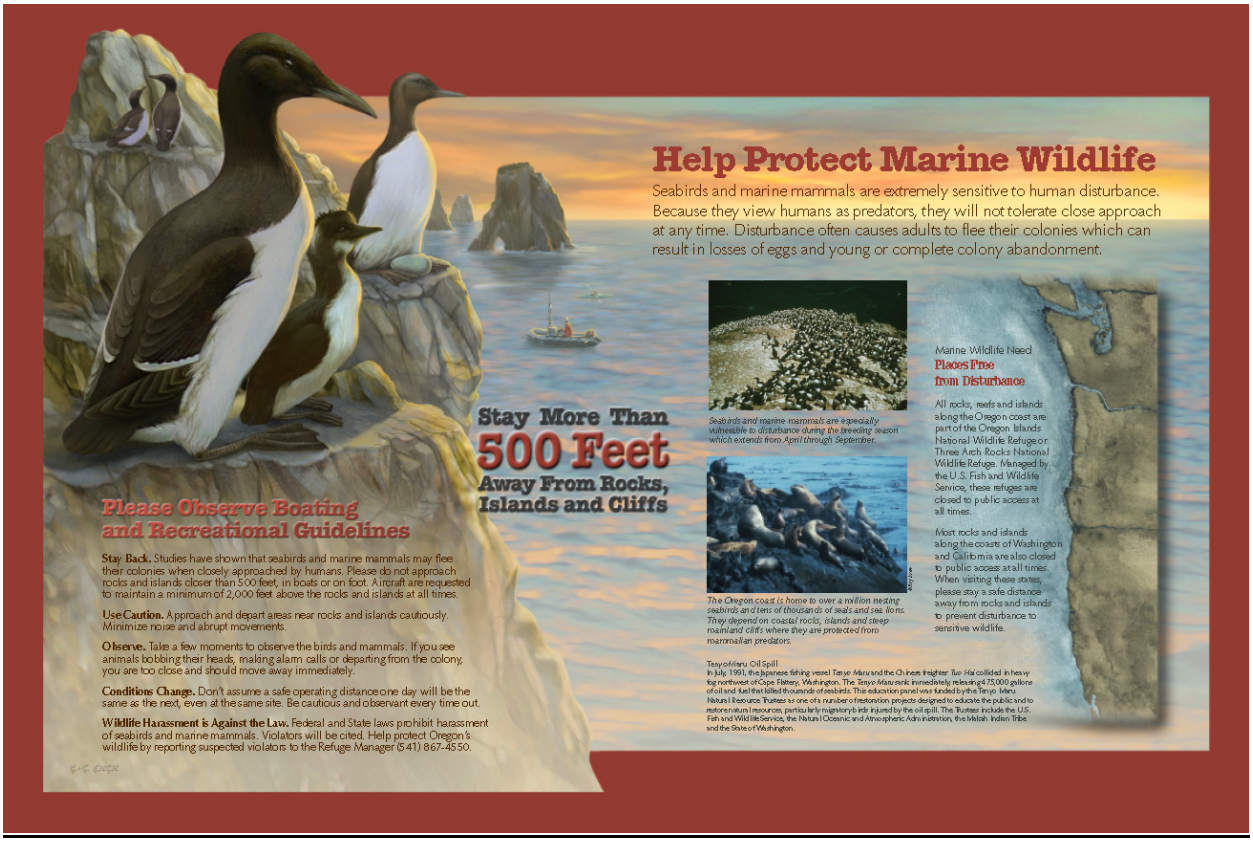
Table 2.1 Alternatives Summary Table – Oregon Islands and Three Arch Rocks NWRs

Key Themes/Issues	Alternative 1 Continue Current Management (No Action)	Alternative 2 Enhance Wildlife and Habitat Management, Increase Wildlife-Dependent Public Use
RESOURCE MANAGEMENT		
Resource Protection	Protect undisturbed natural environment on all refuge rocks, reefs and islands by prohibiting public access.	Same as #1; and Increase emphasis on resource protection through partnerships.
Aerial Disturbance Management	Document and respond to wildlife disturbance violations resulting from overflights.	Same as #1; and Produce and distribute educational materials to advocate a 2,000-foot (610-meter) minimum above ground level (AGL) altitude conservation recommendation for aircraft over refuge rocks, reefs and islands.
Law Enforcement (LE)	Document violations; rely on informal arrangements and opportunistic LE coordination.	Develop LE assistance agreements with county sheriffs and associated marine patrol officers, Oregon State Police, U.S. Coast Guard (USCG) and National Marine Fisheries Service (NMFS) enforcement.
Monitoring and Inventory	Continue current inventory and monitoring activities in support of adaptive management decisions.	Same as #1; and Hire an additional PFT Wildlife Biologist. Research, design, fund and implement a GIS-based inventory and monitoring program for target wildlife/plant species.
Research	Continue to conduct, coordinate, participate, and support research activities on refuge lands.	Work with universities/agencies/organizations to design and implement research on subjects including seabirds, pinnipeds, climate change, and ecological factors affecting seabird survival and reproductive success.
Pest Management	Use IPM techniques to treat invasive plant infestations, as funding and staff time permit.	Same as #1; and Monitor vegetated rock and island habitats for invasive plants. Evaluate and monitor habitat response to IPM treatments.
Predator Control	Implement actions as described in 2005 Mammalian Predator Damage Management Plan	Same as #1; and utilize a collaborative approach to inventory mammalian predators at seabird colonies on a systematic basis
Oregon Department of Fish and Wildlife	Continue to work with ODFW to limit or prevent human disturbance to seabirds and pinnipeds.	Same as #1; and Increase cooperation with ODFW to provide a more systematic and accessible process for sharing information, expertise and funding.
U.S. Coast Guard	Provide occasional wildlife resource protection training to USCG pilots as time permits.	Same as #1; and Work with USCG Motor Lifeboat and Air Stations along the Oregon coast to document major wildlife use areas on nautical charts and flight maps in their Area of Responsibility. Clarify operational measures to avoid wildlife disturbance impacts for non-Search and Rescue missions.
Oregon State Marine Board	Annually deploy warning buoys to delineate the 500-foot watercraft exclusion zone from May 1 to September 15 around Three Arch Rocks NWR.	Same as #1; and Re-examine the need for additional special management area designations and/or buffer zones at thirty-three areas within Oregon Islands and Three Arch Rocks NWR.
Bureau of Land Management (BLM)Yaquina Head Outstanding Natural Area (YHONA)	Continue to coordinate public use management to prevent impacts to wildlife using the refuge rocks directly adjacent to YHONA.	Same as #1, and develop a new MOU with BLM for wildlife management at YHONA, to address wildlife resource impacts associated with current or potential future public use, and monitoring and research programs of mutual interest.

Key Themes/Issues	Alternative 1 Continue Current Management (No Action)	Alternative 2 Enhance Wildlife and Habitat Management, Increase Wildlife-Dependent Public Use
Wilderness	Continue to preserve the wilderness characteristics of Oregon Islands Wilderness and Three Arch Rocks Wilderness by avoiding visually intrusive alterations.	Same as #1; and Initiate management actions to control and where possible eliminate invasive plant and animal species; work with local residents, commercial properties, city, county and state agencies and planning departments to prevent light and noise intrusion into the wilderness.
PUBLIC USE		
Wildlife Observation and Photography	In partnership with others, continue to provide information and offsite facilities for visitors to view and photograph wildlife using coastal rocks and islands.	Same as #1; and Establish new partnerships to facilitate public use opportunities. Design and install interpretive panels, observation decks and materials with partners.
Volunteers – Interpretation and Education	Maintain volunteer presence at key offsite locations to interpret wildlife resources for visitors.	Hire PFT Volunteer Coordinator. With partners, expand volunteer interpreter program to include additional locations and days at key interpretive sites.
OPRD – Interpretation and Education from adjacent state lands	Collaborate with OPRD to station volunteer wildlife interpreters on OPRD lands overlooking Oregon Islands NWR.	Same as #1; and Establish a coastwide MOU with OPRD to formalize and expand cooperative volunteer interpreter program.
Environmental Education – formal programs	Provide annual funding to support Environmental Education positions through AmeriCorps.	Hire a PFT Environmental Education Specialist; develop MOU with school districts to implement EE; and secure long-term funding for AmeriCorps members.
Friends Groups	Support Friends of Haystack Rock and Friends of Southern Oregon Coastal Refuges by having Complex staff members and/or volunteers available to assist with interpretation.	Same as # 1; and Expand support of both Friends of Southern Oregon Coastal Refuges and Friends of Haystack Rock.
Coquille Point	Continue to maintain self-guided interpretation and visitor facilities, and recruit refuge volunteers to lead guided naturalist/wildlife walks.	Same as #1; and Re-design and upgrade parking lot; work with City of Bandon to install wind and wildlife proof trash and pet clean up station. Hire a refuge maintenance position for the south coast.

Table 2.2 Alternatives Summary Table – Cape Meares NWR

Key Themes/ Issues	Alternative 1 Continue Current Management (No Action)	Alternative 2 Enhance Wildlife and Habitat Management, and Increase Wildlife-Dependent Public Use
RESOURCE MANAGEMENT		
Resource Protection	Allow natural processes to occur, and maintain closed areas of refuge.	Same as #1; and Conduct official boundary survey and post boundary. Partner with landowners to maintain and enhance habitat quality on adjacent privately owned lands.
Law Enforcement	Document violations; rely on informal arrangements and opportunistic LE coordination.	Develop LE assistance agreements with county sheriffs and associated Marine Patrol officers, Oregon State Police, and USCG.
Monitoring and Inventory	Conduct boat and land-based surveys for pelagic cormorants (PECO) on cliffs as funding allows; cooperate in monitoring population trends of black oystercatchers and reproductive success of peregrine falcons.	Same as #1; and Hire a PFT Wildlife Biologist. Conduct pelagic cormorant and marbled murrelet surveys annually. Work with partners to research, design, fund and implement inventory and monitoring programs for migratory and resident focal bird species and other wildlife, and certain plant species within forest and riparian habitats.
Research	No existing research.	Encourage research efforts by partners to determine use of refuge habitat by old-growth-dependent avian species, as well as other compatible old-growth forest-related research.
Invasive Species	No systematic invasive species management.	Monitor refuge habitats for invasive plant species and treat infestations with IPM techniques.
PUBLIC USE		
Wildlife Observation and Photography	Maintain refuge-constructed visitor facilities at Cape Meares State Scenic Viewpoint and the portion of the Oregon Coast Trail that runs through refuge lands. Continue to allow hiking and wildlife observation and photography.	Same as #1; and develop a wildlife checklist. Recruit refuge volunteers to lead guided naturalist/wildlife walks.
Interpretation and Education	Station refuge volunteers at Cape Meares every spring/summer to interpret wildlife resources for visitors, and maintain interpretive panels.	Same as #1; and Increase refuge wildlife interpretation volunteer presence; develop and implement an EE program and an evening campground program at adjacent Cape Lookout State Park. Hire a PFT Volunteer Coordinator.
Oregon Parks and Recreation Department	Manage public use facilities under 1986 MOU with OPRD.	Revise 1986 MOU to ensure the goals and objectives of both the OPRD and Complex are met and the roles and responsibilities of each agency are clear. Include protocol for volunteer management.


Help Protect Marine Wildlife
Seabirds and marine mammals are extremely sensitive to human disturbance. Because they view humans as predators, they will not tolerate close approach at any time. Disturbance often causes adults to flee their colonies which can result in losses of eggs and young or complete colony abandonment.
Stay More Than
500 Feet
Away From Rocks, Islands and Cliffs
Seabirds and marine mammals are especially vulnerable to disturbance during the breeding season which extends from April through September.
The Oregon coast is home to over a million nesting seabirds and tens of thousands of seals and sea lions. They depend on coastal rocks, islands and steep mainland cliffs where they are protected from mammalian predators.
Marine Wildlife Need
Places Free from Disturbance
All rocks, reefs and islands along the Oregon coast are part of the Oregon Islands National Wildlife Refuge or Three Arch Rocks National Wildlife Refuge. Managed by the U.S. Fish and Wildlife Service, these refuges are closed to public access at all times.
Most rocks and islands along the coasts of Washington and California are also closed to public access at all times. When visiting these states, please stay a safe distance away from rocks and islands to prevent disturbance to sensitive wildlife.
Tenyo-Maru Oil Spill
In July, 1991, the Japanese fishing vessel Tenyo Maru and the Chinese freighter Tao Hai collided in heavy fog northwest of Cape Flattery, Washington. The Tenyo Maru sank immediately, releasing 475,000 gallons of oil and fuel that killed thousands of seabirds. This education panel was funded by the Tenyo Maru Natural Resource Trustees as one of a number of restoration projects designed to educate the public and to restore natural resources, particularly migratory birds injured by the oil spill. The Trustees include the U.S. Fish and Wildlife Service, the National Oceanic and Atmospheric Administration, the Makah Indian Tribe and the State of Washington.
Please Observe Boating and Recreational Guidelines
Stay Back. Studies have shown that seabirds and marine mammals may flee their colonies when closely approached by humans. Please do not approach rocks and islands closer than 500 feet, in boats or on foot. Aircraft are requested to maintain a minimum of 2,000 feet above the rocks and islands at all times.
Use Caution. Approach and depart areas near rocks and islands cautiously. Minimize noise and abrupt movements.
Observe. Take a few moments to observe the birds and mammals. If you see animals bobbing their heads, making alarm calls or departing from the colony, you are too close and should move away immediately.
Conditions Change. Don't assume a safe operating distance one day will be the same as the next, even at the same site. Be cautious and observant every time out.
Wildlife Harassment is Against the Law. Federal and State laws prohibit harassment of seabirds and marine mammals. Violators will be cited. Help protect Oregon's wildlife by reporting suspected violators to the Refuge Manager (541) 867-4550.

2.4 Alternatives for Oregon Islands and Three Arch Rocks National Wildlife Refuges

2.4.1 Alternative 1: Continue current management (No Action)

This alternative assumes no change from past management programs and would continue refuge management practices already underway or funded. No significant changes would be initiated by the Complex. Although these refuges do not have a recent, integrated plan to guide the management of all of resources and uses, current management efforts on the refuges focuses on the protection of trust and sensitive species and their habitats, and the management of public access. Current management of these refuges is guided by the following plans and other documents.

- Oregon Islands and Three Arch Rocks Wilderness Management Plan (1980)
- Oregon Islands, Cape Meares, Three Arch Rocks, and Bandon Marsh NWRs Refuge Management Plan (1987)
- Oregon Islands, Cape Meares, Three Arch Rocks, and Bandon Marsh NWRs Public Use Management Plan and Sign Plan Refuge Management Plan (1988)
- Oregon Islands NWR Fire Management Plan (2004)
- Environmental Assessment: Mammalian Predator Damage Management To Protect Seabird Colonies on Oregon Islands NWR, Three Arch Rocks NWR, and Adjacent Mainland Areas (2005)
- Integrated Pest Management Plan for Oregon Coast NWR Complex (2009)

2.4.1.1 Wildlife and habitat

The Complex staff would continue to protect and maintain habitat for priority species, including seabirds and pinnipeds. Efforts to prevent wildlife disturbance on refuge rocks, reefs, and islands would continue by restricting public access, posting educational and regulatory signage, enforcing fireworks prohibition laws on areas adjacent to nearshore rocks and islands, and deploying buoys annually to delineate the seasonal 500-foot watercraft exclusion buffer zone around Three Arch Rocks NWR. Habitat protection measures would continue to consist primarily of monitoring for invasive plant species that have a negative effect on wildlife and their habitats, and treating infestations as funding allows. Current levels of infrequent monitoring for mammalian predators would also continue. Mammalian predator control on seabird nesting islands would be conducted as described in the Predator Management EA completed in 2005 (USFWS, 2005a).

Regularly scheduled aerial, boat, and land surveys of nesting seabirds would continue to be conducted by Complex staff. Limited cooperative efforts to assess population trends and habitat use by Aleutian cackling geese (*Branta hutchinsii leucopareia*) on Oregon Islands NWR and private lands will continue. Complex staff would continue to coordinate with Oregon State University (OSU), the Service's Ecological Services Division, and U.S. Geological Survey (USGS) to assist in monitoring long-term population trends of peregrine falcon (*Falco peregrinus*) and black oystercatcher (*Haematopus bachmani*).

Minimal management activity would continue at the Crook Point Unit consisting of occasional monitoring for human trespass violations and the presence/spread of invasive plant species, as well as predator management as needed (USFWS, 2005a). At the Coquille Point Unit, staff would

continue efforts to partner (where feasible) with the City of Bandon and OPRD to decrease wildlife disturbances on refuge lands and adjacent beaches by posting educational and regulatory signage; and maintain and enforce laws prohibiting fireworks in areas adjacent to refuge lands. Monitoring for invasive plant species and treatment of infestations with IPM techniques would continue as funding allows.

Existing cooperative efforts would continue at current levels. State agencies are and would continue to be critical partners for collaborative work along the coast. The Complex staff would continue to work with ODFW on a limited basis on coastal and marine wildlife management issues of mutual interest, including overseeing and participating in Steller sea lion (*Eumetopias jubatus*) research activities on refuge lands, and sharing information and data during seabird mortality events. The OPRD is an important partner in helping us protect refuge wildlife, plants and habitats, and promote conservation of these resources through interpretation and education on lands adjacent to the refuges. Complex staff would continue collaborating with OPRD on various efforts to prevent impacts to refuge resources from adjacent beach uses such as fireworks, beach fires, commercial filming activities and trespass on refuge lands. Staff would also continue to work with Oregon State Marine Board (OSMB) on the 500-foot seasonal watercraft closure zone around Three Arch Rocks NWR.

The Complex's Law Enforcement Officer would continue cooperative efforts with the Federal Aviation Administration (FAA) to reduce wildlife disturbance on refuge lands caused by low-level aircraft overflights, by reporting aircraft/wildlife disturbance violations to the FAA and Oregon Aeronautical Board and using existing refuge regulations to enforce wildlife disturbance violations resulting from overflights. Staff would also work cooperatively with the USCG to protect seabirds and pinnipeds, and would continue to provide wildlife resource protection training to USCG pilots as time and funding allow.

Under the No Action Alternative, Complex staff members would continue to work toward establishing LE Assistance Agreements with Oregon State Police, county sheriffs, city police departments, OPRD, and the USCG to provide primary and backup LE on the refuges. Current LE contacts would continue to be utilized.

2.4.1.2 Public use management

Under the No Action alternative, existing public uses would continue at current levels. All refuge rocks and islands, as well as the Crook Point Unit of Oregon Islands NWR, would continue to be closed to general public use to protect seabirds, pinnipeds and associated habitats from human disturbance. Wildlife photography, observation, and interpretation are existing approved public uses of Oregon Islands that occur at many off-site mainland areas owned and managed by city, county, state and federal agencies. To facilitate off-site public use, the Complex has enhanced wildlife viewing opportunities on several mainland areas that overlook refuge rocks and islands, at sites that are managed by OPRD. These public uses would continue to be offered and maintenance of Service built facilities at off-site mainland areas would continue.

Onsite public use facilities managed by the Complex staff at Coquille Point including the paved hiking trail, two sets of stairs that provide beach access, the paved parking lot, and interpretive panels, would all be maintained. Wildlife observation and photography, as well as interpretation

and environmental education by Complex Staff and partners, would continue to be offered at Coquille Point on a seasonal and limited basis.

The Complex staff would partner with OPRD to provide quality wildlife viewing opportunities at many state parks on the coast where these parks are adjacent to rocks and islands within Oregon Islands and Three Arch Rocks NWR. Under this alternative, the Complex staff would continue to station interpretive volunteers on OPRD-managed viewing decks where visitation by tourists is high and refuge wildlife can be easily viewed. The Complex staff would work to ensure that as part of this partnership OPRD will continue to provide the volunteers with a full hook-up site for a Recreational Vehicle at a nearby state park campground and in return the Complex will recruit, train and provide uniforms and equipment for the volunteers.

The Complex staff would continue to work cooperatively with the BLM to provide quality wildlife viewing opportunities at YHONA and the adjacent rocks within Oregon Islands NWR. Refuge volunteers would continue to be stationed at YHONA to provide wildlife information to the public. Complex staff would continue to provide annual training on resources of Oregon Islands NWR to BLM staff and interpretive docents.

With limited staff time available, the only way the Complex can currently offer a high quality environmental education program coast wide is to hire temporary staff through work-study programs like AmeriCorps. Under the No Action Alternative, the Complex would continue to coordinate and cooperate with school districts and the Northwest Service Academy to hire at least one AmeriCorps member to provide environmental education if funding allows. The formal agreement with the Northwest Service Academy would continue to be reviewed and updated annually to enable support of the environmental education AmeriCorps position.

2.4.1.3 Wilderness stewardship

Under the No Action Alternative, the Complex would continue to promote and preserve the wilderness characteristics of Oregon Islands and Three Arch Rocks Wilderness areas by avoiding physical changes due to management actions and visually intrusive alterations and by working to foster an understanding and appreciation by the public for the importance of wilderness. Boundary and regulatory signs, interpretive panels and other refuge and wilderness protection facilities on the adjacent mainland and at ports along the Oregon coast would continue to be maintained. In addition, construction of temporary structures used for wildlife management or research purposes, construction of signs to prevent trespass, and access to rocks and islands by boats and aircraft would be allowed only when these are the minimum tools necessary to safely and effectively accomplish refuge work. Complex staff would continue to work with current local residents and commercial properties to prevent light and noise intrusion into the wilderness, and with OPRD to locate commercial fireworks displays away from wilderness areas. Wilderness themes and messages would continue to be incorporated into new or updated pamphlets, brochures and interpretive panels, and Complex Staff would include wilderness information and education in all interagency, volunteer and Friends Group training.

2.4.1.4 Cultural resource protection

Native American Tribes and Federal agencies would continue to be essential partners under the No Action Alternative. Complex Staff would continue to coordinate with Native American Tribes when conducting ground-disturbing activities, particularly in the preplanning stage for projects involving significant ground disturbing activities.

2.4.2 Alternative 2 (Preferred Alternative): Enhance wildlife and habitat management, increase wildlife-dependent public use

2.4.2.1 Wildlife and habitat

Under the Preferred Alternative, protection and management of refuge rocks, reefs and islands would expand in scope, and emphasis would shift from Complex staff based efforts to cooperative efforts. The Complex would work with partners to promote the establishment of watercraft free buffer zones in waters around specific refuge rocks, and islands that have seabird colonies and/or pinniped rookeries/haulouts that could be negatively impacted by trespass or harassment. The Complex would also produce and distribute educational materials to airports, aircraft fueling stations, pilots associations, and aircraft publications to advocate the 2,000-foot (610 m) minimum AGL altitude conservation recommendation over refuge rocks, reefs, islands and headlands.

Existing wildlife and habitat surveys for Oregon Islands and Three Arch Rocks NWRs, both staff-conducted and cooperative efforts, would continue. However, greater emphasis would be given to working closely with partners to research, design and implement cooperative studies that would directly contribute toward maintaining or restoring the biological integrity, diversity, and environmental health of the refuges. Specifically, the refuge would seek partners to collaborate on research, design, funding and implementation of a Geographic Information System (GIS) based inventory and monitoring program for pinnipeds, seabirds and other migratory birds, terrestrial mammals, reptiles, amphibians, invertebrates, and plant species. Annual review and reporting of results of monitoring and inventory efforts would be a priority, as well as reporting of results from cooperative monitoring and inventory efforts. As staffing allows, the Complex would begin the establishment of a digital photographic library of species inventoried, as well as the development of a web interface to disseminate results of research, monitoring and inventory. Complex staff members would work with location-specific partners to monitor for invasive plant species and to treat infestations with IPM techniques using mechanical, physical, biological and/or chemical means. The Preferred Alternative would also include the active pursuit of funding and approvals to hire a seasonal GS-7/9 Wildlife Biologist and a PFT GS-9/11 Wildlife Biologist.

Specific areas of research would receive increased emphasis under the Preferred Alternative. Research topics identified to date include but are not limited to the long-term effects of an increasing coastal bald eagle (*Haliaeetus leucocephalus*) population on common murre (*Uria aalge*) colonies, investigation of the population ecology of black oystercatchers to better understand the impacts of human population growth, and threats from invasive plant species and mammalian predators on refuge habitat and wildlife. Additional research topics will be pursued as appropriate. Partnership efforts would also be geared toward research, design and implementation of a comprehensive inventory and standardized census program for burrow and crevice-nesting seabirds to obtain a more accurate estimate of populations, monitor population trends, and establish a long-term seabird research program using seabirds as biological indicators

of ocean conditions and effects of climate change. Native and non-native mammalian predators would be inventoried at seabird colonies and controlled as necessary, as discussed in the Predator Damage Management EA (USFWS 2005). All research efforts would be undertaken through a collaborative approach.

Climate change is an important area in need of collaborative efforts to accomplish meaningful research. Under the Preferred Alternative, Complex Staff would contribute to on-going studies by universities, agencies and organizations to assess the impacts of climate change on seabirds, sea level, invasive species, weather and current patterns. Complex Staff would also contribute to studies analyzing impacts from human activities including fisheries management, wind and wave energy development, and other activities that may be harmful to wildlife and habitat.

The National Wildlife Refuge System Administration Act, as amended, requires "coordination, interaction, and cooperation" with state natural resource agencies. Under the Preferred Alternative, existing cooperative efforts with state agencies would be continued and the partnerships expanded to include more activities in support of the refuges' and the Service's mission and goals. In addition to continuing existing cooperative efforts with ODFW on coastal and marine wildlife management issues of mutual interest, the Complex would establish a schedule of annual meetings to discuss issues and opportunities and develop a strategy for timely notification of pertinent information and actions of mutual interest. More effort would be devoted toward conducting joint wildlife surveys as well as supporting existing ODFW efforts to survey pinnipeds, seabirds, waterfowl and other marine wildlife using the refuges and territorial Sea. The Complex would seek to establish a strategy to obtain wildlife inventory, survey and other data from ODFW on a regular and timely basis, and joint survey results would be reported in publications, periodic reports and on the Complex web site. The Complex would also pursue joint research opportunities with ODFW, OSU and other partners.

Under the Preferred Alternative, the Complex would seek to develop a Memorandum of Understanding (MOU) with the OSMB to formalize specific collaborative actions to protect wildlife using Oregon Islands and Three Arch Rocks NWRs. The Complex would provide refuge information and education materials to be distributed through the state watercraft licensing program and other means, with the goal of reducing wildlife disturbances resulting from watercraft use and operation in waters adjacent to the refuges. Complex staff members would give periodic presentations to OSMB board members regarding refuge issues/concerns for wildlife disturbance caused by watercraft, and would work with the Board to determine if additional State regulated protective measures are necessary and feasible to reduce wildlife disturbance on the refuges.

Under the Preferred Alternative, the Complex would continue to work collaboratively with BLM to promote protection of seabirds and pinnipeds and to provide quality wildlife viewing opportunities at YHONA. A new MOU would be developed to document management responsibilities and to clarify roles and responsibilities with regard to LE jurisdictions, use of volunteers, interpretive messages and programs, and management actions of potential impact to BLM's program. The Complex would also work cooperatively with BLM to develop monitoring and research programs of mutual interest to both agencies at YHONA. In addition, the occurrence and impacts of mammalian predation on nesting seabirds at YHONA would be actively monitored and documented, and the Complex would work cooperatively with BLM to remove predators as needed.

Working cooperatively with the FAA to reduce wildlife disturbance on refuge lands caused by low-level aircraft overflights would be a priority under the Preferred Alternative. The Complex would identify and document priority resource areas where low flights over refuge lands have the potential to cause the greatest impacts and would focus efforts on documenting disturbances at these sites. In coordination with FAA and the Oregon Aeronautical Board, the Complex would develop strategies to educate pilots about the refuges and the impacts caused by low level overflights along the Oregon coast, stressing bird-strike safety concerns for pilots. Coordination with OPRD, BLM and other partners to monitor and immediately report overflight incidents and wildlife response to the FAA would also be a priority, and the Complex would document results in annual reports for use in discussions with FAA on the feasibility of establishing a minimum flight altitude restriction of 2,000 feet AGL over Oregon Islands and Three Arch Rocks NWRs.

Cooperative efforts with the U.S. Coast Guard to protect seabirds and pinnipeds would expand to include development of an MOU with the USCG. The MOU would establish conditions and protocols to facilitate the Complex's use of USCG aircraft and vessels on dual missions, for law enforcement, training purposes, response to and surveillance of oil spills, and in support of other refuge needs. Both air and lifeboat stations would be the focus of increased communication and coordination under this Alternative. The Complex would document major wildlife use areas on USCG flight maps and suggest seasonal or year-round flight restrictions for non-Search and Rescue missions. Staff would also work with USCG Motor Lifeboat Stations along the Oregon coast to document major wildlife use areas on nautical charts and provide measures to avoid wildlife disturbance impacts for non-Search and Rescue missions.

Under the Preferred Alternative, LE jurisdictions and capabilities would be clarified, with the goal of enabling joint enforcement of wildlife protection and refuge trespass laws and regulations. Through the Complex's Law Enforcement Officer, Complex staff members would work cooperatively with Oregon State Police (OSP), county sheriffs, city police departments, OPRD, NMFS Enforcement, and the USCG to provide primary and backup LE on the refuges. A standard LE Management Plan would be developed for each refuge.

2.4.2.2 Crook Point

Current management activities at the Crook Point Unit of Oregon Islands would continue under the Preferred Alternative but would be greatly expanded in scope and level of effort. The South Coast Headland Prairie-Grassland habitat, a small but exceptional example of coastal grassland representing a rare and endemic vegetation type that has almost entirely vanished from the Oregon coast, would be a focus of collaborative studies with other agencies and organizations with expertise and interest in this rare habitat type. The Complex would seek partners to participate in designing and implementing a comprehensive GIS based inventory, restoration, and monitoring program for this habitat. Development of an inventory, monitoring, and habitat management program for other priority habitats and wildlife at the Crook Point Unit would also be a priority for a collaborative effort. Additional efforts would include establishment of a plant herbarium and digital photographic library of plant species inventoried, and web interface development to disseminate the results of habitat monitoring and management efforts.

Under the Preferred Alternative the Complex would also seek to acquire funding to conduct an official boundary survey and complete the boundary posting of this Unit. Hiring of a WG 5/7

Maintenance Worker for the Complex who could assist with restoring habitat, posting boundaries, and maintaining access roads, facilities, and equipment would be a priority.

2.4.2.3 Coquille Point

Under the Preferred Alternative, the Complex would seek partners to assist with research, design and implementation of a GIS based inventory, monitoring, and habitat management program at the Coquille Point Unit. Resources from partners would be sought to restore habitat types using propagated seedlings, transplanted cuttings, and divisions or plugs of native species and facilitate the establishment of a plant herbarium and digital photographic library of species inventoried. A web interface would be developed to disseminate habitat inventory, monitoring and management efforts. Complex staff would seek funding to conduct an official boundary survey and would post the boundary of this refuge unit as appropriate. Complex staff would work with the City of Bandon to educate coastal residents and business owners about the negative effects of light pollution on seabird colonies and how they can help minimize or eliminate this problem.

2.4.2.4 Public use

Under the Preferred Alternative, all refuge rocks, reefs and islands would continue to be closed to public use to protect sensitive seabirds and pinnipeds from human disturbance. Wildlife photography, observation, and interpretation would continue to take place at the many off-site mainland areas owned and managed by city, county, state, and federal agencies. Refuge wildlife resources benefit from the Complex's work with partners such as OPRD and BLM. These agencies improve or maintain visitor facilities and provide wildlife conservation information to the public with emphasis on minimal disturbance to wildlife. Under the preferred alternative, the Complex would maintain and grow existing partnerships and look to establish new partnerships with the Oregon Coast Aquarium and Sea Lion Caves to develop public use facilities, especially interpretive panels, on their lands or within their visitor facilities. Each partnership between the Complex and a private or public group, including OPRD and BLM, would be formalized in an MOU to ensure the goals and objectives of both the cooperator and the refuge are delineated and that the roles and responsibilities of each agency or partner are clear.

Formalizing the cooperative relationship with OPRD would be a priority under the Preferred Alternative. This would be accomplished through establishment of a coast wide MOU which would clarify roles and responsibilities particularly with regard to the placement of Service volunteers on OPRD lands and facilities, training OPRD interpretive docents provided by Complex staff, and maintenance of Service-funded facilities on OPRD lands. The Complex would also undertake a mapping effort for all refuge-constructed and/or maintained visitor facilities on OPRD lands.

The Complex would continue to work cooperatively with BLM to provide quality wildlife viewing opportunities at YHONA and the adjacent rocks within Oregon Islands NWR, stationing Service volunteers at YHONA to provide wildlife information to the public, and providing annual training regarding the resources of Oregon Islands NWR, to BLM staff and interpretive docents.

Due to an increase in the number of visitors to the Oregon coast there is a need to expand the refuge's interpretation program to have volunteers available seven days per week and to include additional locations to station volunteers. Under this alternative the volunteer wildlife interpretation program would be expanded to include new sites that have been identified as high priority for interpretation, including Ecola State Park, Heceta Head State Scenic Viewpoint, Otter

Crest Headland, Port Orford, and Myers Creek Rocks. As the Complex volunteer program grows, more work would be placed on an already limited staff. Therefore, hiring a PFT GS 7/9 Volunteer Coordinator would be pursued. This position would manage a program that annually utilizes volunteers to control invasive species, maintain public use facilities, lead environmental education field trips, and conduct wildlife interpretation, as well as assist with biological tasks.

The Complex has designed and installed interpretive and regulatory panels at offsite locations with dual purposes of explaining the natural history of the wildlife living on the rocks and islands and communicating to visitors the regulations protecting these species. Under the preferred alternative, the Complex would maintain all existing panels. The Complex has determined it is important to develop a new interpretive panel focusing on the wildlife resources and protective strategies of Oregon Islands and Three Arch Rocks Refuges. The panel would be developed and placed at new and appropriate public access sites along coast.

Under this alternative the Complex would develop a quality Environmental Education (EE) program focusing on the wildlife of Oregon Islands NWR. Children and adults would better understand habitat ecology and actions utilized to protect the area. Since Complex staff time is limited, the refuge must hire a PFT environmental educator or temporary staff through work study programs like AmeriCorps and Student Conservation Association, to be able to offer a high quality EE program; therefore, hiring AmeriCorps personnel would continue to be a necessary strategy under the Preferred Alternative, and the Complex would seek to secure long-term funding for AmeriCorps personnel on the Complex. The Complex would develop a MOU with School Districts to implement EE along the Oregon coast, including strategies to secure long-term funding for bus transportation to support school participation in the Complex's EE programs. The Complex would also pursue partnerships to develop, fund, and implement a seabird education module for coastal schools, and hire a PFT Environmental Education Specialist (GS-7/9) for the Complex.

In the past ten years a network of support groups, called Friends, have essentially adopted individual refuges or refuge complexes nationwide and have begun to advocate for the needs of the refuges, providing both financial and volunteer support. The Complex currently has three Friends groups: Friends of the Southern Oregon Coastal Refuges (SEA), Friends of Cape Meares Lighthouse and Wildlife Refuge, and Friends of Haystack Rock. It is in the interest of the Complex to formalize the relationship with each of the Friends groups through development of an MOU. We already have an MOU in place with SEA. Developing MOUs would facilitate improved communication and serve to expand the role of the Friends groups from wildlife interpretation to direct support of marine wildlife conservation and advocacy. Under this alternative the Complex would commit to contributing a regular column to the Friends newsletters. This would provide members of the Friends group with more in depth information about wildlife and current refuge issues that could use their support.

Onsite public use facilities managed by the Complex at Coquille Point including the paved hiking trail, two sets of stairs that provide beach access, the parking lot, and interpretive panels, would all be maintained. Wildlife observation, photography, interpretation and environmental education are existing public uses that would continue to be offered at Coquille Point by Complex staff members and partners. Under the Preferred Alternative, the Complex would work with OPRD and the City of Bandon to reduce user conflicts. The Complex also needs a full-time permanent maintenance worker for the South Coast to perform trail, stairway, trash collection and habitat

maintenance onsite at Coquille Point. Hiring a PFT WG 5/7 Maintenance Worker for the Complex (already listed under Crook Point) would be a priority to assist with this needed work.

2.4.2.5 Wilderness stewardship

Under the Preferred Alternative, the Complex would continue all current actions intended to promote and preserve wilderness characteristics and to foster the public's understanding of and appreciation for the importance of wilderness. In addition, the Complex would complete a botanical survey of Oregon Islands and Three Arch Rocks Wilderness areas, initiating management actions to control and where possible eliminate invasive plants, with special emphasis on eliminating sea fig/ice plant from rocks and islands in Curry County. In cooperation with the U.S. Department of Agriculture (USDA) Wildlife Services, the Complex would also conduct a survey of mammalian predator occurrence, determine impacts to native fauna, develop annual work plans and implement predator removal. Additional efforts would go toward working with city, county and state agencies and planning departments to prevent increased light and noise intrusion into the wilderness as a result of new residential and commercial development.

2.4.2.6 Cultural resource protection

Under the Preferred Alternative, the Complex would continue to work with Native American Tribes, to locate, characterize and protect cultural resource sites on refuge lands, and maintain the secrecy and security of sites. In addition, the Complex would seek the Tribes' assistance to identify and characterize significant archaeological sites and plan for their protection in accordance with provisions of the Archaeological Resource Protection Act of 1979. A refuge GIS layer would be developed for archaeological sites, burial sites and sacred areas, and would contain "constraint for use" conditions to protect sensitive information. In accordance with the Native American Graves Protection and Repatriation Act of 1990, Complex protocol and procedures would be established for handling inadvertent discoveries of human remains, burial objects, sacred objects, and objects of cultural patrimony.

2.5 Alternatives for Cape Meares National Wildlife Refuge

2.5.1 Alternative 1: Continue current management (No Action)

This alternative assumes no change from past management programs and would continue refuge management practices already underway or funded. No significant changes would be initiated by the Complex. Although this refuge does not have a recent, integrated plan to guide the management of all of its resources and uses, current management efforts on the refuge focus on the protection of trust and sensitive species and their habitats, and the management of public access in coordination with OPRD which manages the adjacent lands as a State Park. Current management of the refuge is guided by the following existing plans and other documents which include:

- Refuge Manual 8 RM 10, Research Natural Area Management (1982)
- MOA between Service and OPRD for use of Cape Meares NWR for State Park Purposes (1986)
- Oregon Islands, Cape Meares, Three Arch Rocks, and Bandon Marsh NWRs Refuge Management Plan (1987)

- Oregon Islands, Cape Meares, Three Arch Rocks, and Bandon Marsh NWRs Public Use Mgmt Plan and Sign Plan Refuge Management Plan (1988)
- Cape Meares NWR Fire Management Plan (2003) (USFWS 2003b)
- Integrated Pest Management Plan for Oregon Coast NWR Complex (2009)

2.5.1.1 Wildlife and habitat

Under the No Action Alternative, the refuge would continue to protect and maintain coastal habitats characteristic of Pacific Northwest old-growth Sitka spruce (*Picea sitchensis)* forest and associated stream and riparian zone habitat, the existing coastal bluff and cliff habitat, and the associated wildlife and plant species, allowing natural processes to control successional vegetative changes. Complex staff members would continue to work with OPRD and others to protect habitat and wildlife by utilizing signage and other deterrents to maintain closed areas of the refuge. Cooperative efforts to monitor reproductive success of peregrine falcons, bald eagles, and black oystercatchers at Cape Meares would continue, and surveys to document nesting by marbled murrelet (*Brachyramphus marmoratus*) will be initiated.

2.5.1.2 Public use

Existing public uses, including wildlife observation, photography, and interpretation, would continue at their current levels. Most public use is on OPRD lands, and the only public use on refuge lands at Cape Meares NWR takes place on the portion of Oregon Coast Trail that traverses refuge lands. This trail would continue to be cooperatively maintained with OPRD.

Existing offsite public uses of Cape Meares NWR occur on facilities built or improved by the Service, on lands owned and managed by OPRD as part of Cape Meares State Scenic Viewpoint. Facilities include two viewing decks accessible to individuals with physical limitations, interpretive panels, a welcoming kiosk, and a remote "Wildlife Cam." Public uses at these facilities include wildlife observation, photography, and interpretation. Under this Alternative, the Complex would continue to cooperatively maintain the viewing decks, kiosk, and interpretive panels. Upgrades and replacement of all interpretive panels would be completed as funding allows. Complex staff would continue to provide leadership and resources to manage and train volunteers, and would maintain a presence at local festivals. The Memorandum of Agreement between the Service and OPRD, established in 1986 and predating the 1997 amendments to the National Wildlife Refuge System Administration Act, would be revised and updated as an MOU under this Alternative.

2.5.2 Alternative 2 (Preferred Alternative): Enhance wildlife and habitat management, increase wildlife-dependent public use

2.5.2.1 Wildlife and habitat

Under the Preferred Alternative, the Complex would continue to allow natural processes to occur and drive vegetation succession changes. However, greater emphasis would be given to working closely with partners to research, design and implement cooperative studies that would directly contribute toward understanding and maintaining or restoring the biological integrity, diversity, and environmental health of the refuge.

For refuge habitats, partners would be sought to collaborate on research, design, funding and implementation of a GIS based inventory of refuge habitats and, when appropriate, a monitoring program for forest and riparian habitats and plant species. Establishment of a plant herbarium and digital photographic library of plant habitats and species inventoried would be a priority, as well as annual review and reporting of the results of forest and riparian habitat inventory and monitoring efforts. Refuge lands would be monitored for invasive plant species, and infestations would be treated using IPM techniques. The Complex would promote research efforts by universities and other partners to determine the roles of downed wood in nutrient cycling and habitat suitability for target species in Pacific Northwest old-growth Sitka spruce forest. Efforts would also go toward partnering (where feasible) with landowners to maintain and enhance habitat quality on adjacent privately owned lands. This Alternative would also include conducting an official boundary survey to accurately post the entire Cape Meares Refuge and Research Natural Area (RNA) boundary.

Wildlife conservation would be the focus of increased collaborative efforts as well. Partners would be sought for research, design, funding and implementation of an inventory, and when appropriate, monitoring program for focal bird species, mammals, amphibians, and invertebrates. A web interface would be developed to disseminate avian and other wildlife inventory and monitoring results. The Complex would promote and actively encourage research efforts by universities and other partners to determine use of refuge habitat by threatened marbled murrelets and other old-growth-dependent avian species, as well as migratory and resident focal bird species including brown creeper, red crossbill, pileated woodpecker, varied thrush, and potentially other late-successional forest species. Monitoring plans would be developed as appropriate, based on results of initial inventories. Annual boat and land surveys for pelagic cormorants along the cliff faces would be initiated under this Alternative. The Complex would continue to work cooperatively with partners to monitor reproductive success of black oystercatchers, peregrine falcons and bald eagles at Cape Meares. The Preferred Alternative would also include the active pursuit of funding and approvals to hire an annual seasonal GS-7/9 Wildlife Biologist and an additional PFT GS-9/11 Wildlife Biologist for the Complex.

2.5.2.2 Public use

Under the Preferred Alternative, the Complex would continue to provide onsite and offsite opportunities for visitors to enjoy wildlife observation, photography, and interpretation while limiting disturbance to wildlife. The Complex would also work toward expansion of wildlife interpretation opportunities in cooperation with OPRD. The Complex would continue to partner with OPRD to station refuge volunteers on the viewing decks every spring and summer to interpret wildlife resources, increasing the Service's volunteer presence at Cape Meares to include coverage seven days per week from April 15 to August 1. Leadership and resources to manage and train volunteers would continue to be provided by the Complex. Hiring of a PFT GS-7/9 Volunteer Coordinator would be a priority under this Alternative.

Expansion of environmental education opportunities in cooperation with OPRD would also take place offsite under this Alternative. Specifically, the Complex would work with OPRD and the Friends of Cape Meares Lighthouse and Wildlife Refuge to develop and implement environmental education and evening campground programs at Cape Lookout State Park, seeking grant opportunities to cover expenses. Providing high-quality outreach to visitors, community members, local media and chambers of commerce on the wildlife and habitat resources of Cape Meares would be a priority under this Alternative. Complex staff members or volunteers would

attend local festivals and community events that have a high potential to deliver refuge messages to key audiences. Complex staff would also contribute news and information about refuge wildlife and habitat to be published in future newsletters published by the Friends of Cape Meares.

Under this Alternative, management of public use would continue to include maintaining Service-constructed public use facilities on OPRD lands as well as upgrading and replacing interpretive panels as needed at the kiosk and along the self-guided interpretive trail. In addition, the Complex would increase cooperative LE efforts with state and federal agencies for the protection of refuge habitats and the wildlife associated with them.

2.6 Goals, Objectives, and Strategies

Goals and objectives are the unifying elements of successful refuge management. They identify and focus management priorities, resolve issues, and link to refuge purposes, Service policy, and the Refuge System Mission.

A CCP describes management actions that help bring a refuge closer to its vision. A vision broadly reflects the refuge purposes, the Refuge System mission and goals, other statutory requirements, and larger-scale plans as appropriate. Public use and wildlife/habitat management goals then define general targets in support of the vision, followed by objectives that direct effort into incremental and measurable steps toward achieving those goals. Finally, strategies identify specific tools and actions to accomplish objectives.

In the development of this CCP, the Service has prepared an Environmental Assessment (EA). The EA evaluates alternative sets of management actions derived from a variety of management goals, objectives, and implementation strategies.

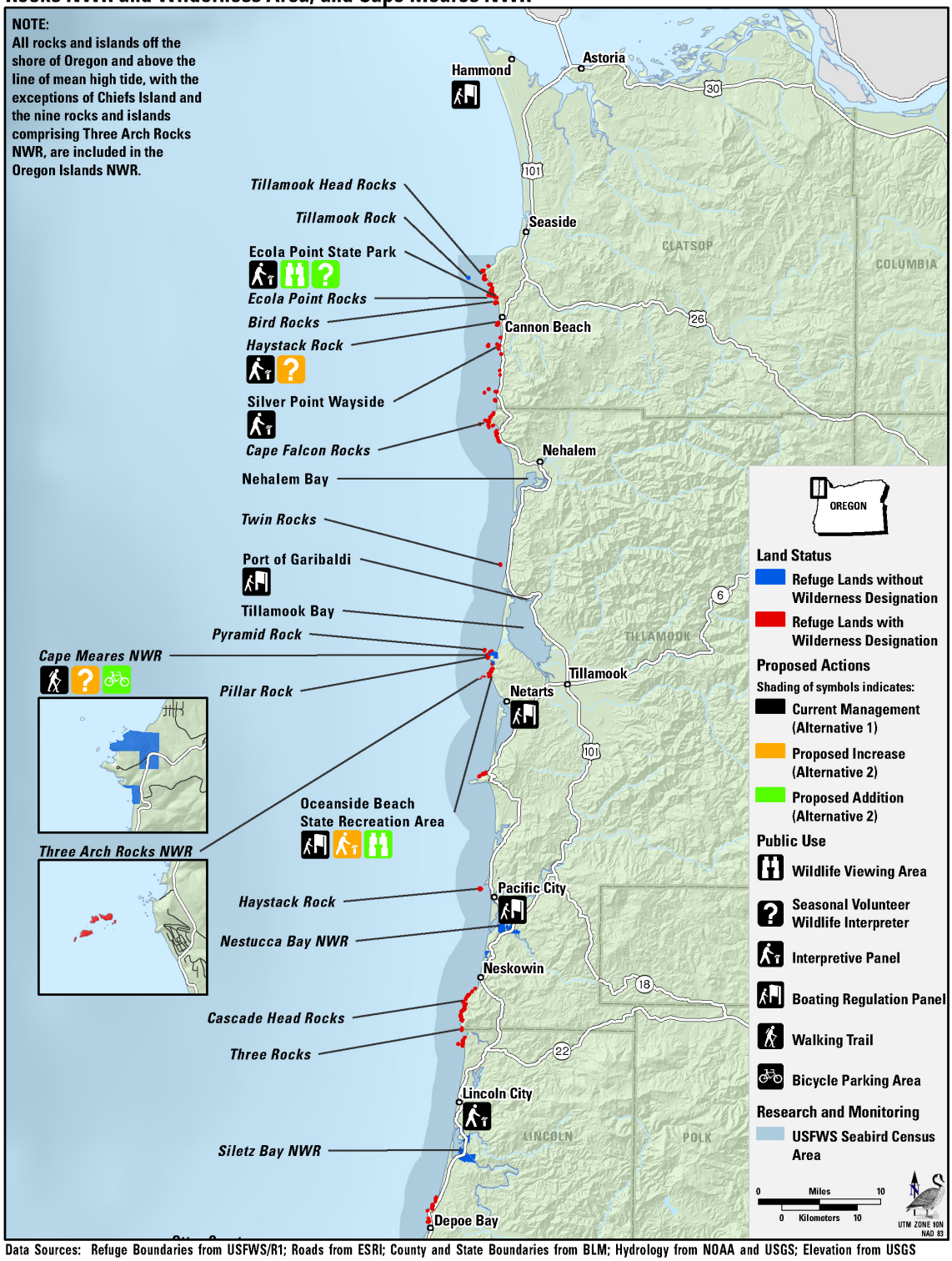
The goals for Cape Meares, Oregon Islands and Three Arch Rocks Refuges over the next 15 years under the CCP/WSP/EA are presented on the following pages. Each goal is followed by the objectives that pertain to it. Some objectives pertain to multiple goals and have simply been placed in the most appropriate spot. Similarly, some strategies pertain to multiple objectives. The objectives remain throughout the life of the CCP unless otherwise specified in the objective.

The goal order does **not** imply any priority. Action priorities are assigned in Appendix G.

Readers, please note the following:

- The objective statement as written specifically applies to the Preferred Alternative, Alternative 2.
- Below each objective statement are the strategies that could be employed in order to accomplish the objective. The “X” marks alongside each strategy show which alternatives include that strategy. If a column for a particular alternative does not include an “X” for a listed strategy, it means that strategy will not be used in that alternative.

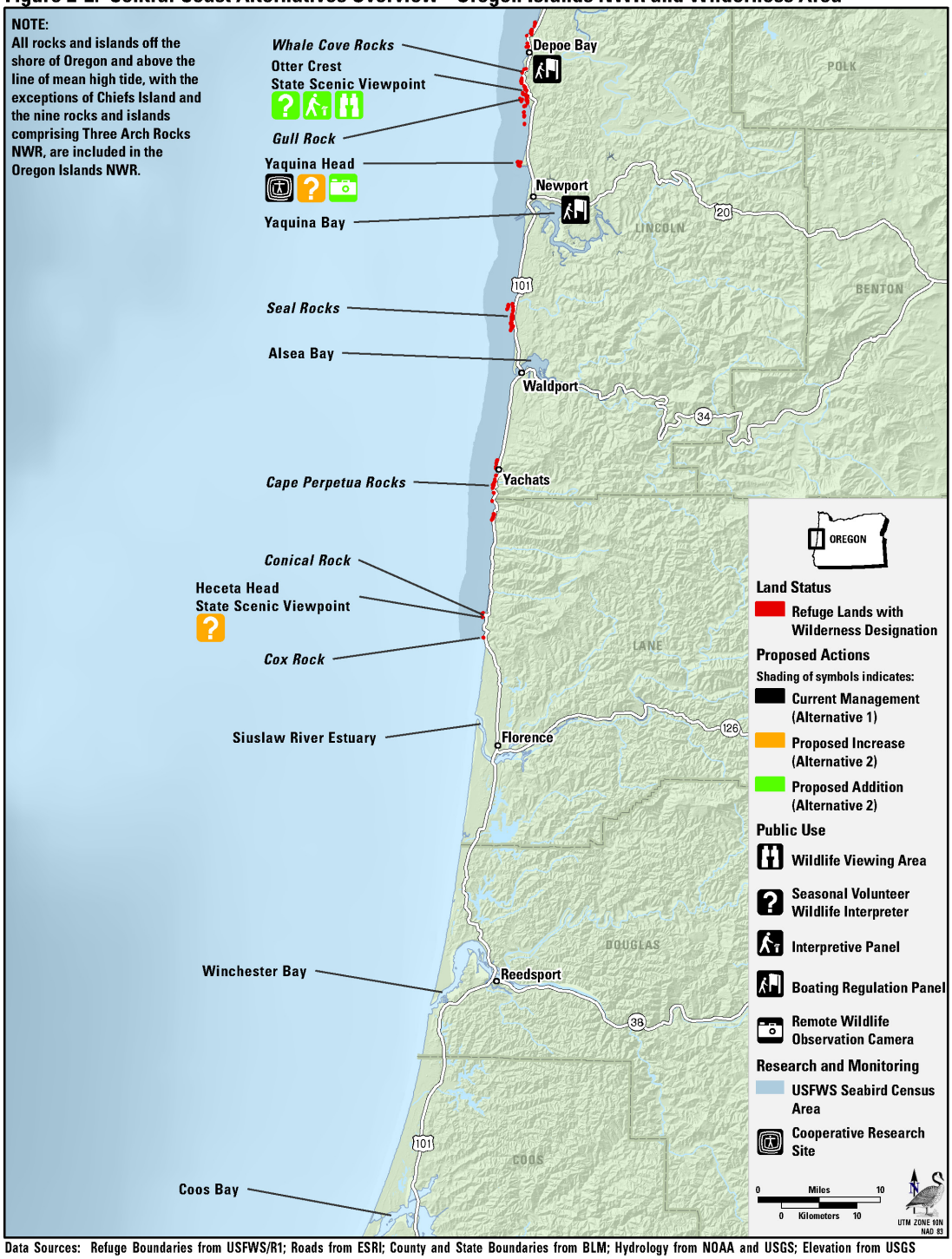
Figure 2-1. North Coast Alternatives Overview - Oregon Islands NWR and Wilderness Area; Three Arch Rocks NWR and Wilderness Area; and Cape Meares NWR



Data Sources: Refuge Boundaries from USFWS/R1; Roads from ESRI; County and State Boundaries from BLM; Hydrology from NOAA and USGS; Elevation from USGS

The back sides of maps are blank to improve readability.

Figure 2-2. Central Coast Alternatives Overview - Oregon Islands NWR and Wilderness Area



Data Sources: Refuge Boundaries from USFWS/R1; Roads from ESRI; County and State Boundaries from BLM; Hydrology from NOAA and USGS; Elevation from USGS

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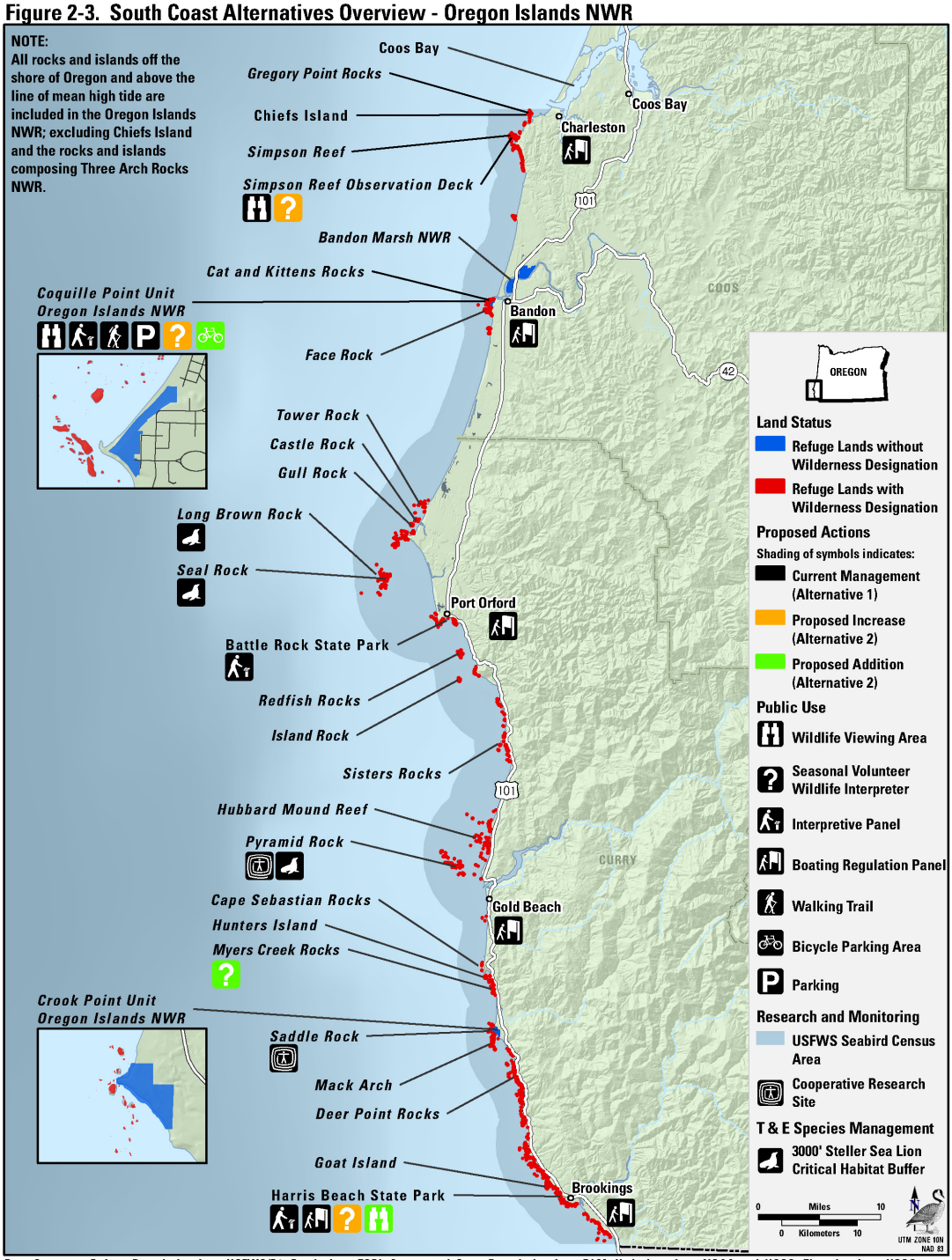
Figure 2-3. South Coast Alternatives Overview - Oregon Islands NWR



Data Sources: Refuge Boundaries from USFWS/R1; Roads from ESRI; County and State Boundaries from BLM; Hydrology from NOAA and USGS; Elevation from USGS

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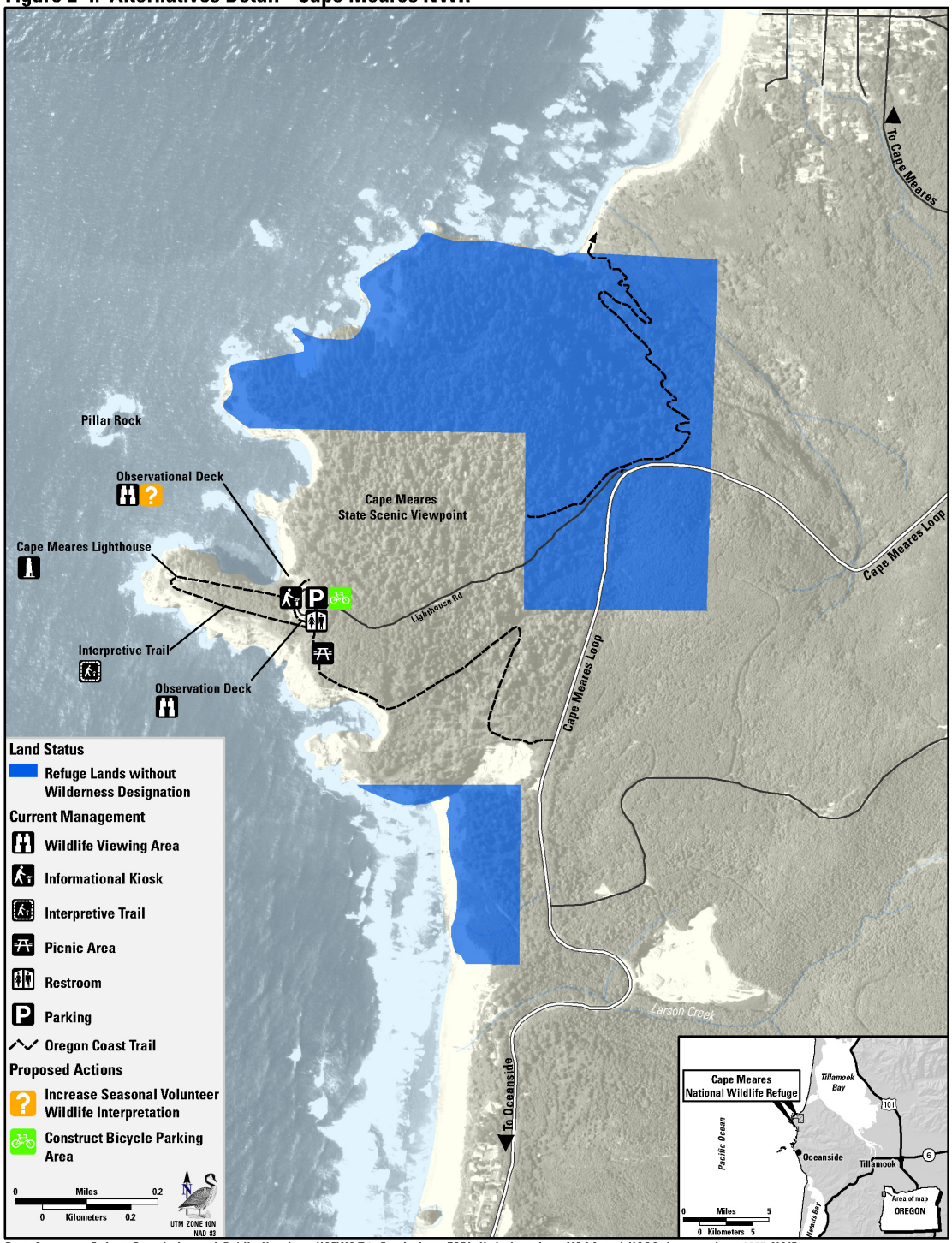
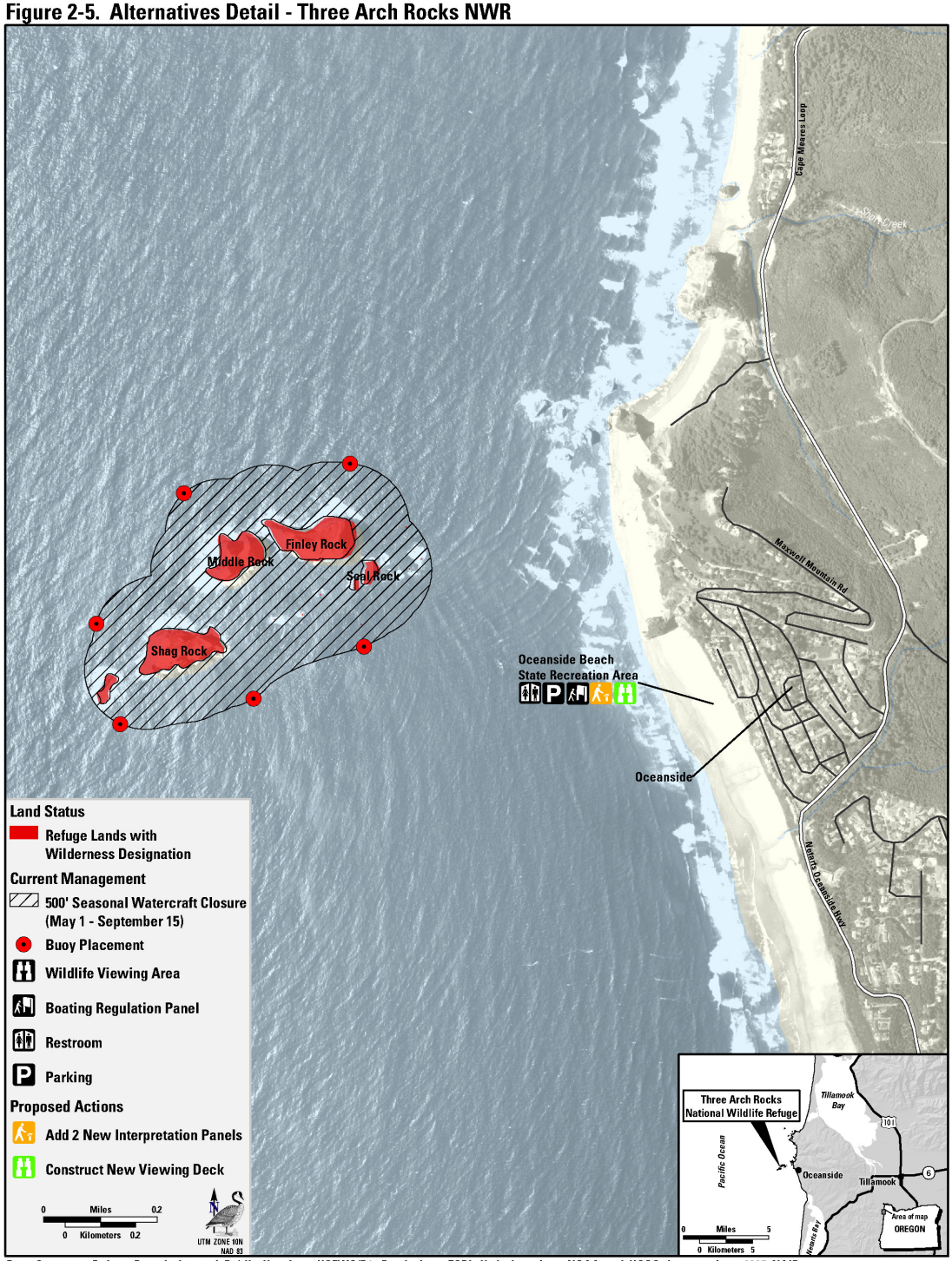
Figure 2-4. Alternatives Detail - Cape Meares NWR



Data Sources: Refuge Boundaries and Public Use from USFWS/R1; Roads from ESRI; Hydrology from NOAA and USGS; Imagery from 2005 NAIP

The back sides of maps are blank to improve readability.

Figure 2-5. Alternatives Detail - Three Arch Rocks NWR



Data Sources: Refuge Boundaries and Public Use from USFWS/R1; Roads from ESRI; Hydrology from NOAA and USGS; Imagery from 2005 NAIP

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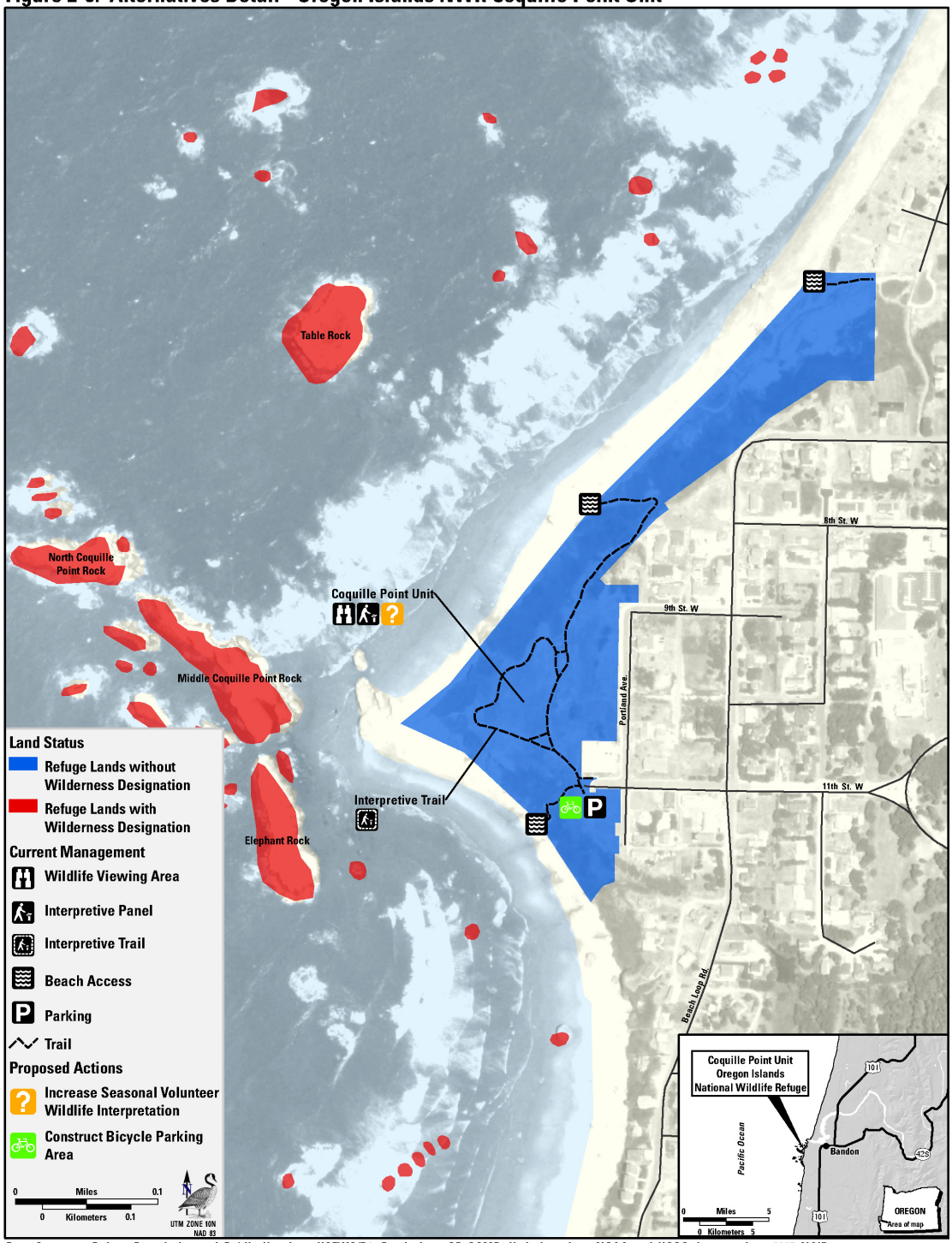
Figure 2-6. Alternatives Detail - Oregon Islands NWR Coquille Point Unit



Data Sources: Refuge Boundaries and Public Use from USFWS/R1; Roads from OR OCMP; Hydrology from NOAA and USGS; Imagery from 2005 NAIP

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2.6.1 Oregon Islands and Three Arch Rocks NWRs

2.6.1.1 Goal 1: Preserve and protect all rocks, reefs and islands within Oregon Islands and Three Arch Rocks NWRs for the benefit of seabirds, shorebirds, waterfowl, other migratory birds, pinnipeds and native plants.

Objective 1.a Rocks, Reefs, and Islands – Oregon Islands and Three Arch Rocks NWRs

Maintain and protect 1,854 rocks, reefs and islands within Oregon Islands NWR and 9 rocks within Three Arch Rocks NWR for Common Murre, Leach's Storm-Petrel (*Oceanodroma leucorhoa*), Pelagic Cormorant (*Phalacrocorax pelagicus)*, Brandt's Cormorant (*Phalacrocorax penicillatus)*, Tufted Puffin (*Fratercula cirrhata*), Black Oystercatcher, Steller Sea Lion, Peregrine Falcon, Brown Pelican (*Pelecanus occidentalis*), Aleutian Cackling Goose, Purdy's Stonecrop (*Sedum spathulifolium*), San Francisco Bluegrass (*Poa unilateralis*), Seaside Goldfields (*Lasthenia maritime*) and other native wildlife and plants.

The rocks, reefs and islands are characterized by the following:

- No invasive plants
- No mammalian predators

	Alternative 1	Alternative 2
Strategies Applied to Achieve Objective		
Allow natural processes to drive vegetative changes	x	x
Protect an undisturbed natural environment on all refuge rocks, reefs and islands by prohibiting public access.	x	x
Use IPM strategies including mechanical, physical, biological, and chemical to eradicate, control, and contain invasive plants.		x
By 2012, complete a limited botanical survey of Oregon Islands and Three Arch Rocks NWRs and document the occurrence and distribution of native and invasive plants and animals. (also addressed in Wilderness Goal 7)		x
In cooperation with the USDA's Wildlife Services, conduct a survey of mammalian predator occurrence, determine impacts to native fauna, develop annual work plans, and implement predator removal (also addressed in Wilderness Goal 7).		x
Document the occurrence and impacts of mammalian predation on nesting seabirds at YHONA and work cooperatively with BLM to remove predators.		x
Facilitate and assist in the implementation of the Service's Regional Seabird Conservation Plan (2005b) in Oregon, including participation in planning efforts and meetings, contribution of data to a common pool, updates to the seabird colony catalog, and participation and support of associated research.	x	x
Rationale: Seabirds and pinnipeds spend the majority of their life at sea foraging on marine fishes and invertebrates and return to land for breeding, loafing and roosting. The rocks, reefs and islands associated with Oregon Islands and Three Arch Rocks NWRs provide habitat that is important for vulnerable adults, young and in the case of seabirds, eggs and young. Nearly 1.3		

million seabirds, representing 12 different species (Naughton et al. 2007), and four species of pinnipeds, including threatened Steller sea lions, depend on these isolated habitats. All rocks, reefs and islands within Three Arch Rocks and Oregon Islands NWRs are closed to public entry to minimize disturbance to wildlife.

A botanical survey has never been attempted for Oregon Islands or Three Arch Rocks NWRs. A single-day botanical survey of Goat Island was conducted on July 17, 1984, and recorded 65 plant species present, of which 20 are classified as invasive species. None of the remaining 1,862 rocks, reefs and islands have been surveyed. General observations in the Crook Point area of Curry County indicate that invasive sea fig is present on the mainland, Saddle Rock and other nearby rocks and is spreading. This introduced plant species poses serious ecological problems, forming vast monospecific z ones, lowering biodiversity, outcompeting native plants, and eliminating habitat for burrow-nesting seabird species. Infestations by other invasive plants on rocks and islands, carries the potential for similar disastrous effects.

Invasive red foxes have been documented on rocks at Coquille Point in Coos County, damaging and destroying nesting seabird colonies. Red foxes have spread to Curry County and may eventually be found in all coastal counties in Oregon, and have the potential for devastating impacts to nesting seabirds within Oregon Islands Wilderness. Other predators may be present as well such as mice, rats and feral cats, but no comprehensive survey has been conducted.

Objective 1.b Respond to and Reduce Damage from Oil Spills – Oregon Islands and Three Arch Rocks NWRs

Throughout the life of the CCP, support regional efforts to reduce the risk of catastrophic damage from oil spills around rocks, reefs and islands within Oregon Islands and Three Arch Rocks NWRs to protect seabirds, pinnipeds and other marine natural resources.

	Alternative 1	Alternative 2
Strategies Applied to Achieve Objective		
Participate in regional spill prevention and planning efforts.	x	x
Participate in updates of the five Oregon Coast Geographic Response Plans.		x
Work with NOAA to make reference of refuge lands/wilderness on navigation charts.		x
Attend Hazardous Materials, Shoreline Assessment and Incident Command training.	x	x
Respond to oil spills in cooperation with the Service's Ecological Services Division, Oregon Department of Environmental Quality (ODEQ) and ODFW.	x	x
Participate in oil spill Natural Resource Damage Assessment (NRDA) program on the Oregon coast working with the Service's Ecological Services Division, ODFW, USCG and Oil Spill Trustees to assess damages, and plan and implement restoration projects.	x	x

Rationale: Oil spills in the California Current System have caused significant seabird and shorebird mortality and are among the greatest threats to refuge resources (USFWS 2005b, USFWS 2007). To minimize the potential effects of a catastrophic spill in Oregon, the main

transportation corridor for crude-laden tankers in the Trans-Alaskan Pipeline Petroleum Trade occurs 30-60 nautical miles offshore. In contrast, numerous small oil tankers, cargo vessels and barges use the waters near the coast as a transportation route. Any spill from these routes could potentially be devastating to populations of marine wildlife and habitat. In addition, non-point source oil tarballs, or slicks periodically wash up on Oregon's beaches and negatively impact wildlife. Non-point chronic sources may be products of vessels illegally pumping bilges, sunken vessels, recreational outboard motors, and improper use of petroleum products in marinas (USFWS 2005b).

To assist watercraft in recognizing hazards and to operate their vessels in a safe manner, NOAA's Office of Coast Survey produces nautical charts and supplemental information on channel descriptions, anchorages, bridge and cable clearances, currents, tide and water levels, prominent features, pilotage, towage, weather, ice conditions, wharf descriptions, dangers, routes, traffic separation schemes, small-craft facilities, and Federal regulations applicable to navigation (NOAA 2007a). The Service, working cooperatively with NOAA, needs to ensure that charts and other supplemental navigation information is updated to assist mariners in understanding the sensitivity of refuge lands and wildlife resources that may be impacted by their activities.

Populations of colonial nesting seabirds and pinniped rookeries are extremely vulnerable to the effects of spills. To ensure these sensitive species are protected during oil spill planning, response and injury assessment the Federal Oil Pollution Act of 1990 requires that a Fish and Wildlife and Sensitive Environment Plan be developed in consultation with the Service, NOAA and other interested parties, including state fish and wildlife agencies. Compliance with the Migratory Bird Treaty Act of 1918, the Marine Mammal Protection Act of 1972, the Endangered Species Act of 1973, and state wildlife rehabilitation rules also apply to oil spill response. In Oregon, pre-spill planning is accomplished by the Northwest Area Committee (NWAC) that consists of representatives from federal and state governments, with input from industry, academia, environmental groups, and the community. The NWAC has written the Area Contingency Plan (2007), including a Wildlife Response Plan that identifies response resources, cleanup strategies, and resources at risk within their jurisdiction. It is the policy of NWAC that representatives of the Service will assume the positions of Director and Deputy Director of the Wildlife Branch. Additionally, 40 CFR 300, Section 300.210(c)(4) sets forth the requirements for this plan as an annex to Area Contingency Plans. The Oregon coast is subdivided into five Area Geographic Response Plans that are an integral part of the Northwest Area Contingency Plan (ODEQ 2007) and Complex Staff has been involved in preparation of these plans.

After an oil spill, response agencies clean up the toxic material and eliminate or reduce risks to human health and the environment. Clean up efforts may not fully restore injured refuge resources or address their lost uses by the public. Through the Natural Resource Damage Assessment (NRDA) process, NOAA's Damage Assessment, Remediation, and Restoration Program and co-trustees, such as the Service, conduct studies to understand the level of resource damage as compared to baseline mortality levels, the best methods for restoring those resources, and the type and amount of restoration required.

Objective 1.c Law Enforcement Efforts to Minimize Human Disturbance – Oregon Islands and Three Arch Rocks NWRs

Work cooperatively with law enforcement entities and other partners to maintain and enforce minimum or no human disturbance on the rocks, reefs and islands of Oregon Islands and Three Arch Rocks NWRs.

	Alternative 1	Alternative 2
Strategies Applied to Achieve Objective		
Increase cooperative LE efforts with state and federal agencies for the protection of seabirds, pinnipeds, and refuge habitats (defined in Partnerships section at end of Chapter 2)		x
Increase LE efforts to enforce and document refuge trespass regulations (CFR 50, part 26.21).		x
Annually deploy warning buoys to delineate the 500-foot watercraft exclusion zone around Three Arch Rocks NWR from May 1 to September 15.	x	x
Develop MOU with the OSMB to facilitate development of cooperative educational strategies to protect wildlife using Oregon Islands and Three Arch Rocks NWR.		x
Provide information and education materials on refuges and refuge wildlife to be distributed through the state watercraft licensing program and other means.		x
Continue to work with OSMB to implement a 500-foot seasonal watercraft closure zone around Three Arch Rocks NWR.	x	x
Develop an MOU with the USCG to facilitate the Service's use of USCG aircraft and vessels on dual missions, for LE, pilot and aircrew-training purposes, response and surveillance of oil spills, and in support of other refuge needs.		x
Provide wildlife resource protection training to USCG pilots.	x	x
Document major wildlife use areas on USCG flight maps that include suggested seasonal or year-round flight restrictions for non-Search and Rescue missions.		x
Work with USCG Motor Lifeboat Stations along the Oregon coast to document major wildlife use areas on nautical charts in their Area of Responsibility and provide measures to avoid wildlife disturbance for non-Search and Rescue missions.		x
Use existing refuge regulations to enforce wildlife disturbance violations resulting from overflights and participate in investigations and court cases when necessary.	x	x
Identify priority resource areas where low flights over refuge lands have the potential to cause the greatest impacts, and focus efforts on documenting disturbances at these sites in cooperation with OPRD, BLM and other partners.		x
Produce and distribute educational materials to advocate the 2,000-foot (610-meter) minimum AGL altitude conservation	x	x

recommendation for aircraft over refuge rocks, reefs and islands.		
Work with FAA, the Oregon Aeronautical Board, and commercial air tour operators to educate pilots about the refuges and the impacts caused by low level overflights along the Oregon coast, stressing bird-strike safety concerns for pilots and passengers.		**x**
Work with OPRD and others to develop signs and other deterrents to keep the public off rocks, reefs and islands that are accessible at low tide.	**x**	**x**
Update the MOU with BLM for management at YHONA, to include measures to prevent human disturbance of wildlife using the rocks and islands adjacent to the headland.		**x**
Assist NOAA and ODFW in the implementation of the Marine Mammal Protection Act (1972) by providing undisturbed breeding and haul-out habitat for pinnipeds.	**x**	**x**

Rationale: Seabirds and pinnipeds spend the majority of their life at sea foraging on marine fishes and invertebrates and return to land for breeding, loafing and roosting. The rocks, reefs and islands associated with Oregon Islands and Three Arch Rocks NWRs provide habitat that is important for vulnerable adults, young, and in the case of seabirds, eggs and young. Nearly 1.3 million seabirds, representing 12 different species (Naughton et al. 2007), and four species of pinnipeds, including threatened Steller sea lions, depend on these isolated habitats. Protective measures for pinnipeds include the designation of critical habitat under the Endangered Species Act for threatened Steller sea lions at the two major rookeries in Oregon (i.e., Rogue and Orford Reefs). All rocks, reefs and islands within Three Arch Rocks and Oregon Islands NWRs are closed to public entry to minimize disturbance to wildlife.

Watercraft approaching too close to the rocks, reefs and islands within Oregon Islands and Three Arch Rocks NWRs can cause serious disturbance to seabirds and pinnipeds and can result in the loss of reproduction and in some cases in colony or rookery abandonment (USFWS, unpublished data). A single aircraft or watercraft disturbance event at a common murre colony has caused reduced reproductive output, breeding failure and abandonment of the colony (Rojek et al. 2007). Legal watercraft-associated activities occurring in the marine environment near these islands (such as scuba diving, sport and commercial fishing, bait and shellfish collection, kayaking, and canoeing) have a high potential for disturbing wildlife. The need for establishment of buffer zones to minimize disturbance around waterbird colonies and pinniped rookeries is well documented (Rodgers and Smith 1997, Oregon Territorial Sea Plan 1994). Three Arch Rocks NWR has an enforceable 500-foot watercraft buffer (closure) zone from May 1 to September 15 annually to minimize wildlife disturbance by boaters (OSMB 1994, OAR 250-20-309). The Complex staff annually deploys buoys to clearly delineate this closure.

In addition to the regulated seasonal closure at Three Arch Rocks NWR, the Complex staff requests that all watercraft voluntarily remain at least 500 feet away from rocks, reefs and islands within Oregon Islands NWR inhabited by seabirds and pinnipeds; Watercraft venturing closer than 500 feet may disturb wildlife. If a vessel operator disturbs wildlife, it would represent an enforceable violation under refuge regulations. Through the watercraft licensing program administered by the Oregon State Marine Board (OSMB), the Complex staff could provide educational materials to marine boat operators with watercraft operation methods to

prevent them from impacting refuge wildlife. In the absence of regulated waters around Oregon Islands NWR, information and education would be critical for the protection of refuge wildlife, and the OSMB licensing program and publications are an effective way to distribute information.

The USCG's activities near refuge rocks, reefs and islands (including patrol flights, aircraft and surface vessel Search and Rescue (SAR) missions, and maintenance and administration of Aids to Navigation in marine waters) have the potential to cause significant levels of disturbance and impacts to seabirds and pinnipeds when conducted too close to refuge lands during the seabird and pinniped breeding season. While emergency SAR missions cannot be delayed, there are measures available to limit disturbance damage caused during these incidents through preplanning. Establishment of an MOU between USCG and the Complex would facilitate preplanning to reduce preventable disturbances as well as establish a formal arrangement for the Complex's use of USCG aircraft and surface vessels. In addition, some non-emergency activities can be altered in location or timing to reduce or eliminate disturbances. Preplanning would include delineating major seabird and pinniped use areas and the timing of use on USCG flight maps and surface vessel navigation charts, alerting USCG personnel to avoid these sensitive wildlife areas and/or providing route recommendations to avoid causing disturbance. The Complex would provide a training presentation for USCG pilots, to include information on wildlife resources, sensitivity of the wildlife to disturbance, impacts caused by disturbance, major wildlife use areas, and measures to avoid causing disturbance.

Most of Oregon's seabird colonies are physically isolated from the shoreline providing a measure of protection from human disturbance. However, some colonies are close enough to shore to be accessible to human intrusion during periods of low tides. These nearshore colonies are accessed from OPRD-managed beaches and other adjacent lands. The Complex staff would work with these public and private land managers to deter trespassing on refuge lands.

Overflights lower than 2,000 feet AGL or closer than ¼ to ½ mile have a high potential for disrupting seabird and pinniped breeding and resting. The FAA's aeronautical charts currently voluntarily request a 2,000-foot AGL vertical distance over all NWRs and Wilderness Areas. This is only a request, not a regulation, and is regularly ignored or overlooked by many pilots. However, wildlife disturbances resulting from low-level aircraft overflights are enforceable under the federal Airborne Hunting Act, Marine Mammal Protection Act of 1972, Endangered Species Act of 1973 (e.g., endangered and threatened species) and Migratory Bird Treaty Act of 1918. With the exception of designated critical habitat for Steller sea lions, which includes a protective air zone that extends 3,000 feet above rookeries, there are no enforceable aircraft regulations, and wildlife disturbances are very difficult to adequately document. It is important for Complex staff members to work cooperatively with the FAA and Oregon Aeronautical Board, and to involve commercial air tour operators on an ongoing basis to educate pilots on the impacts to wildlife from low level overflights, the legal consequences of disturbing wildlife on the refuges, and to fully inform them of the imminent threat to pilot and passenger safety due to bird-strike collision over seabird colonies.

2.6.1.2 Goal 2: Maintain and protect native coastal habitats within the Crook Point Unit of Oregon Islands NWR for the benefit of rare plants, migratory birds and other native wildlife.

Objective 2.a South Coast Headland Prairie-Grassland - Oregon Islands NWR

Throughout the life of the CCP, maintain and protect approximately 15 acres of rare early successional South Coast Headland Prairie-Grassland habitat within the Crook Point Unit of Oregon Islands NWR for Savannah Sparrow (*Passerculus sandwichensis*), Roemer's Fescue (*Festuca roemerii*), Large-flowered Goldfields (*Lasthenia macrantha)* and other plants and wildlife. Early successional South Coast Headland Prairie-Grassland habitat is characterized by:

- Windswept, gently to moderately sloping landscape.
- 60-70% cover of native grasses and forbs (e.g., Red Fescue (*Festuca rubra*), Roemer's Fescue, Beach Strawberry (*Fragaria chiloensis*), Field Horsetail (*Equisetum arvense*), Common Yarrow (*Achillea millefolium*), Selfheal (*Prunella vulgaris*), Western Brackenfern (*Pteridium aquilinum*), Broadleaf Lupine (*Lupinus latifolius*), and Seaside Daisy (*Erigeron glaucus*)).
- Minimal intrusion of woody species (e.g., Sitka Spruce, Shore Pine (*Pinus contorta)*, Evergreen Huckleberry (*Vaccinium ovatum*), and Coyote Bush (*Baccharis pilularis*)).
- Minimal presence of non-native invasive plants (e.g., Tansy Ragwort, Canada Thistle (*Cirsium arvense*))
- Minimal human disturbance

	Alternative 1	Alternative 2
Strategies Applied to Achieve Objective		
Mechanical removal of encroaching woody species.	x	x
Use IPM strategies including mechanical, physical, biological, and chemical means to eradicate, control, or contain invasive plants. (Appendix K)		x
Continue to promote and protect an undisturbed natural environment by excluding public access.	x	x
Conduct official boundary survey and post boundary of refuge unit.	x	x
Hire a PFT WG 5/7 Maintenance Worker for the south coast to perform habitat restoration, post boundaries, and maintain access roads and facilities.		x

Rationale: The Crook Point headland within the refuge has some small but exceptional examples of coastal grasslands, representing rare and endemic vegetation types that have almost entirely vanished from the Oregon coast. At Crook Point these South Coast Headland Prairie-Grassland remnants are found in areas where harsh coastal weather conditions slow forest invasion; however, secondary succession, unimpeded by wildfires and frequent grazing, will eventually lead to forest dominating the entire site unless management action is taken to prevent this succession (Kagan 2002). During the period of 2005-2008, limited habitat management efforts have been initiated to control woody vegetation encroachment on grasslands. These efforts have included mechanical and manual removal of encroaching Sitka spruce, shore pine, evergreen huckleberry, coyote bush, and wax myrtle (*Myrica cerifera*).

Public access to the Crook Point Unit of Oregon Islands NWR would be extremely difficult to manage due to its remote and rugged location, limited access road, and lack of on-site staff to ensure the safety of visitors and protect habitats. Many of the habitats found on the headland are occupied by rare and fragile plants, making them susceptible to erosion and impacts from public use foot traffic (Kagan 2002). Currently used management tools necessary for the long-term survival of these fragile plants and habitats, exposed cultural resources, and adjacent sensitive seabird breeding sites include management of the area as a closed biological reserve with no general public use, limited staff- guided tours, and well posted access points to control unauthorized entry. Lack of funding and maintenance staff is curtailing habitat management efforts, additional boundary posting, and maintenance of access roads and facilities.

Objective 2.b Habitat Complex on Crook Point Unit - Oregon Islands NWR

Throughout the life of the CCP, maintain and protect 134 acres of existing native habitats (classified below) on the Crook Point Unit of Oregon Islands NWR for the benefit of Pocket Gopher (*Geomys bursarius*), Coastal Cutthroat Trout (*Oncorhynchus clarkia*), Clouded Salamander (*Aneides ferreus*), Peregrine Falcon, Hermit Warbler (*Dendroica occidentalis*), Coastal Sagewort (*Artemisia pycnocephala*), Powdery Dudleya (*Dudleya farinosa*) and other native plant and animal species.

The habitat complex is classified and characterized by the following:

- Headland Riparian Shrublands: Stream channel associated riparian corridor with patches of Dwarf Sitka Spruce, Red Alder (*Alnus rubra*), and Hooker Willow (*Salix hookeriana*).
- South Coast Headland Erosion Forblands and Dunes: Exposed, windswept marine terrace and partially stabilized sandstone, forbs and low isolated dunes.
- Steep Rock Cliffs: Very steep, largely unvegetated cliffs that are mostly serpentine rock or sandstone with patches of Seaside Daisy, Pacific Sedum (*Sedum spathulifolium*) and Coast Eriogonum (*Eriogonum latifolium*).
- Steep Coastal Erosion Bluffs: Steep, largely vegetated cliffs/bluffs above the ocean with a mixture of grasses and forbs.
- Minimal invasive plants (e.g., Tansy Ragwort, Canada Thistle, Ice Plant, European Beachgrass)
- Minimal human disturbance

	Alternative 1	Alternative 2
Strategies Applied to Achieve Objective		
Allow natural processes to drive vegetative changes.	x	x
Use IPM strategies including mechanical, physical, biological, and chemical means to eradicate, control, or contain invasive plants (Appendix K).	x	x
Partner (where feasible) with adjacent landowners to maintain and enhance habitat quality on adjacent privately owned lands.		x
Continue to promote an undisturbed natural environment by limiting public access.	x	x
Update Fire Management Plan annually or as needed.	x	x

Rationale: The Crook Point Unit contains rare and exceptional examples of habitat types of great conservation concern, including coastal headland grasslands, shrublands, and forblands. Many of the more common habitats found at Crook Point are neither late-successional nor unusual, but they comprise some of the largest remnants of undeveloped areas in southern Oregon (Kagan 2002). Due to the undeveloped nature of the area, wildlife is abundant and using habitats which have been lost in many areas due to encroaching human presence. Management actions including control of invasive plants and limiting public access are necessary to maintain this condition.

Adjacent to the Unit, private lands are currently managed as large forested parcels and grazed grasslands with residential homes interspersed along the scenic bluffs overlooking the majestic Mack Reef archipelago. Cooperative working relationships with adjacent landowners and managers is essential to curbing the threats of wildland fire, non-native invasive plants, feral and domestic animals (e.g. cows, sheep, goats, horses, dogs and cats) and trespass on refuge lands and resources. Cooperative efforts through programs such as Service Partners for Wildlife Program and forest management initiatives would assist adjacent private and public lands in the management of threats to the unit's biodiversity and rare habitat types.

2.6.1.3 Goal 3: Protect rocks and islands within Oregon Islands NWR by maintaining a mainland buffer zone at Coquille Point Unit for the benefit of seabirds, shorebirds, waterfowl, other migratory birds, pinnipeds and native plants.

Objective 3.a Rocks and Islands – Coquille Point Unit of Oregon Islands NWR

Throughout the life of the CCP, protect the rocks and islands at the Coquille Point Unit of Oregon Islands NWR for the benefit of Black Oystercatcher, Pelagic Cormorant, Brandt's Cormorant, Common Murre, Tufted Puffin, Pigeon Guillemot, Aleutian Cackling Goose, Brown Pelican, and other native coastal wildlife and plants. These rocks and islands (Elephant, Middle Coquille Point, North Coquille Point, and Table rocks) are characterized by the following:

- Natural open space buffer on the headland
- Minimal human disturbance

	Alternative 1	Alternative 2
Strategies Applied to Achieve Objective		
Partner with the City of Bandon, OPRD and adjacent private landowners to reduce negative impacts on refuge resources.	x	x
Work with OPRD and City of Bandon to enforce laws prohibiting fireworks in areas adjacent to refuge lands.	x	x
Work with ODFW and OPRD to decrease wildlife disturbance on refuge lands and the adjacent beach by posting educational and regulatory signage.	x	x
Work with OPRD and Bandon Rural Fire Department to post beach access points with "No Driftwood Fires" signage.	x	x
Update Fire Management Plan annually or as needed.	x	x

Rationale: The Coquille Point Unit of Oregon Islands NWR has limited wildlife use, and its primary value to wildlife is providing a buffer zone between residential development within the City of Bandon and the nearshore rocks and islands that provide habitat to sensitive breeding and loafing wildlife (USFWS 1991). The Unit is bordered to the east, north and south by residential developments. The west boundary of the Unit is ocean shoreline managed by ORPD, which receives regular public use. Immediately adjacent to the refuge, illegal driftwood fires occur year-round and the use of illegal fireworks occurs during the Independence Day holiday, both of which have a high potential for igniting fires in vegetation on the refuge and spreading it rapidly into adjacent residential and commercial properties. To reduce the threat of wildland fire, cooperative efforts by the Bandon Rural Fire Protection District and OPRD seasonally posted the area with "No Driftwood Fires" and "Fireworks Prohibited on all Beaches," in addition the refuge posts "Fireworks and Campfires Prohibited" signage at all beach access points.

One of the purposes for the Coquille Point Unit is to provide for the enjoyment of wildlands and wildlife by the public at one of the premier wildlife observation sites on the Oregon coast (USFWS 1991). The use of the unit's open space buffer zone and interpretive public use facilities, adjacent to significant wildlife populations and habitat, provides the refuge and OPRD an opportunity to reduce negative interactions between the public and wildlife.

Objective 3.b Habitat Complex at Coquille Point

Throughout the life of the CCP, maintain, and where possible restore native vegetation and habitats on 18 acres at Coquille Point (classified below) for the benefit of Savanna Sparrow, Killdeer *(Charadrius vociferous)*, Ensatina Salamander (*Ensatina eschscholtzii oregonensis)*, Pink Sand Verbena (*Abronia umbellate*) and other native wildlife and plant species.

The habitat complex is classified and characterized by the following:

- South Coast Headland Erosion Forblands and Dunes: Exposed, windswept marine terrace and partially stabilized sandstone, forbs and low isolated dunes.
- Steep Coastal Erosion Bluffs: Steep, largely vegetated bluffs above the ocean with a mixture of native grasses and forbs.
- Early successional South Coast Headland Grassland: Windswept, gently to moderately sloping with 60-70% cover of native grasses and forbs (e.g., native grasses, Beach Strawberry, Field Horsetail, Common Yarrow, Selfheal, Western Brackenfern, Broadleaf Lupine, Seaside Daisy).
- Ground surface highly altered to facilitate development for public recreation (e.g., grading, top soil removal, building construction)
- Minimal presence of invasive plants (e.g., Gorse, European Beachgrass).

	Alternative 1	Alternative 2
Strategies Applied to Achieve Objective		
Use IPM strategies including mechanical, physical, biological, and chemical means to eradicate, control, or contain invasive plants (Appendix K).	x	x
Partner with others to restore habitat types with transplanting, fertilizing and maintenance of propagated seedlings or transplanted cuttings, divisions or plugs of		x

select native plants that are fire resistant and/or produce low fuel loads.		
Conduct official boundary survey and post boundary.	x	x

Rationale: One of the purposes for establishing the Coquille Point Unit was to protect and restore the Steep Coastal Erosion Bluff habitat for wildlife species dependent upon it (USFWS 1991). Prior to the acquisition of refuge lands in 1991-1994, non-native invasive plants (e.g., gorse (*Ulex europaeus*), Scotch broom (*Cytisus scoparius*), and European beachgrass (*Ammophila arenaria*) dominated all habitat types associated with the site's dunes, bluffs and headland. Refuge management efforts in 1994-1995 established an interpretive trail and created a natural open space buffer through mechanical re-grading of the headland, importation of topsoil, and restoration of native plant species. Habitat management efforts from 1996 to present have involved mowing, fertilizing, and controlling non-native invasive plants. In addition to establishing public use facilities and restoring headland plants, the refuge initiated invasive non-native gorse control measures using an IPM program of mechanical and chemical treatments. During 2004-2007 extensive infestations (approximately 5-10 acres) of gorse were removed mechanically and treated with herbicides through a Wildland Urban Interface Grant to reduce the threat of wildland fire and to re-establish displaced bluff native plant diversity. Continued efforts will be required to reduce the potential of wildland fire associated with highly flammable gorse and to re-establish low fuel load native vegetation.

The coastal dune habitat is dominated by non-native European beachgrass. This species displaces native dune vegetation, significantly altering the morphology of dune systems (Barbour and Johnson 1977). In 2006, the refuge started a test beachgrass control effort on the northern boundary of the Unit to investigate the potential of native plant re-establishment. Native dunes are important to a suite of dune community plants including pink sand verbena. This species is listed as endangered by the Oregon Department of Agriculture and is considered a Species of Concern by the Service. Restoration of dune habitat and reestablishment of native species at Coquille Point will provide habitat for wildlife and will provide an opportunity for the public to understand the ecology of coastal dunes and restoration techniques.

2.6.1.4 GOAL 4: Collect scientific information (inventories, monitoring, feasibility studies, assessments, and research) to support adaptive management decisions (Goals 1-3) on Oregon Islands and Three Arch Rocks NWRs.

Objective 4.a Inventories - Oregon Islands and Three Arch Rocks NWRs

Throughout the life of the CCP, conduct inventory activities necessary to support adaptive management decisions (Goals 1-3) on Oregon Islands and Three Arch Rocks NWRs. A list of inventory activities for these refuges follows.

	Alternative 1	Alternative 2
Strategies Applied to Achieve Objective		
Hire an additional PFT Wildlife Biologist to meet the needs of the Complex's biological program.		x
Annually review, compile and make available the results of bird, mammal, reptile, amphibian, invertebrate and plant inventory efforts.		x

Assist partners in the development of standardized inventory techniques for inventorying native burrow, crevice and surface-nesting seabird species.		x
Research, design, and implement a GIS based inventory and monitoring program for plant species at Crook Point Unit.		x
Research, design, and implement a GIS based inventory and monitoring program for plant species on vegetated offshore islands.		x
Research, design, and implement an inventory program for mammals, reptiles, amphibians, and invertebrates on vegetated rocks and islands.		x
Research, design, and implement an inventory program for mammals, reptiles, amphibians, fish and invertebrates at Crook Point Unit.		x
Design and implement an inventory program for migratory and resident birds at Crook Point Unit.		x
Research, design, and implement a GIS based inventory for plant species at Coquille Point Unit.		x
Research, design, and implement an inventory program for mammals, reptiles, amphibians, and invertebrates at Coquille Point Unit.		x
Design and implement an inventory program for migratory and resident birds at Coquille Point Unit.	x	x
Rationale: Oregon Islands and Three Arch Rocks NWR's management actions affect sensitive seabird and pinniped populations and increasingly rare offshore and headland habitats. Such actions should be taken with highly trained personnel, up-to-date equipment, and an understanding of the biological rationale and consequences. Focused inventory and monitoring efforts with data collection and properly stored and retrievable results increase the probability that the refuge will make sound and scientifically viable decisions (Service Policy 701 FW 2). Population inventories for seabirds (Naughton et al. 2007) and pinnipeds (Brown et al. 2005, NOAA 2007b) on refuge rocks, reefs and islands have been conducted through cooperative efforts of the refuge and other agencies. However, existing baseline data and inventory of other plant and animal species found on Oregon Islands and Three Arch Rocks NWRs' habitats are currently inadequate for monitoring trends in these communities. The Service should provide staff to adequately address biological complexity of the Complex's six refuges with the goal of one PFT biologist per staffed station (USFWS 1998). Currently, the Complex has only one PFT Wildlife Biologist.		

Objective 4.b Monitoring - Oregon Islands and Three Arch Rocks NWRs

Throughout the life of the CCP, conduct monitoring activities necessary to support adaptive management decisions (Goals 1-3) on Oregon Islands and Three Arch Rocks NWRs. The following is a list of monitoring activities for these refuges.

	Alternative 1	Alternative 2
Strategies Applied to Achieve Objective		
Monitor population trends and distribution of common murres and Brandt's cormorants using aerial photographic surveys.	x	x

Monitor population trend and distribution of pelagic cormorants near Newport using boat and land surveys. Establish monitoring sites on Oregon south coast.	x	x
Work with partners to develop and implement standardized, non-intrusive techniques to determine population trend, distribution and reproductive success of burrow, crevice and surface-nesting seabirds.		x
Monitor vegetated rock and island habitats for presence of invasive plants and treat infestations with IPM techniques (Appendix K).		x
Evaluate and monitor habitat response to IPM treatments		x
Meet annually with ODFW to discuss coastal and marine management issues of mutual interest and develop a strategy of timely notification of pertinent information.		x
Assist NOAA and ODFW to determine reproductive success and population trends of Steller sea lions.	x	x
Conduct joint wildlife surveys and/or support ODFW efforts to survey pinnipeds, seabirds, waterfowl and other marine wildlife using the refuges' and the state Territorial Sea. Report survey results in publications, periodic reports and on the refuge web site.		x
Obtain wildlife survey information and other data from ODFW on a regular and timely basis.		x
Monitor seabird colonies for presence of mammalian predators.		x
Monitor population trend and distribution of brown pelicans in the Pacific Northwest using aerial surveys.	x	x
Continue to work cooperatively with ODFW/Service Migratory Bird Division to determine population trends and distribution of Aleutian cackling geese.	x	x
Cooperate with private individuals, CoastWatch, Coastal Observation and Seabird Survey Team, Oregon Department of Health, ODFW, USGS, and NOAA to monitor baseline levels of seabird and pinniped mortality, wildlife disease levels, carcass deposition, and oiling.	x	x
Work cooperatively with the Service's Ecological Services Division and USGS to determine population trends and distribution of black oystercatchers.	x	x
Work cooperatively with ODFW and OSU to determine peregrine falcon population trends and distribution.	x	x
Monitor management efforts to determine responses of wildlife and habitat to invasive plant and predator controls. Apply adaptive management based upon monitoring results.		x
Rationale: The goal of monitoring at the Complex is to evaluate, regulate, guide, or investigate the success of the Complex's wildlife and land management actions, including wildlife surveys and invasive plant and animal control actions. To meet this goal, the Complex will need to standardize the data collected to facilitate monitoring success or failure of management actions and to assist the refuge in determining how to improve management over time (adaptive management). The complexity, cost, and sample size requirements for these types of monitoring		

efforts, in many cases, often exceed the abilities of individual refuges (USGS 2007) and cooperative programs will be needed to implement these efforts.

Monitoring emphasis at Oregon Islands and Three Arch Rocks NWRs will include species, groups of species or communities that are of importance due to federal or state listing as endangered, threatened or a species of concern, or cited in the refuge's enabling legislation, establishing documentation or contained in international, national, regional, state, or ecosystem conservation plans or acts (Service Policies 620 FW1, 701 FW2). NOAA Fisheries and the Service share responsibility for implementing the Endangered Species Act (ESA) of 1973. Generally, the Service manages land and freshwater species, while NOAA Fisheries manages marine and anadromous threatened and endangered species. In addition, NOAA Fisheries has jurisdiction over the four species of pinniped that occur on the refuges (Steller and California sea lion, harbor and northern elephant seal) under the Marine Mammal Protection Act (MMPA).

Thirteen species of seabird breed on Oregon Islands and Three Arch Rocks NWRs. Many of these species face an array of threats at sea (e.g., oil spills, fishery effects, pollution) and on their breeding grounds (e.g., predation, invasive plants, and disease). Current and formerly listed state and federal threatened and endangered species, discussed above, are monitored largely in accordance with the Endangered Species Act or recovery plan recovery efforts. Monitoring of non-listed seabirds and their threats are prioritized and guided by the Service Pacific Regional Seabird Conservation Plan (USFWS 2005b) and U.S. Shorebird Conservation Plan (USFWS 2000), and the ODFW's Oregon Conservation Strategy (2005). The Service Seabird Conservation Plans rank species according to population size trends, extent of breeding and non-breeding distribution and threats during breeding and non-breeding seasons. Species of concern include: (1) High Concern: black oystercatcher, pelagic cormorant, Cassin's auklet (*Ptychoramphus aleuticus*) and rhinoceros auklet (*Cerorhinca monocerata*); and (2) Moderate Concern: Brandt's cormorant, common murre, pigeon guillemot, and tufted puffin. In the Oregon Conservation Strategy, species determined to be at-risk or have populations that are low and declining include: black oystercatcher, fork-tailed storm-petrel (*Oeanodroma furcata*), Leach's storm-petrel, and tufted puffin.

The Service has conducted seabird surveys along the coast of Oregon from 1966 to present (Naughton et al. 2007). Aerial and boat surveys have been standardized, both in technique and timing (Takekawa et al. 1990) since 1988 to more accurately census and monitor breeding seabirds. These efforts primarily focused on the pelagic and Brandt's cormorants and common murre due to the ability of staff to conduct distant aerial or boat observations and/or photography of surface nesters with little or no disturbance. As one of the important indicators of marine productivity, several colonies of pelagic cormorants near Newport have been monitored for nearly 20 years, primarily because of their proximity to Complex headquarters. Additional colony monitoring sites on the south coast should be established to provide a broader indicator of marine productivity. A discussion of the background and need for monitoring of each species identified as a strategy under this objective can be found in Chapter 4.

The ODFW's management responsibilities along the coast including lands and waters, fish and wildlife, threatened and endangered species and other programs frequently overlap with Service resources and responsibilities. Increased cooperation between ODFW and the Complex will assist both agencies in meeting their missions and mandates and provide a more systematic and accessible process for, sharing information, expertise and funding, as contained in The Oregon

Conservation Strategy (ODFW 2006). The ODFW and the Complex share mutual interests in wildlife surveys, documenting and responding to seabird mortality events, developing joint research projects, education and outreach programs, species management and dissemination of data, results, and information to a wider audience. Working in concert with ODFW is consistent with the policies of Oregon Statewide Planning Goal 19. Ocean Resources and the Territorial Sea Plan. The Territorial Sea Plan (1994) specifies that Oregon should seek co-management arrangements with federal agencies when appropriate to ensure that ocean resources are managed and protected and to cooperate with other states and governmental entities directly and through regional mechanisms to manage and protect ocean resources and uses.

The ODFW has been conducting surveys of pinniped populations using the refuges for more than two decades. The Complex has supported this work by issu omm. Special Use Permits and reporting marked animals. Although the Marine Mammal Protection Act transferred management jurisdiction for pinnipeds from state government to NOAA-Fisheries in 1972, leaving ODFW without management authority for these species, ODFW has been using limited state program funds along with funding support from NOAA-Fisheries to study and manage pinnipeds in Oregon. Complex staff members have been working closely with ODFW and NOAA-Fisheries personnel on research associated with Steller sea lions that use refuge rocks and islands. The data collected by ODFW fulfills population monitoring data needs of the Complex; however, a greater effort in obtaining the data in a timely fashion is needed.

Objective 4.c Research and Scientific Assessments – Oregon Islands and Three Arch Rocks NWRs

Throughout the life of the CCP, encourage applied research and feasibility studies to support adaptive management decisions (Goals 1-3) on Oregon Islands and Three Arch Rocks NWRs. A list of research projects needed for these refuges follows:

	Alternative 1	Alternative 2
Strategies Applied to Achieve Objective		
Work with USGS, universities and others to establish a long-term seabird research program using seabirds as biological indicators of ocean conditions.		x
Work with partners to research and monitor the effects of an increasing coastal bald eagle population on common murre and other seabird colonies.		x
Work with universities, agencies and organizations to research, assess and monitor the interrelationship of climate change on physical and biological factors that are ecologically connected to refuge lands and resources.		x
Pursue joint research opportunities with ODFW and other partners.		x
Work cooperatively with BLM to develop monitoring and research projects of mutual interest to both agencies.		x
In cooperation with ODFW and OSMB, re-examine the need for special management area designation/buffer zones at 33 areas within Oregon Islands and Three Arch Rocks NWR as described in the State's Ocean Plan (1991).		x

Coordinate with the NOAA National Marine Mammal Lab to permit and support on-going Steller sea lion ecological research.	x	x
Work cooperatively with the Service's Ecological Services Division and USGS to assess ecological factors affecting black oystercatcher survival and reproductive success.		x

Rationale: Oregon Islands and Three Arch Rocks NWR primary purposes are the protection and conservation of sea lions and colonial nesting seabirds (Executive Orders 4364 and 699). Seabird conservation and management at the Complex is based upon statistically viable scientific research combined with long-term monitoring. Seabirds using these refuges represent a group of species that use different foraging guilds in the marine food web (R. Suryan, pers. Com.). Long-term small scale or localized research using this suite of species as indicators of ocean conditions can be used to document change in the larger marine environment. The need to change or regulate human induced threats to refuge resources will be driven by an understanding of marine ecological parameters that is directly influenced by anthropogenic actions. The refuge's role in increasing this knowledge is key to making informed management decisions with the best scientific data possible. Research should be focused on understanding the cause of reduced or declining seabird populations and developing tools and techniques to aid recovery of threatened or endangered species (USFWS 2005b).

The Steller sea lion is a federally and state listed species that is monitored by the State of Oregon, Marine Resources Program and NOAA's National Marine Mammal Laboratory, California Current Ecosystems Program (CCEP). In addition to stock assessment monitoring, CCEP is performing research to determine vital rate parameters for this species. The survival rate data collected from this effort provides species-specific ecological data from the southernmost major rookery sites (e.g., St. George and Rogue Reef) and allows comparisons to other rookeries range wide. The goals of this research are to assess survival rates, age of female recruitment, and distribution and dispersal of marked pups and juveniles (NOAA 2007d).

The Complex assists NOAA in meeting the requirements of MMPA by providing disturbance-free habitat for these species and assisting in this recovery research. Although the Marine Mammal Protection Act transferred management jurisdiction for pinnipeds from state government to NOAA-Fisheries in 1972, leaving ODFW without management authority for these species, ODFW has been using limited state program funds along with funding support from NOAA-Fisheries to study and manage pinnipeds in Oregon. The Complex has supported this work through the issuance of Special Use Permits and reporting marked animals.

The black oystercatcher is a species of concern due to a variety of natural and human induced disturbances. The Oregon coast is undergoing increased development and use as people relocate, retire and recreate on the coast. This species is restricted to the narrow rocky coastline and is directly in the path of a concentrated beach user group. Population declines from increased disturbance and associated nest abandonment may lead to local extirpation on the Oregon coast (Tessler et Al., 2007). To assess the importance of demographic parameters, USGS with the Service and a suite of other public agencies have developed a research assessment study to understand the ecology of the species in the southern portion of its range and to determine if increased management (e.g., public education, regulations, predator control) is needed for its conservation (Tessler et Al. 2007).

Bald eagles have been increasing in Oregon steadily since the 1970's. The net increase in the Oregon population was 8.9% in 2007, with an average annual increase of 6.9% from 1995-2004 (Isaacs and Anthony, 2008), while the Oregon coast breeding population increased 17% from 2003-2007. Bald eagles nesting near seabird colonies prey predominantly on seabirds for food (Sherrod et al. 1976; Degange and Nelson 1982). Since 1994, the increasing numbers of bald eagles on the Oregon north and central coast have in turn increased disturbance at common murre and Brandt's cormorant colonies, resulting in colony abandonment, population declines and redistribution (R. Lowe pers. comm..; Naughton et al. 2007). This successfully recovered eagle population is expected to continue its positive growth in Oregon and it is unknown what level of influence this increasing population of predators will have on seabird populations and demography. Cooperative research efforts with the Service, OSU, and Oregon Sea Grant to quantify the effects of bald eagles on common murre reproductive output at YHONA were started in 2007. Preliminary results indicate that eagle foraging disturbance was high prior to incubation initiation by the murres (OSU unpubl. Data). Continuation of this research and expansion to other colony sites is needed to determine if changes in seabird populations are affected by direct mortality and disturbance, secondary predators (e.g., gulls, ravens) during eagle disturbance events, or immature eagle foraging and loafing patterns.

One of the greatest challenges currently facing the National Wildlife Refuge System and wildlife populations in the 21st century is rapid climate change brought about by global warming (Defenders of Wildlife 2006). Oregon's climate is warmer than it was 20 years ago and this trend is likely to continue into the next century. Climate change is a global issue that has and will continue to affect refuge resources in the future. The potential impacts of climate change on the Pacific Ocean and nearshore environment include increase in sea-level and sea-surface temperatures, changes in salinity, alkalinity, wave and ocean circulation patterns and upwelling, and loss of coastal marshes, estuaries and ocean beaches (National Wildlife Federation 2007). The consequence of these changes and losses in Oregon's marine environment include direct loss of habitat through coastal inundation and flooding, changes in species biogeography, including species of marine wildlife (e.g., phytoplankton, krill, forage fish, seabirds, and pinnipeds) and invasive species (e.g., animals, plants, microbes and pathogens). Although there can be no certainty regarding the precise nature and rate of change to Oregon's marine environment, it is clear that changes in the environment have the potential to have negative social, economic and environmental impacts. The monitoring and research of impacts of climate change on refuge species and habitats is complex and difficult, and will require cooperation from numerous public and private organizations to combine all the factors that could affect the region's wildlife and habitat.

The ODFW's management responsibilities along the coast including lands and waters, fish and wildlife, threatened and endangered species and other programs frequently overlap with Service resources and responsibilities. Increased cooperation between ODFW and the Complex will assist both agencies in meeting their missions and mandates and provide a more systematic and accessible process for, sharing information, expertise and funding, as contained in The Oregon Conservation Strategy (ODFW 2006). The ODFW and the Complex share mutual interests in developing joint research projects, species management and dissemination of data, results, and information to a wider audience. Working in concert with ODFW is consistent with the policies of Oregon Statewide Planning Goal 19. Ocean Resources and the Territorial Sea Plan. The Territorial Sea Plan specifies that Oregon should seek co-management arrangements with federal agencies when appropriate to ensure that ocean resources are managed and protected

and to cooperate with other states and governmental entities directly and through regional mechanisms to manage and protect ocean resources and uses (Territorial Sea Plan 1994).

ODFW has been conducting surveys of pinniped populations using the refuges for more than two decades. The Complex has supported this work by issuing Special Use Permits and reporting marked animals. The data collected by ODFW fulfills population monitoring data needs of the Complex; however, a greater effort in obtaining the data in a timely fashion is needed. The refuge has been working closely with ODFW and NOAA-Fisheries on research associated with Steller sea lions within Oregon Islands NWR. The research is investigating population dynamics, recruitment, survivorship and dispersal of young of this threatened species. Annual meetings or conference calls are held to discuss results of previous work and proposed future work. All work is done in accordance with provisions of Special Use Permits issued to ODFW and NOAA-Fisheries Service, and Complex Staff participates in fieldwork.

The Service and BLM have worked cooperatively since the early 1980s to protect the wildlife resources of YHONA and the adjacent rocks within Oregon Islands NWR. Large populations of nesting seabirds in close proximity to the mainland provides an opportunity to conduct monitoring and research on these species including reproductive success, food habitats, response to predators, and response to oceanic events and upwelling. While neither BLM nor the Complex currently have staff available to conduct these studies they will work cooperatively with others entities such as universities to encourage onsite monitoring and research and data sharing. In recent years, a reduction in the number of seabirds nesting at some mainland sites has been noted by Complex staff and may be due, in part, to predation by feral cats, raccoons and weasels. The BLM and Complex should work cooperatively to document occurrence of and impacts from mammalian predators, and implement a plan to remove the predators.

2.6.1.5 Goal 5. Oregon Islands NWR: Promote protection, stewardship and enjoyment of Oregon's seabirds and pinnipeds and their wilderness habitats by providing opportunities for wildlife observation, photography, interpretation and environmental education on appropriate mainland areas.

Objective 5.a Partnerships for Offsite Wildlife Viewing and Photography

Throughout the life of the CCP and in partnership with others provide information and offsite facilities for visitors to view and photograph wildlife using coastal rocks and islands.

	Alternative 1	Alternative 2
Strategies Applied to Achieve Objective		
In cooperation with OPRD ensure maintenance of refuge-constructed Simpson Reef Overlook viewing deck, parking lot and interpretative features at Shore Acres State Park.	x	x
Develop MOU between Shore Acres State Park and the Complex regarding management of Simpson Reef Overlook viewing deck public use facilities.	x	x
In partnership with OPRD, design and build wildlife viewing decks at Harris Beach, Ecola and Otter Crest Headland State Parks.		x

Partner with the BLM and the Oregon Coast Aquarium to obtain funding to acquire and install a wildlife viewing camera at YHONA with live video feed to the BLM Visitor Center, the Aquarium and the Complex's web site.		
Distribute a brochure of the seabirds of the Pacific Northwest.	x	x

Rationale: In accordance with the National Wildlife Refuge System Administration Act of 1996, as amended, refuges are encouraged to provide wildlife observation and photography opportunities wherever they are appropriate and compatible. The Oregon Coast is one of the most popular tourist destinations in the State with 22 million visitor-use days each year, and wildlife observation is the most popular public use that visitors engage in at Oregon Islands NWR. The Pacific Coast Scenic Byway (U.S. Highway 101) runs the length of the Oregon Coast, as does Oregon Islands NWR, making it difficult for Complex Staff to appropriately provide both wildlife protection and wildlife dependent public use. Therefore, the refuge must work as much as possible with federal, state, local and private partners to provide a variety of both onsite and offsite wildlife viewing and photographic opportunities and facilities for visitors. Each partnership between the Complex and another private or public group will be formalized in a MOU to ensure the goals and objectives of both the cooperator and the refuge are delineated and that the roles and responsibilities of each agency or group are clear.

Wildlife enthusiasts from all over the world visit the Oregon Coast to view, photograph and learn about its abundant wildlife. The refuge gets regular requests for an informational brochure about the seabirds breeding on coastal rocks and islands of the refuge. Continued distribution of the Complex-developed "Seabirds of the Pacific Northwest" brochure will enhance their visit and provide the refuge with a venue to discuss the sensitivity of these species to human disturbance.

Objective 5.b Partnership with OPRD for Interpretation and Education

Work with OPRD to protect refuge wildlife, plants and habitats and to promote conservation of these resources through interpretation and education from state lands adjacent to Oregon Islands NWR throughout the life of the CCP.

	Alternative 1	Alternative 2
Strategies Applied to Achieve Objective		
Establish a coast wide MOU with OPRD to assist the Complex in the protecting refuge resources and to promote interpretation and education from OPRD lands adjacent to or overlooking refuge lands.		x
Formalize a coast wide volunteer interpretive program to inform visitors of coastal and marine resource issues and needs.		x
Collaborate with OPRD to prevent impacts to refuge resources from uses occurring on beaches such as fireworks, beach fires, commercial filming activities, and trespass on refuge lands.	x	x
Map all refuge-constructed and/or maintained visitor facilities on OPRD lands.		x

Rationale: The OPRD manages Oregon beaches, numerous State Parks and other designated lands along the entire Oregon coast. Many of these OPRD-managed lands are immediately adjacent to large segments of Oregon Islands NWR. The OPRD's management responsibilities, including lands, facilities, and interpretive and educational programs, frequently overlap with the Complex's goals and responsibilities for public outreach and education. Because of the public use of OPRD-managed lands in immediate proximity to refuge lands careful coordination and cooperation is necessary to protect refuge wildlife and habitats from direct impacts (trespass) and indirect impacts (disturbance). Because OPRD manages numerous sites along the coast that provide optimal opportunities for viewing and interpreting refuge resources and lands, it is imperative to work closely with them on interpretive and educational programs that benefit both agencies programs. Establishment of a coast wide MOU between the Complex and OPRD will clarify and delineate roles and responsibilities regarding mutual interests and formalize and acknowledge programs already underway. The MOU will assist both agencies by providing a more accessible and systematic process for sharing information, funding, staffing, and expertise. Mutual interests include but are not limited to maintaining visitor use facilities, developing new facilities, collaborating on interpretive panel messages, developing joint educational and interpretive programs and utilizing staff and volunteers.

Objective 5.c Partnerships with Friends Groups and Volunteers for Interpretation and Education

Throughout the life of the CCP partner with Friends groups, volunteers and interns to increase interpretation and environmental education programs for visitors and community members.

	Alternative 1	Alternative 2
Strategies Applied to Achieve Objective		
Develop and implement an environmental education program on seabirds for K-12 students. Seek grant opportunities to cover intern educators and program expenses.		x
Increase refuge volunteer presence at key interpretive sites along coast to include coverage seven days/week from May 1 to September 15.		x
Provide leadership and resources to manage and train volunteers. Develop evaluation system for volunteer program to maintain a quality program and volunteer experience.		x
Expand volunteer wildlife interpretation program to include volunteer presence at additional locations along the coast.	x	x
Hire a PFT GS-7/9 Volunteer Coordinator.		x
In cooperation with OPRD and BLM, maintain volunteer presence at offsite locations to interpret wildlife resources.	x	x
Work with BLM staff at YHONA to improve and replace interpretive panels overlooking seabird colonies.		x
Maintain and expand cooperative program with OPRD to provide RV hookup sites for refuge volunteers.	x	x
Hire a PFT GS-7/9 Environmental Education Specialist.		x
Develop and loan out a seabird education module box to coastal schools.		x

Rationale: Each spring and summer the Complex, along with state and federal partners, stations volunteer wildlife interpreters on mainland sites overlooking Oregon Islands. Volunteer wildlife interpreters are on duty a minimum of four days/week to orient visitors, make them aware of the wildlife resources using the rocks and islands, and educate them as to how they can reduce negative wildlife/human interactions. Current sites with volunteer interpreters include Cape Meares Scenic Viewpoint, Heceta Head State Scenic Area, Haystack Rock at Cannon Beach, YHONA, Coquille Point Unit, Simpson Reef Overlook at Shore Acres State Park, and Harris Beach State Park. Having volunteers interact with visitors has been well-received by the visitors, staff from OPRD and BLM, and Refuge Friends groups. In many of these partnerships OPRD provides the volunteers with a full hook-up site for a recreational vehicle at a nearby state park campground and in return the Complex recruits, trains and provides uniforms for the volunteers.

Due to an increase in the number of visitors to the Oregon coast there is a need to expand the interpretation program to have volunteers available seven days/week and to include additional locations to station volunteers. New sites that have been identified include Ecola State Park, Otter Crest Headland, Port Orford, and Myers Creek Rocks. The Complex volunteer program is growing and there is need to formalize the program around available funding, recruitment, training and evaluation. Formalizing the program will ensure volunteers are consistently equipped and trained, and share the same wildlife conservation message with visitors regarding the National Wildlife Refuge System and its mission. A formal program will also reduce the amount of staff-time spent on the process of recruiting and training volunteers by standardizing recruitment announcements, training and evaluation. With a growing volunteer program comes more work on an already limited staff. Therefore, a full-time volunteer coordinator is needed to manage this growing program that annually utilizes volunteers to control invasive species, maintain public use facilities, lead environmental education field trips, and conduct wildlife interpretation and more.

When volunteers aren't available or locations aren't appropriate for volunteers, a series of interpretive panels, located on private, city, county, state and federal lands, offer information about Oregon Islands NWR through a self-guided experience. The refuge already has panels at some locations but many of these are damaged or dated and need to be revised and installed.

Environmental education plays a key role in encouraging current and future generations to engage in environmentally responsible behavior like supporting the protection of habitat for wildlife through the National Wildlife Refuge System. With limited staff time available the only way the refuge can offer a high quality EE program is to hire a full-time environmental educator and temporary staff through work study programs like AmeriCorps and Student Conservation Association to write curriculum and conduct EE.

Objective 5.d Partnerships with Schools for Environmental Education

Coordinate and cooperate with school districts and the Northwest Service Academy to protect Complex resources and develop within students an understanding and appreciation for the resource through environmental education programs.

	Alternative 1	Alternative 2
Strategies Applied to Achieve Objective		
Develop an MOU with School Districts to implement environmental education along the Oregon coast.		x
Annually review and revise the formal agreement with the Northwest Service Academy to support environmental education AmeriCorps positions at the Complex.	x	x
Secure long-term funding for AmeriCorps positions.		x
Hire PFT Environmental Education Specialist for the Complex.		x

Rationale: The Complex administers refuge lands in five coastal counties. Within these counties there are eight school districts that have schools near one of the three marine refuges. Many of these schools have participated in refuge EE programs and it is in the interest of the Complex to formalize the relationship with each district through development of an MOU. An MOU will help advance EE in schools by strengthening and sustaining an EE program for targeted grades focusing on seabirds. The MOU will further serve to clarify each party's role in ensuring a generation of environmentally conscious students especially in the area of marine and estuarine conservation. It is vital to secure long-term funding to assist schools with the cost of bus transportation to get students to the refuges or refuge overlooks. The lack of bus transportation funds is a limiting factor for schools on the Oregon coast and without this funding many school cannot participate.

With limited staff time available the only way the Complex can offer a high quality EE program coast wide is to hire a PFT Environmental Education Specialist and temporary staff through work-study programs like AmeriCorps. An EE Specialist is needed to establish and maintain relationships and programs with school districts. The Specialist would be responsible for designing, coordinating and implementing wildlife based EE programs to schools, conducting teacher workshops, and developing and managing a seabird education module. The Complex has successfully hosted AmeriCorps members for more than six years and the people serving in these positions have educated tens of thousands of students, residents and visitors on the importance and function of coastal headlands, rocks, reefs, and islands and the sensitive wildlife that depend on these habitats for survival. Each year, the Complex will continue to review and revise the formal agreement with the Northwest Service Academy to support AmeriCorps positions at the Complex.

Objective 5.e Outreach to Visitors, Communities and Media

Provide high-quality outreach to visitors, community members, local media and chambers of commerce on the refuge policies, habitat and wildlife resources of Oregon Islands throughout the life of the CCP.

	Alternative 1	Alternative 2
Strategies Applied to Achieve Objective		
Complex Staff or volunteers attend local festivals and/or special events that have a high potential to deliver refuge messages to key audiences.		x
Conduct regular updates of refuge website.	x	x
Distribute, update and maintain refuge brochure.	x	x

Identify existing publications and produce new publications when necessary to reduce and eliminate wildlife disturbance resulting from watercraft use and operation in waters adjacent to the refuges.		x
Maintain permanent full-time Visitor Services position for the Complex.	x	x
Develop written guidelines for commercial and other non-wildlife related interests including filming movies and product commercials. Coordinate with the Oregon Film Board and direct filming interests away from sensitive sites or sensitive times of year. Work with OPRD on coordination of issuing permits.		x
Seek funding to design and construct informational panels at all appropriate major coastal access points along the Oregon coast to alert the public to the presence of the refuge and the measures that should follow to prevent disturbance to marine wildlife.	x	x
Maintain interpretive and regulatory panels already in place on offsite locations of Silver Point Wayfinding Point, Devil's Lake Wayside, Battle Rock Wayfinding Point, and Brookings State Rest Area.	x	x
Upgrade and replace two existing but outdated and damaged interpretive panels at Ecola State Park.	x	x
Work with Oregon Coast Aquarium to update information on interpretive panels in their aviary regarding the habitat provided by Oregon Islands NWR for nesting seabirds and pinnipeds.		x
Maintain website for the Oregon Coast Birding Trail.	x	x

Rationale: With so many agencies and conservation organizations owning and managing lands on the Oregon coast there is often confusion on the part of both community members and visitors about what the refuges are, the agency jurisdiction they are under, and how the resources are managed. Outreach is crucial to distinguishing the Service's National Wildlife Refuge System from other wildlife management agencies or parks. When the public knows and understands the role of the Service and the Refuge System it improves their awareness of refuge regulations and policies, the reasons behind them, and reduces violations necessitating LE.

The Complex will continue to provide city, county, state and federal land managers along the coast, conservation organizations, and the media with the most up to date information regarding the refuge through a variety of avenues including a web site, news releases, refuge brochures, and attendance at local festivals or special events. Having Complex staff members or volunteers attend community festivals, coastal sportsman shows, boat shows, kayak demonstrations, air shows, fly-ins, and sport dive outings gives the refuge an opportunity to deliver refuge wildlife protection messages to key audiences.

The Complex has a website for the purpose of refuge related information dissemination and communication. Maintaining this website into the future is important as it provides a convenient location for anyone to quickly get information about refuges, wildlife, habitat,

wildlife regulations, current events and much more. The site is a powerful communication tool and saves the Service money by reducing the need to generate more printed materials and brochures to correspond with the general public.

In partnership with the Oregon Coast Visitors Association, the Complex currently is in charge of maintaining a website for the Oregon Coast Birding Trail. The Birding Trail is a self-guided driving itinerary highlighting the premier locations for observing birds along the entire Oregon coast and the refuge is included in many sites within the guide. Birdwatching is one of the fastest growing outdoor recreational activities in the country, and in March of 2007 the Service recognized the importance of refuges to future generations of birds and birders by launching a National Wildlife Refuge System Birding Initiative. The goal of this initiative is to strengthen the relationship between the birding community and the Refuge System and to increase opportunities for quality bird watching on refuges. The Complex believes that providing quality wildlife watching experiences can develop a "sense of wonder" for the natural world and a passion for protecting and restoring wildlife populations and their habitat for future generations. Therefore, the Complex will continue to update and maintain the website for the Oregon Coast Birding Trail as it serves as an excellent guide to connecting visitors with wildlife viewing experiences at our National Wildlife Refuges.

The Complex has designed and installed interpretive and regulatory panels at offsite locations with a dual purpose of providing the natural history of the wildlife living on the rocks and islands and communicating to visitors the regulations protecting these species. The Complex will maintain existing panels located at Silver Point Wayfinding Point, Devil's Lake Wayside, Battle Rock Wayfinding Point, and Brookings State Rest Area. Due to an increase in coastal tourism the Complex has determined it is important to develop a new interpretive panel focusing on the wildlife resources of Oregon Islands and how people can protect them to be placed at new and high priority public access sites along the coast. The purpose of the panel would be to increase people's awareness of the vulnerability of marine wildlife to human disturbance and remind them that all rocks, reefs and islands are closed to the public.

Objective 5.f Promote Cooperative Strategies to Minimize Disturbance by Residents, Visitors and Ocean Users

Throughout the life of the CCP, the Complex will implement strategies to promote compliance by residents, visitors, and boat and aircraft operators of refuge rules and recommendations that minimize human disturbance of wildlife on coastal rocks and islands.

	Alternative 1	Alternative 2
Strategies Applied to Achieve Objective		
Increase LE presence and boundary signing, where appropriate, to eliminate illegal trespass into closed refuge areas.	x	x
Partner with State and local agencies to ensure accuracy about refuge and wildlife regulations in their publications and on their websites.	x	x
Develop a joint study with BLM at YHONA to document and control wildlife resource impacts associated with current or potential future public use at YHONA.		x

Work with FAA to advocate a 2,000-foot (610-meter) minimum AGL altitude conservation recommendation for aircraft over refuge rocks, reefs and islands and have the recommendation printed on all aeronautical charts.	x	x
Develop written guidelines for commercial and other non-wildlife related interests including filming movies and product commercials. Coordinate with the Oregon Film Board and direct filming interests away from sensitive sites or sensitive times of year. Coordinate with OPRD on issuing permits.		x
Develop a presentation and accompanying materials to be delivered annually to pilots regarding the potential for, results of, and ways to reduce aerial disturbance to marine wildlife present on coastal islands.		x
Develop and distribute a public service announcement to local media on how boat and aircraft operators can prevent wildlife disturbance.	x	x
Work with ODFW to have the Oregon Islands recommended 500-foot seasonal buffer zone for all coastal rocks and islands included in annual sport and commercial fishing regulations.		x
Develop informational signage and pilot tear-sheets to be placed at small airports or airport fueling stations on the recommendations for preventing disturbance to breeding and resting wildlife.		x
Maintain Tenyo Maru-funded interpretive panels at twelve watercraft launching sites.	x	x
Develop a presentation to be given as annual training to USCG pilots and flight crews at air stations in Astoria, Newport, and North Bend to prevent disturbance to marine wildlife.		x
Work with the OSMB to identify existing publications and produce new publications when necessary to reduce and eliminate wildlife disturbance resulting from watercraft use and operation in waters adjacent to the refuges.		x
Give presentation to Board Members of the OSMB regarding refuge issues/concerns for wildlife disturbance caused by watercraft.		
Provide information and education materials on refuges and refuge wildlife to be distributed through the state watercraft licensing program and other means.		x
Rationale: Seabirds, pinnipeds and their habitats are extremely sensitive to human disturbance. Therefore, the coastal rocks and islands of Oregon Islands and Three Arch Rocks NWRs are closed to public use to protect wildlife and habitat. Although not allowed as a public use and considered trespass on the refuge, tidepoolers, photographers, rock climbers, anglers and recreational kayakers and boaters are frequently found on rocks and islands. It is likely that this pressure will increase over the life of the CCP as the Oregon coast resident population and seasonal visitation increases. Many coastal rocks and islands are accessible to people at low tide so it is necessary to post coastal access sites, where possible, as closed to reduce or eliminate trespass into wildlife use areas.		

The headquarters for the Complex is located in the center of the coast and the staff size is limited making it impossible for Complex staff to be near any sites and react in a timely manner to disturbance of wildlife. In addition, because there is limited LE personnel available, illegal activities such as climbing on rocks and general trespass continue to cause disturbance to seabirds and pinnipeds. Therefore, the Complex relies on refuge volunteers, OPRD staff, BLM staff, Friends Group members, other LE agencies and local residents to report wildlife disturbance events by boaters, aircraft, and people on foot, but also to share the message of disturbance prevention. By necessity the refuge has come to rely on informal arrangements and coordination with the USCG, NMFS Enforcement, OPRD, and Oregon State Police to help with trespass and disturbance. Because there is only one LE officer for the Complex, coordination will continue to be critical. Furthermore, the Complex needs to develop a standard educational presentation to be delivered annually to pilots including commercial, Air National Guard, and USCG regarding the potential for, results of, and ways to reduce aerial disturbance to marine wildlife present on coastal rocks, reefs and islands.

Because refuge boundaries stop at the mean high tide line, ODFW and other state agencies are in a unique position to greatly assist the Complex in protecting sensitive seabirds and pinnipeds from human disturbance in close proximity to the refuges though management actions as described in the Rocky Shores Management Strategy of the Territorial Sea Plan (DLCD 1994).

The Service and BLM have been working cooperatively since the early 1980s to protect the wildlife resources of YHONA and the adjacent rocks within Oregon Islands NWR. The existing MOU for Yaquina Head signed in 1985, is a three-party agreement among the Service, BLM and the USCG. At the time of MOU establishment, USCG managed the lighthouse and 10 acres of the site. With the exception of a dilapidated stairway to the Cobble Beach, BLM did not have any structures or facilities on the headland and only one seasonal employee was present during the spring and summer months. At this time the public was accessing many of the cliff edges and rocks within the refuge, frequently disturbing harbor seals and preventing seabird nesting in these areas. Since establishment of the MOU, BLM has developed the headland for wildlife viewing, photography, interpretation and environmental education. In addition, BLM has added permanent staff on site as well as seasonal employees and volunteers. Complex staff members have worked with BLM employees and their volunteers to conduct annual training to teach them life history information on seabirds and harbor seals to share with the visiting public and also how to identify and prevent human disturbance to wildlife. In recent years, the Complex has begun stationing refuge volunteers at YHONA in spring and summer to assist BLM in interpreting the natural resources of the headland and adjacent refuge rocks. Working in concert with Complex staff, BLM has restricted and enforced where the public is allowed to go on the headland to protect wildlife and visitors.

Working in close cooperation with BLM over the past two decades has resulted in the protection of existing seabird colonies and the harbor seal haulout site and provided for dramatic population increases in nesting seabirds and the colonization of new sites on the mainland and refuge rocks. The common murre population at YHONA has grown from one colony supporting 23,604 birds in 1988 to six colonies supporting 92,368 birds (R Lowe, pers. comm.; Service unpublished data). Public use of YHONA exceeds 350,000 visitors annually and this site is now one of the premier seabird viewing locations in the country and provides opportunities for wildlife resource interpretation and environmental education. There is a need for continued close coordination between Service and BLM to share data and ensure that adaptive management of public use and

wildlife protection continues to prevent impacts to wildlife using the refuge rocks directly adjacent to YHONA.

Low-flying aircraft causes serious disturbance to seabird colonies. The FAA aeronautical charts depict the presence of the Oregon Islands NWR, but the minimum aircraft 2,000-foot AGL altitude is strictly a conservation request and may be ignored by pilots. To help eliminate disturbance to seabirds and pinnipeds the Complex should work with the FAA toward establishing an official minimum 2,000-foot AGL flight restriction zone for all aircraft above refuge rocks and islands. The Complex will work with ODFW and the OSMB to determine the need for additional 500-foot watercraft buffer zones around refuge seabird colonies and pinniped use sites along the Oregon coast to prevent disturbance events.

Strategically placed interpretive media including information panels, fliers and posters are currently used by the Complex and will continue to be developed and used as an educational tool to reduce wildlife disturbance events caused by boats and aircraft. A series of interpretive panels aimed at educating recreational boaters about their impacts on seabirds and pinnipeds were designed and installed at 12 watercraft launch sites on the coast. These panels will be maintained, upgraded, and replaced, as needed, by the Complex. Other interpretive media developed by the Complex includes two posters aimed at educating boaters and pilots about their impacts on coastal wildlife and how they can reduce the chance of a disturbance event. The Complex will continue to distribute these posters to appropriate businesses, outfitters, and visitor facilities on the coast. In addition, the Complex recently completed the Seabirds of the Pacific Northwest brochure funded by the Nestucca Oil Spill Trustees. This educational tool describes measures to protect seabirds, shorebirds and pinnipeds and will be distributed in Oregon, Washington and California.

In addition to the regulated seasonal closure at Three Arch Rocks NWR, the Complex requests that all watercraft remain at least 500 feet away from rocks, reefs and islands within Oregon Islands NWR inhabited by seabirds and pinnipeds, however, this is an unenforceable request only, unless vessel operators disturb wildlife. Watercraft venturing closer risk disturbing wildlife on the refuge and enforcement actions can be taken under refuge regulation within the Code of Federal Regulations. Complex staff would make a presentation(s) to the Board Members and senior staff of OSMB to inform and educate them on the refuges and sensitive wildlife resources. The presentation would include measures on how the OSMB can continue to assist in conserving and protecting refuge resources and educating the boating public. Through the watercraft licensing program administered by the OSMB, the Complex could reach all boat operators in the state and provide them conservation information and watercraft operation methods to prevent them from impacting refuge wildlife. In the absence of regulated waters around Oregon Islands NWR, information and education is critical for the protection of refuge wildlife and the OSMB licensing program and publications are an effective way to distribute information.

Objective 5.g Partnership - Friends of Southern Oregon Coastal Refuges

Throughout the life of the CCP strengthen the partnership with the Friends of the Southern Oregon Coastal Refuges (also known as Shoreline Education for Awareness, Inc. (SEA, Inc.)).

	Alternative 1	Alternative 2
Strategies Applied to Achieve Objective		
Support SEA and provide technical support to Friends regarding refuge regulations and policy.	x	x
Provide SEA with office and storage space at the South Coast Refuge office.	x	x
Every five years, review and if necessary revise the MOA between the Service and SEA.		x
Work with SEA and OPRD to equip, train and utilize refuge volunteers at Simpson Reef Overlook, Harris Beach State Park and Coquille Point Unit every spring and summer to interpret wildlife resources.	x	x
Work to expand SEA's role in communicating with visitors about refuge policies and wildlife resources.		x
Contribute news and information about refuge wildlife and habitat to be published in SEA's newsletter.	x	x
Dedicate a Complex staff member as the liaison between SEA and the refuge, including attendance of staff member at board meetings and key events.	x	x
Support SEA by having Complex staff and/or volunteers assist with interpretation on busy holidays and weekends.		x
Provide refuge LE support during busy weekends and holidays, and technical support at all times.		x
Update refuge website to include refuge Friends groups.	x	x

Rationale: Due to severe budget constraints the National Wildlife Refuge System faces a growing shortage of staff, and in many cases funding for key conservation programs has been reduced. In the past 10 years a network of groups, called Friends, have essentially adopted individual refuges or Complexes and have begun to advocate for the needs of the refuges by providing both financial and volunteer support. Shoreline Education for Awareness, Inc. or SEA was founded in Bandon, Oregon in 1990, and it has been an all volunteer organization supported by membership dues and donations received while interpreting the marine environment for visitors. In 2005, SEA entered into an MOU with the Complex to make them an official refuge Friends Group known as the Friends of the Southern Oregon Coast Refuges. The MOU formalized the relationship between the Complex and SEA and facilitated open communication between both. It is important for the Complex to continue to support this Friends Group as they play a critical role in providing volunteer interpretive support for the refuge and are an advocate for protecting refuge wildlife and habitat. The Complex will start regularly contributing to the Friends newsletter through a column focusing on the news and or natural history of the refuge's wildlife with the purpose of providing members of the Friends group with more in depth information about wildlife and or current refuge issues that need their advocacy and support.

Objective 5.h Partnership – Friends of Haystack Rock/ Haystack Rock Awareness Program at Cannon Beach

Throughout the life of the CCP strengthen the partnership with the Friends of Haystack Rock and the Haystack Rock Awareness Program.

	Alternative 1	Alternative 2
Strategies Applied to Achieve Objective		
Continue to support the Friends of Haystack Rock by having Complex staff and/or volunteers present to assist with interpretation on busy holidays and weekends.	x	x
Develop a MOU between the Complex and the Friends of Haystack Rock.		x
Work with Haystack Rock Awareness Program (HRAP) and the Friends to place a volunteer onsite to conduct wildlife interpretation from May 1 to September 15.	x	x
Ensure that visitors are aware of refuge closure at Haystack Rock by maintaining up to date signage and information brochures and through volunteers and staff on site.	x	x
Work to expand the Friends' role in communicating with visitors about refuge policies and wildlife resources and provide regular contributions to the Friend's quarterly newsletter.		x

Rationale: The Friends of Haystack Rock formed in 2005 and have a mission to support HRAP in cooperation with the City of Cannon Beach and a goal of encouraging the preservation and protection of natural resources, and promote living in harmony with the natural world. The HRAP was founded in 1985, and is a stewardship and environmental education program with a mission to increase the awareness of the fragile environment in the Haystack Rock Marine Garden and adjacent Oregon Islands NWR. The HRAP is a professionally staffed and volunteer driven program that receives funding from the City of Cannon Beach and private donations. Haystack Rock is closed to public access, but is frequently climbed on by visitors at low tide. Because it contains large colonies of nesting seabirds, the Complex provides extra support in the form of technical assistance, onsite staff and volunteer interpretation and enforcement during busy weekends and holidays to reduce disturbance to wildlife and habitat. It is in the interest of the Complex to formalize the relationship with the Friends of Haystack Rock, through development of an MOU, and broaden their mission to include the refuge, as they are in a good position to be advocates for this popular wildlife refuge. An MOU will facilitate improved communication and serve to expand the role of the friends group in supporting wildlife conservation and appropriate public use on the beach adjacent to Haystack Rock. The Complex will further look to start regularly contributing to the Friends newsletter through a column focusing on the news and or natural history of the refuge's wildlife with the purpose of providing members of the Friends group with more in depth information about wildlife and or current refuge issues that need their support.

Objective 5.i Wildlife-Dependent Recreation - Coquille Point Unit

Throughout the life of the CCP continue to welcome and orient visitors to Coquille Point Unit and provide high quality self-guided interpretation and facilities for visitors to observe and photograph wildlife in a safe manner.

	Alternative 1	Alternative 2
Strategies Applied to Achieve Objective		
Maintain two sets of stairs that allow visitors access to beach from the north and south part of headland.	x	x
Maintain paved accessible interpretive trail on headland.	x	x
Maintain, upgrade and replace, as needed, interpretive panels, orientation kiosk and benches on headland.	x	x
Work with OPRD to address activities that are disturbing to wildlife on the beach adjacent to refuge.	x	x
Construct secure bicycle parking area.		x
Work with local conservation organizations and the Friends group and recruit refuge volunteers to lead guided naturalist/ wildlife walks.	x	x
Re-design and upgrade the parking lot to allow more parking, add spaces, and fence the east boundary.		x
Work with the City of Bandon to install wind and wildlife proof trash and recycling receptacles and a pet clean up station.		x
Hire a PFT WG maintenance position for the south coast.		x

Rationale: The Coquille Point Unit was established to create a buffer zone to protect wildlife on the adjacent rocks and islands from encroaching residential development and to provide a site for wildlife-dependent recreation. Public use facilities include an orientation kiosk, interpretive panels, a self-guided paved interpretive trail, two sets of stairways to the beach, benches, a sidewalk and parking lot, and unfenced viewing areas. The Complex will continue to maintain, upgrade and replace all existing public use facilities. Furthermore, all public uses will be designed to increase the visiting publics' understanding and appreciation of refuge resources. By increasing public understanding and appreciation of these resources, the Complex expects increased public support for protecting and enhancing refuge lands; and thereby achieving the overall wildlife goal of protection and stewardship of marine wildlife.

Coquille Point receives over 300,000 visitors annually and this number is growing. Current wildlife-dependent public uses include wildlife observation, photography, interpretation, and environmental education. Unsanctioned non-wildlife dependent activities occurring on refuge lands as a result of the site and trail's location within the community include bicycle riding, geo-caching, dog walking, and kite and model airplane flying. The Complex will review all appropriate activities for compatibility and work with adjacent landowners, including OPRD and the City of Bandon, to address activities occurring on their lands that are disturbing to wildlife.

With so many visitors, it is necessary for the refuge to reduce user conflicts. Thus, the refuge needs to add a secure bicycle rack adjacent to the parking lot to encourage cyclists to park their bicycles before walking along the headland trail instead of riding along it creating safety

concerns for wildlife watchers that are on foot. Because the Coquille Point Unit is located next to a residential neighborhood, there are people who use the headland trail to walk their pets on a daily basis. Defecation along the trail by pets has become a nuisance making it necessary to post signs in the area indicating that owners need to pick up after their pets. To further encourage pet owners to take responsibility for cleaning up after their dogs, the refuge recommends adding two pet poop clean-up stations that provide complimentary plastic bags and a waste basket. The refuge needs a full-time permanent maintenance worker for the South Coast to perform trail, trash and habitat maintenance onsite at Coquille Point.

Objective 5.j Guided Access – Crook Point Unit

Throughout the life of the CCP provide limited and infrequent guided access to the Crook Point Unit in keeping with the goal of protecting theist unique biological and cultural resources.

	Alternative 1	Alternative 2
Strategies Applied to Achieve Objective		
Periodically provide guided tours that focus on the topics of rare plants, coastal rocks, wildlife, and cultural resources of the headland.	x	x
Conduct regular updates of the Complex's website.	x	x
Recruit, train and utilize a resident refuge volunteer.		x
Develop an RV hook-up site for resident volunteers at Crook Point and remove existing dilapidated structure.		x
In cooperation with OPRD delineate and post the State Park and refuge boundaries.		x
Maintain entrance road and facilities.	x	x

Rationale: The Crook Point Unit is closed to public use to protect significant cultural resources, unique geologic formations, and rare and sensitive plants, and to prevent disturbance to nearby islands that harbor loafing pinnipeds and tens of thousands of colonial burrow-nesting seabirds. Due to the sensitive nature of the site, existing public use is restricted to include a small number of staff-led tours of the headland annually. By offering this limited public access to Crook Point, the Complex has the opportunity to increase the public's appreciation and understanding of the sensitivity of the site's resources while at the same time maintaining full protection of the resources.

A resident volunteer needs to be stationed onsite to protect sensitive resources, conduct refuge grounds maintenance, report trespass violations to Service LE agents and to assist with occasional guided tours of the headland. In order to facilitate recruitment and retention of volunteers, the main entrance road needs upgrading and continuous maintenance, and an RV pad with full hook-up for electricity, water and septic system needs to be developed to replace an existing dilapidated and unlivable house, using the disturbed site as the footprint. These facilities, access road, and human presence are not in areas where habitation and maintenance activity would be a disturbance to wildlife or habitat. The Complex also recognizes a need to work with SEA and other local conservation organizations, to potentially help lead guided tours of the site on an as needed basis. Many of these organizations have members that are knowledgeable about coastal geology, plants, cultural resources, and wildlife and are sensitive to the fragile nature of Crook Point.

2.6.1.6 Goal 6. Three Arch Rocks NWR: Promote protection, stewardship and enjoyment of Oregon's seabirds and pinnipeds and their wilderness habitats, and the historical significance of the refuge to marine wildlife conservation.

Objective 6.a Cooperative Strategies to Enforce Seasonal Buffer Zone – Three Arch Rocks NWR

Throughout the life of the CCP, the Complex will implement strategies to encourage residents, visitors, and boat and aircraft operators to comply with refuge rules and recommendations that minimize human disturbance to wildlife around Three Arch Rocks NWR.

	Alternative 1	Alternative 2
Strategies Applied to Achieve Objective		
Develop a public service announcement on prevention of wildlife disturbance by boaters, and place it in local media.		x
Provide LE presence at Three Arch Rocks from May to September to ensure compliance with watercraft closure zone.		x
Develop an updated interpretive panel delineating the seasonal 500-foot closure zone around Three Arch Rocks and install it at boat launches in Tillamook and Netarts Bays.	x	x
Ensure refuge regulations regarding the 500-foot seasonal closure are available to the public by maintaining an up-to-date refuge brochure and website.	x	x

Rationale: Because the Complex's headquarters is located approximately 70 miles south of Three Arch Rocks NWR, it is extremely difficult for Complex staff to be near the refuge to interact with visitors, residents, and the USCG on issues of wildlife disturbance. Therefore, Complex staff members' rely on refuge volunteers, OPRD staff, Friends of Cape Meares Lighthouse and Wildlife Refuge members, and local residents to report wildlife disturbance events by boaters and aircraft, but also to share the message of disturbance prevention. The Complex will use strategically placed and up-to-date interpretive media including brochures and website updates to seek compliance with boating and aircraft regulations and to ensure regulations are clear and available to the public.

Objective 6.b Provide Offsite Information to Visitors about Three Arch Rocks NWR

Within 10 years of the CCP approval, visitors overlooking the refuge from public viewpoints will have access to information on the wildlife of Three Arch Rocks and the history of the establishment of this refuge.

	Alternative 1	Alternative 2
Strategies Applied to Achieve Objective		
Upgrade and replace four interpretive panels at Cape Meares State Scenic Viewpoint.	x	x
Update and maintain interpretive panel at Oceanside Beach State Recreation Area.	x	x
In coordination with the Service's National Conservation and Training Center, make Finley and Bohlman's historical		x

photography available to interested citizens through DVDs and the refuge website.		
Add a section on the history of the refuge to the volunteer handbook. Refuge volunteers will share this story with visitors.	x	x
Partner with OPRD to host refuge volunteers at Cape Meares State Scenic Viewpoint every spring/summer to interpret refuge history and wildlife resources.	x	x
Increase refuge volunteer presence at Cape Meares to include coverage from May 1 to September 15.		x
Construct an accessible viewing deck and two interpretive panels at Oceanside Beach.		x
Offer bi-annual presentations by Complex staff or a local historian on the natural and human history of the refuge.		x
Complex staff or volunteers attend appropriate local festivals, special events or community meetings which provide a venue for distributing refuge material.		x
Work to bring out-of-print children's book *Sanctuary* by Mary Ann Fraser back into circulation.		x
Create a one-page flyer with information on what residents should do if they witness boats or aircraft disturbing wildlife.	x	x
Encourage Friends of Cape Meares Lighthouse and Wildlife Refuge to expand their support to Three Arch Rocks NWR.		x
In cooperation with OPRD, ensure the refuge-constructed Three Arch Rocks viewing deck and interpretive panels are maintained.	x	x
Rationale: This 15-acre refuge and wilderness area is closed to the public to protect breeding seabirds and marine mammals from human disturbance. Interpretation and wildlife observation occur off-site from Cape Meares State Scenic Viewpoint and from Oceanside Beach State Recreation Area. The protection of Three Arch Rocks and its establishment as the oldest refuge west of the Mississippi River are due to the efforts of two early 20th century conservationists, William L. Finley and Herman Bohlman. The story is important to share with visitors because their efforts were significant to wildlife conservation on the Pacific coast and are echoed today as protection of these islands continues under increasing pressure by recreationists and low flying aircraft. By sharing this story with visitors they will understand how the perseverance of two individuals in documenting the exploitation of wildlife resulted in the creation of a refuge that ensured the survival of seabird and pinniped populations. It is also important that local residents and visitors receive the message that they play an important role in further protecting the refuge's wildlife from human disturbance today. Their support and assistance is needed to help enforce the OSMB closure of waters within 500 feet of the refuge to all watercraft from May 1st through September 15th. This message can be delivered through refuge volunteers stationed at Cape Meares State Scenic Viewpoint on a seasonal basis, an informational flyer, and interpretive panels. To further facilitate this understanding and awareness, Complex staff will attend local festivals, special events or community meetings. The Complex will begin to regularly contribute to the Friends' newsletter through a column focusing on the news and or natural history of the refuge's wildlife with the purpose of providing members of the Friends group with more in depth information about wildlife and or current refuge issues that need their support.		

2.6.1.7 Goal 7: Preserve and protect the wilderness character of Oregon Islands Wilderness and Three Arch Rocks Wilderness including the areas' untrammeled nature, naturalness, and undeveloped condition.

Note: Some of the objectives found under other goals in this CCP also apply to wilderness lands. They are listed here, and additional details can be found under their respective goals.

- 1.a No invasive plants or mammalian predators
- 1.b Reduce damage from oil spills
- 1.c Minimize human disturbance through law enforcement
- 4.a Conduct inventories
- 4.b Conduct monitoring
- 4.c Conduct research and scientific assessments
- 5.f Minimize disturbance through cooperative strategies to promote compliance
- 6.a Cooperative strategies to enforce seasonal buffer zone around Three Arch Rocks

Objective 7.a Wilderness Character - Maintain Undeveloped Quality

Continue to promote and preserve the undeveloped quality of Oregon Islands Wilderness and Three Arch Rocks Wilderness by avoiding visually intrusive alterations.

	Alternative 1	Alternative 2
Strategies Applied to Achieve Objective		
Develop and install interpretive panels and regulatory signage on the adjacent mainland and at ports along the Oregon coast to identify designated wilderness and prohibit access.	x	x
Install boundary and regulatory signs within and/or adjacent to the wilderness areas at locations where trespass is a serious and frequent issue. Ensure that signs are essential and not visually intrusive.	x	x
Ensure that temporary structures used for wildlife management, monitoring or research purposes, and signs to prevent trespass, are the minimum tools necessary to accomplish the work and are visually unobtrusive. Follow "Leave No Trace Principles" when removing structures.	x	x
Complete the Minimum Requirements Decision Guide process prior to engaging in management actions inside wilderness.	x	x

Rationale: The Wilderness Act defines wilderness as "an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation." Under Wilderness Act implementation guidance, the presence of structures, installations, habitations and other evidence of modern human presence or occupation degrades this quality, as does the use of motorized equipment or mechanical transport.

The undeveloped refuge rocks, reefs and islands within Oregon Islands Wilderness and Three Arch Rocks Wilderness provide a dramatic natural setting along the Oregon coast. Millions of annual visitors to the Oregon coast appreciate the scenic natural beauty and the ecological values associated with the abundant marine wildlife populations these wilderness areas protect. All of

Oregon Islands Wilderness and Three Arch Rocks Wilderness are closed to public access at all times to prevent disturbance to sensitive seabirds and pinnipeds and to prevent destruction of native plants and habitats. Many of the rocks, reefs and islands are accessible from land during low tides; therefore, trespass is an issue throughout the Oregon coast. Informational, regulatory, and interpretive signs, informing the public that these areas are closed to public access to protect native habitat and wildlife sensitive to human disturbance, have been installed and will be maintained at a variety of off site locations adjacent to wilderness, such as headlands, state parks, ports, and trailheads. At some locations trespass is a serious and recurring problem, necessitating the placement of boundary and regulatory signs just above the intertidal zone at accessible sites on the rocks and islands. Installation of these signs is an action which carries the potential for degradation of the undeveloped quality of the wilderness at the particular location.

In some cases, refuge management or research activities may require temporary structures or equipment necessary to prevent impacts to the wildlife and habitat while conducting the activities. For example, following Minimum Requirements Analyses, a temporary boardwalk was installed on Saddle Rock to provide a platform for researchers to work from while conducting population studies on burrow-nesting Leach's Storm-Petrels. The boardwalks are temporary and will be completely removed when the research project is completed. Failure to construct the temporary boardwalk would have prevented the work from occurring, as researchers working from the ground would crush numerous burrows, killing birds inside and significantly altering the habitat.

Helicopter transport to certain rocks and islands for refuge and wildlife management purposes is occasionally determined to be necessary as it is the only safe and effective means of accessing certain steep-sided and otherwise inaccessible rocks and islands to accomplish mission-critical work. Because helicopter access is considered a non-emergency use of mechanical transport, it has only been utilized on rare occasions when it is determined through a Minimum Tool/Minimum Requirements Analysis to be the minimum tool necessary to achieve refuge purposes and purposes of the Wilderness Act.

Objective 7.b Wilderness Character – Maintain Untrammeled Quality

Initiate management actions to control, and where possible eliminate, invasive species to protect native wildlife populations and habitats on islands with the highest potential to sustain irreversible damage to wilderness character from invasive species.

	Alternative 1	Alternative 2
Strategies Applied to Achieve Objective		
Use IPM strategies including mechanical, physical, biological, and chemical to eradicate, control, or contain invasive plants.		x
In 2009, initiate measures to eliminate sea fig (ice plant) from rocks and islands in Curry County.		x
In cooperation with the USDA's Wildlife Services, utilize results of mammalian predator surveys on rocks and islands to develop annual work plans and implement predator removal.		x
Complete the Minimum Requirements Decision Guide process prior to engaging in any invasive species control actions.	x	x

Rationale: Under Wilderness Act implementation guidance, "untrammeled" quality refers to modern human actions that intentionally control or manipulate the components or processes of ecological systems inside the wilderness. The Refuge System's policy defines 'untrammeled' as: ". . .refers to the freedom of a landscape from human intent to permanently intervene, alter, control, or manipulate natural conditions or processes."

The Oregon Islands and Three Arch Rocks Wilderness values include supporting more than one million nesting seabirds and tens of thousands of pinnipeds, and functioning as a botanical reserve for native plants. Protecting the untrammeled character of these wilderness areas requires protecting the flora and fauna found within them, and the ecological system in which these species and communities exist. Complex staff members have concluded that maintenance of the untrammeled quality should include removal of selected plants and animals when it is determined that their presence is negatively impacting the wilderness ecological system and processes in a manner that will cause irreversible harm to the native species.

General observations in the Crook Point area of Curry County indicate that invasive sea fig (or ice plant) is present on the mainland, Saddle Rock and other nearby rocks and is spreading. This introduced plant species poses serious ecological problems, forming vast monospecific zones, lowering biodiversity, outcompeting native plants, and eliminating habitat for burrow-nesting seabird species. Other invasive plants have the potential to cause similar devastation if not controlled.

Invasive red foxes have been documented on rocks at Coquille Point in Coos County, damaging and destroying nesting seabird colonies. Red foxes have spread to Curry County and may eventually be found in all coastal counties in Oregon, and have the potential for devastating impacts to nesting seabirds within Oregon Islands Wilderness. Other predators may be present as well such as mice, rats and feral cats, but no comprehensive survey has been conducted. A Predator Management Plan (USFWS, 2004) details criteria and methods for addressing control of mammalian predators on wilderness rocks and islands as well as adjacent mainland units (addressed in Objective 1a).

Objective 7.c Wilderness Character – Maintain Natural Quality

Maintain wilderness quality of naturalness through inventorying ecological systems (plant and animal species and communities) and evaluating impacts from internal and external forces on these systems.

	Alternative 1	Alternative 2
Strategies Applied to Achieve Objective		
Work with city, county, state and federal agencies and planning departments, as well as residents and developers, to prevent light and noise intrusion into the wilderness caused by new construction and operation of facilities.		x
Work with OPRD to locate commercial fireworks displays away from wilderness areas.	x	x
Work with the Oregon Aeronautical Board and FAA to eliminate low level aircraft flights over the wilderness areas.		x

By 2012, complete a botanical survey of at least six of the Oregon Islands and Three Arch Rocks Wilderness areas' vegetated rocks and islands that are accessible by boat, and document the occurrence and distribution of native and invasive plants.		x
In cooperation with USDA's Wildlife Services, conduct a survey of mammalian predators on wilderness rocks and islands accessible by foot, and determine impacts to native fauna.		x

Rationale: Under Wilderness Act implementation guidance, "natural" quality means that wilderness ecological systems are substantially free from the effects of modern civilization.

Many of the rocks and islands within Oregon Islands Wilderness are located immediately adjacent to the shoreline, an area receiving ever-increasing development pressure for residential housing and commercial development for restaurants, hotels and resorts. Private residences and commercial properties often install and operate large lighting systems that are directed toward the beach and nearshore, unnaturally illuminating the area at night. In some cases, rocks and islands within the wilderness are completely illuminated by the lights. In addition, loud noise from these areas can easily carry into the wilderness. The light and noise destroys the wilderness solitude and impairs the natural condition. In addition, ecological values can be severely impacted, as nesting seabirds may abandon or avoid lighted areas and then be subjected to increased predation by nocturnal predators. In adverse weather, seabirds and other migratory birds may become disoriented or attracted to the lights resulting in grounding and mortality. Complex staff members plan to continue making specific suggestions to planning and development entities which will result in reducing and/or preventing harmful light intrusion into the wilderness. These suggestions include measures such as light shielding; reduced light intensity; use of blue lights (rather than red or white lights that operate in the visual spectrum usually linked with bird mortality); restricting use of lights to a limited number of hours immediately after dusk rather than continuous illumination throughout the night; and eliminating the light source during foggy or low-ceiling environmental conditions.

Most cities along the Oregon coast have large commercial aerial fireworks displays on July 4th and on a few other occasions. When aerial fireworks are ignited in close proximity to the refuges' wilderness areas, it temporarily trammels the wilderness character and impairs natural conditions with intense light and noise. This also impacts ecological processes by causing seabirds and pinnipeds to flee the safety of the wilderness rocks and islands and can result in the loss of eggs or young. Noise from low-flying aircraft causes seabirds and pinnipeds to flee the wilderness rocks, reefs, and islands and can cause mortality.

The wilderness quality of "naturalness" also refers to the abundance, distribution, or number of invasive non-indigenous species. A botanical survey has never been attempted for either Oregon Islands or Three Arch Rocks Wilderness. A single-day botanical survey of Goat Island was conducted on July 17, 1984, and 65 plant species were recorded present, of which 20 are classified as invasive species. None of the remaining 1,863 rocks, reefs and islands have been surveyed. This lack of baseline data severely hampers the Complex's ability to monitor the natural quality of these wilderness areas with respect to invasive species. Invasive mammals, including red fox, have been documented on several rocks on the south coast and may eventually be found in all coastal counties in Oregon. These invasive predators as well as others such as

mice, rats and feral cats, have the potential for devastating impacts to nesting seabirds within Oregon Islands Wilderness. A comprehensive survey has not been conducted so it is unknown how many and which islands and rocks may be infested by these predators.

Objective 7.d Foster Public Appreciation of the Importance of Wilderness

Foster the public's understanding and appreciation of the importance of wilderness designation in protecting the natural resources of Oregon Islands and Three Arch Rocks NWRs.

	Alternative 1	Alternative 2
Strategies Applied to Achieve Objective		
Integrate wilderness information and education in all refuge outreach programs when appropriate.		x
Incorporate wilderness themes and messages in new or updated pamphlets, brochures and interpretive panels.	x	x
Include wilderness information and education in all interagency, volunteer and Friends Group training.	x	x

Rationale: Oregon Islands Wilderness and Three Arch Rocks Wilderness are two of only ten wilderness areas in the country closed to public access, yet the dramatic scenery these areas provide is highly visible to residents and visitors of the Oregon coast. Like the natural resource values and benefits of these refuges, wilderness values and benefits can also be enjoyed and appreciated from a distance without actually entering the areas. The scenic wilderness attributes and the important wildlife resources using these refuges can be viewed and enjoyed from headlands, beaches and other areas along the highly accessible coastline of Oregon. Integrating wilderness information into written material such as brochures, pamphlets, and interpretive panels along with verbal communication in presentations by staff, volunteers, Friends Group members, and other agencies will reach hundreds of thousands of people annually helping them to better understand and appreciate wilderness areas and the National Wilderness Preservation System.

Objective 7.e Monitor Wilderness Character

Annually monitor the wilderness characteristics (as defined in Objectives 7.a – 7.c) of Oregon Islands and Three Arch Rocks NWRs to determine if stewardship actions are needed to reduce or prevent impacts to and maintain wilderness characteristics.

	Alternative 1	Alternative 2
Strategies Applied to Achieve Objective		
Monitor number of regulatory signs placed on or adjacent to wilderness boundaries. Continue to evaluate existing and proposed new signs for visual intrusiveness and determine if current signs need to be relocated. (Objective 7a)		x
Evaluate and monitor habitat response to IPM treatments on rocks and islands that have been treated for invasive plants, and implement additional IPM treatments as needed. (Objective 7b)		x

Monitor presence/absence of invasive plants on vegetated rock and island habitats which have been visited by refuge staff in a given year. (Objective 7c)		x
Monitor number of coastline development proposals reviewed for potential noise and light intrusion into the wilderness areas. Determine level of success in preventing this intrusion and document successful solutions. (Objective 7c)		x
Monitor number of fireworks displays permitted by OPRD near wilderness areas. (Objective 7c)		x
Develop protocol to allow monitoring of the number of low level flights documented over wilderness areas. (Objective 7c)		x
Annually monitor outreach programs, interpretive materials, and training presented by Complex staff for inclusion of wilderness-oriented themes and messages. (Objective 7d)	x	x
Rationale: Monitoring of wilderness character is required by Service policy (610 FW 3) to determine if wilderness stewardship objectives are being met. Monitoring strategies should identify indicators of change in resource conditions, standards for measuring that change; and conditions or thresholds that will trigger management actions to reduce or prevent impacts on the wilderness. Information from monitoring is needed to assess whether stewardship actions for an individual wilderness are fulfilling the mandate to "preserve wilderness character" (Landres et al. 2008). Monitoring of the "undeveloped" quality tracks trends in the number and development level of structures, installations, or other developments inside wilderness, as well as trends in mechanization inside wilderness. The "untrammeled" quality is monitored for trends in actions that control or manipulate the "earth and its community of life inside wilderness." Monitoring of the "natural" quality refers to the intentional and unintentional effects from actions taken inside wilderness as well as from external forces on these systems including anthropogenic effects on natural conditions.		

2.6.1.8 Goal 8: At Cape Meares NWR, protect and maintain coastal habitats characteristic of Pacific Northwest old-growth Sitka spruce forest to allow natural succession to occur consistent with Research Natural Area designation, for the benefit of these habitat types and the plant and animal species associated with them.

Objective 8.a Sitka Spruce/Salal (*Gaultheria shallon*) forest - Cape Meares NWR

Maintain and protect 110 acres of Old-growth and Late-successional Sitka Spruce/Salal (*Gaultheria shallon*) forest and interspersed riparian habitat, at Cape Meares NWR, with the following habitat attributes:

- Old-growth Sitka Spruce forest in various stages of decay, including large, hollow snags greater than 82 feet (25m) tall with greater than or equal to 60% canopy closure.
- Late seral stage Sitka Spruce forest with tree/snag densities greater than 18 per hectare (ha) with a diameter breast height (dbh) greater than 18 inches (46 cm) and an understory dominated by Salal.
- Late-successional Sitka Spruce/Salal-Salmonberry forest including old-growth Sitka Spruce with an understory of Salal and Salmonberry (*Rubus spectabilis*) exhibiting the

following characteristics: mature forest with greater than 70% canopy closure, high stem density, multiple tree layers, relatively open low understory and forest floor with much soft, loose debris, decomposing woody material and berry-producing shrubs.

- Large snags and defective live trees with greater than 70% canopy closure providing greater than or equal to 5 nest snags per 10 ha (2 per 10 acres).
- Stream and riparian zone habitat including streams with medium to steep gradient, step-pool morphologies and basalt parent geology, and canopy dominated by early-successional Red Alder.
- No English Ivy (*Hedera helix*)

	Alternative 1	Alternative 2
Strategies Applied to Achieve Objective		
Allow natural processes to drive vegetation succession.	x	x
Work cooperatively with OPRD to develop and install signs and other deterrents to maintain closed areas of refuge.	x	x
Conduct official boundary survey and post boundary of refuge/Research Natural Area (RNA).		x
Increase cooperative LE efforts with state and federal agencies.		x
Enforce and document refuge trespass regulations (CFR 50, part 26.21) by Service personnel.		x
Partner (where feasible) with adjacent landowners to maintain and enhance habitat quality on adjacent privately-owned lands.		x
Use IPM strategies including mechanical, physical, biological, and chemical means to eradicate, control, or contain invasive plants. (Appendix K)		x
Review Fire Management Plan annually or as needed to update contact information.	x	x

Rationale: Most of Cape Meares NWR is covered by old-growth Sitka spruce/western hemlock (*Tsuga heterophylla*) forest, with intermittent open areas of forest wind-throw and an understory dominated by salal. Surveys and observations on the refuge have revealed the presence of a diversity of wildlife species including bald eagle, threatened marbled murrelet, peregrine falcon, Roosevelt elk, black bear and numerous migratory songbirds. The majority of the refuge is closed to the public; however, a segment of the Oregon Coast Trail passes through the northeast portion of the refuge. In 1987, the entire refuge, with the exception of the Trail, was designated a RNA. In RNA's, natural processes are allowed to predominate without human intervention. However, under certain circumstances such as invasion by non-native plant species, deliberate manipulation may be used to maintain the unique features for which the RNA was established. Because of the refuge's purpose and the RNA restrictions, management of Cape Meares NWR and RNA will focus on protection, preservation, inventory, monitoring and research, and detection and control of invasive species.

Illegal activities such as rock climbing, mushroom collection, and general trespass have the potential to cause disturbance to wildlife, and to introduce invasive plant species into closed areas of the refuge. Service LE capability is currently very limited, with only one full time officer for the Complex. Boundary survey and posting are necessary to delineate where certain public use activities are permitted and to reduce or eliminate accidental logging or other

trespass on refuge lands, and are most critical along the boundary of the refuge/RNA tract on the east side of Three Capes Scenic Route and on the northeastern portion of the refuge adjacent to private and county forest lands. The Fire Management Plan needs to be reviewed annually or as needed to ensure that contact information is up-to-date and the responding agencies are familiar with allowable suppression techniques and sensitive areas within the refuge/RNA.

There are potentially direct negative impacts from nonfederal forest management on species that move between federal and nonfederal forest habitats during the year, or during their life cycle. A review of the cumulative effects analysis of spotted owl habitat management alternatives, highlighting the role of nonfederal lands in maintenance of old-growth-dependent amphibian and bird species and their habitats, emphasizes the desirability of partnering with adjacent landowners to maintain and enhance habitat quality on adjacent privately owned forest lands (USDA 1994). Maintenance and improvement of habitat on adjacent forest land would also provide a protective buffer from high winds and secondary effects of timber harvest.

Objective 8.b Steep Rock Cliffs and Steep Coastal Erosion Bluffs-Cape Meares NWR

Throughout the life of the CCP, maintain and protect approximately 28 acres of habitats classified as Steep Rock Cliffs and Steep Coastal Erosion Bluffs at Cape Meares NWR, with the following habitat attributes:

- Very steep or vertical basalt rock faces extending in elevation from mean high tide to higher than 200 feet above sea level
- Vegetated and unvegetated ledges, pockets of vegetated soil, stunted trees and shrubs and seeps
- No invasive plants present

	Alternative 1	Alternative 2
Strategies Applied to Achieve Objective		
Use IPM strategies including mechanical, physical, biological, and chemical means to eradicate, control, or contain invasive plants. (Appendix K)		x
Allow natural processes to occur and drive successional vegetative changes.	x	x

Rationale: The vertical sea cliffs of Cape Meares NWR provide nesting habitat for peregrine falcons, pelagic and Brandt's cormorants, common murres, tufted puffins, rhinoceros auklets, pigeon guillemots, western gulls (*Larus occidentalis*), and black oystercatchers. Cape Meares NWR and RNA is managed to protect and preserve the existing cliff habitat and the old-growth forest in an "unaltered, natural condition" to support migratory bird and other wildlife populations. Because of the inaccessibility of this habitat type and the susceptibility of nesting seabirds to disturbance, it is necessary to implement a hands-off management approach to this habitat type. The Complex will monitor to ensure that the conditions that determine its importance to nesting seabirds and peregrine falcons are maintained including removal of invasive species. Control of invasive species, both plant and animal, is a priority for national wildlife refuges as mandated by Executive Order 13112 (1999).

2.6.1.9 Goal 9: Collect scientific information (inventories, monitoring, feasibility studies, assessments, and research) to support adaptive management decisions (Goal 8) on Cape Meares NWR and RNA.

Objective 9.a Inventory and Monitoring – Cape Meares NWR and RNA

Throughout the life of the CCP, conduct inventories, and if appropriate, monitoring of Old-growth and Late-successional Sitka Spruce/Salal (*Gaultheria shallon*) forest and interspersed riparian habitat, Steep Rock Cliffs, and Steep Coastal Erosion Bluffs within the Cape Meares NWR, to support adaptive management decisions.

	Alternative 1	Alternative 2
Strategies Applied to Achieve Objective		
Research, design, and implement a GIS based inventory of forest and riparian habitats and plant species.		x
Research, design, and implement a monitoring program for certain plant species within forest and riparian habitats.		x
Establish a plant herbarium and digital photographic library of plant habitats and species inventoried.		x
Annually review and report the results of forest and riparian habitat inventory and monitoring efforts.		x
Develop a web interface to disseminate habitat inventory and monitoring results.		x
Monitor for invasive plant species and evaluate efficacy of IPM treatments.	x	x
Hire an additional PFT Wildlife Biologist for the Complex.		x

Rationale: Designing and implementing a comprehensive inventory and monitoring program for the distinct habitat types at Cape Meares NWR will assist in determining management actions and responding effectively to resource impacts. Focused inventory and monitoring efforts which include data collection and properly stored and retrievable results, including a plant herbarium and digital photographic library of plant habitats and species inventoried, should be undertaken with highly trained personnel, up-to-date equipment, and an understanding of the biological rationale and consequences. Such actions increase the probability that the refuge will make sound and scientifically viable decisions (Service Policy 701 FW 2). This will also allow the refuge to use adaptive management to evaluate the effectiveness of its management practices and to identify research needs. Other than the basic habitat information used to nominate and approve the RNA designation of Cape Meares, existing baseline data and inventory of plants and wildlife species found within Cape Meares NWR habitats are currently nonexistent or inadequate for monitoring trends in these communities, and the current biological staff of one is insufficient to collect and analyze this baseline information.

Through development of GIS technology, the refuge's capability to address priority management recommendations will be greatly enhanced. Specifically, new imagery resources and on site procedures (e.g., GPS mapping surveys) can be used to produce comprehensive maps of Cape Meares NWR habitats and plant associations, if determined useful for future conservation and management of these refuge habitats. These GIS inventory maps would provide foundations for monitoring long-term change in biodiversity and for investigation of wildlife-habitat relationships.

Objective 9.b Monitoring – Terrestrial Species – Cape Meares NWR

Throughout the life of the CCP, conduct inventories, and if appropriate, monitoring of terrestrial/aquatic mammals, amphibians, and invertebrates using Late-successional and Old-growth Forest, Coastal Riparian, Rock Cliff, and Erosion Bluff habitats within Cape Meares NWR, to support adaptive management decisions.

	Alternative 1	Alternative 2
Strategies Applied to Achieve Objective		
Research, design, fund and implement an inventory program for mammals, amphibians, and invertebrates.		x
Research, design, fund and implement a monitoring program for certain mammals, amphibians, and invertebrates.		x
Establish a digital photographic library of wildlife and invertebrate species inventoried.		x
Annually review and report the results of mammal, amphibian, and invertebrate inventory and monitoring efforts.		x
Hire an additional PFT Wildlife Biologist for the Complex.		x

Rationale: Baseline surveys of many species including mammals, reptiles, amphibians, and invertebrates are lacking due to insufficient staffing and funding. The only wildlife inventory that has been conducted in this habitat type at Cape Meares NWR is a 1996 study of small mammal and amphibian abundance conducted under contract by the Oregon Cooperative Wildlife Research Unit at OSU (Gomez et al. 1997).

Designing and implementing a comprehensive inventory and monitoring program for terrestrial and aquatic mammals, amphibians, and invertebrates at Cape Meares NWR would assist the refuge in using adaptive management to respond effectively to resource impacts and to identify research needs. Focused inventory and monitoring efforts with data collection and properly stored and retrievable results should be undertaken using highly trained personnel, up-to-date equipment, and an understanding of the biological rationale and consequences. Such actions increase the probability that the refuge will make sound and scientifically viable decisions (Service policy 701 FW 2). Existing baseline data and inventory of wildlife species found in the refuge are currently nonexistent or inadequate for monitoring trends in these communities.

Objective 9.c Monitoring – Focal Avian Species – Cape Meares NWR

Throughout the life of the CCP, inventory, and if appropriate, monitor focal avian species using Late-successional and Old-growth Forest, Coastal Riparian, Rock Cliff, and Erosion Bluff habitats within Cape Meares NWR, to support adaptive management decisions.

Old-growth species:
Marbled Murrelet (*Brachyramphus marmoratus*)
Vaux's Swift (*Chaetura vauxi*)

Late-successional Sitka Spruce species :
Brown Creeper (*Certhia americana*)
Red Crossbill (*Loxia curvirostra*)

Pileated Woodpecker (*Dryocopus pileatus*)
Varied Thrush (*Ixoreus naevius*)

Steep Rock Cliffs and Steep Coastal Erosion Bluff species:
Pelagic Cormorant (*Phalacrecorax pleagicus*)
Black Oystercatcher (*Haematopus bachmani*)
Peregrine Falcon (*Falco peregrinus*)

	Alternative 1	Alternative 2
Strategies Applied to Achieve Objective		
Conduct systematic annual boat and land-based surveys for pelagic cormorants to monitor nesting population trends.		x
Work cooperatively with the Service's Ecological Services Division and USGS to monitor population trends of black oystercatchers.	x	x
Promote research efforts by universities and other partners to determine use of refuge habitat (inventory) by migratory and resident focal bird species including brown creeper, red crossbill, pileated woodpecker, varied thrush and potentially other late-successional forest species.		x
Work cooperatively with others to monitor peregrine falcon reproductive success at Cape Meares.	x	x
Promote research by universities and other partners to determine refuge habitat use (inventory) by threatened marbled murrelets and other old-growth-dependent avian species.		x
Develop a web interface to disseminate avian inventory and monitoring results.		x

Rationale: Cape Meares NWR provides permanent protection to one of the few remaining old-growth Sitka spruce and late-successional forest habitats on the Oregon coast. Baseline surveys of focal avian species and their associated habitats are lacking due to insufficient staffing and funding. Although habitat manipulation within the RNA is not envisioned, an inventory of focal avian species that encompasses the broad range of habitat conditions used by the forest songbird community could be used to assess the relative condition of refuge forest habitats within Cape Meares NWR in terms of providing the necessary "coarse-filter" habitat requirements for the songbird community (Rempel 2007). Designing and implementing a comprehensive inventory and monitoring program for focal avian species will assist the Complex in responding effectively to resource impacts and will allow for the use of adaptive management to evaluate the effectiveness of management practices and to identify research needs.

Cape Meares NWR was established primarily to protect seabirds. The Complex has conducted seabird surveys along the coast of Oregon from 1966 to present (Naughton et al. 2007). Aerial and boat surveys have been standardized, both in technique and timing (Takekawa et al. 1990) since 1988 to more accurately census and monitor breeding seabirds. Pelagic cormorants have been and will continue to be one of the focal birds for these surveys due to the ability of staff to conduct distant aerial or boat observations and/or photography of surface nesters with little or no disturbance. This survey needs to be completed annually.

The black oystercatcher is one of the Service's Focal Species for priority conservation efforts due to its restricted population size and range, susceptibility to human-caused disturbances, and lack of baseline natural history and ecological data to assess management actions and conservation status (Tessler et al. 2007). The black oystercatcher is also listed as a species of high concern within the national, state and regional shorebird conservation plans. As an obligate rocky shore species and keystone species the Complex has monitored it along the central Oregon coast, including below Cape Meares, since 1997. Reproductive output during this period has shown a stable population with interannual variability and no significant trend over the study period (USFWS unpubl. data). Because of this species' status as a species of concern, the Complex will continue to assist Ecological Services and USGS with monitoring.

The American peregrine falcon is a recovered species that was removed from the federal threatened and endangered species list in August 1999 and the state list in 2006. The peregrine falcon breeds, loafs and forages on the coastal habitat found on Cape Meares NWRs. The Complex initiated reproductive success monitoring efforts in 1993 at peregrine eyries at Three Arch Rocks and Cape Meares NWRs. In 2004, the monitoring effort was expanded with the inclusion of 15 newly re-occupied south and north coast eyries (USFWS unpubl. data). This coast wide nesting success data is combined with state and nationwide efforts to monitor population trends in a national post-delisting monitoring program that was initiated in 2002 (Isaacs 2007; USFWS 2003a). Monitoring surveys will be conducted on the refuge every three years and will be added to the national effort that will review the status of the species in 2015.

Objective 9.d Research and Scientific Assessments – Cape Meares NWR and RNA

Conduct or encourage research, feasibility studies, and scientific assessments to support adaptive management decisions (Goal 8) on Cape Meares NWR. A list of research-related activities for this refuge follows.

	Alternative 1	Alternative 2
Strategies Applied to Achieve Objective		
Promote research efforts by universities and other partners to determine role of downed wood in nutrient cycling and habitat success in Pacific Northwest old-growth Sitka spruce wind-throw forest areas.		x
Promote research efforts by universities and other partners to document life history parameters and needs for refuge birds, mammals, amphibians and invertebrates.		x

Rationale: In *Fulfilling the Promise* (March 22, 1999), the Service acknowledged the need for each refuge to identify management oriented research needs based on Refuge System, ecosystem, and refuge goals. Because of the refuge's purpose and the RNA restrictions, management of Cape Meares NWR and RNA will focus on protection, preservation, inventory, monitoring, and research. Complex staff members need to identify and prioritize the research needs for Cape Meares NWR, as well as resources and partners required to accomplish this targeted high priority research.

Cape Meares NWR and RNA provide permanent protection to one of the few remaining old-growth Sitka spruce and late-successional forest habitats on the Oregon coast. The 20-acre unit east of the Three Capes Scenic Route is an early seral stage forest resulting from an almost

complete wind-throw of the old-growth forest during a 1981 storm event. This area is one of very few coastal locations in the Pacific Northwest where timber salvaging of old-growth was not conducted following a blowdown event, and natural forest regeneration was allowed to occur. The unique resources and conditions of Cape Meares present many opportunities for research, all of which would contribute greatly to the available scientific knowledge of Pacific Northwest old-growth forest processes.

2.6.1.10 Goal 10. In cooperation with OPRD, provide onsite and offsite opportunities for visitors to enjoy wildlife observation, photography, environmental education and interpretation while limiting disturbance to wildlife. Visitors will be able to gain an understanding of the basic ecological concepts of the Coastal Cliffs and Old-growth Sitka Spruce and Western Hemlock Forests of Cape Meares, and appreciate wildlife and wildlands which are being protected.

Objective 10.a Provide Information and Facilities for Visitors at Cape Meares

Throughout the life of the CCP, provide information and facilities both onsite and offsite for visitors of Cape Meares to observe and photograph wildlife.

	Alternative 1	Alternative 2
Strategies Applied to Achieve Objective		
Cooperatively maintain elevated viewing decks for wildlife observation at Cape Meares State Scenic Viewpoint.	x	x
Develop a checklist of the wildlife of Cape Meares and make it available to the public in hard copy and web format.		x
Work with local conservation organizations and recruit refuge volunteers to lead guided naturalist/wildlife walks.		x
Cooperatively maintain refuge-constructed visitor use facilities on OPRD property.	x	x
Cooperatively maintain portion of Oregon Coast Trail that goes through refuge lands and continue to allow hiking and wildlife observation.	x	x
Construct secure bicycle parking area on OPRD property.		x

Rationale: Cape Meares NWR surrounds Cape Meares State Scenic Viewpoint managed by OPRD. Almost all public use at Cape Meares is concentrated on OPRD lands, except for a portion of the Oregon Coast Trail which runs through the refuge. Many of the existing public use facilities on OPRD lands were constructed or enhanced using Federal funds (i.e. Refuge Roads, Watchable Wildlife). The Service has used its own funds to enhance visitor facilities on OPRD lands because Three Arch Rocks NWR, Oregon Islands NWR and most of Cape Meares NWR are closed to all public use to protect breeding wildlife species. By concentrating public use facilities on the Cape Meares headland, visitors get an opportunity to watch and photograph wildlife using these refuges without disturbing them. Cape Meares currently offers excellent wildlife viewing and photography opportunities, especially in the spring and summer, from two accessible viewing decks. A walk along the paved headland trail provides visitors with spectacular panoramic views of the Pacific Ocean, Three Arch Rocks NWR, and Oregon Islands NWR making it the only viewpoint in Oregon, and perhaps in the nation, where three NWRs can be seen from a single location. Hiking enthusiasts use the Oregon Coast Trail that winds through the headland and old-growth forest to learn about this rare habitat.

Most of the public use facilities at Cape Meares are in excellent to good condition and the Complex is dedicated to maintaining these facilities with the help of OPRD. Facilities include a welcoming kiosk, two accessible viewing decks, accessible sidewalks, a parking lot, interpretive panels, and three benches for resting. Cyclists riding along the Oregon Coast are frequent visitors to Cape Meares; however, those who want to walk the trail have no place to secure their bicycles. Adding a bicycle rack next to the main parking lot would alleviate this problem and serve to reduce user conflicts between hikers and cyclists on the Oregon Coast Trail and OPRD trails. Birdwatchers and wildlife enthusiasts from all over the United States visit Cape Meares to see the cliff-nesting pair of peregrine falcons, seabirds, and birds in old-growth forest. The refuge gets regular requests from visitors for a wildlife checklist. Development of a checklist of birds, mammals, reptiles and amphibians would provide visitors with information on the presence/absence and seasonal habitat use of Cape Meares old-growth forest and freshwater streams by these species.

Objective 10.b Provide Both Onsite and Offsite Interpretation and Environmental Education at Cape Meares

Throughout the life of the CCP expand wildlife interpretation opportunities and initiate EE programs both onsite and offsite for visitors and community members.

	Alternative 1	Alternative 2
Strategies Applied to Achieve Objective		
Work with OPRD and Friends of Cape Meares to develop and implement an EE program and an evening campground program at adjacent Cape Lookout State Park. Seek grant opportunities to cover program expenses.		x
Increase refuge wildlife interpretation volunteer presence at Cape Meares to include coverage seven days/week from May 1 to September 15.		x
Continue to partner with OPRD to station refuge volunteers at Cape Meares State Scenic Viewpoint every spring/summer to interpret wildlife resources.	x	x
Provide leadership and resources to manage and train volunteers. Develop an evaluation system for the volunteer program to maintain a high quality program and volunteer experience.	x	
Upgrade and replace all interpretive panels as needed at Cape Meares State Scenic Viewpoint.	x	x
Hire a PFT GS-7/9 Volunteer Coordinator.		x

Rationale: Cape Meares currently receives over 400,000 visitors annually. To engage visitors and teach them about the wildlife of the area, OPRD and the Complex have been training and using volunteers as wildlife interpreters four days/week during the peak tourism season (May-July). Stationing wildlife interpretation volunteers onsite interacting with visitors has been well-received by OPRD staff, visitors, and the Friends group alike to the point where the program needs to be expanded to have interpretive volunteers available seven days/week when wildlife is most abundant (May-Sept) and tourists are plentiful. Furthermore, the volunteer program at the Complex is growing, and volunteer recruitment, training and evaluation needs

to be formalized. Formalizing the program will ensure volunteers are equally and properly equipped and trained and that they all share the same message about the National Wildlife Refuge System and its mission with visitors. A formal program will also reduce the amount of staff time spent on recruiting and training volunteers by standardizing recruitment fliers, training, and evaluation. To provide volunteers onsite at Cape Meares, the Complex has partnered with OPRD. Through this partnership, OPRD provides the volunteer with a full hook-up site for a Recreational Vehicle at Cape Lookout State Park (located 20 minutes south of Cape Meares), two spotting scopes, wildlife field guides, and binoculars. In return, the Complex recruits, trains and provides uniforms for volunteers. When the current MOA between the Complex and OPRD is updated the volunteer partnership will be added.

When volunteers aren't available, a series of self-guided interpretive panels along the headland trail tell the story of the wildlife using the rocks, islands and old-growth forest of Cape Meares, Oregon Islands and Three Arch Rocks. All but four of the interpretive panels at Cape Meares were recently updated and replaced; the last four will be revised and installed to complete the phase of upgrading self-guided interpretation at Cape Meares.

Environmental education plays a key role in encouraging current and future generations to engage in environmentally responsible behavior such as supporting habitat protection for wildlife through the National Wildlife Refuge System. With the development of a quality environmental education program to introduce the ancient forest and steep sea cliff habitats of Cape Meares, children and adults can understand the ecology of this habitat and the importance of how their actions can protect its native wildlife and plants.

Objective 10.c Outreach to Visitors, Community and Media – Cape Meares NWR

Provide high-quality outreach to visitors, community members, local media and chambers of commerce on the wildlife and habitat resources of Cape Meares throughout the life of the CCP.

	Alternative 1	Alternative 2
Strategies Applied to Achieve Objective		
Complex staff members or volunteers maintain presence at local festivals, community events and/or special events that have a high potential to deliver refuge messages to key audiences.	x	x
Conduct regular updates of Complex website.	x	x
Update and maintain refuge brochure.	x	x
Cooperatively maintain orientation/interpretive kiosk on offsite OPRD location.	x	x
Contribute news and information about refuge wildlife and habitat to be published in Friends Newsletter.		x

Rationale: Outreach is two-way communication between the Service and the public to establish mutual understanding, promote involvement, and influence attitudes and actions, with the goal of improving joint stewardship of our refuge resources. With so many agencies and conservation organizations owning and managing lands on the Oregon coast there is often confusion on the part of both community members and visitors about what the refuge is, whose jurisdiction it is and how the resources are managed. Outreach is crucial to distinguishing the Service from other wildlife management agencies or parks. When the public knows and

understands the role of the Service and the Refuge System it improves their awareness of refuge regulations and policies and the reasons behind them, and helps reduce violations and the need for LE actions. The Complex will provide OPRD, the Friends Group, local media and others with the most up to date information regarding the refuge through a variety of media including a website, news releases, the Complex brochure, and attendance at local festivals, community events or special events. The Complex will start regularly contributing to the Friends newsletter through a column focusing on the news and or natural history of the refuge's wildlife with the purpose of providing members of the friends group with more in depth information about wildlife and current refuge issues that need their support.

Objective 10.d Refuge Regulations – Cape Meares NWR

Throughout the life of the CCP, make refuge and wildlife regulations clear and available to visitors.

	Alternative 1	Alternative 2
Strategies Applied to Achieve Objective		
Survey and post refuge boundary to eliminate illegal trespass into closed refuge areas.		x
Maintain gate on entrance road to protect both Complex and OPRD assets and facilities.		x
Delineate public use area and ensure public use is confined to open area.	x	x
Partner with State and local LE agencies to ensure accuracy about refuge and wildlife regulations in their publications.	x	x

Rationale: Public use (over 400,000 annual visitors), limited refuge LE capacity, spotty coverage by other LE agencies, and an unsurveyed boundary, all pose potential threats to the plants and wildlife of Cape Meares NWR. An official boundary survey and subsequent posting is needed to make it clear to the visiting public, OPRD, adjacent landowners and other refuge partners where refuge lands begin and end. The Complex is committed to working with OPRD to keep public use at Cape Meares confined to areas where visitor use facilities have been constructed and to keep visitors out of areas where wildlife are sensitive to human disturbance. The Complex LE Officer will work to improve communication with other agencies to ensure refuge and wildlife laws are being enforced, to eliminate illegal trespass into closed areas of refuge and encroachment by adjacent landowners, and reduce impacts on sensitive wildlife and habitat. The Complex will continue to work with OPRD to determine how to best meet increasing public use while safeguarding the habitat, wildlife and facilities it is mandated to protect. A locked entrance gate is one way visitor use facilities have been protected in the past; however, OPRD funds to maintain and staff the gate are not an annual certainty, potentially leaving visitor use facilities exposed to potential theft and vandalism, and wildlife to poaching. The Complex will work with OPRD to secure funds to once again maintain and staff the entrance gate.

Objective 10.e Partnership with OPRD and Friends of Cape Meares		
Throughout the life of the CCP, strengthen the partnership with OPRD and the Friends of Cape Meares Lighthouse and Wildlife Refuge to help protect refuge natural resources.		
	Alternative 1	**Alternative 2**
Strategies Applied to Achieve Objective		
Develop an MOU between the Service and the Friends of Cape Meares Lighthouse and Wildlife Refuge.		x
Update and revise the MOU between the Service and OPRD.		x
Work to expand the Friends role in communicating with visitors about refuge policies and wildlife resources.		x
Expand refuge involvement in the Friends of Cape Meares by sending a staff member to board meetings.		x
Rationale: Public use facilities that enhance visitor enjoyment of refuge wildlife resources are managed cooperatively by the Complex and OPRD under a MOU dated February 21, 1986. On-site management of public use facilities by OPRD, as well as recruitment and supervision of volunteers providing interpretation of refuge resources to visitors, necessitates frequent coordination between OPRD and Complex staff. These responsibilities tend to be undocumented or unclear and should be formalized. The current MOU is for "the Use of Cape Meares National Wildlife Refuge for State Park Purposes." Under the MOU, OPRD is required to provide public use opportunities at Cape Meares State Scenic Viewpoint, and to maintain a trail and trailhead, parking lot, signs, and other necessary public access and facilities. A revised and updated MOU will ensure the goals and objectives of both the refuge and OPRD are met and that the roles and responsibilities of each agency are clear. The Friends of Cape Meares Lighthouse and Wildlife Refuge have played a significant role in supporting the development of public use facilities at Cape Meares. Continued support of the Friends group is very important to the Complex and needs to be formalized in a MOU which will facilitate improved communication and serve to expand the role of the Friends group in supporting wildlife conservation as well as compatible and appropriate public use at Cape Meares NWR.		

2.6.1.11 Goal 11: Promote conservation of cultural resources on refuge lands through effective coordination and cooperation with Tribes having adjoining ownership or management responsibilities.

Objective 11.a Work With Tribes to Protect Cultural Resources on refuges		
Working with Native American Tribes, locate, characterize and protect cultural resource sites on refuge lands and maintain secrecy and security of sites.		
	Alternative 1	**Alternative 2**
Strategies Applied to Achieve Objective		
Comply with Section 106 of the National Historic Protection Act of 1966 when conducting ground-disturbing activities.	x	x

Coordinate with Native American Tribes in preplanning stage for projects involving significant ground disturbing activities.	x	x
Identify and characterize significant archaeological sites and plan for their protection in accordance with provisions the Archaeological Resource Protection Act of 1979.		x
Develop a refuge GIS layer for archaeological sites, burial sites and sacred areas that contains "constraint for use" conditions to protect sensitive information.		x
In accordance with the Native American Graves Protection and Repatriation Act of 1990, establish Refuge Complex protocol and procedures for handling inadvertent discoveries of human remains, burial objects, sacred objects, and objects of cultural patrimony.		x
Rationale: Archaeological resources and sites are irreplaceable parts of American heritage. Federal laws, including the Archaeological Resource Protection act of 1979, National Historic Protection Act of 1966, and the Native American Graves Protection and Repatriation Act of 1990, mandate protection of these sites on refuge lands. The Complex has good working relationships with Native American Tribes and consults them regularly on proposed ground disturbance events, discovery and preservation of resources and sites, public education, interpretation, and investigation/research of sites. Information regarding archaeological sites on these refuges is very limited. Some investigation has occurred at known sites on the rocks, reefs, islands and headlands, but many suspected sites have not been surveyed or investigated. The Complex should develop a strategy with the Tribes to identify and document all significant archaeological resource sites in order to protect and preserve them. It is also important to continue and to expand regular communication and consultation with coastal Tribes in Oregon.		

2.7 Partnerships

Partnerships are an extremely important component of the implementation of this CCP and are reflected in the goals, objectives, and strategies identified in Chapter 2. Partnership efforts will focus on fish, wildlife and plant inventories and monitoring; habitat restoration; environmental education; outreach; and quality wildlife-dependent recreation.

The Oregon Coast NWR Complex already enjoys significant positive relationships with numerous partners including state and federal agencies, Tribes, volunteers, Friends Groups, schools, conservation organizations, municipalities, and individuals. Refuge Complex staff will work to strengthen existing partnerships and will actively look for new partnerships to assist in achieving the goals, objectives, and strategies set forth in this Draft CCP/WSP/EA.

2.7.1 Oregon Department of Fish and Wildlife (ODFW)

The ODFW's management responsibilities along the coast, including lands and waters, fish and wildlife, threatened and endangered species and other programs, frequently overlap with Service resources and responsibilities. Because refuge boundaries stop at the mean high tide line, ODFW and other state agencies are in a unique position to greatly assist the Complex in protecting sensitive seabirds and pinnipeds from human disturbance in close proximity to the refuges. The ODFW and the Complex share mutual interests in wildlife surveys, documenting and responding to seabird mortality events, developing joint research projects, education and outreach programs,

species management and dissemination of data, results, and information to a wider audience. The ODFW has been closely involved with Complex staff in waterfowl surveys, predator management, and restoration project permits. Increased cooperation between ODFW and the Complex will assist both agencies in meeting their missions and mandates, and provide a more systematic and accessible process for sharing information, expertise and funding.

The ODFW has been conducting surveys of pinniped populations using the refuges for more than two decades. The Complex has supported this work through the issuance of Special Use Permits and reporting of marked animals. Although the Marine Mammal Protection Act transferred management jurisdiction for pinnipeds from state government to NOAA-Fisheries in 1972, leaving ODFW without management authority for these species, ODFW has been using limited state program funds along with funding support from NOAA-Fisheries to study and manage pinnipeds in Oregon. Complex staff members have been working closely with ODFW and NOAA-Fisheries personnel on research associated with Steller sea lions that use refuge rocks and islands.

2.7.2 Oregon Parks and Recreation Department (OPRD)

The OPRD manages Oregon beaches, numerous coastal State Parks, and State Scenic Viewpoints, many of which are immediately adjacent to large segments of Oregon Islands and Cape Meares NWR's, and provide optimal opportunities for viewing and interpreting refuge resources and lands. The OPRD's management responsibilities, including lands, facilities, and interpretive and educational programs, frequently overlap with Complex goals and responsibilities for public outreach and education. The Complex works closely with OPRD to maintain visitor use facilities, develop new facilities, collaborate on interpretive panel messages, develop joint educational and interpretive programs and utilize shared volunteers. The Complex plans to establish a coastwide MOU with OPRD to formalize and expand the cooperative volunteer interpreter program. The MOU would also clarify roles and responsibilities with regard to stationing Service volunteers on OPRD lands and facilities, training OPRD interpretive docents by Complex staff, and maintenance of Service-funded facilities on OPRD lands.

2.7.3 Bureau of Land Management (BLM) at Yaquina Head Outstanding Natural Area (YHONA)

The Complex and BLM have been working cooperatively since the early 1980s to protect the wildlife resources of YHONA and the adjacent rocks within Oregon Islands NWR. Complex staff members work with BLM employees and their volunteers to conduct annual training to assist BLM in interpreting the natural resources of the headland and adjacent refuge rocks, and a Service volunteer is stationed here during the summer. Working in close cooperation with BLM over the past two decades to define and restrict visitor access has resulted in the protection of existing seabird colonies and the harbor seal haulout site, and provided for dramatic population increases in nesting seabirds and the colonization of new sites on the mainland and refuge rocks. The Complex also works with BLM and OSU researchers to monitor common murre populations at YHONA. There is a need for continued close coordination between the Service and BLM to share data and ensure that adaptive management of public use and wildlife protection continues to prevent impacts to wildlife using the refuge rocks directly adjacent to YHONA. The Complex plans to develop a new MOU with BLM that would clarify roles and responsibilities with regard to LE jurisdictions, research and management activities, use of volunteers, and interpretive messages and programs.

2.7.4 Law Enforcement Entities

Oregon Islands NWR spans six counties and 320 miles of the coastline. Oregon Islands and Three Arch Rocks NWRs protect major seabird nesting colonies, pinniped rookeries, threatened and endangered species use areas, as well as sensitive cultural resource sites. In addition, there are numerous public use facilities overlooking these refuges. Many of these sites are in remote locations while others are adjacent to coastal communities and are very susceptible to human-caused disturbance, vandalism, theft and other crimes. Until late 2008 the Complex had no LE capability on staff, and enforcement coverage by necessity relied on informal arrangements and inconsistent coordination with the USCG, NMFS Enforcement, city police, county sheriff departments, and Oregon State Police. The Complex's LE officer will work to establish and maintain cooperative LE programs with the Oregon State Police, NOAA-Fisheries special agents, county sheriffs, local police departments, and the USCG. Specific LE tasks include: (1) Clarifying jurisdictions of Service and all other enforcement agencies regarding refuge regulations, determine the extent of proprietary state law authority on Federal Lands, and enable joint enforcement of wildlife protection and refuge trespass laws and regulations; and (2) Developing LE assistance agreements with Oregon State Police; county sheriffs and associated Marine Patrol officers; city police departments in cities where refuge lands are located; USCG; and NOAA for enforcement of wildlife and refuge regulations including joint enforcement of Marine Mammal Protection Act regulations.

2.7.5 Friends of Cape Meares Lighthouse and Wildlife Refuge

The Friends of Cape Meares Lighthouse and Wildlife Refuge have played a significant role in supporting the development of public use facilities at Cape Meares NWR. The mission of this Friends Group is to (1) promote and interpret the natural and historical qualities of Cape Meares State Park and Wildlife Refuge, and (2) assist in the development and implementation of improvements and educational programs at Cape Meares State Scenic Viewpoint and Wildlife Refuge. The Complex plans to formalize the relationship with this Friends Group through development of an MOU, which would facilitate improved communication and expand the Friends Group's role to include direct support of marine wildlife conservation and advocacy.

2.7.6 Friends of Southern Oregon Refuges/SEA

Shoreline Education for Awareness, Inc. or SEA was founded in Bandon, Oregon in 1990, and it has been an all volunteer organization supported by membership dues and donations received while interpreting the marine environment for visitors. In 2005, SEA entered into an MOU with the Complex to make them an official Refuge Friends Group known as the Friends of the Southern Oregon Coast Refuges. This Friends Group plays a critical role in training and recruiting seasonal volunteer wildlife interpreters to serve at a variety of locations on the south coast of Oregon. The SEA is also an active advocate for protecting refuge wildlife and habitat.

2.7.7 Haystack Rock Awareness Program (HRAP) and Friends of Haystack Rock

The HRAP was founded in 1985, and is a stewardship and environmental education program whose mission is to increase the awareness of the fragile environment in the Haystack Rock Marine Garden and adjacent Oregon Islands NWR. Since its beginning, HRAP has educated and inspired tens of thousands of adults and children to learn about the natural resources not only at

Haystack Rock but also in their own backyards and other special places. The Friends of Haystack Rock FHR) formed in 2005 in support of the HRAP and in cooperation with the City of Cannon Beach. They promote the preservation and protection of the intertidal life and birds that inhabit the Marine Garden and the Oregon Islands NWR at Haystack Rock. The Complex plans to formalize the relationship with HRAP/FHR through development of an MOU which would facilitate improved communication and serve to expand the Friends group's role to include direct support of marine wildlife conservation and advocacy.

2.7.8 Volunteers

Each spring and summer the Complex and state and federal partners, station volunteer wildlife interpreters on mainland sites overlooking Oregon Islands NWR. Volunteer wildlife interpreters are on duty a minimum of four days/week to orient visitors, make them aware of the wildlife resources using the rocks, reefs, and islands, and educate them as to how they can help reduce negative wildlife/human interactions. Having volunteers interact with visitors has been well-received by the visitors, staff from OPRD and BLM, and Refuge Friends groups. Volunteers are extremely important in helping reduce wildlife disturbance, educating the public, and disseminating information on the mission of the National Wildlife Refuge System.

2.7.9 U.S. Coast Guard (USCG)

The USCG conducts daily activities near refuge rocks, reefs and islands. These activities, which have high potential for negative impacts to refuge wildlife, include routine patrol flights, aircraft and surface vessel Search and Rescue (SAR) missions, oil spill response missions, and maintenance and administration of Aids to Navigation in marine waters. Because of the occasional need for refuge staff to access rocks and islands, and the frequent flights and boat patrols conducted in these areas by USCG, a close partnership between the Service and USCG has developed to allow Complex staff to utilize USCG aircraft and surface vessels during non-emergency missions. In return, the Complex has provided information and training to reduce preventable disturbances by USCG and plans to formalize and expand this partnership. The Complex plans to establish an MOU with USCG to document this arrangement.

2.7.10 Oregon State Marine Board (OSMB)

The OSMB has established an enforceable 500-foot watercraft buffer (closure) zone around Three Arch Rocks NWR from May 1 to September 15 annually, to minimize wildlife disturbance by boaters. This is the first and only marine waters closure in the state of Oregon. The Complex plans to develop an MOU with OSMB to formalize specific collaborative actions to protect wildlife using Oregon Islands as well as Three Arch Rocks NWRs.

2.7.11 School Districts

Within the five coastal counties where the Complex administers refuge lands, there are eight school districts that have schools near one of the three marine refuges. Many of these schools have participated in refuge EE programs and it is in the interest of the Complex to formalize the relationship with each district through development of an MOU. An MOU will help advance EE in schools by strengthening and sustaining an EE program for targeted grades focusing on

seabirds. The MOU will further serve to clarify each party's role in ensuring a generation of environmentally conscious students especially in the area of marine and estuarine conservation.

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Chapter 3. Physical Environment

3.1 Climate

The Oregon Coast National Wildlife Refuge Complex comprises six National Wildlife Refuges that span nearly 320 miles along the rugged Oregon coastline. We discuss three of the six NWR's associated with the Complex: Oregon Islands, Three Arch Rocks, and Cape Meares. Oregon Islands NWR spans nearly the entire length of the Oregon coastline and consists of two headlands and all coastal rocks, reefs, and islands that are exposed at mean high tide and not connected to the mainland, except Chief's Island. Three Arch Rocks NWR includes three large rocks and six smaller rocks located one half mile offshore from the town of Oceanside on Oregon's north coast. Cape Meares NWR is a coastal headland also located on the north coast approximately 12 miles southwest of Tillamook.

The region's climate is greatly influenced by the Pacific Ocean on the west and the Coast Range to the east. The Coast Range rises between 2,000 and 3,000 feet (610-914 m) above sea level in the north and between 3,000 and 4,000 feet (914–1,219 m) in the southwestern portion of the state with occasional mountain peaks rising an additional 1,000 to 1,500 feet (305–457 m). The coastal zone is characterized by wet winters, relatively dry summers, and mild temperatures throughout the year. Because of the moderating influence of the Pacific Ocean, extremely high or low temperatures are rare and annual temperature range is lower than any other Oregon climate zone. The area's heavy precipitation during winter results from moist air masses moving from the Pacific Ocean onto land. The lower elevations along the coast receive annual precipitation of 65 to 90 inches (165–229 cm), which can cause flood events if abundant rainfall is consistent for several days. The west slope of the Coast Range can receive 200 inches (508 cm) of annual precipitation, some of that in the form of snow. Occasional strong winds occur along the coast, usually in advance of winter storms. Wind speeds can exceed hurricane force and have caused substantial damage to structures and vegetation in exposed coastal locations. Skies are usually cloudy in the winter and partly cloudy during summer due to localized fog. As a result of persistent cloudiness, total solar radiation is lower along the north and central coast than in any other part of the state.

The Oregon coast in general has a temperate marine climate but is subject to strong winds and tides especially during the winter. Temperatures occasionally fall to freezing and rarely exceed 75°F (24°C) although temperatures exceeding 90-100°F (38°F) have been recorded. Precipitation is heavier and more persistent during the winter but regular moisture occurs from rain and fog throughout the year.

The National Climatic Data Center established the Oregon Coast, from Astoria to Brookings, as Climate Division 1. Meteorological measurements have been taken at 22 NOAA Climate Stations throughout Climate Division 1 (NCDC website) and are representative of the general climatic conditions of the refuge complex. We used NOAA's weather data to discuss weather patterns on the refuges.

3.1.1 Temperature

Based on data collected from 1948 through 2008 at Climate Division 1, the average monthly temperatures for the coast range from a low of 43.2°F (6.2°C) in January to a high of 61.2°F

(16.2°C) in August. The highest winter monthly average temperature recorded was 51.4°F (10.8°C) in February 1963, and the lowest average monthly temperature was 33.9°F (1.1°C) in January 1949. The highest summer monthly average temperature recorded was 64.1°F (17.8°C) in August 2004, and the lowest monthly average temperature was 54.9°F (12.7°C) in June 1954 (National Climatic Data Center (NCDC) website).

Based on data collected from 1971 to 2000, daily maximum temperatures at Newport, Oregon, located near the center of the Oregon coast, vary from an average of 51.2°F (10.7°C) in January to 65.7°F (18.7°C) in August. There are, on average, 0.5 days annually with maximum temperatures exceeding 90°F (32.2°C). The record maximum daily temperature was 100°F (37.8°C), recorded on July 11, 1961. The average daily minimum temperature at Newport is 38.6°F (3.7°C) during January and 50.7°F (10.4°C) during August. On average, the daily minimum temperature drops to or below 32°F (0°C) 20.3 days per year. The record minimum temperature of 1°F (-17.2°C) was recorded December 8, 1972 (NOAA Western Regional Climate Center website). The all-time maximum high temperature recorded on the Oregon coast is 108°F (42°F) and occurred in Brookings on July 8, 2008.

3.1.2 Precipitation

Average annual precipitation for the Oregon coast is 77.0 inches (195.6 cm). In 1996, the wettest year on record the precipitation measured was 108.4 inches (375.3 cm); in 1976, the driest year, only 49.0 inches (124.5 cm) were measured. The wettest season on record was the winter of 1956–57, with 18.8 inches (47.8 cm) of precipitation; the driest season was the summer of 2003, with only 0.2 inches (0.5 cm) of precipitation (NCDC website). Winter is defined as December, January, and February and summer as June, July, and August. More than half of the total annual amount of precipitation occurs from November through February.

Average snowfall in Newport ranges from a maximum of 0.6 inches (1.5 cm) in January, to 0.1 inch (0.2 cm) in February, to 0.3 inches (0.8 cm) in December. The record monthly snowfall of 11.0 inches (27.9 cm) occurred in January 1943 and December 1972. The annual record snowfall of 15.5 inches (39.4 cm) occurred in 1972. Snowfall accounts for less than 1% of all precipitation from December through February (NOAA Western Regional Climate Center website).

Fog (water vapor condensing into tiny liquid water droplets in the air) is a common phenomenon along the Oregon coast because of contrasting differences between air, land, and ocean temperatures and humidity. The average number of days per year with dense fog (visibility of 0.25 mile or less) in Astoria is 41. Fog records for central and south coastal locations were unavailable. June averaged the fewest days (1) with dense fog and October with the most days (7) (NOAA Western Regional Climate Center website).

3.1.3 Wind

Average wind speeds have been calculated on hourly data collected from 1996 to 2006 from automated stations at reporting airports in Oregon. The average annual wind speed for Newport is 8.8 mph (14.2 km/h). The highest average wind speed occurred during December and January at 11.2 (18) and 11.0 mph (17.7 km/h) respectively. The calmest month, September, recorded an average wind speed of 6.5 mph (10.5 km/h). Astoria airport recorded an average annual wind speed of 7.7 mph (12.4 km/h) with highest speeds during December at 8.7 mph (14 km/h) and

lowest during September and October at 6.7 mph (10.8 km/h) (NOAA Western Regional Climate Center website).

Prevailing wind direction, defined as the direction with the highest percent of frequency, was calculated from hourly data during 1992 to 2002. The average annual prevailing wind direction in Newport (on the central coast) blows from the east and south respectively. In Newport, winds from the east occur in December through February, from the south during fall and spring, and NNW during the summer months (NOAA Western Regional Climate Center website).

As a rule, Oregon does not experience hurricanes, and tornadoes are infrequent and generally small in the northwestern part of the United States. However, the National Weather Service issued a hurricane warning for the first time for the Oregon coast during an extremely powerful storm which slammed into the Pacific Northwest during December 2-4, 2007, during which winds topped out at 130 mph (209 km/hr) along coastal Oregon (NOAA Western Regional Climate Center website). The NCDC maintains a database that provides information on the incidence of tornados reported in each county in the United States. This database reports that 94 tornados were reported in Oregon since 1950. The 7 counties closest to the refuges (Clatsop, Tillamook, Lincoln, Lane, Douglas, Coos, and Curry), only 19 tornados have been recorded since 1950. Of these, 11 tornadoes had maximum wind speeds estimated in the range of 40 to 72 mph (F0), and 8 had maximum wind speeds in the range of 73 to 112 mph (F1).

3.2 Hydrology

A description of a hydrological system usually includes parameters such as stream/river flow, runoff, ground water, and snow pack. However, the hydrology of the Oregon Islands and Three Arch Rocks NWR would be better described by Pacific Ocean processes. This immense water body surrounds, impacts, and influences the refuge headlands, rocks, islands, and reef habitats continually.

The Pacific Ocean processes can be explained by investigating features and dynamics of the California Current, also known as the Eastern Boundary Current. The California Current System extends up to 1,000 km offshore from southern British Columbia to Baja California and encompasses a southward meandering surface current, a poleward undercurrent, and surface countercurrents. This system exhibits high biological productivity, diverse regional characteristics, and intricate eddy motions. The California current system is driven by prevailing northerly winds and is associated with upwelling areas off Oregon and California (Miller et al. 1999). Wind-induced upwelling is the dominant mechanism for bringing nutrients to the surface.

The Oregon coast experiences large seasonal changes in the strength of upwelling, clearly related to seasonal differences in wind strength and direction. There are four or five periods of strong upwelling separated by periods of little or no upwelling (Mann and Lazier 2006). Each of these events precipitates a burst of productivity equivalent to a spring bloom (Barber and Smith 1981). In addition, coastal upwellings tend to be centered on topographical features such as capes and canyons. The bathymetric features along the Oregon coast are very irregular which is indicative of fracture zones, basins, ridges, and canyons. Seabirds, pinnipeds and marine fish benefit from the high productivity associated with coastal upwelling. In fall and winter a weaker counter current, known as the Davidson Current, flows north occasionally moving somewhat warmer water northward along the California and Oregon coast.

The stream and riparian habitat within Cape Meares NWR and RNA is located in the northeast corner of the northern unit, in an active glacial slide area. Several spring-fed and surface runoff streams with medium to steep gradient, step-pool morphologies, and basalt parent geology flow across this area from the top of the adjacent privately-owned headland. The streams cross under an early-successional red alder canopy and end in a 12-foot drop to the beach on a continually eroding bank. A fork of the Oregon Coast Trail passes through this portion of the refuge and parallels the main stream before dropping to the beach at the extreme northeast corner of the cape while the main trail continues north across county lands to the community of Cape Meares.

3.3 Topography and Bathymetry

To be within Oregon Islands and Three Arch Rocks NWRs, a rock, reef, or island must be separated from the mainland and above the surface of the sea at mean high tide. Reefs are low elevation, essentially bare rocks that are awash during storms at higher tides. Rocks are taller, essentially bare rocks that may or may not be inundated, and usually have rather precipitous sides. Grassy islands are generally the highest land mass. They usually have precipitous sides, vegetated tops with varying amounts of soil, and are never immersed in water. Many rocks and islands are close to shore and accessible by foot at low tides.

In areas along the southern Oregon coast, headlands often show varying stages of deposition, deflation, and extended periods of surficial stability. The Crook Point and Coquille Point headlands, consisting of Holocene dunes and floodplains, are subjected to high-energy geomorphic processes that contribute to their alteration or destruction. These processes are marine transgression and erosion by tides, winds and storm waters, as well as past human altercation (Davis 2006). The Crook Point headland is dominated by a generally barren, windblown landscape of flat to gentle slopes approximately 100 to 200 feet above sea level. The Coquille Point headland is relatively flat, and the bluffs below the headland are classified as steep coastal erosion bluff habitat.

Cape Meares NWR consists of vertical coastal cliffs, rock outcroppings and rolling headlands with old-growth forest dominated by Sitka spruce and western hemlock. Cape Meares is located on a prominent coastal headland that rises more than 640 feet above sea level. The western border of the headland ends dramatically at sheer cliffs above the Pacific Ocean, while north aspects of the headland descend gradually to sandy beaches that occur beyond the refuge boundaries. Topography is generally steep with a prominent gully formed from landslides of unstable soils being a landmark in the southern end of the refuge. The central portion of the Cape Meares headland, largely on OPRD lands, is less steep than the north or south portions and is bisected by the roadway to the State Scenic Viewpoint and lighthouse. Two small drainages contain the spring-fed and surface run-off streams mentioned previously.

Ocean bathymetry along the Oregon coast features a series of seamounts, small valleys, channels, and ridges on a multilevel plain. Bathymetric characteristics can be an important indicator of marine bird-habitat associations because they are fixed in space and can produce hydrological processes (Yen et al. 2005). Seamounts are known for their productivity and concentrations of birds (Yen et al. 2004) possibly because of upwellings that can concentrate prey. Upwelling often occurs at sills and ocean floor ridges which can increase prey abundance and availability for seabirds (Hunt and Schneider 1987). Results of another study conducted in Prince William Sound,

Alaska concluded marbled and Kittlitz's murrelets (*Brachyramphus brevirostris)* were clearly associated with bathymetric features that promote upwelling and currents (Kuletz 2005, Stephensen *In review*). These hydrographic features may create accessible concentrations of invertebrates and fish that are lifted into the upper water column (Hunt et al. 1990, 1999; Coyle et al. 1992) and produce "hot spots" where birds aggregate.

3.4 Geology

The refuge landscape has been shaped by water, wind, plate tectonics and millions of years of volcanic activity. A volcanic island chain collided with North America about 50 million years ago and formed many of the scenic headlands, rocks, reefs, and islands along the coast. The Cape Meares headland is composed of solid basalt which was uplifted in the Tertiary Period approximately 65 to 1.8 million years ago. In addition, sediments that have accumulated in the coastal zone contain marine fossils that help explain the formation and origin of the unique geology of the area.

Approximately 66 million years ago, during the Cretaceous period, volcanic (Roseburg Volcanics) activity created offshore islands in the southern portion of the current Coast range. The northern portion of the range was created by Siletz River Volcanics. Lastly, a series of basalt flows from the Columbia River basalts also added to these formations with some smaller flows in-between. Pillow basalt formations were created when a hot basalt flow rapidly cooled upon meeting the salt water of the ocean. These offshore deposits were then pushed into the continental plate as a forearc basin rotating slowly over millions of years. This tectonic collision forced the basalt and newer sedimentary rock formations (including marine terrace deposits) upward and created the coastal range. Additional basalt flows originated from Eastern Oregon and added to the layers that were uplifted, as the newer Cascade Mountains had not yet been formed. By the early Oligocene period 36 million years ago, the current coastline was in place and erosion has continued to shape the range primarily through rivers cutting deep valleys through the igneous and sedimentary rocks (Orr et al. 1992).

The geologic boundaries of the coast range formation extend from southwest Washington to the Coquille River, where the older and taller Klamath Mountains begin. In the east, the mountains begin as foothills forming the western edge of the Willamette Valley and continue west to the coastline and beyond where the basalt formation tapers off into the continental shelf and ends at the continental slope with several banks and basins offshore (Orr et al. 1992). Physiographically they are a section of the larger Pacific Border province, which in turn are part of the larger Pacific Mountain System physiographic division.

3.5 Soils

Cape Meares and the coastal headland soils range from shallow to moderate in depth, are well drained, and are derived from sedimentary sandstones and or siltstones. The majority of the rocks and reefs are generally devoid of soil and vegetation. The islands have varying accumulations of soils on top which often support permanent coverings of low-growing coastal-type vegetation, ranging from extremely sparse to quite dense. Soil data are limited since reconnaissance studies have not been conducted on the refuge to determine soil type and distribution. The Crook Point headland is dominated by a generally barren, windblown landscape of flat to gentle slopes approximately 100 to 200 feet above sea level. The Coquille Point headland

is relatively flat and when acquired by the Service this headland was devoid of topsoil due to past construction disturbance. It has since been restored with imported topsoil and some native plantings. The bluffs below the headland are classified as steep coastal erosion bluff habitat.

3.6 Environmental Contaminants

Few contaminant studies have been conducted on the refuges and the majority of collected data were obtained during the 1970s and 1980s. Pollutants in Oregon seabirds have not been systematically studied; however, one study was conducted in 1979 (Henny et al. 1982). The purpose of this study was to determine organochlorine burdens in seabird eggs, measure eggshell thickness, evaluate the importance of the residues and eggshell thickness detected, and compare results to the same species at other locations. A single egg was collected at 62 nests of 10 seabird species and analyzed for organochlorine contaminants (PCB and DDE). Eggshell thickness was measured for each egg. Six of the ten seabird species had less than 1 ppm (part per million) geometric mean concentration of DDE and seven species showed geometric means of PCBs less than 1 ppm. One shorebird (snowy plover, C*haradrius alexandrinus)* also had a geometric mean of less than 1 ppm concentration of DDE and PCBs. Double-crested cormorant, Leach's storm-petrel, and fork-tailed storm-petrel were the most contaminated, with concentrations greater than 1 ppm. The fork-tailed storm-petrel samples had the largest residue concentrations of 12 ppm DDE and 5.1 ppm PCBs. In all species except the fork-tailed storm-petrel, the residues were generally low, and concentrations are below estimated thresholds that may affect the species examined. The single fork-tailed storm-petrel egg was in the critical range and indicates further research is needed for that species. Eggshell thickness data can provide important supplementary information when DDE is of concern. Keith and Gruchy (1972) and Lincer (1975) reported that 18-20% shell thinning may result in reduced reproductive success. Eggshell thinning of the 1979 samples did not approach the 18-20% range and all samples had greater thickness compared to data collected in the 1950s (Henny et al. 1982).

Seabirds along the Pacific coast have great potential to be exposed to contaminants from oil spills, chemical releases, pesticide use, and other general sources. Oregon has experienced large die-offs of pre and post-fledging juvenile common murres occurring from July to October. These die-offs of juvenile common murres occur almost annually and infrequently die-offs of adult murres have occurred during the summer months, the causes of the mortality events are unknown. Several beach transects near Newport, ranging from 4.4 to 7.5 km in length, were monitored for many years to document mortality events and one beach transect has been monitored continuously year-round from 1978 to present. Observations found that murre carcasses can exceed 1,000 individuals on a 7.5 km stretch of beach per year (Bayer et al. 1991). Numerous carcasses of juvenile and adult common murres have been sent to the USGS National Wildlife Health Center in Madison, Wisconsin for analysis. The cause of these mortality events remain unknown, however, necropsies results indicate poor body condition, emaciation, no fat and no food items in the digestive system suggesting starvation (USFWS unpubl. data). The highest mortality occurs prior to fledging of juvenile murres when they are still dependent on the adult male parent at sea. Forage fish populations sustaining these birds may disappear locally and neither the juvenile murre nor the attending adult male can fly to seek forage elsewhere. The lack of forage fish and the stress of swimming long distances to seek prey can result in starvation and death. In 1995, Service personnel collected common murre father/chick pairs at sea near Newport to determine if contaminants and biotoxins played a role in the annual common murre mortality events. Results of this study indicated that there did not appear to be any immediate life threatening

abnormalities in inorganic and organic concentrations measured. However, the condition of the birds and the concentrations of various potentially harmful chemicals detected in tissues indicate that the birds were experiencing cumulative stressors, which ultimately contribute to their poor health and increase susceptibility to pathogens and mortality. A 1969 study found body weights of dead common murres were significantly lower than healthy birds collected during a die-off period. Necropsy of the emaciated dead birds suggested drowning was the proximate cause of death and all DDE and PCB levels were considerably less than reported lethal concentrations in other bird species, however, environmental stress may have been sufficient to contribute to mortality (Scott et al. 1975).

Double-crested cormorants were collected on Hunters Island in 1992 (Kiff 1994) and 1993 (Buck and Sproul 1999). Eggs were collected at Hunters Island to serve as a reference site for studies being conducted in the Channel Islands in California (Kiff 1994) and the lower Columbia River (Buck and Sproul 1999) where contaminant levels in double-crested cormorants were known or suspected to be elevated. Eggs were analyzed for the presence of DDT and transformation products, PCBs, dioxins, and furans. Concentrations of DDT and DDE were present in Hunters Island eggs but at significantly lower concentrations than in eggs from the lower Columbia River cormorants (Buck and Sproul 1999). Eggshells measured from Hunters Island by Kiff (1994) were thicker compared to eggshells from the lower Columbia River, indicating these birds experience little or no effects from DDE exposure. Few PCB congeners were above detection limits in Hunters Island eggs. Likewise, all dioxin and furan congeners tested were below detection limits, whereas these compounds were elevated above effects-thresholds in eggs of lower Columbia River cormorants (Buck and Sproul 1999). Overall, organochlorine contaminants in eggs from Hunters Island cormorants were insufficient to impair reproduction or cause mortality.

3.7 Surrounding Land Uses

There are no large cities on the Oregon coast, mainly due to the lack of deep commercial harbors with access to the inland agricultural and metropolitan areas. The largest population area on the South Coast consists of the bordering cities of Coos Bay and North Bend, with a population of approximately 25,000 people. On the north coast the population centers are the cities of Newport and Astoria (approximately 10,000 each). The relative isolation of the coast from nearby large population centers of Portland, Salem, and Eugene has given the coast a reputation for being somewhat rustic, being a mixture of old logging towns, fishing villages, seasonal resorts, and artists' colonies. Tourism, commercial fishing and logging are the major industries on the coast.

3.7.1 Land development

The Oregon coast offers breathtaking scenery, mild temperatures and climate, wide open spaces, outdoor recreational activities, and many other desirable features that attract people from all over the world. Oregon coast real estate has become a popular commodity and many coastal lands are being or have already been developed into vacation resorts, commercial property, and residential communities. New residential subdivisions and other developments have emerged along the coast at a rapid rate in the last 20 years. Many new residential communities are in close proximity to the ocean and structures are being built near water's edge. Building structures and development continue to encroach upon the remaining undeveloped lands and threaten biological resources.

3.7.2 Logging

The logging industry began in the Pacific Northwest at the beginning of the twentieth century and has been a dominant industry in Oregon's economy. Many old-growth forests have disappeared and the resources associated with the habitat have frequently declined as a result. Refuge lands are protected; however, forested areas surrounding Cape Meares NWR have undergone extensive logging and development during the past century.

From 2002 through 2007, Oregon's timber harvest averaged 4 billion board feet (Oregon Department of Forestry). Over the last two decades timber production has declined by 30-50% in all coastal counties, with the sole exception of Clatsop, where timber production has increased. Yet the coast remains one of the largest producers of timber in Oregon; in 2002, the coast accounted for more than a quarter of all timber production in the state.

3.7.3 Agriculture

Agriculture is important along the Oregon coast and thousands of acres of farmland are in close proximity to the refuges. In 2001, gross farm sales on the Oregon coast totaled more than $175 million (Oregon Agricultural Information Network 2001). Dairy products brought in nearly $95 million in sales, which is more than one third of the state's dairy production. Tillamook County alone produces $85 million in dairy products annually (OAIN 2002). Farms on the south coast, in Curry County, account for 90% of the Easter lily bulbs (Curry County website) and in Coos County, 35 million pounds of cranberries are produced near the city of Bandon (Nakano 2002).

3.7.4 Recreation

Millions of people annually visit Cape Meares NWR, the Coquille Point Unit of Oregon Islands NWR, Yaquina Head, Cape Arago and other viewing areas or parks along the Oregon coast. Along the entire Oregon coast, outstanding natural, scenic, cultural, historical, and recreational sites for education and enjoyment are available to the public. All land within 16 vertical feet of the average low tide mark belongs to the people of Oregon and guarantees the public has free and uninterrupted use of the beaches along Oregon's 363 miles of coastline (Oregon Shores Conservation Coalition website). Locals and visitors can find a large number of private and state owned campsites with access to Oregon's beaches. The Oregon Parks and Recreation Department administers 19 parks on the north coast, 37 on the central coast, and 28 on the south coast (OPRD website). The refuge works cooperatively with OPRD to maintain wildlife viewing structures, interpretive facilities, and lands for the benefit of present and future generations.

3.8 Global Climate Change

A continuously growing body of scientific evidence supports the theory of global climate change. During the 20th century, the global environment experienced variations in average worldwide temperatures, sea levels, and chemical concentrations. Global air temperatures on the earth's surface have increased by 1.3°F since the mid 19th century (Solomon et al. 2007). Eleven of 12 years from 1995 to 2006 are the warmest on record since 1850 (IPCC 2007).

During the next 20-40 years, the climate of the Pacific Northwest (PNW) is projected to change significantly. Global climate models project mid-21st century temperatures in the PNW that are

well outside the natural range of temperature observed in the 20th century. They also suggest important changes in future precipitation: nearly all the climate models project wetter winters and drier summers in the 2020s through the 2040s (Mote et al. 2003).

3.8.1 Sea level rise

The National Wildlife Federation engaged sea-level rise modeling expert Jonathan Clough, of Warren Pinnacle Consulting, Inc., to simulate how sea-level rise during this century would affect coastal habitats in 10 areas in Puget Sound as well as the Pacific Coast from northwestern Oregon to southwestern Washington. One of the sites included in this report was the mouth of the Columbia River. While there have been several past studies of sea-level rise in the Pacific Northwest, this study provides the most comprehensive and detailed analysis to date of the potential impacts of sea-level rise on the region's coastal habitats.

The model used for this analysis is called Sea Level Affecting Marshes Model, Version 5.0 (SLAMM 5.0), which was designed to simulate the dominant processes involved in wetland conversion and shoreline modification under long-term sea-level rise. The model integrates information about projected global sea-level rise with area-specific NOAA tidal data, detailed wetland information from the Service's National Wetlands Inventory, regional Light-imaging Detection and Ranging (LiDAR) data, and USGS Digital Elevation Maps to project habitat changes associated with sea-level rise. The study maintains that global average sea level increases could increase by an average of 0.28 meters (11.2 inches) by 2050 and by 0.69 meters (27.3 inches) for the study locations in the Willapa Bay, Columbia River, and Tillamook Estuary (Glick et al. 2007). The impacts of these changes to Oregon's coastal ecosystem include a projected increase in ambient temperature, more frequent and intense wildfires, changes in stream flow and freshwater systems, and rising sea levels that will inundate coastal areas (Alley et al. 2007, Westerling et al. 2006).

The potential large-scale impacts of global warming on the Pacific Ocean and nearshore environment include increase in sea-level and sea-surface temperatures; changes in salinity, alkalinity, wave and ocean circulation patterns and upwelling; and loss of coastal marshes, estuaries and ocean beaches (National Wildlife Federation 2007). The consequences of these changes to Oregon's marine environment include direct loss of habitat through coastal inundation and flooding, changes in species biogeography, including species of marine wildlife (e.g., phytoplankton, krill, forage fish, seabirds, pinnipeds) and invasive species (e.g., animals, plants, microbes and pathogens).

Radically different weather patterns influence wind and ocean currents that precipitate seasonal upwellings. The upwellings bring nutrients into the photic zone, stimulating plankton blooms close to the surface. These upwellings have been inconsistent over the last 10 years (Defenders of Wildlife 2006). During this time, large numbers of seabirds, including species not typically part of the standard annual dieoff, have washed up on the Oregon beaches, apparently casualties of shifts in the California Current's primary productivity (Johnson 2007). The system is primed to be warm and somewhat unproductive, which translates in less food for piscivorous (fish-eating) and planktivorous bird species (Lawler et al. 2008). In extreme events of change in upwelling, there is the potential of increased dead zones where low oxygen levels in ocean waters will inhibit most forms of marine life (Barth et al. 2007).

3.8.2 Potential changes to refuge habitats

There have been no specific studies documenting potential affects to refuge habitats from future climate change. However based on the various climate modeling scenarios for the Pacific Northwest, there are several potential problems that are envisioned by the refuge planning team. One of the main concerns is potential loss of available nesting and roosting areas for pinnipeds and seabirds. Large concentrations of harbor seals, California sea lions, Steller sea lions, and northern elephant seals use refuge lands to rest and breed, and an estimated 1.2 million seabirds breed on the Oregon Islands and Three Arch Rocks NWR (Naughton et al. 2007). Under the modeling done by the National Wildlife Federation Study, the sea level could rise almost a foot by 2050. This could cause significant loss of surface area on rocks and islands, and subsequent competition for available areas would cause wildlife displacement, abandonment, reduced breeding success, and increased bodily stress. Another potential loss of habitat would occur from the increased intensity of storm/wave events resulting from higher sea levels as well as precipitation, both of which could erode soil and vegetation and eliminate burrow-nesting habitat.

Numerous other changes to the refuges' habitats and wildlife would likely result from increases in ambient temperature and precipitation over the next 50-100 years. However, until a more detailed analysis of the effects of global climate change can be completed on specific refuge units, more generalized modeling will continue to be used to assess how and what the Complex should do to prepare for upcoming changes to the natural environment. While this management plan is intended to cover a 15-year time span, it is clear that for the Complex to adequately plan for climate change, it will have to look further into the future. During the 15-year time span of this management plan, the Complex will be monitoring changes in conditions and using adaptive management to properly manage, conserve and perpetuate the unique wildlife and habitat with which it was entrusted.

3.9 Environmental Consequences

This section provides an analysis of the environmental consequences of implementing the alternatives described previously in Chapter 2. Impacts are described for the physical aspects of the environment described in this Chapter. Both adverse and beneficial effects of implementing each alternative are described, as are the cumulative effects.

3.9.1 Summary of effects

Table 3.1 provides an overview of the effects under each alternative by indicator. Effects are described in terms of the change from current conditions. Thus Alternative 1, the no-action alternative (current management), has a neutral effect because no changes to management programs would occur under this alternative. Although the analysis shows that none of the alternatives would be expected to result in significant effects, some positive (beneficial) or negative effects are expected. To interpret these terms, "intermediate" is a higher magnitude than "minor," which is of a higher magnitude than "slight." The word "neutral" is used to describe a negligible or unnoticeable effect compared to the current situation.

Table 3.1 Summary of Physical Environment Effects under CCP Alternatives.

Indicator	Alternative 1	Alternative 2
Visual Quality	Neutral effect.	Neutral effect to slight negative impact initially from additional facilities; long term minor positive effect.
Effects to Wilderness Characteristics	Neutral effect	Intermediate positive effect due to increased invasive plant and animal species control, inventory, and monitoring efforts. Minor positive effect resulting from increased law enforcement efforts.
Hydrology	Neutral effect.	Slight positive effect resulting from collaborative studies to better understand and manage local hydrology.

3.9.2 Physical Environment Effects

Topics addressed under the physical environment section include direct and indirect effects to visual quality, wilderness characteristics, and hydrology. The criteria used in this document to determine if a particular impact represents a significant adverse effect are present below for each topic:

- **Visual Quality** – A proposal that would substantially alter the natural landform, or block public view to a public resource from designated open space or public roads, would be considered a significant adverse effect on visual quality. Analysis and discussion of effects to visual quality are necessarily from the human perspective.

- **Wilderness Characteristics** – A significant adverse effect to the wilderness characteristics of the Oregon Islands and Three Arch Rocks Wilderness Areas would occur if visually intrusive alterations and physical changes to the environment resulted due to management actions proposed under Alternative B. Also, certain public activities would cause significant adverse effects to the wilderness character if not monitored, regulated, or prohibited.

- **Hydrology** – Impacts to hydrology, including water quality and quantity, would be considered significant if the actions would violate any water quality standards or waste discharge requirements, substantially increase downstream or ocean sedimentation, introduce contaminants (nonpoint source pollution) into the ocean, watershed or stream, or substantially alter water quantity.

3.9.2.1 Effects to visual quality

Neither of the alternatives is expected to have more than slight effects on visual quality (i.e., scenery). Alternative 2 may result in a very minor negative effect on visual quality of some refuge locations through the installation of new interpretive facilities including kiosks, interpretive panels, signs and viewing decks. However, these improvements would be placed on OPRD lands overlooking refuge rocks and islands and would be designed to enhance visitors' appreciation of the natural and visual resources contained within these areas, resulting in an overall slightly positive effect. Similarly, the installation of facilities including trash cans and pet waste removal stations under Alternative 2 could initially be considered a slightly negative effect on visual quality, but the end result of public usage of these facilities would be a minor to intermediate positive effect for visitors. Installation of boundary signs following the boundary survey proposed

under Alternative 2 could result in a slight negative effect on visual quality in some areas. Finally, both alternatives involve removal of invasive plant species from areas visible to the public, to a greater extent in Alternative 2. This action could initially result in a slight negative effect if the affected area is left bare of vegetation; however, the end result would be a minor to intermediate positive effect when native plants are returned to the site.

3.9.2.2 Effects to wilderness characteristics

Under both alternatives, the Refuge Complex would continue to promote and preserve the wilderness characteristics of Oregon Islands and Three Arch Rocks Wilderness areas by inventorying ecological systems (plant and animal species and communities) and evaluating impacts from internal and external forces on these systems; initiating management actions to control, and where possible eliminate, invasive species to protect native wildlife populations and habitats on islands with the highest potential to sustain irreversible damage to wilderness character from invasive species; avoiding visually intrusive alterations; and working to foster an understanding and appreciation by the public for the importance of wilderness.

Under Wilderness Act implementation guidance, "untrammeled" quality refers to modern human actions that intentionally control or manipulate the components or processes of ecological systems inside the wilderness. The Complex's staff have concluded that maintenance of the untrammeled quality should include removal of selected plants and animals when it is determined that their presence is negatively impacting the wilderness ecological system and processes in a manner that will cause irreversible harm to the native species. A botanical survey and subsequent treatment of invasive plant species, as well as predator surveys and removal, would result in an intermediate positive effect on wilderness characteristics through the re-growth and restoration of native plants and subsequent increased use by native wildlife. This would have a long-term minor to intermediate positive effect on the wilderness characteristics of the affected rocks and islands through the continued viability of nesting seabird habitat.

Wilderness Act implementation guidance states that the "natural" quality refers to wilderness ecological systems that are substantially free from the effects of modern civilization. Alternative 2 proposes more efforts by refuge staff toward working with local residents and commercial properties as well as city, county and state agencies and planning departments, to prevent increased light and noise intrusion into the wilderness as a result of new construction. This coordination would result in a slight positive effect to wilderness characteristics. Increased efforts would be devoted toward actively working with OPRD to locate commercial fireworks displays away from wilderness areas, resulting in a slight positive effect.

Oregon Islands Wilderness and Three Arch Rocks Wilderness are two of only 10 wilderness areas in the country closed to public access, yet the dramatic scenery they provide is highly visible to residents and visitors of the Oregon coast. Like the natural resource values and benefits of these refuges, wilderness values and benefits can also be enjoyed and appreciated from a distance without actually entering the area. The incorporation of wilderness themes and messages into new or updated pamphlets, brochures and interpretive panels, and the inclusion of wilderness information and education in all interagency, volunteer and Friends Group training, would potentially have a slight positive effect on wilderness characteristics if these activities resulted in changes to the public's behavior and attitudes toward wilderness protection.

The presence of structures, installations, habitations and other evidence of modern human presence or occupation is considered to degrade the "undeveloped" quality of wilderness, as does the use of motorized equipment or mechanical transport. Boundary and regulatory signs and interpretive panels on the adjacent mainland and at ports along the Oregon coast would continue to be maintained under both alternatives, resulting in a neutral to slight negative impact initially from the presence of these structures. Maintenance of these signs, and installation of additional signs and similar structures, are actions which carry the potential for degrading the undeveloped quality of the wilderness at the particular location. However, at some locations trespass is a serious and recurring problem, necessitating the placement of boundary and regulatory signs just above the intertidal zone at accessible sites on the rocks and islands. The installation and maintenance of regulatory and other signs and panels near wilderness is expected to have a long term minor positive effect through resulting changes in the public's behavior regarding trespass. In addition, under both alternatives any temporary structures used for wildlife management or research purposes would employ the use of the Minimum Requirements Decision Guide to choose the minimum tool necessary to accomplish the work.

3.9.2.3 Effects to hydrology

Both alternatives are expected to have a neutral effect on the local hydrology, with potential for a slightly positive effect resulting from collaborative studies to better understand and manage local hydrology. There are two small freshwater streams or stream systems on these refuges, Sand Creek within the Crook Point Unit of Oregon Islands NWR, and the small braided streams within Cape Meares NWR. Neither of these streams would be affected by the public uses proposed under both alternatives nor by the additional interpretive facilities proposed under Alternative 2. Additional inventory and monitoring activities proposed under Alternative 2 would have a neutral or slightly positive effect on the hydrology of these two streams, since information gleaned through inventory and monitoring could result in more informed management of both streams. All research activities proposed under Alternative 2 would be subject to the Service's Compatibility Determination process if proposed by an outside entity, or evaluated carefully before initiation by Complex staff, and therefore, research activities would be expected to have a neutral effect on the refuges' hydrology. No changes are proposed to the trail adjacent to the Cape Meares streams.

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Chapter 4. Refuge Biology and Habitat

This chapter addresses the biological environment of the Oregon Islands, Three Arch Rocks, and Cape Meares NWRs, however, it is not an exhaustive overview of all species and habitats. The chapter begins with a discussion of biological integrity; we then focus on the presentation of pertinent background information for the conservation targets designated under the CCP. Background information includes a description, location, condition, and the trends associated with wildlife or habitats, key ecological attributes, and stresses and sources of stress (collectively, "threats") to the target. The information presented was used when the CCP team developed goals and objectives for each of the conservation targets. The biological integrity (601 FW3) analysis section introduces the biological environment by describing the native wildlife and vegetation that occur on the three refuges in comparison to the surrounding landscape. The conservation target identification and analysis section identifies species, species groups, and features the Refuge Complex personnel will actively manage to accomplish biological conservation and restoration. The biological research and monitoring programs section describes techniques and studies and their relationship to conservation targets. In conclusion, the environmental consequences section describes and compares the environmental effects to biological resources associated with implementing management actions prescribed under Alternatives for each refuge.

4.1 Biological Integrity Analysis

The National Wildlife Refuge System Improvement Act of 1997 directs the FWS to ensure that the biological integrity, diversity, and environmental health (BIDEH) of the Refuge System are maintained for the benefit of present and future generations of Americans. In simplistic terms, elements of BIDEH are represented by native fish, wildlife, plants, and their habitats as well as those ecological processes that support them. The Service's policy on BIDEH (601 FW 3) also provides guidance on consideration and protection of the broad spectrum of fish, wildlife, and habitat resources found on refuges, and associated ecosystems that represent BIDEH on each refuge.

The Oregon Islands and Three Arch Rocks NWRs include rocks, reefs and islands in an isolated and protected marine environment. In addition, Oregon Islands NWR includes two coastal headlands with native grasslands, second growth forests, rocky cliffs, and human impacted dunes and bluffs. Cape Meares NWR encompasses one of the few remaining stands of old-growth forest on the Oregon coast. The marine waters, adjacent to or surrounding these three NWRs is not under the jurisdiction or management of the Service.

Human impacts on refuges lands have been limited since refuges are protected from exploitation and development. However, the ecosystem surrounding the refuges has undergone dramatic alteration since pre-settlement times. The most discernible change is the conversion of large portions of coastal areas into residential and commercial lands. Also, the marine ecosystem experiences impacts due to human presence, resource exploitation, and climate change. This summary is not a complete analysis of all factors related to changes in native vegetation, fish, and wildlife. Much of the information presented here is based upon the CCP team's knowledge and existing scientific understanding of the area.

Arial view of development along the coast. (Roy W. Lowe/USFWS)

4.1.1 Coastal lands conversion and development

4.1.1.1 Human population growth

The effects of human-induced stresses on habitat and species of the coastal lands and estuarine systems of the Pacific Northwest have increased due to population growth. As of 2005, Oregon has an estimated population of 3,641,056, which is an increase of 49,693 (1.4%) from the prior year and an increase of 219,620 (6.4%) since the year 2000. The cities of the central Oregon coast have experienced moderate (24-49% increase) to rapid (greater than 50% increase) human population growth rate over a 20-year period from 1980 to 2000 (Achterman et al. 2005). As a result of the population growth, activities such as boating, personal aircraft, surfing, and other recreational activities have increased along the coast. These activities often cause stress, reduced productivity, and increased predation rate to seabirds and pinnipeds associated with the refuge (Rojek et al. 2007, Rodgers and Smith 1997, OPAC 1994). Please refer to section 4.2 for further discussion and detailed descriptions of habitat, associated wildlife, and disturbance factors,

4.1.1.2 Land development

The beautiful Oregon coast offers breathtaking scenery, mild temperatures and climate, wide open spaces, recreational activities, and many other desirable features that attract people from all over the world. Oregon coast real estate has become a popular commodity and many coastal lands are being or have already been developed into vacation resorts, commercial property, and residential communities. New residential subdivisions and other developments have emerged

along the coast at an increasing rate in the last 20 years. Many new residential communities are in close proximity to the ocean and structures are being built near water's edge. Building structures and development continually encroach upon wildlife habitat and in some cases cause increased stress on biological resources (SCBC 2003).

4.1.1.3 Logging

The logging industry began in the Pacific Northwest at the beginning of the twentieth century and has been one of the dominant natural resource extraction industries in Oregon's economy. Many old-growth forests have been logged and the wildlife resources associated with the habitat altered (Maas-Hebner and Schrader 2001). The public now realizes the importance of the old-growth ecosystem and actions have been initiated to preserve these fragile wildlife areas. The establishment of Cape Meares NWR in 1938 ensured that these refuge lands are protected; however, forested areas surrounding Cape Meares NWR have undergone extensive clearcut logging and replanting during the past century.

4.1.2 Marine ecosystem changes

4.1.2.1 Contaminant load

Shipping lanes for cargo ships and large oil transport vessels that carry crude oil to refineries are located along the Oregon coast. These shipping lanes are designated marine highway channels or routes that vessels use near the coastline to avoid marine hazards and are part of the Great Circle Route that ships transit between the west coast and Asia. More than 7,000 ships per year travel the route, almost 20 per day, and the number is growing. With increased vessel presence, the risk of oil spills that can cause devastation to the marine ecosystem increases as well. Large scale marine oil spills that have occurred in Oregon or influenced Oregon resources include: the New Carissa in 1999, the Tenyo Maru in 1991, the Nestucca in 1988, and the Blue Magpie in 1983. The fuel or oil is persistent and remains in the environment for years and causes long-term environmental damage as well as acute and chronic effects to wildlife. In addition, ballast water and other waste dumping from ocean vessels increase contaminant load in the Pacific Ocean (Flagella et al. 2007). Pollution, caused by the transfer and introduction of exotic or foreign aquatic species through the ballast water of ships, threatens the conservation and sustainable use of biological diversity (Bax et al. 2003).

4.1.2.2 Changes to colonial nesting birds

Approximately 1.3 million seabirds, representing 13 species, breed at 393 colonies along the Oregon coast. Current seabird breeding populations for the entire coast of Oregon can be found in Naughton et al. (2007) or are available by contacting the refuge headquarters in Newport, Oregon. The most common seabird species that breeds in Oregon is the common murre with 685,000 individuals or 53% of total breeding population (Naughton et al. 2007). Murres are difficult to census, as numbers on the colony at any one time depend on a host of variables including ocean productivity, nesting chronology, time of day, weather conditions, disturbance events, and tidal conditions (Birkhead 1978, Slater 1980, Rodway 1990). However, the overall health and status of the marine ecosystem can be determined by observing population trends of the common murre since populations are indicative of prey availability, suitable nesting habitat, and overall ocean productivity (Carter et al. 2001). Murres have been termed marine condition "indicator species", a biological species that defines a trait or characteristic of the environment.

Indicator species can be among the most sensitive species in the region, acting as an early warning of changing environmental conditions. Population surveys have been conducted at the Yaquina Head common murre colony at Newport, Oregon from 1988 to 2007 and indicate an upward population trend (Figure 4-1). The population increase at this colony is probably a result of bird immigration from other colony sites that are impacted by bald eagle disturbance (USFWS unpublished data). The murre population at Yaquina Head is increasing; however, the total population in Oregon remains stable and fluctuates annually in correlation with marine ecosystem changes and other factors.

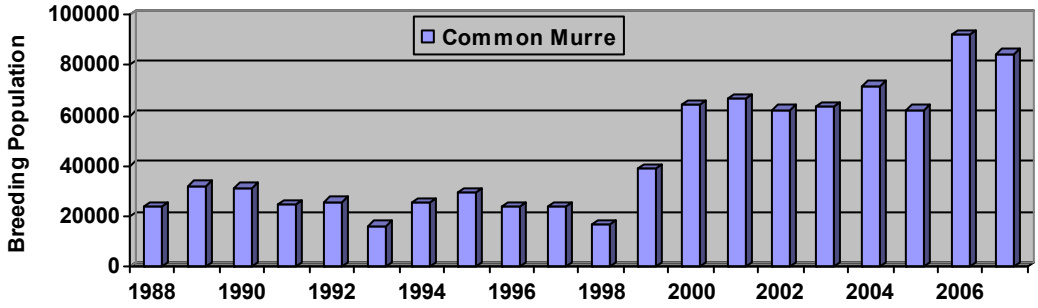

Figure 4-1. Breeding population of common murre at Yaquina Head (1988–2007; USFWS unpublished data).

4.1.2.3 Coastal biodiversity changes

Currently, we are in a state of climate change and global warming that will increase the earth's surface temperature, cause ocean levels to rise due to polar ice melt, change precipitation patterns, cause glacial retreat, and influence ocean productivity and food availability (Defenders of Wildlife 2006, Kuletz et al. 2003, Irons et al. 2008). The climate change effects for Oregon's coastal ecosystem likely include a projected increase in ambient temperature, more frequent and intense wildlife fires, changes in stream flow and freshwater systems, and rising sea levels that will inundate coastal areas (Defenders of Wildlife 2006). Climate induced changes in the California current, driven by wind and climate effects off the Oregon coast, may delay upwelling of nutrient rich waters that will result in a reduction of prey for seabirds and pinnipeds (Lawler et al. 2008, Irons et al. 2008). In extreme events of change in upwelling, there is the potential of increased dead zones where low oxygen levels in ocean waters inhibit most forms of marine life (Barth et al. 2007).

4.1.3 Influx of exotic and invasive species

One of the largest threats to wildlife and habitat of the refuges is invasive plants and pest animals. Invasive plant species displace native vegetation, altering the composition and structure of vegetation communities, affecting food webs, and modifying ecosystem processes (Olson 1999). Introduced native and non-native animal species are usually in direct competition with native wildlife species for food, shelter, and breeding areas and often cause existing native species populations to decline or become extirpated. Ultimately, both plant and animal invasive species can result in considerable impact to native wildlife and the habitat they are dependant upon. For example, introductions of Arctic (*Alopex lagopus*) and red (*Vulpes fulva*) foxes for fur farming purposes resulted in widespread extirpation of breeding Aleutian cackling geese in the Aleutian

Islands, Alaska due to predation (USFWS 1993, Bailey and Trapp 1984). The fox decimated goose populations by preying upon vulnerable nesting adults, chicks, and eggs. The Aleutian cackling geese inhabit refuge lands in Alaska during the summer and Oregon during the winter. Because of cooperative recovery efforts, the Service officially delisted this species from threatened status in 2001 (USFWS 2001). Another example is ice plant (*Carpobrotus chilensis*), native to South Africa, it was brought into the country for bank stabilization and landscaping. This species excludes native dunemat vegetation, stabilizes sand, and displaces native dune plant species such as beach layia (*Layia camosa*), Wolf's evening primrose (*Oenothera wolfii*), and pink sand verbena (*Abronia umbellate brevifolia*; NPS 2001).

4.1.3.1 Invasive plants

Non-native invasive plants on the refuges include gorse (*Ulex europaeus*), European beachgrass (*Ammophila arenaria*), tansy ragwort (*Senecio jacobaea*), Canada thistle (*Cirsium arvense*), and ice plant (USFWS unpublished data; Kagan 2002). This list is not all inclusive and includes only the most problematic species, many other exotic plants have been introduced.

The most aggressive and prolific species on the Coquille Point Unit is gorse. Gorse is native to western and central Europe where it was cultivated as hedgerows, and reserves for livestock forage. In southern coastal Oregon, gorse was introduced by early European emigrants and planted as an ornamental shrub. This invasive non-native plant grew in monotypic stands and became an established exotic shrub in most coastal habitats. This species is extremely competitive, displaces native plants, and impoverishes the soil. In addition, it creates an extreme fire hazard due to oily, highly flammable foliage and seeds, and abundant woody material in the plant's center. The city of Bandon in southwestern Oregon was almost completely destroyed by a fire fueled in part by gorse in 1936. All but 16 buildings out of 500 were completely burned to the ground.

Wide spread infestations of ice plant occur throughout the southern portion of Oregon Islands NWR and along public mainland beach areas. This species stabilizes sand and prevents its natural movement, which most native dune species need to survive. Ice plant is usually associated with disturbed areas and is capable of growing over entire beaches (NPS 2001).

Tansy ragwort, a common wildflower introduced by early pioneers, is native to the Eurasian continent. This species contains many different alkaloids, making it poisonous to animals and can have a cumulative effect (Sharrow et al. 1988). A substantial infestation of tansy ragwort exists on the north side of the riparian area at Cape Meares NWR, predominantly on adjacent county lands. This species also occurs at Crook Point and many islands along the coast.

4.1.3.2 Pest animals

Native and nonnative mammals that have the potential to negatively affect seabird populations and their habitat on the refuges include raccoon (*Procyon lotor*), river otter (*Lutra canadensis*), short and long-tailed weasels (*Mustela* spp.), mink (*Mustela vison*), stripped and spotted skunks (*Spilogale putorius; Mephitis mephitis*), feral cats (*Felis domestica*), dogs (*Canis familiaris*), rats and small rodents (*Rattus* spp.), gray and red fox (*Urocyon cinereoargenteus*; *Vulpes fulva*), and feral livestock (e.g., sheep, goats). Based on observations at the Coquille Point Unit, knowledge of local wildlife and feral animal populations, and a review of scientific literature, the Service and cooperating agencies have identified red foxes, feral cats, rats, and raccoons as having

the greatest potential to negatively impact Oregon's seabird colonies (USFWS 2005a). Predation, particularly by non-native predatory mammal species, has been documented to have devastating effects on nesting seabird populations throughout the world (Kadlec 1971, Jehl 1984, Atkinson 1985, USFWS 1993, Ashmole et al. 1994, Gaston 1994). Predator impacts on seabirds may include direct predation on eggs, young and adults; reproductive failure due to disturbance during nesting season; and detrimental alteration of habitat including destruction of nesting burrows. These impacts can result in complete abandonment of nesting colonies.

Raccoons are opportunistic omnivorous predators that have adapted well to human altered urban and rural landscapes. An increasing population of coastal raccoons can be attributed to easily accessible human supplied or available food sources (garbage cans, compost bins, gardens, outdoor pet food bowls). When available, raccoons naturally feed upon avian and mammalian food resources including seabirds (eggs, young, and adults). In 2006-2007, signs of mammalian predation were documented on Saddle Rock of Oregon Islands NWR. Through direct observations and the use of infra-red photographic techniques, refuge biologists were able to determine that western gulls (*Larus occidentalis*), great horned owls (*Bubo virginianus*), and barn owls (*Tyto alba*), with river otter (*Lutra canadensis*) and raccoon, impact the seabird colony. Biologists concluded raccoons were the primary predator preying upon nesting Leach's storm-petrels (*Oceanodroma leucorhoa*) and eradication efforts were initiated (USFWS 2005a).

A feral cat is a domestic cat that is free roaming, untamed, and un-owned. These cats live and breed entirely in the wild and depend on native wildlife as prey items. Feral cats are often apex predators in local ecosystems feeding on local birds and small mammals. Feral cat predation has been documented to be particularly devastating to colonies of island-breeding seabirds. Keitt et al. (2002) documented annual growth rates of black-vented shearwaters (*Puffinus opisthomelas*) and manx shearwater (*Puffinus puffinus*) to decline approximately 5% for every 20 cats in a population of 150,000 birds on Natividad Island, Baja California Sur, Mexico. Jehl (1984) summarized conservation problems associated with seabirds in Baja California, Mexico, and the Pacific Coast of North America and concluded that feral cats are an important predator of island seabirds, specifically storm-petrels and alcids, including Craveri's murrelet (*Synthlibocamphus craveri*). Feral cats were documented by Moors and Atkinson (1984) to be responsible for killing 1.2 million birds each year on Kerguelen Island in the southern Indian Ocean (USFWS 1993). Ashmole et al. (1994) attribute the decline of shearwaters on Ascension Island in the South Atlantic to the introduction of feral cats and rats. Seabirds nesting on the mainland at Yaquina Head, Oregon, have experienced feral cat predation in the past (USFWS unpublished data).

Feral and trespass cats and dogs can also be a source of disturbance of native wildlife on the refuges. The Coquille Point Unit and Cape Meares receive heavy visitor use annually and it continues to grow. Current wildlife-dependent public uses on these refuges include wildlife observation, photography, interpretation, and environmental education. Dog walking, with animals on leash, is a non-wildlife dependent use that currently occurs on the refuge trail at Coquille Point. An Appropriateness Finding and a Compatibility Determination (CD) have been completed for this use on the Coquille Point Unit and these documents are appended to this CCP (Appendices D and E).

Rats and small rodents of different species are found along the Oregon mainland and likely occur on some rocks and offshore islands. Rats are considered to be a threat to seabirds during all life stages, but especially to eggs and chicks prior to fledging. The potential introduction of rats to the

islands and rocks from shipwrecks is of particular concern. The sailing ships of European explorers provided a mechanism for roof rats (*Rattus rattus*), also known as black rats, to spread rapidly to six continents and thousands of islands (Clark 1981). Roof rats can occupy available vegetated habitats from desert scrub to lush montane forests (Clark 1981). They commonly nest in trees and roof rats can potentially prey upon almost any bird nest (Atkinson 1985). Roof rats are omnivorous with plant foods comprising an average of 80% of sampled stomach contents. However, animal food also occurred in at least 81% of the rats examined on the Galapagos Islands (Clark 1981).

The Norway rat (*Rattus norvegicus*), also called the house rat, sewer rat, wharf rat, brown rat and gray rat, was also introduced into North America by sailing ships from Europe (Timm 1994). The predominantly nocturnal habits of these rats make both their identification and observation of their predatory behavior difficult. Consequently, the incidence of rat predation is probably higher than realized (Atkinson 1985). Even a low frequency of rat predation can have a severe effect if, for other reasons, there are few birds (Bourne 1981, Moors and Atkinson 1984). According to Gaston (1994), introduced raccoons and rats are believed to be responsible for the decline of the formerly very large colony of ancient murrelets at Langara Island, British Columbia. This population has decreased by about 90% over recent decades. Additionally, raccoons and rats are believed to be responsible for population declines of ancient murrelets occupying colonies on Lyell Island, the Limestone islands and islands of Englefield Bay in British Columbia. In all cases, these declines seem to be related to the presence of introduced rats or raccoons. Unless rats and raccoons can be eliminated, or the spread of raccoons can be halted, a high proportion of the population of ancient murrelets may be extirpated within a few decades (Gaston 1994). Atkinson (1985) documented that within a few years of the introduction of rats on Lord Howe Island, Australia; more than 40% of the indigenous bird species became extinct.

Historically, feral sheep and goats have been observed on the mainland adjacent to refuge lands and on islands on the Oregon south coast. Goat Island, on the Oregon south coast, received its name because goats were placed on the island to graze by a Scottish pioneer named George Harris in the late 1880s. In 2006, feral goats were observed at Boardman State Park during a seabird survey and again in 2008 (USFWS, unpublished data). Prior to acquisition in 2000, feral goats were observed grazing at Crook Point (USFWS, unpublished data). Feral goats and sheep could cause damage to wildlife and associated habitat if they were immigrated to or were released on refuge lands. During the colonization period, many islands off the East Coast were cleared of predators and set aside for sheep: Nantucket, Long Island, and Martha's Vineyard were notable examples. Placing semi-feral sheep and goats on islands was common practice in colonization during this period (Anderson 2006).

Red fox are notorious seabird predators and have caused many population declines, and in some cases total eradication, of a prey species from an area. The Service (1993) conducted a comparative study of bird populations on islands in Alaska with and without foxes, and documented that fork-tailed storm-petrels (*Oceanodroma furcata*), Leach's storm-petrels, Aleutian terns (*Sterna aleutica*), arctic terns (*Sterna paradisaea*), ancient murrelets (*Synthliboramphus antiquus*), Cassin's auklets (*Ptychoramphus aleuticus*), and tufted puffins were not present in substantial numbers on islands with foxes. During 2001 and 2002, red foxes caused the failure of seabird nesting on Middle Coquille and Elephant Rocks within Oregon Islands NWR (USFWS, unpublished data). Red foxes were observed loafing near the entrances to the nesting burrows of tufted puffins and pigeon guillemots and in the area of ground nesting

western gulls, Brandt's cormorants and double-crested cormorants (USFWS, unpublished data). Red foxes were also observed eating and burying western gull eggs. During the 2003 through 2008 nesting seasons, no red foxes were observed in the area and nesting western gulls, pigeon guillemots and black oystercatchers successfully bred on the rocks. A number of seabird species, including tufted puffin and Brandt's cormorant which historically bred on Middle Coquille and Elephant Rocks, were observed in the area, but continued to restrict their breeding efforts to islands not accessible to red foxes (USFWS unpublished data). In addition to the loss of valuable seabird breeding habitat, opportunities to observe seabirds like tufted puffins have been greatly reduced due to the presence of red fox.

4.1.3.3 Integrated Pest Management (IPM)

Mechanical, physical, biological, and chemical means have been utilized to combat invasive plants throughout the refuges in accordance with 7 RM 14 (Pest Control policy). Plans to remove, control, and prevent establishment of non-native plant species and treat infestations with IPM techniques are implemented on an as needed basis. Control efforts are planned annually, as staff and funding are available. An insect introduced for biological control for nonnative gorse includes the gorse spider mite (*Tetranychus lintearius*) that was only marginally effective because of predation by other arthropods at Coquille Point Unit. Considerable progress has been made in some areas with infestations of invasive plants being reduced or eliminated by volunteers and refuge staff (USFWS unpublished data).

Control of pest mammals negatively effecting seabird colonies have been implemented at the Crook Point Unit where raccoons have impacted nesting Leach's storm-petrels (A. Pollard, unpublished data). Efforts for the predation management program are guided by the tools and techniques detailed in the Environmental Assessment for Mammalian Predator Damage Management to Protect Seabird Colonies on Oregon Islands National Wildlife Refuge, Three Arch Rocks National Wildlife Refuge, and adjacent mainland areas (USFWS 2005a).

4.2 Conservation Target Selection and Analysis

4.2.1 Conservation target selection

In preparing this plan, the Service reviewed other local, regional, and national plans that pertain to the wildlife and habitats of the Oregon Coast. The Service also sought input from Oregon State conservation agencies, non-governmental organizations, and the general public. The refuge purposes, as stated in the enabling legislation for each refuge (see Chapter 1) were carefully reviewed as was the refuges contribution to maintenance of BIDEH (Appendix J) on the Oregon Coast. As a result of this information gathering and review process, certain species and habitats were identified as resources of concern. From this list of resources of concern, those species and habitats that are most representative of refuge purposes and habitats, BIDEH (Appendix J), as well as other Service and ecosystem priorities, were chosen as priority resources of concern. Examples include the common murre (refuge purposes) for Oregon Islands Refuge, the Vaux's Swift (represents species that utilize old growth Sitka spruce) for Cape Meares, and the Brandt's cormorant (species that nests on the rocks) for Three Arch Rocks. The complete list of priority resources of concern, i.e., focal species and habitat types, for each refuge is also contained within Appendix J. These priority resources of concern are the species and habitats whose conservation and enhancement will guide refuge management into the future. Potential management actions

will be evaluated on their effectiveness in achieving refuge goals and objectives for the priority resources of concern.

Management of refuge focal species and habitats that support them will benefit many of the other native species that are present on the refuges and the Oregon Coast. Many of the species that will benefit from management of the refuge focal species are identified in the "Other Benefiting Species" column in Appendix J. Through the consideration of BIDEH, the refuges will provide for or maintain all appropriate native habitats and species. Refuge management priorities may change over time and since the CCP is designed to be a living flexible document, changes will be made as needed and at appropriate times as identified by refuge personnel.

Note that although migratory birds comprise a major focus of the purpose on the refuges, migratory birds were not designated as a conservation target separately, mainly because migratory birds occupy such a variety of habitat niches. Also, Complex staff members do not attempt to monitor and document the status of many migratory bird species, such as passerines, due to time constraints and work load. Instead, most migratory bird species were grouped or categorized into groups as seabirds and endangered, threatened, or sensitive species (Table 4-1).

Table 4-1. Key habitats or species groups identified during the conservation target identification analysis

System Targets	Nested or Benefiting Resources
Old-growth and late-successional Sitka spruce/ salal forest habitats	All vegetation and wildlife species associated with old-growth forest and late-successional Sitka spruce/salal forest habitats as detailed in Appendix J.
Steep rock cliff and coastal erosion bluff habitats	All vegetation and wildlife species associated with steep rock cliff and steep coastal erosion bluff as detailed in Appendix B but not including seabirds and endangered, threatened or sensitive species.
Stream and riparian habitat	All stream and riparian habitat associated species as detailed in Appendix B but not including seabirds and endangered, threatened or sensitive species.
Headland riparian shrublands	All vegetation and wildlife species associated with headland riparian shrubland habitat associated species as detailed in Appendix B but not including seabirds and endangered, threatened or sensitive species.
South coast headland erosion forblands and dunes	All vegetation and wildlife species associated with south coast headland erosion forbland and dune habitat associated species as detailed in Appendix B but not including seabirds and endangered, threatened or sensitive species.
Rare early successional south coast headland prairie-grassland habitats	All early successional south coast headland prairie-grassland habitat associated species and habitat.
Rocks, reefs, and islands	All vegetation and wildlife species associated with coastal rocks, reefs and islands that extend above the surface of the ocean and are surrounded by water at mean high tide, including nesting and roosting seabirds, wintering waterfowl, and other migratory birds as detailed in Appendix B.
Seabirds	All birds that frequent coastal waters and nest and or loaf on refuge rocks, reefs, islands, and cliffs.
Endangered, threatened, or sensitive species	Species currently present or suspected historically to have inhabited the refuges that are listed as endangered, threatened, candidate, or proposed under the Federal Endangered Species Act, as well as Federal Species of Concern. Target also includes Oregon State-listed threatened, endangered or candidate species but does not include State-listed sensitive species; these are included as nested species under the appropriate habitat targets.

System Targets	Nested or Benefiting Resources
Pinnipeds	All pinnipeds that frequent coastal waters, haulout, and or breed on refuge rocks, reefs and islands.

4.2.2 Conservation target analysis

4.2.2.1 Old-growth and late-successional Sitka spruce/salal forest

Description and Location

Cape Meares NWR provides permanent protection to one of the few remaining old-growth Sitka spruce (*Picea sitchensis*) and late-successional forest habitats on the Oregon coast. The refuge is located along the Three Capes Scenic Route, approximately 10 miles west of Tillamook, Oregon. The 138-acre forested headland consists of Sitka spruce and western hemlock (*Tsuga heterophylla*) with intermittent open areas of forest wind-throw and an understory dominated by salal (*Gaultheria shallon*). The overstory Sitka spruce and western hemlock are very large and some individual trees approach 800 and 195 years in age respectively (USFWS 2004). Oregon's state champion Sitka spruce, the largest known representative of its species in Oregon, is located on Cape Meares NWR. This individual tree stands 144 feet tall, measures 576 inches in circumference and 15.5 feet in diameter, the crown averages 93 feet across (crown spread 90 x 88 feet), and it is estimated at 750-800 years old (French 2008).

Forested communities present at Cape Meares NWR include both Sitka spruce/salal and Sitka spruce-western hemlock/swordfern (*Polystichum munitum*). Neither community is represented in a pure stand which is typical for coastal Sitka spruce forests. There is a tendency for the salal understory to predominate toward the windward or coastal edge of the site and for the swordfern understory to dominate on steep northerly slopes and to the interior of the site. The understory in the community is dominated by swordfern with salal, salmonberry, leatherleaf licorice fern (*Polypodium scouleri*), wood sorrel (*Oxalis oregana*), evergreen huckleberry (*Vaccinium ovatum*), and vine maple (*Acer circinatum*) also occurring in lesser amounts (USFWS 2004).

The Sitka spruce/western hemlock/swordfern vegetation type, once common to the central and northern Oregon coast, remains uncut in only a few isolated areas, including Cape Meares NWR. This community is found on the upper reaches of the cape, usually on more gentle topography on all aspects. The canopy has a more closed appearance than that of the Sitka spruce/salal community. The western hemlock dominates the overstory in actual numbers of trees, but Sitka spruce trees are much larger in diameter. Pockets of extensive blow-down are found in this community, especially on the north slope of the cape. The Sitka spruce/salal community is found primarily as a narrow band atop the ocean cliffs. The key natural process that influences the unique habitat characteristics for this community appears to be intense exposure to salt spray and high winds coming from the ocean. The spruce trees are widely spaced in this community and the understory is dominated by salal (30%-80% cover), and salmonberry (*Rubus spectabilis*; 15% - 30% cover; USFWS 2004).

Condition and Trends

The forest community within the Cape Meares NWR represents old-growth or late-successional forest conditions with representative large downed wood, standing snags, and a variety of age class trees present. The forest on surrounding refuge lands has been harvested by clearcutting,

the majority of which took place 25-30 years ago. Because of adjacent clearcut logging practices, Cape Meares is more exposed to high southerly winds and forest blow-down has increased.

In 1987, the entire refuge, with the exception of the Oregon Coast Trail, was designated a Research Natural Area (RNA) by the Oregon Natural Heritage Program (2003). Within designated RNA's, natural processes are allowed to predominate without human intervention and drive successional vegetative changes. An example of this management at Cape Meares NWR is the 20-acre unit east of the Three Capes Scenic Route that is an early seral stage forest resulting from an almost complete wind-throw of the old-growth forest during a 1981 high-wind storm event. This stand appears to have been largely a Sitka spruce-western hemlock/swordfern stand. This site is one of the very few coastal locations in the Pacific Northwest where timber salvaging of downed old-growth was not conducted following a blowdown event and natural forest regeneration was allowed to occur. However, under certain circumstances such as invasion by non-native plant species (e.g., tansy ragwort), deliberate manipulation may be used to maintain the unique features for which the RNA was established. Because of the refuge's purpose and the RNA restrictions, management of Cape Meares NWR and RNA will focus on protection, preservation, inventory, monitoring and research.

In order to assist settlement after the Civil War, Congress began offering land grants from federally owned land to assist rail and wagon road construction. In 1866, the state of Oregon received a grant that included every other square mile (section) in a 40-mile swath of land stretching from Portland to the California border. Oregon then awarded a private railroad company the land, to sell to settlers, and clear-cutting practices began. The BLM acquired almost 2.4 million acres and the U.S. Forest Service administered several hundred thousand acres. The federal timber sale program began with the post World War II housing boom and within 50 years over 80% of old-growth forest was lost. Logging reached its peak in the 1980s and only several hundred thousand acres remain protected in old-growth preserves. Because land was granted as every other section, it formed a checker board ownership pattern. Several areas have been consolidated over the years as a result of land exchanges, and some large blocks of old-growth forest still persist in Oregon, on BLM land.

Old-growth forests in California, Washington, and Oregon cover about 10.3 million acres. Oregon has almost half of the old-growth acres with about five million acres in seven different ownerships. More than 80% of the old-growth is on federal land, primarily National Forests. Old-growth occupied about half of the forest area when the first comprehensive forest surveys were made in the 1930s and 1940s. Less than 20% of the forest is now old-growth (Bolsinger and Waddell 1993). Future trends of old- growth in the state may change, by proposals developed by federal land management agencies to alter protection for the remaining old-growth forests.

4.2.3 Associated wildlife

4.2.3.1 Migratory birds

Species known to generally occur in old-growth forests within coastal Oregon that have been observed at Cape Meares NWR include marbled murrelet (*Brachyramphus marmoratus*) and Vaux's swift (*Chaetura vauxi*). In addition, northern spotted owl (*Strix occidentalis caurina*) may occur, however, there have been no observations or reports in the past two decades. The late-successional Sitka spruce species include brown creeper (*Certhia americana*), red crossbill

(*Loxia curvirostra*), pileated woodpecker (*Dryocopus pileatus*), and varied thrush (*Ixoreus naevius*). Other species common to the area are bald eagle (*Haliaeetus leucocephalus*), peregrine falcon (*Falco peregrinus*), and numerous migratory songbirds (The Birds of North America Online 2008; USFWS unpublished data). Inventories and monitoring of avian species within this habitat community of the refuge have not been initiated and are needed.

4.2.3.2 Terrestrial mammals

Observations of mammals on the refuge have revealed the presence of a diversity of large vertebrate species including Roosevelt elk (*Cervus canadensis roosevelti*), black-tailed deer (*Odocoileus hemionus*), and black bear (*Ursus americanus*; USFWS unpublished data, USFWS 2004). Carnivores such as coyote (*Canis latrans*), raccoon (*Procyon lotor*), and striped skunk (*Mephitis mephitis*) are frequently observed and an occasional mountain lion (*Felis concolor*) may also forage or range through the refuge (USFWS unpublished data). Seven species of rodents were documented in the old-growth forest habitat during a 1996 study, where Townsend's chipmunk (*Tamias townsendi*) and deer mouse (*Peromyscus maniculatus*) accounted for over 70% of the captured animals, along with Oregon meadow mouse (*Microtus oregoni*), California red-backed vole (*Clethrionomys californicus*), red tree mouse (*Phenacomys longicaudus*), northern flying squirrel (*Glyucomys sabrinus*), and bushy-tailed wood rat (*Neotoma cinerea*; Gomez et al. 1997). Surveys to determine current population estimates for all mammal species within this refuge habitat community have not been attempted, and estimates do not exist and are needed.

4.2.3.3 Herptiles (reptiles and amphibians)

During the 1996 study of small mammal and amphibian abundance at Cape Meares NWR conducted under contract by the Oregon Cooperative Wildlife Research Unit at OSU, five amphibian species were captured in old-growth forest habitat. These species include roughskin newt (*Taricha granulose*), western red-backed salamander (*Plethodon vehiculum*), Ensatina (*Ensatina eschscholtzi*), torrent salamander (*Rhyacotriton spp.*), and long-toed salamander (*Ambystoma macrodactylum*; Gomez et al. 1997). Further inventory is needed in this habitat community to develop baseline population estimates and trends.

4.2.4 Key ecological attributes

Table 4-2 describes key ecological attributes of a functioning old-growth forest and associated indicators. For each indicator, the conditions that would represent "good" or better are shown. Desired conditions stated in the tables are descriptions and information of the listed ecosystem type as outlined by Oregon Natural Heritage Program and Information Center, OSU Institute for Natural Resources (ONHIC 2008).

Table 4-2. Old-growth and late-successional Sitka spruce/salal forest ecological attributes, indicators, and condition parameters*.

Key Ecological Attributes	Indicators	Desired Conditions
Late seral stage Sitka spruce	• Various stages of decay • Large hollow snags • Some trees 300 years old or older • Multiple tree layers	• Decomposing woody material • Snags ≥25 meters tall • Tree/snag densities >18/hectares • ≥60% canopy cover
Salal dominated	• High stem density	• Relatively low open understory and forest

Key Ecological Attributes	Indicators	Desired Conditions
understory	• Multiple floor vegetation layers • Soft loose floor debris	floor • ≥2 feet • Decomposing woody and plant material
Salmonberry forest	• Berry producing shrubs	• 3-5 feet tall
Native plant species	• Total native plant cover • Understory native plant richness	• >70% • Natural succession
Stream and riparian zone habitat	• Streams with medium to steep gradient • Basalt parent geology • Canopy dominated by early-successional red alder	• Step-pool morphology • High percent basalt base • Non-native invasive plants absent

*Not all key ecological attributes or indicators were deemed ultimately feasible or necessary to design an objective around. In addition, while the key ecological attribute identifies a desired condition for most indicators, other factors, such as feasibility and the ability to reasonably influence certain indicators played a role in determining the ultimate parameters and condition levels chosen for each conservation target. Thus the key ecological attributes should be viewed as a step in the planning process but the ultimate objective design was subject to further discussion and consideration.

4.2.5 Threats

A threat or stress is something that destroys, degrades, or impairs a conservation target by impacting a key ecological attribute of that target. In addition, different stresses place varying degrees of pressure on the environmental system, and sources (the proximate cause of a stress) can contribute to more than one stress. Sources contributing to multiple stresses and having high contribution and irreversibility are of major concern and must be addressed.

4.2.5.1 Human activities

Human induced wildfire is a potential catastrophic threat to old-growth forest habitat. The Fire Management Plan (USFWS 2004) needs to be reviewed annually or as needed to ensure that contact information is up-to-date and the responding agencies are familiar with allowable suppression techniques and sensitive areas within the refuge/RNA.

At Cape Meares NWR, illegal activities such as rock climbing, mushroom collection, and general trespass have the potential to cause tremendous disturbance to wildlife, and also have the potential for introduction of invasive plant species into closed areas of the refuge. Boundary survey and posting are necessary to delineate where certain public use activities are permitted and to reduce or eliminate illegal logging or other trespass on refuge lands, and are most critical along the boundary of the refuge/RNA tract on the east side of Three Capes Scenic Route and on the northeastern portion of the refuge adjacent to private and county forest lands.

There are potentially direct impacts from nonfederal forest management practices on species that move between federal and nonfederal forest habitats during the year or during their life cycle. A review of the cumulative effects analysis of spotted owl habitat management alternatives, highlighting the role of nonfederal lands in maintenance of old-growth-dependent amphibian and bird species and their habitats, emphasizes the desirability of partnering with adjacent landowners to maintain and enhance habitat quality on adjacent privately owned forest lands

(USFS and BLM 1994). Maintenance and improvement of habitat on adjacent forest land would also provide a protective buffer from high winds and secondary effects of logging.

4.2.5.2 Edge effects

A specialized range of plant and wildlife species exists and is dependant upon old-growth forest habitat. Some of these species depend on the more stable climatic environment of the forested interior; whereas, others require snags and decaying woody debris often found there. Many species require large unbroken tracts to survive, however, the amount and quality of this habitat has gradually decreased due to logging. As forests are harvested, edges are created. The environmental conditions produced along these edges may modify habitat values that are important to interior old-growth forest dwellers. Habitat disruption and potential loss of landscape-level biodiversity may ensue if interior habitat ecosystems and processes are not sustained. Therefore, preserving sufficient interior habitat is important to protect these species and maintain biodiversity (BCMF and BCMELP 1995).

Plants and animals adapted to the moderate climatic conditions of interior habitat often cannot survive the effects of drying winds and temperature changes that penetrate from edge environments. The depth of influence for air temperature and humidity extended 120-140 meters from a clear-cut edge into an old-growth Douglas-fir forest in southern Washington State. For soil temperature and moisture the range of edge influence was 60-120 meters (Chen et al. 1990).

Edge effects can be positive or negative because some species thrive in the edge habitat while others perish. For example, species such as elk and deer tend to flourish in edge environments because the habitat contains a wide variety of cover and food resources (Nyberg and Janz 1990). Many amphibians require the cool moist conditions of forest floor microhabitats and they may be vulnerable to the drier, warmer, exposed edges between forests and clear-cuts (Davis 1996). Breeding populations of marbled murrelets decline as areas of old-growth forest decrease since this species largely relies on heavily forested areas with large trees having high epiphyte cover (Piatt et al. 2007).

4.2.5.3 Pest species

Urbanization often causes changes in hydrology, increased disturbance, pollution, and the introduction of plants and animals (USFS 2006). All of these changes can lead to an increase in biological invasions and unwanted infestations of introduced plants (Reichard 2004). A substantial infestation of non-native invasive tansy ragwort is spreading and threatening native plants and wildlife habitat on the north side of the riparian area predominantly on adjacent county lands near Cape Meares NWR. In addition, urbanization causes introductions of non-native animal species. Populations of raccoon, feral cat, feral livestock, and rats may increase and cause predation and competition of native wildlife species. See section 4.1 Biological Integrity Analysis section for detailed description of invasive plants and animal species associated with the refuge.

4.2.6 Steep rock cliffs and coastal erosion bluffs

4.2.6.1 Description and location

Areas of steep basalt cliffs and coastal bluffs can be found throughout the Cape Meares NWR and the two headland units of Oregon Islands NWR, Coquille Point and Crook Point. The forested headland of Cape Meares NWR consists of a mosaic of habitats including Old-growth Forest, Headland Riparian Shrublands, Stream Mouth Coastal Riparian, Steep Rock Cliffs and Steep Coastal Erosion Bluffs and Cliffs. The area occupied by these habitats at Cape Meares has not been surveyed and is hard to quantify, but it's estimated that cliffs and bluffs occupy approximately 28.5 acres (USFWS 2004).

The Coquille Point Unit, located within the city limits of Bandon, Oregon, also has sections of steep coastal erosion bluffs. One of the primary purposes for establishing the Coquille Point Unit was to protect and restore the steep coastal erosion bluff habitat for wildlife species dependent upon it (USFWS 1991). Total acreage of bluff areas for the Coquille Point Unit has not been surveyed and is needed.

The Crook Point Unit, is located approximately 12 miles south of the town of Gold Beach, and is an example of southern Oregon's diverse habitat types including steep rock cliffs and coastal erosion bluffs. The steep rock cliffs and coastal erosion bluffs at this unit have not been surveyed; surveys are needed before pursuing specific management actions.

The rock cliff and coastal erosion bluff vegetative characteristics are similar for the Coquille Point and Crook Point Units. The steep rock cliff face areas are generally devoid of vegetation with occasional wind sweep shrubs, succulents and grasses growing from rock fissures. Plant species present on the cliff sides and nearby surrounding headlands and bluffs at Coquille Point include gorse, kinnikinnick (*Arctostaphylos uva-ursi*), shore pine (*Pinus contorta contorta*), plantain (*Plantago lanceolata*), dock (*Rumex spp.*), and rushes (*Juncus spp.*; USFWS 2004). Vegetation inventories and surveys have not been completed at refuge rock cliffs and coastal erosion bluffs, and are needed.

4.2.6.2 Condition and trends

Cape Meares NWR and RNA is managed to maintain and protect the existing steep rock cliff habitat and the old-growth Sitka spruce/salal forest in an "unaltered, natural condition" to support migratory bird and other wildlife populations. In addition to the requirements of management as an RNA, the inaccessibility of the steep cliff habitat at Cape Meares and at Crook Point together with the susceptibility of nesting seabirds to disturbance, make it necessary to implement a hands-off management approach to this habitat type. The condition trend of the steep cliff habitat habitats is generally stable and not impacted by human disturbance.

Other than the limited habitat and wildlife data or observations used to nominate and approve the RNA designation of Cape Meares NWR, existing baseline data and inventory of plants and wildlife species found within Cape Meares NWR and the two mainland units' steep cliff and coastal erosional bluff habitats are currently nonexistent, or inadequate for monitoring trends in these communities.

At Coquille Point Unit, prior to the acquisition of lands by the refuge from 1991 to 1994, invasive gorse and European beachgrass dominated Coquille Point Unit's erosional bluffs and headland habitats. Refuge management efforts in 1994-1995 involved mechanical re-grading of the headland to create a natural vegetated open space buffer and to establish an interpretive trail. Efforts also included importation of topsoil and restoring vegetation with native plant species. Habitat management efforts from 1996-present have involved mowing, fertilizing, and controlling invasive plants. In addition to establishment of headland native plant and soil restoration, Complex staff members initiated invasive gorse control measures along the erosional bluffs and headland habitats using an IPM program of mechanical, biological and chemical treatments. During 2004-2007 extensive infestations (approximately 5-10 acres) of gorse have been removed mechanically and treated with herbicides through a Wildland Urban Interface Grant to reduce the threat of wildland fire and to re-establish displaced coastal erosional bluff and headland native plant diversity (USFWS unpublished data). Continued efforts will be required to reduce the potential of wildland fire associated with highly flammable gorse, and to re-establish low fuel load native vegetation in the bluff habitat for the benefit of wildlife species.

4.2.6.3 Associated wildlife

These steep rock cliffs and coastal erosional bluffs provide nesting habitat for cliff dwelling seabirds and raptors, as well as foraging and shelter habitat for various small mammals and herptiles. Inventory and baseline surveys of many species including mammals, reptiles, amphibians, and invertebrates are lacking due to insufficient staffing and funding. The only wildlife inventory that has been conducted is in the rock cliffs of Cape Meares NWR, that provide nesting habitat for peregrine falcon, pelagic cormorant (*Phalacrocorax pelagicus*), Brandt's cormorant (*Phalacrocorax penicillatus*), common murre (*Uria aalge*), tufted puffin (*Fratercula cirrhata*), rhinoceros auklet (*Cerorhinca monocerata*), pigeon guillemot (*Cepphas columba*), and western gull (*Larus occidentalis).* Current seabird breeding populations for the entire coast of Oregon can be found in Naughton et al. (2007).

4.2.6.4 Key ecological attributes

The CCP team members identified the following as key ecological attributes for a healthy and functioning cliff and bluff system:

Table 4-3. Steep rock cliff and coastal erosion bluff ecological attributes, indicators, and condition parameters*

Key Ecological Attributes	Indicators	Desired Conditions
Very steep or vertical basalt rock faces	• Elevation, mean high tide to higher than 200 feet above sea level • Basalt Rock	• Stable cliff material • Nesting birds • Invasive plants not present
Vegetated and unvegetated ledges	• Pockets of Vegetated Soil • Native vegetation present	• Ledges for nesting birds • Invasive plants not present
Steep rock cliffs	• Very steep, largely unvegetated cliffs of mostly serpentine rock or sandstone with patches of seaside daisy, Pacific sedum and coast eriogonum.	• Nesting birds • Invasive plants not present
Steep coastal erosion bluffs	• Steep, largely vegetated cliffs/bluffs above the ocean with a mixture of grasses and forbs	• Large concentrations of native coastal grasses and forbs

Key Ecological Attributes	Indicators	Desired Conditions
		• >75% native plant species
High levels of disturbance by past human activities	• grading, top soil removal, building construction	• No or minimal human disturbance
Non-native invasive plants actively managed	• Reduced gorse, European beachgrass	• Non-native or introduced plant species absent

*Not all key ecological attributes or indicators were deemed ultimately feasible or necessary to design an objective around. In addition, while the key ecological attribute identifies a desired condition for most indicators, other factors, such as feasibility and the ability to reasonably influence certain indicators played a role in determining the ultimate parameters and condition levels chosen for each conservation target. Thus the key ecological attributes should be viewed as a step in the planning process but the ultimate objective design was subject to further discussion and consideration.

4.2.6.5 Threats

Introduced invasive plants (e.g., gorse, European beachgrass, tansy ragwort, ice plant) are a constant issue along the Oregon coast and within the habitats of steep rock cliffs and erosional bluffs. Refuge management will prevent the establishment of invasive plant species and treat existing or new infestations with IPM techniques using mechanical, physical, biological, and chemical means.

Human induced wildfire is a potential catastrophic threat at Coquille Point Unit due in large part from invasive nonnative gorse. The Fire Management Plan (USFWS 2004) needs to be reviewed annually or as needed to ensure that contact information is up-to-date and the responding agencies are familiar with allowable suppression techniques and sensitive areas within the refuge/RNA.

At the Coquille Point and Crook Point Units, where steep rocky cliffs and erosional bluffs occur, illegal activities such as rock climbing and general trespass have the potential to cause tremendous disturbance to wildlife, and introduce invasive plant species into closed areas of the refuge units. Boundary survey and posting are necessary to delineate where certain public use activities are permitted and to reduce or eliminate trespass on refuge lands.

4.2.7 Stream and riparian habitat

4.2.7.1 Description and location

Cape Meares' forested headland consists of a mosaic of habitats including Headland Riparian Shrublands, Stream Mouth Coastal Riparian, Steep Rock Cliffs, and Steep Coastal Erosion Bluffs and Cliffs. The stream and riparian habitat within Cape Meares NWR and RNA is located in the northeast corner of the northern unit, in an active glacial slide area. Several spring-fed and surface runoff streams flow across this area from the top of the adjacent privately-owned headland, crossing under an early-successional red alder canopy and ending in a 12-foot drop to the beach on a continually eroding bank.

4.2.7.2 Condition and trends

The condition and trend of the Cape Meares NWR's stream and riparian area remains stable. Because Cape Meares NWR is classified a RNA, and the riparian habitat is closed to the general public, the human influences are minimal and land management practices are not implemented. Natural processes are allowed to predominate without human intervention and successional

vegetative changes occur naturally. However, at Cape Meares a substantial infestation of tansy ragwort exists on the north side of the riparian area predominantly on adjacent county lands.

4.2.7.3 Associated wildlife

The large mammal and bird species listed for the old-growth habitat also frequent riparian areas. The 1996 small mammal and amphibian survey at Cape Meares NWR indicated the total capture rate of rodents was highest in the riparian area (Gomez et al. 1997). Townsend's chipmunk, deer mouse, Oregon vole (*Microtis oregoni*), Pacific jumping mouse (*Zapus trinotatus*), and long-tailed vole (*Microtis longicaudus*) were captured in the riparian habitat. Insectivore captures included Trowbridge's shrew (*Sorex trowbridgii*), Pacific shrew (*Sorex pacificus*), marsh shrew (*Sorex bendirii*), and shrew-mole (*Neurotrichus gibbsii*).

Amphibian species richness was greatest in the old-growth and riparian habitat with five species, but total capture rate was highest in the riparian zone at Cape Meares. The species documented include roughskin newt, western red-backed salamander (*Plethodon vehiculum*), torrent salamander, Pacific giant salamander (*Dicamptodon tenebrosus*), and Pacific tree frog (*Pseudacris regilla*; Gomez et al. 1997).

4.2.7.4 Key ecological attributes

The CCP team members identified the following as key ecological attributes for a healthy and functioning riparian system:

Table 4-4. Riparian ecological attributes, indicators, and condition parameters*

Key Ecological Attributes	Indicators	Desired Conditions
Streams with medium to steep gradient	• Good drainage • Seasonal runoff	• Step-pool morphology • Natural flood regime
Native species representation	• Native plant species cover • Early successional red alder	• Greater than 75% Native plant species cover • Non-native or introduced plant species absent

*Not all key ecological attributes or indicators were deemed ultimately feasible or necessary to design an objective around. In addition, while the key ecological attribute identifies a desired condition for most indicators, other factors, such as feasibility and the ability to reasonably influence certain indicators played a role in determining the ultimate parameters and condition levels chosen for each conservation target. Thus the key ecological attributes should be viewed as a step in the planning process but the ultimate objective design was subject to further discussion and consideration.

4.2.7.5 Threats

The area of riparian habitat at Cape Meares NWR is in the remote portion of the refuge and is closed to public access. More than 20 million visitors travel the Oregon coast immediately adjacent to and through Cape Meares NWR on an annual basis. Visitation of Cape Meares NWR will probably increase due to the new state champion Sitka Spruce tree and upgrades at the lighthouse and state scenic viewpoint. The increase in visitation to the champion trees may bring issues of trespass into closed areas and an increase in the potential of non-native plant invasion.

4.2.8 Headland riparian shrublands

4.2.8.1 Description and location

The Crook Point Unit is an example of southern Oregon's diverse habitat types that are associated with a windswept marine terrace headland bordered by relatively undisturbed beaches, small coastal streams, and Sitka spruce forests. The headland riparian shrublands located at the Crook Point Unit are in the northeastern portion of the unit. Plant species associated with the riparian habitat include a mixture of native rushes, Sitka spruce, red alder, willow, and a variety of grasses and forbs.

4.2.8.2 Condition and trends

The Crook Point Unit is designated as a Natural Heritage Conservation Area (ORS 273-586) by the Oregon Department of State Lands, Oregon Natural Heritage Program. To be designated as a Natural Heritage Conservation Area it was determined that the refuge unit has substantially retained its natural character, or, if altered in character, shall in addition to its natural heritage resource values, be valuable as habitat for plant and animal species or for the study and appreciation of the natural features. Since Crook Point Unit is classified as a Natural Heritage Conservation Area and the riparian habitat is closed to the general public, human influences have been and are expected to be minimal. Natural processes are allowed to predominate without human intervention and successional vegetative changes occur naturally.

4.2.8.3 Associated wildlife

Wildlife inventories and monitoring surveys have not occurred at the Crook Point Unit and are needed to understand the significance of the headland shrubland riparian habitat. Due to the undeveloped nature of Crook Point Unit, wildlife is abundant and use the unit's habitats. Migrant songbird species that may breed or roost in this riparian habitat include red crossbills (*Loxia curvirostra*), hermit warblers (*Dendroica occidentalis*), and Swainson's thrush (*Catharus ustulatus*; USFWS unpublished data).

Common mammalian species such as black bear, black-tailed deer, mink, river otter, and bobcat have been observed using the headland and undisturbed portions of the headland shrubland riparian habitat. Found in the refuge's waters of Sand Creek, coastal cutthroat trout, which have been considered a sensitive species by the Service and the State of Oregon, are associated with the unit's lush riparian corridor that is a mixture of native rushes, Sitka spruce, red alder, willow, and a variety of grasses and forbs (USFWS unpublished data).

4.2.8.4 Key Ecological attributes

Table 4-5. Headland riparian shrubland ecological attributes, indicators, and condition parameters*

Key Ecological Attributes	Indicators	Desired Conditions
Headland riparian shrublands	• Stream channel associated riparian corridor with patches of Sitka spruce, red alder, and hooker willow	• 60-70% native plant cover in riparian area
Native species representation	• Native plant species cover • Early successional red alder	• >75% Native plant species cover

		• Non-native or introduced plant species absent
Minimal human disturbance	• Human presence	• No human impacts

*Not all key ecological attributes or indicators were deemed ultimately feasible or necessary to design an objective around. In addition, while the key ecological attribute identifies a desired condition for most indicators, other factors, such as feasibility and the ability to reasonably influence certain indicators played a role in determining the ultimate parameters and condition levels chosen for each conservation target. Thus the key ecological attributes should be viewed as a step in the planning process but the ultimate objective design was subject to further discussion and consideration.

4.2.8.5 Threats

The Crook Point Unit of Oregon Islands NWR offers spectacular coastal views and if opened to the public would be difficult to control due to its remote and rugged location, limited access road, and lack of public use facilities and staff to ensure the safety of visitors. Many of the habitats found on the headland are occupied by rare and fragile plants, making them susceptible to erosion and impacts from public use foot traffic (Kagan 2002). Current management tools necessary for the long-term survival of these fragile plants and habitats, exposed cultural resources, and adjacent sensitive seabird breeding sites include management of the area as a closed biological reserve with no general public use, limited staff guided tours, and well posted access points to control unauthorized entry. The refuge promotes an undisturbed natural environment by excluding public access. Lack of funding and maintenance staff is curtailing habitat management efforts, additional boundary posting, and maintenance of access roads and facilities.

Adjacent to the Crook Point Unit, private lands are currently managed as large forested parcels and grazed grasslands with residential homes interspersed along the scenic bluffs overlooking the majestic Mack Reef archipelago. Cooperative working relationships with adjacent landowners and managers is essential to curbing the threats of wildland fire, non-native invasive plants, feral and domestic animals (e.g., sheep, goats, cows, horses, dogs, and cats) and trespass on refuge lands and resources. Cooperative efforts through programs such as the Service's Partners for Wildlife Program and forest management initiatives would assist adjacent private and public landowners in the management of threats to the unit's biodiversity and rare habitat types.

The presence and extent of invasive plant infestations in this habitat are unknown due to lack of plant inventories and surveys, which are needed. Invasive plant and animal species cause competition and degradation of native species. Efforts to remove, control, and prevent establishment of invasive woody and non-native plant species will be accomplished with IPM techniques using mechanical, physical, biological, and/or chemical means.

4.2.9 South coast headland erosion forblands and dunes

4.2.9.1 Description and location

Coquille Point Unit consists of a headland jutting toward the ocean and overlooking rocks and islands within Oregon Islands NWR. From the point, a beach stretches to the north and another to the south. At the time of acquisition, the bluff portion of the headland was covered with large areas of eroded hardpan soil interspersed with gorse, Scotch broom (*Cytisus scoparius*) and other invasive plants. The northern portion of the property is low-lying stabilized dunes with invasive European beachgrass (USFWS 2004). A small one-acre emergent wetland, formed from ground water seepage from the bluff's base, exists between the bluff and dunes at the unit's north end.

The Crook Point Unit is an example of southern Oregon's diverse habitat types that are associated with a windswept marine terrace headland bordered by relatively undisturbed beaches, small coastal streams, and Sitka spruce forests. Uplifted serpentine and sedimentary layers dominate the soils and geology of the headland with plant communities that have developed on partially stabilized sand dunes or on marine terraces. Within the refuge unit, examples of rare and exceptional habitat types of great conservation concern occur, including coastal headland forblands and dunes. Many of the more common habitats found at Crook Point are not late-successional or unusual, but they are one of the largest remnants of undeveloped areas in southern Oregon (Kagan 2002).

4.2.9.2 Condition and trends

The Crook Point Unit is designated a Natural Heritage Conservation Area (ORS 273-586) by the Oregon Department of State Land's Oregon Natural Heritage Program. To be designated as a Natural Heritage Conservation Area it was determined that the refuge unit has substantially retained its natural character, or, if altered in character, is in addition to its natural heritage resource values, valuable as habitat for plant and animal species or for the study and appreciation of the natural features. The coastal headland forblands and dunes at Crook Point are managed to retain their current state by controlling non-native invasive plants.

The coastal dune habitat at Coquille Point Unit is dominated by non-native European beachgrass. This species displaces native dune species significantly altering the morphology of dune systems (Barbour and Johnson 1977). In 2006, the refuge started a test beachgrass control effort on the northern boundary of the unit to investigate the potential of native plant re-establishment. This habitat is of importance to a suite of dune community plants including pink sand verbena. This extirpated species is listed as endangered by the Oregon Department of Agriculture and is considered a Species of Concern by the Service. Restoration of this habitat and reestablishment of native species at Coquille Point will provide habitat for wildlife and will provide an opportunity for the public to understand the ecology of coastal dunes and restoration techniques.

4.2.9.3 Associated wildlife

No wildlife inventories or monitoring surveys have occurred at the Crook Point Unit and are needed to understand the wildlife significance of the headland forblands and dune habitat. Due to the undeveloped nature of Crook Point Unit, wildlife is abundant and using habitats lost in other areas due to encroaching human presence. Common mammalian species such as black bear, black-tailed deer, mink, river otter, and bobcat have been observed using the headland forblands and dune habitat for foraging and as travel corridors.

Wildlife inventories and monitoring surveys have not occurred at Coquille Point Unit and are needed to understand the wildlife significance of the headland forblands and dune habitat. In contrast to undeveloped Crook Point Unit, there is minimal wildlife use of Coquille Point's habitats due to limited natural habitat onsite, its small size, and encroaching human presence. Common mammalian species such as black-tailed deer, long-tailed weasel, and brush rabbit are rarely observed in headland forblands and dune habitat. These habitats are extremely important as open space for migrant birds and travel corridors for breeding seabirds (USFWS unpublished data).

4.2.9.4 Key ecological attributes

Table 4-6. South coast headland erosion forblands and dunes ecological attributes, indicators, and condition parameters*

Key Ecological Attributes	Indicators	Desired Conditions
South coast headland erosion forblands and dunes	Exposed, windswept marine terrace and partially stabilized sandstone, forbs and low isolated dunes	Stable or increasing
Minimal non-native invasive plants	Tansy ragwort, Canada thistle, ice plant, European beachgrass	Less than 10% invasive species
Native forbs	Beach strawberry, field horsetail, common yarrow, selfheal, western brackenfern, broadleaf lupine, seaside daisy, coastal sagewort	60-70% native plant cover
Minimal human disturbance	Human presence	No human impacts at Crook Point Unit Minimal human impacts at Coquille Point Unit

*Not all key ecological attributes or indicators were deemed ultimately feasible or necessary to design an objective around. In addition, while the key ecological attribute identifies a desired condition for most indicators, other factors, such as feasibility and the ability to reasonably influence certain indicators played a role in determining the ultimate parameters and condition levels chosen for each conservation target. Thus, the key ecological attributes should be viewed as a step in the planning process but the ultimate objective design was subject to further discussion and consideration.

4.2.9.5 Threats

The lands at Crook Point Unit are in a remote location and closed to public access, while lands at Coquille Point Unit are within an urban environment and are designed to manage high levels of human-caused disturbance, and trespass. The Coquille Point Unit is bordered to the east, north and south by residential development within the City of Bandon. The west boundary of the unit is ocean shoreline managed by ORPD which abuts the unit's coastal forblands and dunes. The shoreline has heavy public use for recreation and wildlife viewing. Immediately adjacent to the refuge, illegal driftwood fires occur year-round and the use of illegal fireworks occurs during the Fourth of July holiday, both of which have a high potential for igniting vegetation on the refuge and spreading rapidly into adjacent residential and commercial properties. To reduce the threat of wildland fire, cooperative efforts by the Bandon Rural Fire Protection District and OPRD, result in seasonally posting "No Driftwood Fires" and "Fireworks Prohibited on all Beaches" signs in the area, in addition the refuge's "Fireworks and Campfires Prohibited" signage at all beach access points.

Invasive plants dominate the coastal forblands and dunes at Coquille Point and are minimally present at the Crook Point Unit. Invasive plants cause competition and degradation of native species and in the high levels at Coquille Point Unit they constitute a wildland fire threat. Efforts to remove, control, and prevent re-establishment of invasive non-native plant species could be accomplished with IPM techniques using mechanical, physical, biological, and/or chemical means.

Many of the habitats found on the Crook Point Unit headland are occupied by rare and fragile plants, making them susceptible to erosion and impacts from public use foot traffic (Kagan 2002). The unit is closed to public access; however, lack of funding and maintenance staff is limiting habitat management efforts, additional boundary posting, and maintenance of access roads and facilities.

4.2.10 Rare early successional south coast headland prairie-grasslands

4.2.10.1 Description and location

The 134-acre Crook Point Unit, the second mainland addition within Oregon Islands NWR, was acquired in 2000 and is located along Oregon's south coast approximately 12 miles south of Gold Beach. It is bordered on the west by a coastal beach administered by the State of Oregon, on the south and east by private property, and on the north by Pistol River State Park. Crook Point contains numerous rare plant species, undisturbed cultural resource sites, unique geological formations, and one mile of pristine beach with interspersed rocky intertidal habitat, and serves to protect major seabird colonies.

The Crook Point Unit consists of grassland, meadows, Sitka spruce forest, unvegetated headland, and coastal beach. The top of the headland slopes off to the north into a small watershed and to the west down to the beach. These vegetated grassland slopes are dominated by native red fescue (*Festuca rubra*) as well as other unique plant species including San Francisco bluegrass (*Poa unilateralis*) and Roemer's fescue (*Festuca roemeri*). The red fescue grassland on Crook Point is among the largest and best in Oregon. This area is managed as a biological reserve under the State of Oregon Natural Heritage Conservation Area designation. The Oregon Natural Heritage Program has identified 19 "special status" plant species that may occur on Crook Point. Two rare plants, large-flowered goldfield (*Lasthenia macrantha ssp. prisca*) and beach wormwood (*Artemisia pycnocephala*), have been observed on Crook Point.

An objective of the refuge is to preserve and maintain the native coastal habitats within the Crook Point Unit, for the benefit of rare plants, migratory birds, and other native wildlife. The Crook Point Unit has some small but exceptional examples of coastal grasslands, representing rare and endemic vegetation types that have almost entirely vanished from the Oregon coast. South Coast Headland Prairie-Grassland is unnamed in the National Vegetation Classification System (Grossman et al. 1998) and the Oregon Classification of Native Vegetation (Kagan et al. 2000). The closest existing alliance is *Festuca rubra* coastal headland vegetation that is classified by the State of Oregon as critically imperiled because of extreme rarity, with five or fewer occurrences or very few remaining acres in the state, and is globally imperiled because of rarity, with 6-20 occurrences or few remaining acres worldwide. Romer's fescue (*Festuca rubra*) is found in the South Coast Headland Prairie-Grassland habitat in Crook Point. In addition, this rare early successional South Coast Headland Prairie-Grassland at Crook Point is one of four large populations of large-flowered Goldfields, endemic to Curry County, which is known to occur at only 16 locations along the coast from Brookings to Cape Blanco. This member of the Asteraceae family is listed as a Candidate Species by the State of Oregon and is imperiled because of its rarity, with 6-20 occurrences or few remaining acres.

4.2.10.2 Condition and trends

Crook Point is the narrow headland between the dunes created by the mouth of the Pistol River to the north, and the sedimentary terraces to the south. The point itself is of serpentine origin. The Crook Point headland consists of a mosaic of habitats including grassland, meadows, coniferous forest, rock formations, and barren ground. The western portion of Crook Point is dominated by a barren, windblown, highly eroded landscape of flat to gentle slopes approximately 100 feet above sea level. The history and reason for the barrenness of the area is unclear, but human activities

(e.g., human induced fires, forest management practices, grazing), weather and local geomorphology have likely played a major role. Crook Point is located in one of the windiest locations on the Pacific Coast. During the spring and summer, strong persistent northwest winds sweep the area with gusts sometimes exceeding 50 miles per hour. During the fall and winter, powerful Pacific storms pound the area with wind gusts commonly exceeding 100 miles per hour in the bigger storms. Annual precipitation ranges from 60 to 100 inches. If this barren area was once vegetated it would have taken little disturbance or vegetation removal to initiate serious top soil erosion. Geologic formations and the presence of numerous landslides and slips indicate that the area is highly unstable, and much of the area may be naturally unvegetated. The extreme western tip of Crook Point consists of a rock outcrop that forms a large pinnacle. Numerous seeps and springs can be found throughout Crook Point (USFWS 2004).

At Crook Point the South Coast Headland Prairie-Grasslands are found in areas where harsh coastal weather conditions slow forest invasion, but they will not persist over time, as secondary succession will eventually lead to forest dominating the entire site unless management action is taken to prevent this succession (Kagan 2002). During the period of 2005-2008, limited habitat management efforts, using volunteer labor has been initiated to control woody vegetation encroachment on grasslands. These efforts have included mechanical and manual removal of encroaching Sitka spruce, shore pine, evergreen huckleberry, coyote bush, and wax myrtle.

4.2.10.3 Associated wildlife

No wildlife inventories or monitoring surveys have occurred at the Crook Point Unit and are needed to understand the wildlife significance of the South Coast Headland Prairie-Grassland habitat. Due to the undeveloped nature of Crook Point Unit, wildlife is abundant and using habitats lost in other areas due to encroaching human presence. Common mammalian species such as black bear, black-tailed deer, mink, river otter, and bobcat have been observed using the South Coast Headland Prairie-Grassland habitat for foraging and as travel corridors.

There has been one survey to document the presence of the Oregon silverspot butterfly's (*Speyeria zerene hyppolyta*) obligate host plant, the western blue violet (*Viola adunca*), at Crook Point. The Oregon silverspot butterfly is federally listed as a threatened species. In the spring of 2008, it was determined that there are a minimum of 12 discrete violet locations within the South Coast Headland Prairie-Grassland at Crook Point. Three of these plant locations are in areas managed for woody vegetation control. No larvae of Oregon silverspot were observed in this initial survey, but six of the larger concentrations of *Viola adunca* could possibly support the species or would potentially be suitable habitat for reintroduction of this butterfly (D. and D. Bilderback unpublished data). It remains to be determined if the Crook Point Unit has sufficient plant resources to support this threatened invertebrate species. "Hundreds" of silverspots were observed during a field visit in August 2008 at Cape Blanco, north of Crook Point (USFWS unpublished data).

4.2.10.4 Key ecological attributes

Table 4-7. Rare early successional south coast headland prairie-grassland ecological attributes, indicators, and condition parameters*

Key Ecological Attributes	Indicators	Desired Conditions
Early successional south coast headland grassland	Windswept, gently to moderately sloping with 60-70% cover of native grasses and forbs (e.g., native	• Stable or increasing

Key Ecological Attributes	Indicators	Desired Conditions
	grasses, beach strawberry, western blue violet, field horsetail, common yarrow, selfheal, western brackenfern, broadleaf lupine, seaside daisy).	• 60-70% native plant cover
Minimal non-native invasive plants	• Tansy ragwort, Canada thistle, ice plant, European beachgrass	• Less than 10% invasive species
Minimal intrusion of woody species	• Sitka spruce, shore pine, evergreen huckleberry, coyote bush	• Less than 30% woody species cover
Minimal human disturbance	• Human presence	• No human impacts

*Not all key ecological attributes or indicators were deemed ultimately feasible or necessary to design an objective around. In addition, while the key ecological attribute identifies a desired condition for most indicators, other factors, such as feasibility and the ability to reasonably influence certain indicators played a role in determining the ultimate parameters and condition levels chosen for each conservation target. Thus the key ecological attributes should be viewed as a step in the planning process but the ultimate objective design was subject to further discussion and consideration.

4.2.10.5 Threats

The Crook Point Unit offers spectacular coastal views and would likely be a popular location for wildlife dependent activities if opened to the public. However, due to its remote and rugged location, limited access, and lack of public use facilities and staff to ensure the safety of visitors, allowing public use at Crook Point Unit could result in adverse effects to wildlife and habitat. This is because many of the habitats found on the unit, including South Coast Headland Prairie Grassland, are occupied by rare and fragile plants, making them particularly susceptible to erosion and impacts from foot traffic (Kagan 2002). Thus, the current management approach used for the long-term survival of these fragile plants and habitats is to manage the area as a closed biological reserve with no general public use, allow limited staff guided tours, and post access points to control unauthorized entry.

A minimal amount of invasive non-native plants (e.g., tansy ragwort, Canada thistle, ice plant, European beachgrass) and a suite of encroaching native woody species (e.g., Sitka spruce, shore pine, evergreen huckleberry, coyote bush) are present at Crook Point Unit which cause competition and degradation of rare native species found in early successional South Coast Headland Prairie-grassland. Efforts to remove, control, and prevent establishment of invasive woody and non-native plant species could be accomplished with IPM techniques using mechanical, physical, biological and/or chemical means.

4.2.11 Rocks, reefs, and islands

4.2.11.1 Description and location

Oregon Islands and Three Arch Rocks NWRs include all land mass that extends above the ocean surface and is surrounded by water at mean high tide with the exception of Chief's Island at Gregory Point. Oregon Islands NWR is also a designated Wilderness (Oregon Islands Wilderness) that spans 6 counties and 320 miles of the Oregon coastline from Tillamook Head south to the California border and includes 1,854 rocks, reefs, and islands. Three Arch Rocks NWR is comprised of 3 large and 6 smaller rocks totaling 15 acres and lies a half mile offshore from the community of Oceanside, and is also a designated Wilderness (Three Arch Rocks Wilderness). The total area of all rocks reefs and islands of Oregon Islands and Three Arch Rocks

NWRs is estimated at 373 acres. These two refuges have highly vulnerable wildlife habitats including major seabird nesting colonies, pinniped rookeries, and threatened and endangered species use areas.

4.2.11.2 Condition and trends

Seabirds and pinnipeds spend the majority of their life at sea foraging on marine fishes and invertebrates, and return to land for breeding, loafing, and roosting. The rocks, reefs, and islands associated with Oregon Islands and Three Arch Rocks NWRs provide wildlife habitat that is important for vulnerable adults, young and in the case of seabirds, eggs and young. Nearly 1.3 million seabirds, representing 13 different species (Naughton et al. 2007), and 4 species of pinnipeds, including threatened Steller sea lions, depend on these habitats. Protective measures for pinnipeds include the designation of critical habitat under the Endangered Species Act for threatened Steller sea lions at the two major rookeries in Oregon (i.e., Rogue and Orford Reefs). All rocks, reefs and islands within Oregon Islands and Three Arch Rocks Refuges are closed to public entry to reduce disturbance to wildlife. Management of seabird resources is facilitated by implementation of the Service's Regional Seabird Conservation Plan (2005b). Pinniped resources are managed and protected by the Marine Mammal Protection Act of 1972 by providing undisturbed breeding and haul-out habitat for pinnipeds.

The Steller sea lion was listed as a threatened species in Oregon, and in 1990 critical habitat was designated around the major breeding rookeries including Pyramid Rock on the Rogue Reef Unit and Large Brown Rock on the Orford Reef Unit of Oregon Islands NWR. Critical habitat includes an aquatic zone that extends 3,000 feet out from the shoreline of these rocks into the State Territorial Sea and a 3,000-foot air zone that extends over these rocks (CFR 50, Part 226.202b). Listing as a threatened species and classification of critical habitat extended additional legal protection to Steller sea lions and provided awareness on the status and management concern for these species to ocean users and the general public.

The goal of protecting an undisturbed natural environment on all refuge rocks, reefs and islands is being accomplished by prohibiting public access. Refuge personnel enforce and document trespass violations according to federal regulations (CFR 50, part 26.21). Cooperative law enforcement efforts with state and federal agencies, with limited Service law enforcement efforts for the protection of seabirds, pinnipeds and refuge habitats, have been initiated. In addition, signs and other deterrents to keep the public off rocks, reefs and islands that are accessible at low tide have been developed (see Chapter 5).

The Coquille Point Unit of Oregon Islands NWR has limited wildlife use, and its primary value is providing a buffer zone between residential development within the City of Bandon and the nearshore rocks and islands that provide habitat to sensitive breeding and loafing wildlife (USFWS 1991). These rocks and islands provide habitat to hundreds of loafing harbor seals (Brown et al. 2005) and breeding habitat for thousands of migrating and nesting birds (Naughton et al. 2007). The adjacent islands of Elephant, Middle Coquille Point, North Coquille Point, and Haystack rocks are close to shore and accessible to the public at low tides. These easily climbed islands provide cliff and island top habitat for black oystercatchers, Aleutian cackling geese, peregrine falcons and a suite of seabirds including tufted puffin and brown pelican. As the human population in Bandon and on the Oregon south coast increases, the pressure on refuge resources grows with additional recreational beach use, trespass on refuge islands, illegal driftwood beach

fires and fireworks, and development of adjacent lands for residential homes and hotels with exterior lighting, non-native landscaping, domestic and feral animals, and human-related refuse.

4.2.11.3 Associated wildlife

Colonial seabirds

Nesting seabird colonies are the most distinctive biological feature of the rocks, reefs, and islands. Oregon Islands and Three Arch Rocks provide nesting habitat for 1.3 million seabirds of 13 species including fork-tailed storm-petrel, Leach's storm-petrel, Brandt's cormorant, double-crested cormorant, pelagic cormorant, black oystercatcher, western gull, glaucous-winged gull, common murre, pigeon guillemot, Cassin's auklet, rhinoceros auklet, and tufted puffin. The seabird nesting season on the islands generally extends from March through August. Another seabird bird that frequents the refuges is the endangered brown pelican.

Pinnipeds

The Steller sea lion, California sea lion, northern elephant seal and harbor seal use the rocks, reefs, and islands as haulouts throughout the year.

Reptiles and amphibians

No reptile and amphibian inventories or monitoring surveys have occurred on the rocks, reefs and islands associated with Oregon Islands and Three Arch Rocks NWRs. Anecdotal observations of clouded and Ensatina salamanders have been documented on larger islands (Goat and Hunter islands and Saddle Rock) in the southern portion of the Oregon Islands NWR (USFWS unpublished data).

4.2.11.4 Key ecological attributes

Table 4-8. Rocks, reefs, and islands ecological attributes, indicators, and condition parameters*

Key Ecological Attributes	Indicators	Desired Conditions
Steep, rocky, and precipitous edges	Basalt, metasedimentary, and sandstone	Stable rock fissures and ledges with a variety of aspects.
Non-vegetated without soil or vegetated with soil	Native coastal plants	Non-native invasive plants not present
Native species representation	Native species percent cover	100% native plants
Coastal rocks and islands	Water depth around islands	Land mass exposed at mean high tide
Sanctuary	Secure roosting and nesting habitats for seabirds. Secure haul-out and pupping habitat for pinnipeds. Predation. Impacts from diseases.	Wildlife areas protected from disturbance. Rocks and islands with soil covered by native plant communities. No invasive mammals present and avian predation limited to natural events. Limited or no disease.

*Not all key ecological attributes or indicators were deemed ultimately feasible or necessary to design an objective around. In addition, while the key ecological attribute identifies a desired condition for most indicators, other factors, such as feasibility and the ability to reasonably influence certain indicators played a role in determining the ultimate parameters and condition levels chosen for each conservation target. Thus, key ecological attributes should be viewed as a step in the planning process but the ultimate objective design was subject to further discussion and consideration.

4.2.11.5 Threats

Some of the onsite threats to the wildlife associated with rocks, reefs and islands include human induced disturbance events, invasive species competition with native plants and animals, and predation that causes direct mortality of native wildlife species. A single aircraft or watercraft disturbance event at a common murre colony can cause reduced reproductive output, breeding failure, and abandonment of the colony (Rojek et al. 2007). The presence of an individual mammalian (e.g., climbing human, red fox) or avian (e.g., bald eagle) predator can have serious negative effects on seabird nesting success (USFWS 1993, Rojek et al. 2007). Human disturbance to pinnipeds using the refuge can cause direct mortality of pups, loss of energy resources to resting animals, and disruption of normal loafing activities (Riemer and Brown 1997). The invasion of seabird breeding habitat by non-native plants, such as ice plant and tansy ragwort, may restrict or eliminate burrow-nesting species (e.g., Leach's storm-petrels) from the capability to access or dig nesting burrows (A. Pollard unpublished data). Oil spills in the California Current System have caused significant seabird and shorebird mortality and are the greatest threat to refuge resources (USFWS 2005b, USFWS 2007a).

Many of Oregon's seabird colonies are physically isolated from the shoreline providing a measure of protection from humans and mammalian predators. However, many other colonies are close enough to shore to be accessible to human intrusion during periods of low tides. Predation of seabirds, particularly by non-native red fox and raccoon, has been documented to have negative effects on nesting seabirds on Oregon's south coast (USFWS 2005a; A. Pollard unpublished report). The Oregon coast is experiencing rapid growth in residential, resort and recreational development. As the human population increases and lands are developed there will likely be accompanying increased range expansion and population sizes of predators such as red foxes, raccoons, feral cats, and rats. To reduce predation at seabird colonies where mammalian predators have been determined to be a threat, the Refuge Complex would manage the predation problem using procedures approved in the Mammalian Predator Damage Management Environmental Assessment (USFWS 2005a). In addition, it is expected that with increased illegal activities (e.g., trespass) caused by rapid human population growth on the coast there would be an increased risk of invasive non-native plant species introduction on coastal rocks and islands, thereby altering seabird nesting habitats.

Watercraft approaching too close to the rocks, reefs and islands within Oregon Islands and Three Arch Rocks NWRs can cause serious disturbance to seabirds and pinnipeds and can result in the loss of reproduction, and in some cases, colony or rookery abandonment (USFWS unpublished data). Legal watercraft activities occurring in the marine environment near these islands, such as scuba diving, sport and commercial fishing, bait and shellfish collection, kayaking, and canoeing have a high potential for disturbing wildlife. The need to establish buffer zones to minimize disturbance around waterbird colonies and pinniped rookeries is well documented (Rodgers and Smith 1997, OPAC 1994). The NOAA guidelines request the public and watercraft to remain a minimum of 100 yards from pinnipeds when they are hauled out on shore. All NWRs that support seabird colonies or pinniped haul-out areas strictly regulate or close the area to human entry (CFR 50, Part 26.21). Three Arch Rocks NWR has an enforceable 500-foot watercraft buffer (closure) zone annually from May 1 to September 15 to minimize wildlife disturbance by boaters (Oregon State Marine Board 1994, OAR 250-20-309). The Refuge Complex continues to deploy buoys annually to delineate the Three Arch Rocks closure. This is currently the only watercraft closure zone in Oregon marine waters.

Aircraft overflights lower than 2,000 feet above ground level (AGL) or closer than a quarter- or half-mile have a high potential for disrupting seabirds and pinnipeds. The FAA's aeronautical charts currently request a 2,000-foot AGL vertical clearance over all National Wildlife Refuges; however this is only a request, not a regulation and is regularly ignored by many pilots. The Service does not have jurisdiction over air space above the rocks, reefs and islands of Oregon Islands and Three Arch Rocks NWRs.

Populations of colonial nesting seabirds and pinniped rookeries are extremely vulnerable to the effects of oil or hazardous material spills. To minimize the potential effects of a catastrophic spill in Oregon, the main transportation corridor for crude-laden tankers in the Trans-Alaskan Pipeline Petroleum Trade occurs 30-60 nautical miles offshore. In contrast, numerous small oil tankers, cargo vessels, bulk carriers and barges use the waters near the coast as a transportation route. Any spill from these routes could potentially be devastating to populations of marine wildlife and habitat. In addition, non-point source oil tarballs, or slicks periodically wash up on Oregon's beaches and impact wildlife. Non-point chronic sources may be products of vessels illegally pumping bilges, recreational outboard motors, and improper use of petroleum products in marinas (USFWS 2005b).

4.2.12 Seabirds

4.2.12.1 Description and location

There are an estimated 1.3 million breeding seabirds of 13 species nesting on the refuges 1,854 rocks, reefs, and islands. The Oregon Islands and Three Arch Rocks NWRs primary purposes are the protection and conservation of sea lions and colonial nesting seabirds (Executive Orders No. 4364 and 699). Seabird conservation and management at the Refuge Complex has been extensive over the past three decades despite limited staff and funding. Future efforts will be based upon statistically viable scientific research, combined with long-term monitoring of key species, provided funding is available for these important tasks. Seabirds using Oregon Islands and Three Arch Rocks NWRs represent a group of species that use different foraging guilds in the marine food web (R. Suryan unpublished data). Long-term small scale or localized research using this suite of species as indicators of ocean conditions can be used to document change in the larger marine environment. The need to change or regulate human induced threats to refuge resources will be driven by an understanding of marine ecological parameters that is directly influenced by anthropogenic actions. The refuges' role in increasing this knowledge is key to making informed management decisions with the best scientific information possible. Emphasis of research should focus on understanding the cause of reduced or declining seabird populations and development of tools and techniques to aid recovery of threatened or endangered species (USFWS 2005b).

4.2.12.2 Condition and trends

The Service has conducted seabird surveys along the coast of Oregon from 1966 to present (Naughton et al. 2007). Aerial and boat surveys have been standardized, both in technique and timing (Takekawa et al. 1990, Carter et al. 2001) since 1988 to more accurately census and monitor breeding seabirds. Pelagic and Brandt's cormorants have been monitored to determine population trends, and since 1988, have shown inter-annual variation in numbers, but overall remain stable over the study period (USFWS unpublished data). Common murre population levels have shown

Pigeon guillemot. (Roy W. Lowe/USFWS)

during this time period to be influenced by natural (e.g., levels of upwelling, prey availability, bald eagle predation and presence) and human induced (e.g., oil spills, aircraft and boating disturbance) factors and maybe on the verge of population decline (Naughton et al. 2007; R. Lowe pers. com.). Limited data and qualitative observations indicate that tufted puffin have been in decline in Oregon for more than a decade (Piatt and Kitaysky 2002) and may now represent less that 50% of the population present in 1988 (R. Lowe pers. com.). Common murres, Brandt's and pelagic cormorants have been and will continue to be focal species for these surveys due to the ability of staff to conduct distant aerial or boat observations and/or photography of surface nesters with little or no disturbance. The knowledge is limited concerning the majority of seabirds that nest on the refuges and is needed to determine the status of population levels and trends.

The black oystercatcher is a Service Focal Species for priority conservation efforts due to its restricted population size and range, susceptibility to human-caused disturbances, and lack of baseline natural history and ecological data to assess management actions and conservation status (Tessler et al. 2007). The black oystercatcher is also listed as a species of high concern within national, state, and regional shorebird conservation plans. As an obligate rocky shore species and good keystone species, it has been monitored along the central Oregon coast since 1997 by the Service. Reproductive output during this period has shown a stable population with interannual variability and no significant trend over the study period (USFWS unpublished data). Population declines from increased disturbance and associated nest abandonment may lead to local extirpation on the Oregon coast. To assess the importance of demographic parameters, USGS with the

Service's Ecological Services Division and a suite of other public agencies have developed a research assessment study to understand the ecology of the species in the southern portion of its range and to determine if increased management (e.g., public education, regulations, predator control) is needed for its conservation (Tessler et al. 2007). Because of this species' status as a species of concern, refuge staff will continue to assist the Service's Ecological Services Division and USGS with monitoring population trends.

The ODFW's management responsibilities along the coast including lands and waters, fish and wildlife, threatened and endangered species, and other programs that frequently overlap with Service resources and responsibilities. Increased cooperation between ODFW and the Refuge Complex will assist both agencies in meeting their missions and mandates and provide a more systematic and accessible process for sharing information and expertise, and funding as contained in The Oregon Conservation Strategy (ODFW 2006). Since refuge boundaries stop at the mean high tide line, ODFW and other state agencies are in a unique position to greatly assist the Refuge Complex in protecting sensitive seabirds and pinnipeds from human disturbance in close proximity to the refuges though management actions as described in the Rocky Shores Management Strategy of the Territorial Sea Plan (DLCD 1994). The ODFW and the Refuge Complex share mutual interests in wildlife surveys, documenting and responding to seabird mortality events, developing joint research projects, education and outreach programs, species management, and dissemination of data, results, and information to a wider audience. Working in concert with ODFW is consistent with the policies of Oregon Statewide Planning Goal 19 - Ocean Resources and the Territorial Sea Plan. The Territorial Sea Plan specifies that Oregon should seek co-management arrangements with federal agencies when appropriate to ensure that ocean resources are managed and protected and to cooperate with other states and governmental entities directly and through regional mechanisms to manage and protect ocean resources and uses (DLCD 1994). The potential establishment of Marine Reserves in waters surrounding refuge rocks, reefs and islands by the State of Oregon could add additional protection to refuge wildlife and habitats.

The Refuge Complex and the BLM have been working cooperatively since the early 1980s to protect the wildlife resources of Yaquina Head Outstanding Natural Area (YHONA) and the adjacent rocks within Oregon Islands NWR. Working in close cooperation with BLM over the past two decades has resulted in the protection of existing seabird colonies and the pinniped haulout site, and provided for dramatic population increases in nesting seabirds and the colonization of new sites on the mainland and refuge rocks (R. Lowe pers. com.). Public use of YHONA is extremely high, exceeding 350,000 visitors annually. And, this site is now one of the premier seabird viewing locations in the country; it provides tremendous opportunities for wildlife resource interpretation and environmental education. There is a need for continued close coordination between the Refuge Complex and BLM to share data and ensure that adaptive management of public use and wildlife protection continues to prevent impacts to wildlife using refuge rocks directly adjacent to YHONA.

4.2.12.3 Key ecological attributes

Table 4-9. Key ecological attributes for seabirds*

Key Ecological Attributes	Indicators	Desired Conditions
Species abundance and diversity	• Population levels • Population available for viewing	• Stable or increasing • Large concentrations
Sanctuary	• Secure roosting and nesting habitats • Native plants	• Roosting and nesting areas protected from disturbance • Rocks and islands with soil

Key Ecological Attributes	Indicators	Desired Conditions
	• Predation • Impact from diseases	covered by native plant communities. • No invasive mammals present and avian predation limited to natural events • Minimal avian and mammalian predators • Limited or no disease

*Not all key ecological attributes or indicators were deemed ultimately feasible or necessary to design an objective around. In addition, while the key ecological attribute identifies a desired condition for most indicators, other factors, such as feasibility and the ability to reasonably influence certain indicators played a role in determining the ultimate parameters and condition levels chosen for each conservation target. Thus the key ecological attributes should be viewed as a step in the planning process but the ultimate objective design was subject to further discussion and consideration.

4.2.12.4 Threats

One of the greatest challenges currently facing the National Wildlife Refuge System and fish and wildlife populations in the 21st century is rapid climate change brought about by global warming (Defenders of Wildlife 2006). Oregon's climate is warmer than it was 20 years ago and this trend is likely to continue into the next century. Climate change is a large-scale issue that has and will continue to affect refuge resources in the future. The potential large-scale impacts of global warming on the Pacific Ocean and nearshore environment include increase in sea-level and sea-surface temperatures, changes in salinity, alkalinity, wave and ocean circulation patterns and upwelling, and loss of coastal marshes, estuaries, and ocean beaches (National Wildlife Federation 2007). The consequence of these changes and losses in Oregon's marine environment include direct loss of habitat through coastal inundation and flooding, changes in species biogeography, including marine wildlife species (e.g., phytoplankton, krill, forage fish, seabirds, pinnipeds) and invasive species (e.g., animals, plants, microbes, and pathogens). Although there is no certainty regarding the precise nature and rate of changes to Oregon's marine environment, it is clear that changes in the environment have the potential for serious social, economic, and environmental impacts. The monitoring and research of potential climate change impacts on refuge species and habitats is complex and difficult, and will require cooperation from numerous public and private organizations to analyze all the factors that could affect the region's wildlife and habitat.

Many seabird colonies are located immediately adjacent to the coastline and some are connected to the beach at low tides. Human disturbance impacts to nesting seabirds at these sites are of great concern. The Refuge Complex has initiated and maintained a number of extensive outreach and educational efforts designed to prevent or lessen human disturbance impacts at seabird colonies (see Chapter 5). At some locations such as Yaquina Head, Seal Rock, and Heceta Head, seabird nesting populations have shown significant growth following outreach and education efforts designed to lessen human impacts. Efforts to continue to protect seabirds and pinnipeds on the refuges from human disturbance will need to continue and expand as land development continues to increase and more tourists visit the Oregon coast.

Predation of seabirds, particularly by nonnative and native mammalian predators, has been documented to have negative effects on nesting seabirds on the Oregon coast (USFWS 2005a; A. Pollard unpublished data). Many of the rocks and islands impacted by these mammals are connected or within swimming distance during low tides and are easily accessible to predators.

The Oregon coast is experiencing rapid human growth in residential, commercial and recreational development. As the human population increases and lands are developed there will likely be accompanying increased range expansion and population sizes of predators, such as red foxes, raccoons, feral cats and rats, that find beneficial aspects of human refuse as a food resource and infrastructure that can be used as shelter or breeding sites. In recent years, a reduction in the number of seabirds nesting at some mainland sites has been noted and may be due, in part, to predation by red foxes, feral cats and raccoons, which are often attracted to areas of public use such as Harris State Beach Park and Bandon's waterfront on the south coast and YHONA to the north.

Bald eagles nesting near seabird colonies prey predominantly on seabirds for food (Sherrod et al. 1976, Degange and Nelson 1982). Bald eagles in Oregon have been increasing steadily since the 1970s. The net increase in the Oregon population was 8.9% in 2007, with an average annual increase of 6.9% from 1995-2004. Along the Oregon coast, the nesting bald eagle population increased 17% from 2003-2007 (Isaacs and Anthony 2008). Since 1994, disturbance at common murre and Brandt's cormorant colonies from increasing numbers of bald eagles on Oregon's north and central coast has resulted in colony abandonment, population declines, and redistribution (R. Lowe pers. com.; Naughton et al. 2007). This successfully recovered eagle population is expected to continue a positive growth trend in Oregon and it is unknown what level of influence this increasing population of predators will have on seabird populations and demography. Cooperative research efforts with the refuges, OSU, and Oregon Sea Grant, to quantify the effects of bald eagles on common murre reproductive output at Yaquina Head, were started in 2007. Preliminary results indicate that eagle foraging disturbance was high prior to incubation initiation by the murres (OSU unpublished data). Continuation of this research and expansion to the entire Oregon coast is needed to determine if changes in seabird populations are affected by direct mortality and disturbance, secondary predators (e.g., gulls, ravens) during eagle disturbance events, or immature eagle foraging and loafing patterns. In addition, research should also focus on developing long-term population and range trends for seabird species, such as the common murre, facing impacts from the expanding bald eagle population.

4.2.13 Endangered, threatened, and sensitive species

4.2.13.1 State or federally listed species known to occur on refuges

One goal of the Refuge System is "to conserve, restore where appropriate, and enhance all species of fish, wildlife, and plants that are endangered or threatened with becoming endangered." In the policy clarifying the mission of the Refuge System, it is stated "We protect and manage candidate and proposed species to enhance their status and help preclude the need for listing."

In accordance with the above, the CCP team considered any species with federal or state status in the planning process. Table 4-7 lists the species that are state or federally listed that are known to occur on the refuges. Other state listed species may occur, but have not been documented. Listed species that are suspected to have occupied refuge lands historically are also part of this target. Discussion on the listed species follows Table 4-10.

Peregrine falcon perched on a cliff. (Dave Ledig/USFWS)

Table 4-10. Federal and State listed species known to occur or very likely to occur on Oregon Islands, Three Arch Rocks, and Cape Meares National Wildlife Refuges.

Species	Federal*	Oregon*	Current Occurrence on Refuges
California brown pelican	Endangered	Endangered	Common visitor; roosting on rocks and islands
Black oystercatcher	Species of Concern	Sensitive-Vulnerable	Resident; Breeds on rocks and islands
Marbled murrelet	Threatened	Threatened	Possible breeder in old-growth forest at Cape Meares NWR
Bald eagle	Species of concern	Threatened	Common year-round; forages on seabirds. Nests at Cape Meares NWR
American peregrine falcon	Species of concern	Species of Concern	Common year-round; nests on all three NWRs
Aleutian cackling goose	Species of concern	Species of Concern	Migrant during spring and fall; winters on Haystack Rock at Pacific City
Northern spotted owl	Threatened	Threatened	Formerly occurred on Cape Meares NWR; no reliable observations in decades
Steller sea lion	Threatened	Unknown	Common throughout year; Breeds on Oregon Islands and Three Arch Rocks NWRs

* Federal status of species located at http://ecos.fws/Endangered/wildlife.html
* Oregon status of species located at http://www.dfw.state.or.us/

4.2.13.2 Condition and trends of federally listed species and habitats utilized on refuges

The California brown pelican breeds in southern California and Mexico during the winter and early spring and migrates north to Oregon and Washington where it is common from late spring through fall. In Oregon brown pelicans use refuge rocks and islands as secure roosting sites. It is rarely seen inland or far out at sea as the species forages for small fish in the nearshore coastal waters. The primary reason for severe declines in the U.S. population, and for designating the species as endangered, was DDT contamination in the 1960s and early 1970s. The pesticide DDT and its principal metabolite DDE are not easily broken down and accumulate in the tissues of species at the top of the food chain (USFWS 1983). Since banning of these organochlorine pesticides, brown pelican abundance has shown a dramatic recovery, and although annual reproductive success varies widely, populations have remained generally stable for at least 20 years (USFWS 2007b). Therefore, the Service proposed to remove the brown pelican from the List of Endangered and Threatened Wildlife because it no longer meets the definition of endangered or threatened (USFWS 2008a, USFWS 2008b).

The black oystercatcher is a Service Focal Species for priority conservation efforts due to its restricted population size and range, susceptibility to human-caused disturbances, and lack of baseline natural history and ecological data to assess management actions and conservation status (Tessler et al. 2007). The black oystercatcher is also listed as a species of high concern within the national, state, and regional shorebird conservation plans (USFWS 2000). As an obligate rocky shore species and good keystone species it has been monitored along the central Oregon coast, including below Cape Meares, since 1997 by the Service. Statewide monitoring for this species has occurred since 2005 determining that the south coast has the largest portion of the breeding population (Elliott-Smith et al. 2007). Reproductive output during this period has shown a stable population with interannual variability and no significant trend over the study period (USFWS unpublished data). Because of this species' status as a species of concern, refuge staff will continue to assist the Service's Ecological Services Division and USGS with monitoring of population trends.

The marbled murrelet, a small oceanic seabird that nests in the coastal, old-growth forests of the Pacific Northwest, is listed as a threatened species under the ESA for the lower 48 states (USFWS 1997). The birds were disappearing rapidly from California, Oregon, and Washington as its coastal habitat came under pressure from logging and human development. The three northwestern states marbled murrelet population is estimated at 17,000 to 27,000 and has continued to decline (4-7% per year) and fragment over the last 10 years (McShane et al. 2004). The Canada population is estimated to be between 54,000 to 92,000, and Alaska has approximately 270,000 individuals, and has experienced a 70% decline during the past 25 years (Piatt et al. 2007). The Service identified 3.6 million acres in California, Oregon, and Washington as critical habitat to aid in the recovery process (USFWS 2006). Marbled murrelet surveys in 1989 and 1990 detected this species at Cape Meares NWR and adjacent state park (USFWS unpublished data). The old-growth habitat at Cape Meares is considered potential breeding habitat, but breeding surveys have not occured.

Bald eagles are year round residents of the refuges. They forage over or perch on rocks and islands were they actively pursue and capture seabirds. This activity is most common during spring and summer seabird breeding season. An active bald eagle nest has been present at Cape Meares since 1985 (Isaacs and Anthony 2008). In 1973, the bald eagle was listed as threatened in Oregon (43 FR 6230-6233) and in June 2007 it was delisted in the lower 48 states (72 FR 37345-37372). There are almost 10,000 breeding pairs in the lower 48 states and more than 40,000 individuals reside in Alaska (USFWS 2007c).

The American peregrine falcon was removed from the federal endangered species list in August 1999 (64 FR 46541-46558), and from the state of Oregon list in 2007. The peregrine falcon breeds, loafs, and forages on the coastal habitat found on the three refuges. The Refuge Complex initiated reproductive success monitoring efforts in 1993 at peregrine eyries at Three Arch Rocks and Cape Meares NWRs. In 2004, the monitoring effort was expanded with the inclusion of 15 newly re-occupied south and north coast eyries (USFWS unpublished data). This coast wide nesting success data is combined with state and nationwide efforts to monitor population trends in a national post-delisting monitoring program that was initiated in 2002 (Isaacs 2007, USFWS 2003). Monitoring surveys will be conducted on the refuges every three years and will be added to the national effort that will review the status of the species in 2015.

The Aleutian cackling goose was delisted 2001 and currently uses Three Arch Rocks and Oregon Islands NWRs as foraging and nocturnal roosting habitat. The rocks and islands are important for staging Aleutian cackling geese as they prepare for migration to breeding grounds. Geese occupy the refuge islands mainly from January through April, with peak numbers in March in California and in early April for Oregon (USFWS unpublished data). The unique Semidi Islands subpopulation of Aleutian cackling geese, numbering approximately 140 birds, winters at Nestucca Bay from October-April and uses Haystack Rock at Pacific City as their nocturnal roosting site. The overall population of Aleutian cackling geese has recovered from a low of 790 in 1973 to the current estimated population of 114,000 (USFWS unpublished data).

The northern spotted owl primarily inhabits old-growth forests in the northern portion of the Pacific coast from southern British Columbia to northern California. Historically, the greatest threat to this species is the loss of old-growth and mature late-seral forests that contain large dead trees for nesting and prey habitat. In 1989 and 1990, the Service reviewed its status and proposed listing the species as threatened throughout its range in northern California, Oregon, and Washington (55 FR 26114-26194). Protection of the owl under the Endangered Species Act has led to significant changes to forest practices and land management in the northwest and has curtailed logging in old-growth forest. Currently, there are 3,000 to 5,000 pairs remaining in the states of Washington, Oregon, and California, and the population continues to decline 3.7 percent per year (Nickerbocker 2007). This species has not been observed or reported at Cape Meares NWR for more than several decades, however, the old-growth habitat has suitable characteristics for nesting but likely comprises too small of an area.

The Steller sea lion is divided into the western (Gulf of Alaska, Bering Sea, Russia, and Japan) and eastern (California, Oregon, British Columbia, and Southeast Alaska) stocks based on genetic evidence and population trends (Bickham et al. 1996, Loughlin 1997). The western stock has declined 70–80 percent since the 1970s and was listed as endangered in 1990 (62 FR 24345-24355). The eastern stock, which occurs in Oregon, was listed as threatened in 1990 (55 FR 49204). Suspected causes of the precipitous decline include over-fishing of prey stocks, orca predation, disease, climate change, and human interactions (NOAA 2007a, NOAA 2007b). The eastern stock's total population size was 46,000-58,000 and increasing at 3 percent per year (Pitcher et al. 2007, NOAA 2007c). The Steller sea lion use refuge rocks, reefs, and islands within Oregon Islands and Three Arch Rocks NWRs, as haul out areas year round (R. Lowe pers. com.). The Rogue Reef Unit and Orford Reef Unit of Oregon Islands NWR support breeding rookeries of Steller sea lions and 1,128 pups were produced in 2002 (Pitcher et al. 2007). In addition, small numbers of pups (fewer than 10) are born annually on Seal Rock at Three Arch Rocks NWR (R. Brown pers. com.).

4.2.13.3 Key ecological attributes and threats

Key ecological attributes and threats differ for each listed species, and are not described here in the interest of space. Recovery plans and other species specific documents are the best source for in depth information on these species.

4.2.14 Pinnipeds

4.2.14.1 Description and location

The Oregon Islands and Three Arch Rocks NWRs' primary purposes are the protection and conservation of pinnipeds and colonial nesting seabirds (Executive Orders No. 4364 and 699). Steller and California sea lion and harbor seal haulout on many rocks, reefs and islands associated with Oregon Islands and Three Arch Rocks NWR. Steller sea lions breed and pup at Rogue and Orford Reefs. Harbor seals breed and pup at many refuge rocks, reefs and islands along the Oregon coast. Northern elephant seals haul out and pup (fewer than 15 individuals) on Shell Island within the Simpson Reef Unit of Oregon Islands NWR near Cape Arago.

4.2.14.2 Condition and trends

Results from ODFW and NOAA Fisheries Service studies indicate the Steller sea lions in Oregon are year -round residents and have breeding rookeries at several sites on the refuges. At least 10 haul-out sites are used on a regular basis, with reproductive activities occurring primarily at Orford and Rogue Reefs. An additional small number of pups (fewer than 10) are born each year on Seal Rock at Three Arch Rocks NWR on the north coast (R. Brown pers. com.). Recent counts of Steller sea lions (4,000-5,000) in Oregon have increased from counts made in the late 1970s (2,000-2,500). Annual peak counts occur during the June and July reproductive season. Winter counts range from 1,000 to 1,500 statewide. In 1994, 2,696 adults and juveniles and 423 pups were counted at the two major south coast rookeries (Rogue Reef and Orford Reef). Population estimates using aerial photography in 2002 determined Oregon's Steller sea lion population at 4,169 nonpups and 1,136 pups (Pitcher et al. 2007). Steller sea lions marked as newborn pups on Rogue Reef have been resighted at various ages (6 months-5 years) at haulout areas from northern California through Washington, British Columbia, southeast Alaska, and the eastern and central Gulf of Alaska (NMFS 2008).

Peak counts of California sea lions in Oregon have increased from 1,000-2,000 in the late 1970s to 5,000-7,000 into 2000 (ODFW unpublished data). California sea lions are found in greatest abundance on the south coast of Oregon at Rogue Reef and Orford Reef (500-1,000), at Cape Arago and Sea Lion Caves on the central coast (2,000-3,000), and at Cascade Head and the south jetty of the Columbia River on the north coast (2,000-3,000). Peak number estimates can vary between annual surveys from 100 to 1,000 individuals due to seasonal migration (S. Riemer pers. com.) California sea lion numbers fluctuate seasonally, with peaks occurring in fall and spring as males move north from California breeding sites in the fall and then back south in the spring. Recently, researchers have observed more females than in the past, and in general, the sea lions appear to return earlier compared to historical accounts (ODFW unpublished data). Continuous counts occur at the East Mooring Basin in Astoria, Oregon where branding work occurs.

Historic population levels of harbor seals in Oregon are unknown. The distribution and abundance of harbor seals in Oregon were monitored from 1977 to 2003 by ODFW through aerial photographic surveys. Harbor seals on shore were counted each year during the reproductive period. Mean annual counts of non-pups (adults and subadults) were used as an index of population size and the trend in the counts was modeled using exponential (density-independent) and generalized logistic (density-dependent) growth models. The population grew following protection under the Marine Mammal Protection Act of 1972, until stabilizing in the early 1990s. The estimated absolute abundance of harbor seals (all age classes) during the 2002 reproductive period was 10,087. The current predicted population size for harbor seals in Oregon is above its estimated maximum net productivity level and hence within its optimum sustainable population range. The ODFW speculates that recent increases in ocean productivity in the eastern Pacific Ocean may lead to an increase in carrying capacity and renewed growth in Oregon's harbor seal population (Brown et al. 2005).

Elephant seals are found occasionally in Oregon either resting or molting on refuge rocks, reefs and islands and adjacent sandy beaches. Elephant seals do not generally breed in Oregon, however, there is one pupping site in Oregon at Shell Island near Cape Arago State Park where elephant seals haul-out year-around and pup. The majority of the elephant seals in Oregon observed at locations other than Cape Arago are sub-adult animals that come to shore to molt.

4.2.14.3 Key Ecological attributes and threats

Key ecological attributes and threats, most of which occur off of the refuges, differ for each listed species, and are not described here in the interest of space. Recovery plans and other species specific documents are the best source for in depth information on these species.

4.3 Current Wildlife and Habitat Research and Monitoring Efforts

The National Wildlife Refuge System Administration Act (16 U.S.C. 668dd–688ee), as amended requires the Service to monitor the status and trends of fish, wildlife, and plants on each refuge in the Refuge System. The Oregon Coast Refuge Complex has relatively limited staff but extensive responsibilities managing six National Wildlife Refuges, resulting in insufficient capacity to carry out well-designed population inventories, assessments, and report impacts of management actions. For many species and habitats baseline inventories have not yet been conducted. The Service needs to provide additional staff to address the biological complexity of the Complex's six refuges. The 2008 Staffing Plan Model for the Refuge Complex identifies the need for an additional 21 employees, not including additional law enforcement personnel needs, to effectively manage the six refuges within the Complex. The 2008 Staffing Plan calls for an additional six biologists for the refuge Complex, however, due to budget constraints a single permanent full time biologist continues to coordinate the biological program for the Complex. The CCP Implementation Plan (Appendix G) identifies staffing proposals over the 15-year life of this CCP, for administration of the Complex's various management programs

The Refuge Complex is continuing to conduct boat, ground, and aerial seabird surveys (e.g., cormorants, common murre, pigeon guillemot, tufted puffin, western and glaucous-winged gulls/hybrids, black oystercatcher, small nocturnal burrow-nesting species) along the coast of Oregon (Naughton et al. 2007; USFWS unpublished data). In addition, the Refuge Complex assists

other agencies (NOAA, USGS) in surveying listed or delisted threatened/endangered species (e.g., Steller sea lion, brown pelican, peregrine falcon, Aleutian cackling goose).

Over the past 40 years the Refuge Complex has conducted seabird surveys and continues to standardize the effort, both in technique and timing (Takekawa et al. 1990) to more accurately census and monitor breeding seabirds. Survey methods vary by species, location, size of colony, logistics and personnel/organization conducting the surveys. Surveys are conducted from boats, aircraft, and land. Land or ground surveys are conducted from remote vantage points or from within the colony. In general, four techniques are used: (1) counts of nests, either directly or from aerial photographs; (2) counts of adult birds on or around the colony, either directly or from aerial photographs; (3) sampling to estimate burrow density and occupancy rates, combined with estimates of colony area; and (4) crude estimates of nests, birds, or burrows.

Seabird colony estimates are based on actual nest counts that provide the most accurate information, and this method is currently used on all counts of pelagic cormorants, Brandt's cormorants, double-crested cormorants, and western/glaucous-winged gulls. Direct nest or burrow counts are also employed whenever possible to estimate tufted puffin populations, but their burrow-nesting habits make the results less reliable.

Estimates based on the total number of adults present on the colony are used for those species whose nests are difficult to find and for species that nest in dense colonies, where it is difficult, or impossible, to distinguish breeding from nonbreeding individuals. Pigeon guillemots and black oystercatchers are often quite conspicuous around nesting colonies, but their actual nest sites are difficult to locate. Common murre nest in large, dense colonies and estimates of colony size for this species are based on counts of adult birds on the colony (from aerial photographs), adjusted by a correction factor, to account for breeding birds away from the colony and non-breeding birds in attendance.

Burrow-nesting species are the most difficult to survey and colonies are directly sampled to estimate burrow density and occupancy rates. The area of the colony is estimated in the field or from aerial photographs. Density of active burrows is combined with estimates of colony area to generate colony estimates. Protocols and procedures have not been standardized for burrow-nesting species even though they comprise 38% of the 1.3 million seabirds that nest along the Oregon coast (Naughton et al. 2007). The Refuge Complex has begun investigations to determine methods for monitoring small nocturnal burrow nesting species (e.g., Leach's and fork-tailed storm-petrels, rhinoceros and Cassin's auklets), but much work remains to be done.

Major roosts of federally listed threatened brown pelican are found on Oregon Islands and Three Arch Rocks NWRs and other estuaries managed by the Refuge Complex. At Oregon Islands and Three Arch Rocks NWRs, monitoring efforts to assist in the recovery of this species started in 1987 (R. Lowe pers. com.). Annual aerial counts during the fall at coastal rocks, reefs, islands and estuaries have documented a positive population trend of roosting pelicans from 4,622 in 1988 to 18,589 during the 2007 survey (USFWS unpubl. data). Continuation of these annual aerial surveys will assist the Service in determining if the California brown pelican population is recovered to the level of delisting under the Endangered Species Act (Act) (USFWS 1983). If this species is delisted, section 4(g)(1) of the Act requires the Service to implement a plan to effectively monitor the status of all species that have been recovered and delisted. To assist in these recovery

efforts, the continuation of annual monitoring efforts will document the population numbers of Pelicans along the coast of Oregon during the tenure of this CCP.

The recently de-listed peregrine falcon breeds, loafs, and forages on the coastal habitat found on all three coastal refuges. The Refuge Complex initiated reproductive success monitoring efforts in 1993 at peregrine eyries at Three Arch Rocks and Cape Meares NWRs. In 2004, the monitoring effort was expanded with the inclusion of 15 newly re-occupied south and north coast eyries (USFWS unpublished data). This coast wide nesting success data is combined with state and nationwide efforts to monitor population trends in a national post-delisting monitoring program that was initiated in 2002 (Isaacs 2007, USFWS 2003). Monitoring surveys will be conducted on the refuges every three years and will be added to the national effort that will review the status of the species in 2015.

The Aleutian cackling goose was recently delisted and currently uses the vegetated islands associated with the Oregon Islands NWR, along with private and public coastal short-grass pasturelands along the coast of northern California and Oregon (e.g., Nestucca Bay NWR). The Act requires that the Service monitor population levels of formerly listed species for five years after delisting (USFWS 2001). Post de-listing monitoring efforts by the refuge involve assisting the Service's monitoring plan in surveying the spring migration population by conducting direct counts of geese as they leave their roosts and through indirect population estimations based on the marked to unmarked ratio of neck-collared birds (Ross et al. 2007). Current annual monitoring of this subspecies is conducted as part of the Aleutian Cackling Goose Monitoring Program that is funded and managed by the Service's Division of Migratory Bird Management to assess management actions (e.g., hunting, and land acquisition) that may affect population levels.

The ODFW and NOAA-National Marine Fisheries Service are continuing to conduct surveys of pinniped populations that use the refuges and adjacent mainland areas. The Refuge Complex supports this work by issuing Special Use Permits and reporting marked animals. The refuge works closely with ODFW and NOAA-Fisheries Service personnel on research associated with Steller sea lions within Oregon Islands NWR. The research is investigating population dynamics, recruitment, survivorship and dispersal of young of this threatened species.

4.4 Environmental Consequences

This section provides an analysis of the environmental consequences of implementing the alternatives described previously in Chapter 2. Impacts are described for the biological aspects of the environment described in this chapter. The alternatives are compared "side by side" under each topic, to facilitate comparison. Both adverse and beneficial effects of implementing each alternative are described. A more detailed description of cumulative effects relating to public use and implementation of various alternatives is presented in chapter 5.

4.4.1 Summary of effects

Table 4-11 provides an overview of the effects under each alternative by indicator. Current management or Alternative 1 does benefit wildlife and habitat, however, effects are described in terms of the change from current conditions. Thus, Alternative 1, the no-action alternative (current management) has a neutral effect because no changes to management programs would occur under this alternative. The word neutral is used to describe a negligible or unnoticeable

effect compared to the current situation. Although the analysis shows that none of the alternatives would be expected to result in significant effects, some positive (beneficial) or negative effects are expected. To interpret these terms, intermediate is a higher magnitude than minor, which is of a higher magnitude than slight.

An action that would result in a substantial change in the amount or quality of available habitat for a native wildlife species would be considered significant; a significant adverse impact (e.g., catastrophic wildland fire or disease outbreak) to a habitat resulting from an action would be defined as a large scale reduction of available acreage or quality of habitat for a native species within the refuge; a significant beneficial impact would be defined as a substantial increase in the quality of habitat for native wildlife species within the refuge.

A substantial adverse effect to seabirds, pinnipeds, or endangered, threatened, and sensitive species would be considered significant if the proposed action, either directly or through habitat modifications, negatively affected the quality, diversity and long-term optimum productivity of the wildlife populations.

Table 4-11. Summary of biological environment effects under ccp alternatives

Indicator	Alternative 1	Alternative 2
Effects to old-growth and late-successional Sitka spruce/salal forest habitats and associated wildlife	Neutral effect	Intermediate positive effect due to increased invasive species control, inventory, and monitoring efforts. Minor positive effect resulting from increased law enforcement efforts.
Effects to steep rock cliff and coastal erosion bluff habitats and associated wildlife	Neutral effect	Intermediate positive effect due to increased invasive species control, inventory, and monitoring efforts. Minor positive effect resulting from increased law enforcement efforts.
Effects to stream and riparian habitats and associated wildlife	Neutral effect	Intermediate positive effect due to increased invasive species control, inventory, and monitoring efforts. Minor positive effect resulting from increased law enforcement efforts.
Effects to headland riparian shrublands and associated wildlife	Neutral effect	Intermediate positive effect due to increased invasive species control, inventory, and monitoring efforts. Minor positive effect resulting from increased law enforcement efforts.
Effects to south coast headland erosion forblands and dunes and associated wildlife	Neutral effect	Intermediate positive effect due to increased invasive species control, inventory, and monitoring efforts. Minor positive effect resulting from increased law enforcement efforts.
Effects to rare early successional south coast headland prairie-grassland habitats and associated wildlife	Neutral effect	Intermediate positive effect due to increased invasive and woody vegetation species control, inventory, and monitoring efforts. Minor positive effect resulting from increased law enforcement efforts.
Effects to rocks, reefs, and islands and associated wildlife	Neutral effect	Intermediate positive effect due to increased invasive species and mammalian predator control, inventory, and monitoring efforts. Minor positive effect resulting from increased law enforcement efforts.
Effects to seabirds	Neutral effect	Intermediate positive effect due to increased mammalian predator and invasive species control, inventory, and

Indicator	Alternative 1	Alternative 2
		monitoring efforts. Minor positive effect resulting from increased law enforcement efforts to reduce human induced disturbance events.
Effects to endangered, threatened, and sensitive species	Neutral effect	Neutral effect from increased predator and invasive species control, inventory, and monitoring efforts. Minor positive effect resulting from increased law enforcement efforts.
Effects to pinnipeds	Neutral effect	Minor positive effect due to increased law enforcement efforts.

4.4.2 Effects Common to All Action Alternatives (IPM)

Potential effects to the biological and physical environment associated with the proposed site-, time-, and target-specific use of pesticides (Pesticide Use Proposals [PUPs]) on the refuges would be evaluated using scientific information and analyses documented in "Chemical Profiles" within the Oregon Coast NWRC IPM Plan (2009). These profiles provide quantitative assessment/ screening tools and threshold values to evaluate potential effects to species groups (birds, mammals, and fish) and environmental quality (water, soil, and air). The PUPs (including appropriate BMPs) would be approved where the Chemical Profiles provide scientific evidence that effects to refuge biological resources and its physical environment are likely to be only minor, temporary, or localized in nature. Along with the selective use of pesticides, PUPs would also describe other appropriate IPM strategies (biological, physical, mechanical, and cultural methods) to eradicate, control, or contain pest species in order to achieve resource management objectives.

The effects of these non-pesticide IPM strategies (biological, physical, mechanical, and cultural methods) to address pest species on the refuge would be similar to those effects described elsewhere within this chapter, where they are discussed specifically as habitat management techniques to achieve resource management objectives on the refuge. For example, the effects of mowing to control invasive plants in an improved pasture would be similar to those effects summarized for mowing, where it would be specifically used to provide short-grass foraging habitat for wintering geese.

Based on scientific information and analyses documented in "Chemical Profiles," pesticides allowed for use on the refuge would be of relatively low risk to non-target organisms as a result of low toxicity or short persistence in the environment. Thus, potential impacts to refuge resources and neighboring natural resources from pesticide applications would be expected to be minor, temporary, or localized in nature.

4.4.3 Effects to species and habitats

Topics addressed under the biological environment section include direct and indirect effects to wildlife species and associated habitats. Cumulative effects are addressed in Chapter 5.

4.4.3.1 Effects to old-growth Sitka spruce/salal forest, steep rock cliff, coastal erosion bluff, coastal headland streams and riparian shrublands, coastal headland erosion forblands and dune, early-successional south coast headland prairie-grassland habitats and associated wildlife

No significant adverse effects to refuge habitats are expected under either of the alternatives. Under both alternatives, Complex staff members would continue to protect and maintain coastal habitats characteristic of Pacific Northwest old-growth Sitka spruce/salal forest and associated headland stream and riparian shrubland zone habitats, the existing coastal headland bluff, cliff, forblands, and dune habitats, and the associated wildlife and plant species, by allowing natural processes to control successional vegetative changes. The continued maintenance and protection of these habitats would have a neutral effect as natural succession would occur with little or no active management input. In addition, under both alternatives the Complex's staff would continue efforts to protect and maintain early-successional south coast headland prairie-grassland habitat through limited volunteer and staff effort in management of invasive woody vegetation. This action would have a neutral to slight positive effect on this habitat type through maintenance of existing prairie-grasslands at the current condition and acreage. If efforts to manage woody vegetation continue to increase over time, there would be a minor to intermediate positive effect on this habitat type since the acreage would increase through halting or reversing the encroachment of woody vegetation.

Refuge staff members would continue to work with OPRD and others to protect coastal habitat and wildlife by utilizing signage and other deterrents to maintain closed refuge areas under these two alternatives. The additional law enforcement presence under the preferred alternative would improve enforcement of closed areas, resulting in a neutral to slight positive effect through a decrease in human disturbance of wildlife and in the human-caused spread of non-native plant species.

Under alternative 2, the Preferred Alternative, the Complex's staff would continue to allow natural processes to occur and drive successional vegetative changes. However, greater emphasis would be given to working closely with partners to research, design, and implement cooperative studies that would directly contribute toward understanding and maintaining or restoring the biological integrity, diversity, and environmental health of the refuges. These cooperative efforts, detailed in Chapter 2, would have minor to intermediate positive effects on the various habitats on all three refuges. These positive effects would occur as a result of the increased resources and funding that is likely to accompany the cooperators, which would allow the establishment of a GIS-based inventory of refuge habitats, and when appropriate, a monitoring program for habitats and plant species. Active promotion of appropriate and compatible research efforts by universities and other partners would also likely have slight to intermediate positive effects on refuge habitats through increased understanding of refuge habitats within a larger context, and improved adaptive management strategies as a result of that increased knowledge.

An intermediate positive effect to wildlife is expected under alternative 2, as wildlife conservation would be the focus of increased collaborative efforts. Partners would be sought for research, design, funding and implementation of an inventory, and when appropriate, monitoring program for focal bird species, mammals, amphibians, and invertebrates in various refuge habitats. The Complex's staff would also promote and actively encourage research efforts by universities and other partners to determine use of refuge habitats. These cooperative efforts, detailed in Chapter 2, will also have a minor to intermediate positive effect on refuge wildlife as a result of increased

resources and funding that is likely to accompany the cooperators, and the subsequent knowledge gained through the research efforts that in turn can be applied to adaptive management of refuge wildlife.

The Preferred Alternative would also include the active pursuit of funding and approvals to hire additional biological staff for the Complex. These additional staff would reduce the work load for existing personnel and facilitate increased research, monitoring, and the ability to achieve refuge wildlife and habitat management goals through direct effort and coordination of cooperative efforts. The addition of biological staff will have an intermediate positive effect on wildlife and habitat as the implementation of inventories, monitoring, control of invasive species and better coordination would be expected to occur.

4.4.3.2 Effects to rocks, reefs, and islands

No significant adverse effects to the refuge's rock, reef and island habitats are expected under either of alternatives. Under the No Action alternative (Alternative 1), all refuge rocks and islands, as well as the Crook Point Unit, would continue to be closed to general public use to protect seabirds, pinnipeds and associated habitats from human disturbance. The growing human population along the coast carries the potential for increased wildlife disturbance, and increased law enforcement coordination proposed under Alternative 2 is expected to have a slight positive effect on refuge habitats and wildlife through more active protection and enforcement of closures, and concurrent reduction in wildlife disturbance on rocks, reefs and islands. Wildlife observation, photography, and interpretation of wildlife associated with Three Arch Rocks and Oregon Islands NWRs are existing public uses that occur at many off-site mainland areas owned and managed by city, county, state, and federal agencies. To facilitate off-site public use, the refuge has enhanced wildlife viewing opportunities on several mainland areas that overlook refuge rocks and islands and at sites that are managed by OPRD. Under both alternatives, maintenance of these existing facilities will continue; however, enhancing these sites when possible and adding new interpretive panels and locations under Alternative 2 would have a slight positive to neutral effect on rocks, reefs and islands through the increased protection afforded by an informed and engaged public (see Chapter 5 for further details).

Oregon Parks and Recreation Department is also an important partner along the entire coast, helping to protect refuge wildlife, plants, and habitats and promoting conservation of these resources through interpretation and education from state lands adjacent to Cape Meares, Oregon Islands, and Three Arch Rocks NWRs. Under both alternatives refuge staff will continue to collaborate with OPRD on various efforts to prevent impacts to refuge resources from adjacent beach uses such as fireworks, beach fires, commercial filming activities, and trespass on refuge lands. Staff would also continue to work with Oregon State Marine Board on the 500-foot seasonal watercraft closure zone around Three Arch Rocks NWR. These continuing collaborative efforts to reduce wildlife disturbance on refuge rocks, reefs, and islands have a neutral to slight positive effect on sensitive habitat and wildlife, and the increased formal collaboration is expected to have a slight to moderate positive effect. The reduction of disturbance to wildlife will allow seabirds and pinnipeds to maintain or increase reproductive output, breeding success, and colony attendance. Adults will be able to conduct normal daily activities such as spending time caring for young and themselves, rather than expending energy avoiding perceived threats. In addition, reducing disturbance will allow wildlife to focus on fulfilling other life functions. The predominant factors which determine long-term persistence are factors such as ocean conditions, prey availability, weather, and cyclic environmental change. Our efforts to reduce disturbance should

result in beneficial effects, however, these beneficial effects do not represent a substantial effect in the context of the far more pervasive factors of which we have no control. Studies indicate a significant negative effect to physiology, reproductive behavior, reproductive success, and population trends of colonial waterbirds when exposed to human disturbance (Carney and Sydeman 1999).

Under both alternatives a neutral to slight positive effect is expected from having refuge staff members continue to work cooperatively with BLM and OPRD to provide quality wildlife viewing opportunities at Yaquina Head Outstanding Natural Area and Harris Beach State Park. Stationing Refuge Complex staff or Friends group members as interpretive docents at these public use facilities to provide wildlife information to the public has the effect of decreasing wildlife disturbance events and trespass on refuge rocks, reefs, and islands. Volunteer presence at these locations would increase under Alternative 2, which would have a slight to minor positive effect on refuge wildlife and habitats. Disturbance events may cause wildlife increased stress and unproductive energy expenditure, thus decreasing the amount of available energy needed to sustain life functions. If disturbance and negative human interactions are limited, wildlife can utilize their energy more efficiently and less time is spent searching for food to replace wasted energy. In addition, a well-informed public will understand the importance and need to reduce disturbance and maintain pristine habitat conditions for wildlife.

Under the Preferred Alternative, protection and maintenance of refuge rocks, reefs, and islands would expand in scope, with emphasis shifting to Refuge Complex driven law enforcement and additional cooperative law enforcement efforts. Establishing multi-agency coordination agreements with other law enforcement agencies would be a priority under this alternative. Enforcement issues would be handled cooperatively between the Refuge Complex officer, the Service's Zone Law Enforcement Officer, and other enforcement agencies which would increase efficiency and would have a minor to intermediate positive effect on refuge rocks, reefs, and island habitat, as well as associated wildlife.

A priority under the Preferred Alternative is to work cooperatively with the FAA to reduce wildlife disturbance on refuge lands caused by low-level aircraft. The Refuge Complex would identify and document priority resource areas where low flights over refuge lands have the potential to cause the greatest impacts and would focus efforts on documenting disturbances at these sites. In coordination with FAA and the Oregon Aeronautical Board, the Refuge Complex would then develop strategies to educate pilots about the refuges and the impacts caused by low level overflights along the Oregon coast, stressing bird-strike safety concerns for pilots. Coordination with OPRD, BLM and other partners to monitor and immediately report overflight incidents and wildlife response to the FAA would also be a priority under this alternative, and the Complex would document results in annual reports for use in discussions with FAA on the feasibility of establishing a minimum flight altitude restriction of 2,000 feet AGL over Oregon Islands and Three Arch Rocks NWRs. The Complex would also produce and distribute educational materials to airports, aircraft fueling stations, pilots associations, and aircraft publications to advocate the 2,000-foot (610 m) minimum AGL altitude conservation recommendation over refuge rocks, reefs, islands, and headlands.

It is expected that the reduction in low-level aircraft over the refuges' rocks, reefs, and islands as a result of the actions proposed in Alternative 2 would have a minor positive effect in reducing wildlife disturbance events. Low overflights may cause nesting seabirds to flush from their nest

site leaving the egg or chick exposed to the elements and predators. Exposure to extreme cold or hot temperatures for long periods of time will reduce egg viability and cause chick mortality. Predators such as gulls and ravens may also take advantage of the situation and eat unprotected eggs or chicks. Often, as the adult flies from the nest site, eggs are dislodged and fall from the cliff edge or become inaccessible to the incubating parent. Adults are reluctant to return to the nesting site if flushed often, thereby reducing productivity. One study indicated significant numbers of gulls flew from their nests, increased predation, egg breakage, and lower mean clutch size resulted because of aircraft overflight (Burger 1981). Pinnipeds can trample their young during disturbance events, adults become separated from young, and if disturbed frequently, abandoned their young. If low overflights are eliminated or reduced, wildlife productivity will increase and negative human impacts will be minimal. In addition, injury to aircraft and flight personnel will be reduced since bird-strike collision over seabird colonies will also be reduced.

An additional minor positive effect to the wildlife associated with rocks, reefs, and islands is expected under the preferred alternative with the expansion of cooperative efforts with the U.S. Coast Guard to include development of an MOU. The MOU would establish conditions and protocols with both air and lifeboat stations to facilitate the Service's use of USCG aircraft and vessels on dual missions, for law enforcement, training purposes, during response and surveillance of oil spills, and in support of other refuge needs. The Refuge Complex would document major wildlife use areas on USCG flight maps and suggest seasonal or year-round flight restrictions for non-search and rescue missions. Staff would also work with USCG Motor Lifeboat Stations along the Oregon coast to document major wildlife use areas on nautical charts and provide measures to avoid wildlife disturbance impacts for non-search and rescue missions.

4.4.3.3 Effects to seabirds and pinnipeds (including endangered, threatened, and sensitive species).

No substantial adverse effects to refuge seabirds, pinnipeds and endangered, threatened, and sensitive wildlife species are expected under either of the alternatives. Management to benefit these species and their habitats would be emphasized under both alternatives.

Inventories and monitoring

Existing wildlife and habitat surveys for Oregon Islands and Three Arch Rocks, both staff-conducted and cooperative efforts, would continue under both alternatives. Refuge staff will continue to monitor common murre, Brandt's cormorant, and endangered California brown pelican populations using aerial surveys, and continue monitoring population trends and distribution of pelagic cormorants near Newport using boat and land survey techniques. Limited cooperative efforts to assess population trends and habitat use by Aleutian cackling geese on Oregon Islands NWR and private lands will continue. Refuge staff will continue to coordinate with OSU, Ecological Services, and USGS to assist in monitoring population trends of peregrine falcons and black oystercatchers. The continuation of existing surveys and monitoring efforts is expected to have a neutral effect on non-listed wildlife species using refuge habitats. No changes to current management strategies will be implemented, thus, benefits that improve current survivability and productivity for these wildlife species are not anticipated.

Aerial seabird surveys at higher altitude (1,000 feet AGL) are known to only rarely flush roosting brown pelicans and if they are flushed they are likely to return to the same roost fairly quickly. Very few brown pelicans are present at the time of year when seabird surveys are conducted.

Lower altitude (400 to 500 feet AGL) surveys, conducted in mid September each year specifically to document brown pelican populations, may cause pelicans to temporarily leave the roost site, and in some cases, move temporarily to another nearby roosting site. Brown pelicans are preparing to migrate south when this survey takes place. This effect is likely to be insignificant because of its low frequency (once per year) and the very short time needed during the survey to take photographs. Seabird surveys by boat in early summer may result in some pelicans being flushed off the water. This activity is likely to result in insignificant effects because the affected individuals will only be briefly disturbed and are likely to immediately resume loafing and foraging activities in the same location.

Aerial seabird surveys at higher altitude (1,000 feet AGL) over open water are unlikely to disturb foraging marbled murrelets because these surveys are very infrequent and are visually distant from potentially affected individuals. Lower altitude (400 to 500 feet AGL) surveys, conducted specifically to document brown pelican populations, may occasionally cause foraging or loafing murrelets on the water to dive or flush and temporarily disrupt their behavior. This effect is likely to be insignificant because the affected individuals are also likely to move to nearby areas and immediately resume normal foraging or loafing activities. Lower altitude surveys will not disturb nesting murrelets because they are not likely to occur in close proximity to potential murrelet nesting habitat, are very infrequent, and are of short duration. Seabird surveys by boat in early summer may occasionally cause foraging or loafing murrelets on the water to dive or flush and temporarily disrupt their behavior. This effect is likely to be insignificant because the affected individuals are also likely to move to nearby areas and immediately resume normal foraging or loafing activities.

Continuation of existing inventories and monitoring is expected to continue to have a neutral effect on Steller sea lions. Aerial and boat surveys generally avoid areas where these animals are breeding and loafing.

Wildlife disturbance

Under both alternatives, the Refuge Complex would continue to protect and maintain refuge habitat for breeding and loafing seabirds and pinnipeds, along with resident and migratory endangered, threatened, and sensitive wildlife species. Efforts to prevent wildlife disturbance on refuge rocks, reefs, islands, and headlands would continue through prohibition of public access, posting of educational and regulatory signage, prohibition of fireworks on refuge lands adjacent to nearshore rocks and islands, and deployment of buoys annually to delineate the seasonal 500-foot watercraft exclusion buffer zone around Three Arch Rocks NWR. Current levels of infrequent monitoring for mammalian predators would also continue. Increased law enforcement coordination and presence under the preferred alternative would result in continued abatement of threats to wildlife through reduction in disturbance. Human disturbance by land, sea, or air can force wildlife to expend precious energy that can reduce reproductive success, survival, and impair bodily functions. Increased law enforcement efforts will reduce disturbance events caused by human activities. Law enforcement agent presence increases public awareness of laws and stipulations, which often results in improved compliance with laws designed to decrease disturbance.

Since seabirds and pinnipeds utilize refuge rocks, reefs, and islands as breeding sites, reducing disturbance at those sites may have a slight positive effect by reducing stress and improving

productivity. The effect of reducing disturbance on refuge rocks and islands on endangered brown pelicans and threatened marbled murrelets is expected to be neutral since neither of these species utilizes rocks and islands for nesting, and affected individuals are likely to move to nearby areas and immediately resume normal foraging or loafing activities. Disturbance from boats and aircraft can cause Steller sea lions to stampede from the rocks, crushing pups in the process and leaving them exposed to the elements. Reducing disturbance through various strategies including law enforcement and education is expected to have a minor positive effect on Steller sea lions using refuge rocks and islands.

Under the preferred alternative, the Complex would work cooperatively with ODFW to re-examine the need for special management area designation/buffer zones at 33 areas of Oregon Islands and Three Arch Rocks NWRs to reduce disturbance events and protect seabirds and pinnipeds and their habitat. The Complex staff would work with partners to promote the establishment of watercraft free buffer zones in waters around specific refuge lands that have seabird colonies and pinniped rookeries/haulouts. These buffer zones could decrease negative impacts or harassment caused by watercraft and it is expected that these partnerships and designations, if created, may have a minor positive effect to refuge wildlife. If watercraft users are not permitted to approach nesting areas, a minor positive effect could result since wildlife reproductive activities will not be interrupted. A reproductive decline of common murre was noted because eggs and chicks were lost during aircraft and water vessel disturbance events (Rojek et al. 2007). Also, seabirds and pinnipeds which prey on food items near refuge lands may benefit through establishment of buffer zones which will allow prey to be obtainable and not artificially dispersed. Seabird feeding flocks occur as a result of schooled fish near the water's surface. Watercraft users have the potential to disrupt the feeding process as well as disperse prey. Studies indicate marbled murrelets can be impacted from sustained, close-proximity boat disturbance at foraging areas (Kuletz 1996, Speckman et al. 2004) as availability of their preferred prey and feeding methodology are disrupted.

Under the Preferred Alternative, another expected minor positive effect would occur with the development of an MOU with the Oregon State Marine Board (OSMB), which would result in decreased disturbance to wildlife. This MOU would formalize specific collaborative actions to protect wildlife using Oregon Islands and Three Arch Rocks NWR by reducing wildlife disturbance events caused by watercraft users. The Refuge Complex would provide information and education materials on refuge resources and wildlife, to be distributed through the state watercraft licensing program and other means. This would reduce wildlife disturbances resulting from watercraft use and operation in waters adjacent to the sensitive refuge habitats. Refuge staff would give periodic presentations to OSMB board members regarding refuge issues and concerns for wildlife disturbance caused by watercraft. The refuge would work with the Board to determine if additional State regulated protective measures are necessary and feasible to reduce wildlife disturbance on the refuges. Disturbance events caused by watercraft can negatively affect wildlife by disrupting normal activities, interrupting parents attending to young, destroying nests, injuring or killing parents, and colony abandonment. In the wake of a small shipwreck, common murre colonies in California experienced colony abandonment and reduced productivity due to disturbance and predation (Thayer et al. 1999). As disturbance is reduced, the negative effects will also be reduced. Wildlife would be able to utilize their time and energy efficiently to effectively sustain life processes without human caused disruption.

Interagency coordination

Both alternatives will involve the continuation of existing cooperative efforts with state agencies, which are critical partners for collaborative wildlife and habitat conservation work along the coast. The Refuge Complex will continue working under both alternatives with the ODFW on coastal and marine wildlife management issues of mutual interest; including overseeing and participating in threatened Steller sea lion research activities on refuge lands and sharing information and data during seabird mortality events. Increased formal interagency coordination efforts under Alternative 2 are expected to have a slight to minor positive effect on refuge wildlife through the resulting increase in knowledge and capabilities, which contribute to adaptive management capability. For example, Canada goose monitoring studies conducted cooperatively by Service and ODFW determined that a sub-species (Aleutian cackling), which breeds on the Semidi Islands of Alaska in the summer, overwinters near Pacific City, Oregon. The geese spend the night on Haystack Rock, and during the day travel to a nearby farmer's field to feed. The farmer subsequently sold the property to the Service to aid in preservation of the species. This acquisition resulted directly from cooperative efforts with ODFW.

The Zone Law Enforcement Officer would continue under both alternatives to work cooperatively with the FAA to reduce wildlife disturbance on refuge lands caused by low-level aircraft overflights. Wildlife disturbance violations caused by aircraft overflights will continue to be reported to the FAA and Oregon Aeronautical Board. Refuge staff will also work cooperatively with the USCG to protect seabirds and pinnipeds, and would continue to provide wildlife resource protection training to USCG pilots. All of the federal and state interagency coordination efforts, which would increase under the Preferred Alternative, are expected to provide a neutral to slight positive effect on the conservation and preservation of seabirds, pinnipeds, and endangered, threatened, and sensitive wildlife species. A slight positive effect is a result of fewer low-level aircraft overflights that cause disturbance to wildlife. Aviation personnel will become more aware of the detrimental effects caused by low overflights through training, brochures, and personal observations. Wildlife protection training of USCG pilots by refuge personnel will result in greater understanding of disturbance and impacts to wildlife. Low-level overflights must be avoided especially during the summer when seabirds and pinnipeds are breeding. Low-level flights over wild animals may cause physiological and behavioral responses that reduce the animals' fitness or ability to survive. It is believed that low-altitude overflights can cause excessive arousal and alertness, or stress. If chronic, stress can compromise the general health of animals. Also, the way in which animals behave in response to overflights could interfere with raising young, habitat use, and physiological energy budgets (NPS 1994).

Under the Preferred Alternative, the Refuge Complex would continue and bolster the collaborative efforts with BLM to promote protection of seabirds and pinnipeds and to provide quality wildlife viewing opportunities at YHONA. A new MOU would be developed to document management responsibilities and to clarify roles and responsibilities with regard to law enforcement jurisdictions, use of volunteers, interpretive messages and programs, and management actions of potential impact to the other agency's program. The Refuge Complex would also work cooperatively with BLM to develop monitoring and research programs of mutual interests to both agencies at YHONA. In addition, the occurrence and impacts of mammalian predation on nesting seabirds at YHONA would be actively monitored, documented and subsequently controlled. The increased coordination and resulting protection would be expected to have a slight to minor positive effect on the wildlife in this area, and the expected intermediate positive effect of predator control would substantially increase reproductive success of seabirds

nesting in the controlled areas. Increased coordination will result in the Refuge Complex and partners having enhanced abilities to discover predators and more effectively and efficiently conduct control measures. Enhanced predator control capacity should allow seabird reproductive success to remain at or near current levels.

In addition, the prevention and response efforts to reduce the negative effects of oil spills on seabirds would be enhanced under the Preferred Alternative. The Refuge Complex would attend and participate, in cooperation with the Northwest Area Committee, in updating five Oregon Coast Geographic Response Plans. Planning for spill response strategies would have a positive effect on refuge resources at risk. Training refuge staff to respond to spills and assist in shoreline assessments will be implemented under this alternative. Cooperative work with NOAA in development of watercraft navigation charts that depict and reference refuge resources and lands is expected to have a slight to minor positive effect in the reduction of spills in the area of sensitive wildlife breeding and loafing grounds.

In the instance of an actual spill, the formalized coordination and response protocol would have an expected intermediate positive effect on wildlife in the spill area of impact. The positive effect stems from quick response time by oil spill response personnel, therefore, a reduction in the amount of oil spread throughout the environment. Oil spills are a serious danger to marine life. When oiled, bird plumage and pinniped fur instantly loses insulative properties, causing the animal to chill or die. Wildlife will attempt to clean and remove oil residue from their fur or feathers by preening or licking. When sufficient oil is orally ingested, bodily functions cease and physiological processes are altered, which results in accelerated exhaustion and death. An Oil Vulnerability Index for marine oriented birds was established (King and Sanger 1979) and indicates that the avifauna species within the refuge are very susceptible to oil spills. The common murre has been recognized as a prominent indicator of marine conservation issues, especially regarding oil pollution and human disturbance (Carter et al. 2001). Rodway (1990) indicated large numbers of common murres were killed by the 1988 Nestucca oil spill. Breeding population, attendance patterns, and hatching chronology were also studied. The sooner a response can be initiated to control or stop the spread of pollutants, the less impact the toxicant will have on the wildlife and environment. This leads to a positive effect.

Invasive species control

Under the Preferred Alternative, management to specifically benefit seabirds and seabird nesting habitat would be emphasized and maximized. Additional biological and maintenance staff would be hired, and prevention and control of invasive plant species and native and non-native mammalian predators would be a priority. The addition of biological and maintenance staff to perform increased conservation efforts for wildlife and the prevention and control of invasive species is expected to have an intermediate positive effect on seabirds and seabird nesting habitat. The positive effect stems from a reduction in seabird mortality. Mammalian predators prey upon nesting seabirds by taking eggs, chicks, or adults. If predation and invasive plant infestations are reduced by hiring additional staff to perform control actions, then seabird productivity and populations may increase. Destruction of nesting habitat will also be reduced because some predators dig and destroy nest cavities of burrow-nesting seabirds. In addition, invasive plant species change soil characteristics, landscape, and cover which make the area less desirable or suitable for nesting.

Native and non-native mammalian predators would be inventoried at seabird colonies and controlled as necessary, as discussed in the Predator Damage Management EA (USFWS 2005a). The results of the predator inventory would provide resource managers information concerning predator locations, abundance, and possible effects on seabirds. Control efforts and methods that are specific to predator species would be implemented in areas of high predation rate and high density population areas (USFWS 2005a). This results in efficient use of time and money to control predators and determine effects on seabirds.

Research and assessments

Consultation for Steller sea lion research conducted on refuge lands is covered by NOAA as part of their ongoing multi-state research program. The most recent biological opinion for Steller sea lion and northern fur seal research activities on the west coast including Oregon is dated June 2007. Future implementation of research and assessment actions that may affect marbled murrelets or brown pelicans will be the subject of separate Endangered Species Act section 7 consultations prior to commencement.

Additional cooperative efforts under the Preferred Alternative would include working with universities and others to establish a long-term seabird research program using seabirds as biological indicators of ocean conditions, working with USGS to assess ecological factors affecting black oystercatchers, working with partners to research and monitor the effects of increasing bald eagle numbers on seabird colonies, and working with other seabird researchers to develop non-intrusive and standardized techniques to determine population trends, distribution, and reproductive success of burrow, crevice, and surface nesting seabirds. In addition, annual boat and land surveys for pelagic cormorants along the cliff faces would be initiated under this alternative. The expected intermediate positive effects from these efforts will enhance our understanding and knowledge of these species and help implement conservation strategies to conserve and protect these resources. Recently, a graduate student (A. Pollard) from the Oregon Institute of Marine Biology conducted Leach's storm-petrel studies on refuge lands. The data collected were invaluable and are already contributing to the preservation of that species through management actions and design of strategies for the future. Population, productivity, burrow density, and predation rate were documented during the study. In addition, cameras were stationed on one island and through the photographs, raccoon predation was documented. Efforts to control raccoon were initiated and the non-native pest was removed. Because of the study, storm-petrel breeding phenology, behavioral aspects, population, nesting characteristics, and predator prey relationships are better understood.

Under the preferred alternative, greater emphasis would be given to working closely with partners to research, design, and implement cooperative studies, as detailed in Chapter 2 (alternatives). Existing cooperative efforts with state agencies would be continued and the partnerships expanded to include more activities in support of the refuges' and the Service's mission and goals. These cooperative efforts would directly contribute toward maintaining or restoring the biological integrity, diversity, and environmental health of the refuges. Specifically, the establishment of a cooperatively developed GIS based inventory and monitoring program for seabirds, endangered, threatened and sensitive wildlife species, and other wildlife and plant species, as well as pursuit of joint survey and monitoring opportunities and information sharing, would significantly increase understanding of wildlife, habitats, and ecosystem processes. This would allow implementation of adaptive management techniques which would result in an

expected minor positive effect on refuge resources. For example, a cooperative study of bald eagle predation on common murre at YHONA between the Service, BLM, and OSU could be initiated. This study would determine annual murre productivity, breeding phenology, behavioral aspects (murre and eagle), predation rate, and population effects. This would be a minor positive effect on refuge resources since managers would better understand predator prey relationships, population dynamics, and behavioral aspects of both species. In addition, study results would be shared between agencies and management techniques implemented cooperatively.

An expected intermediate positive effect on refuge resources may occur in the long term under the Preferred Alternative with the increased emphasis on specific areas of wildlife and habitat research through a collaborative approach. This strategy includes cooperative interagency or collaborative efforts with universities to perform research on issues such as the long-term effects of an increasing coastal bald eagle population on common murre colonies, investigation of the population ecology of black oystercatchers to better understand the impacts of human population growth, and threats from invasive plant species and mammalian predators on refuge habitat and wildlife. Additional research topics will be pursued as appropriate under the Preferred Alternative. Partnership efforts would also be geared toward research, design, and implementation of a comprehensive inventory and standardized census program for burrow and crevice-nesting seabirds. As a result, a more accurate estimate of populations and trends would be obtained. Resource managers will have reliable seabird population census data to properly guide management of species and ecosystems. A long-term seabird research program using seabirds as biological indicators of ocean conditions and effects of climate change would be established. Thus, climate change and its influence on biological processes would be better understood, allowing likely scenarios to be factored into habitat management and protection strategies.

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Chapter 5. Public Use Programs and Impact on Social and Economic Environment

5.1 Public Infrastructure and Administrative Facilities

The infrastructure and facilities discussed in this section include boundary signs, public entrances, roads, trails, and administrative buildings. Facilities associated with specific public use programs are discussed in section 5.2. All public and administrative facilities, with the exception of boundary signs, are depicted on the maps located in chapter 2: Figures 2-1 (North Coast); 2-2 (Central Coast); 2-3 (South Coast); 2-4 (Cape Meares detail); 2-5 (Three Arch Rocks detail); and 2-6 (Oregon Islands Coquille Point Unit detail).

5.1.1 Boundary and markers

5.1.1.1 Oregon Islands NWR

All refuge rocks, reefs and islands are closed to public use. The Service requests all aircraft to maintain a 2,000-foot (610-meter) minimum AGL altitude over all National Wildlife Refuges including the rocks, reefs and islands along the Oregon coast in order to minimize disturbance to seabirds, pinnipeds and other wildlife. The minimum altitude request, notice to pilots and the majority of the refuge rocks, reefs and islands are printed on the two FAA Sectional Aeronautical Charts that cover the Oregon coast. The 18.52 acre Coquille Point Unit is not posted with standard boundary signs. The boundary of the 133.71 acre Crook Point Unit is approximately 50% posted.

5.1.1.2 Three Arch Rocks NWR

The refuge is closed to public use. To protect wildlife during the breeding season, waters within 500 feet of the refuge are closed to all watercraft from May 1st through September 15th by an Oregon State Marine Board closure (Oregon Revised Statutes 830.110 and 830.175). Buoys are deployed annually to mark the seasonal water closure. The requested 2,000-foot (610-meter) minimum AGL altitude over Three Arch Rocks is also printed on all FAA sectional aeronautical charts that cover the Oregon coast.

5.1.1.3 Cape Meares NWR

This Refuge and RNA has a total size of 138.5 acres. Approximately five percent of this boundary is posted. Boundary signs are located primarily where refuge lands are adjacent to roads and OPRD lands.

5.1.2 Entrances, access points, roads and parking

5.1.2.1 Oregon Islands NWR

There are no entrances, roads or vehicle parking areas on any of the rocks, reefs and islands. There are four entrances to the Coquille Point Unit of the refuge. Two of the entrances permit vehicular access and parking. The unit's primary entrance is located at the western end of NE

11th Street in the City of Bandon. The Complex maintains a parking lot for visitors at the main entrance and a second, unofficial entrance (dirt path) is located at the western end of NE 8th Street and is managed by the City of Bandon. Two staircases located on the unit's primary entrance provide pedestrian access to the adjacent OPRD managed ocean shore.

The Crook Point Unit is closed to all public entry. There is one entrance road that permits vehicular access to the unit. This road is privately owned up to the Crook Point Unit boundary and the Service has a road easement through private property to maintain this access route. The unit can also be accessed from the public beach to the west. Pistol River State Park is adjacent to the north boundary of the Crook Point Unit and there is an abandoned horse trail leading from the state park that is used on occasion to trespass on this unit.

5.1.2.2 Three Arch Rocks NWR

There are no entrances, roads or vehicle parking areas on this refuge as it lies a half-mile offshore, west of the town of Oceanside.

5.1.2.3 Cape Meares NWR

There are three entrances to the refuge. One permits vehicular access and two are accessible to pedestrians. The vehicular access road (Lighthouse Drive) is located just off and to the west of the Three Capes Scenic Loop. The road is maintained by OPRD and provides access to both the refuge and the Cape Meares State Scenic Viewpoint. The road ends in a parking lot recently expanded and upgraded by the Refuge Complex, but maintained by OPRD and includes 36 spaces for cars and three designated spaces for Recreational Vehicles and Tour buses. One of the pedestrian access points is located at the entrance to Cape Meares; the other is to the north of the refuge through county lands, accessed from the town of Cape Meares.

5.1.3 Trails

5.1.3.1 Three Arch Rocks NWR

There are no trails because the refuge is closed to public entry.

5.1.3.2 Oregon Islands NWR

The Coquille Point Unit has a half-mile self-guided, paved interpretive trail that is accessible to people with disabilities.

5.1.3.3 Cape Meares NWR

There are two hiking trails within Cape Meares NWR. Both are one-way, unpaved trails and they are not accessible to people with disabilities. One of the trails is a quarter-mile long and ends at a giant old-growth Sitka spruce. A longer trail approximately two miles in length is part of the Oregon Coast Trail. From the trailhead it winds in a northerly direction through an old-growth Sitka spruce and western hemlock forest, a red alder meadow, and ends on a county road south of the community of Cape Meares. The trail through Cape Meares NWR was once much longer than the present configuration. The trail once extended from the town of Cape Meares south to Lighthouse Road as it currently does, then continued around the east, north, and west sides of the

north unit of the refuge, terminating in the parking lot of the Cape Meares Scenic Viewpoint. From January 5-9, 1990, Cape Meares was pounded by a series of powerful Pacific storms resulting in a catastrophic blowdown of trees and landslides. Approximately 200 feet of the trail on the north slide was lost in a slide. Prior to rebuilding or relocating the trail, it was discovered that a pair of bald eagle (a threatened species at the time) had relocated their nest within 15 feet of the trail with the tree canopy extending over the trail. In addition, detections of federally threatened marbled murrelets occurred in this same area the previous two breeding seasons. Out of concern that public disturbance could impact the nesting bald eagles, marbled murrelets, and other listed species, the trail was temporarily closed in 1990. In January1991, the Refuge Complex consulted with wildlife experts from OSU, ODFW, and the U.S. Forest Service and subsequently prepared an Intra-Service Section 7 Evaluation (dated March 14, 1991). The conclusion of the Section 7 Evaluation was to permanently close this section of the trail to provide maximum protection to threatened and endangered species.

5.1.4 Administrative facilities

The Oregon Coastal Field Office is located within the Hatfield Marine Science Center and houses the Refuge Complex headquarters and the Service's Newport Ecological Services Field Office. The administrative facilities consist of a small interpretive display, two labs, a large meeting room, office space for 12 permanent employees and 2-4 temporary employees, and a maintenance shop/garage. The Oregon Coastal Field Office provides three enclosed vehicle/boat bays.

A south coast administrative facility is located in Bandon, Oregon, on Bandon Marsh NWR. The facility complex consists of an office building for the South Coast Refuge Manager, with office space for the Friends of Southern Oregon Coastal Refuges, a detached garage with three bays, and a nearby maintenance shop with four bays. There is a five bedroom bunkhouse with a detached garage located adjacent to the refuge office. In addition, the facilities complex contains a two bedroom doublewide manufactured home, an adjacent three bay shop building, and two RV sites on lands within the Smith Tract of Bandon Marsh NWR. The bunkhouse, manufactured home, and RV sites serves as housing for refuge volunteers, visiting staff, and researchers.

5.1.5 Easements and rights-of-way

5.1.5.1 Oregon Islands NWR

At the Crook Point Unit, the Service has an easement from U.S. Highway 101, west to the entrance of the unit across private property for egress and ingress purposes. The southern 10 acres of the unit is under a 75-year lease (initiated in 2000) to the former owners where a residence and associated storage building is located.

5.1.5.2 Cape Meares NWR

In June 1971 the Service granted a road right-of-way easement to the Oregon State Highways Division for a 50-year period. The easement covers all of the Three Capes Scenic Route that bisects refuge land.

Observation deck with visitors. (Roy W. Lowe/USFWS)

5.2 Public Use Overview

The Oregon Coast is one of the most popular tourist destinations in the State with over 25 million visitor-use days each year. Wildlife observation is an activity that many visitors engage in during their visit. The Pacific Coast Scenic Byway (U.S. Highway 101) runs the length of the Oregon Coast, providing dramatic views of the rocky coastline, pastoral scenes through verdant farmland, and educational excursions at nature-based interpretive centers. The Complex provides funding for and manages a variety of both onsite and offsite facilities for hundreds of thousands of visitors to view wildlife. The Refuge Complex has one full-time staff member dedicated to the public use program and uses volunteers on both a seasonal and year-round basis to assist with site-specific interpretation programs and environmental education for targeted audiences.

5.2.1 Current public uses and wildlife dependent public uses

5.2.1.1 Oregon Islands NWR

The coastal rocks, reefs and islands are closed to public use to protect wildlife, which is sensitive to human disturbance, and to protect fragile habitats. Wildlife photography, observation and interpretation are existing public uses of Oregon Islands that occur at many off-site mainland areas owned and managed by city, county, state and federal agencies, as well as on-site at the Coquille Point Unit. To facilitate off-site public use, the Complex has enhanced wildlife viewing opportunities on several mainland areas that overlook refuge rocks and islands at sites managed

by OPRD. To facilitate interpretation, volunteer wildlife interpreters are stationed at several key viewing locations on the coast. They orient visitors, help them to become aware of the wildlife resources using the rocks and islands, and educate them as to how they can reduce negative wildlife/human interactions. Oregon Islands NWR overlook sites with volunteer interpreters include Haystack Rock at Cannon Beach, Yaquina Head Outstanding Natural Area, Heceta Head State Scenic Viewpoint, Coquille Point Unit of Oregon Islands NWR, Simpson Reef Overlook at Shore Acres State Park, and Harris Beach State Park. From mid-April through August, refuge volunteers interpret at least four days per week and in some cases provide full coverage seven days a week.

When volunteers aren't available or locations aren't appropriate for volunteers, a series of interpretive panels, located on private, city, county, state and federal lands, offer self-guided interpretation about Oregon Islands NWR. Excellent refuge wildlife observation and photography opportunities are available to visitors from an untold number of off-site viewing decks, highway pullouts, and beach locations along the entire Oregon coast.

The Service and the BLM have been working cooperatively since the early 1980s to protect the wildlife resources of YHONA and the adjacent rocks within Oregon Islands NWR. The existing MOU for YHONA signed in 1985, is a three-party agreement among the Service, BLM, and USCG. When the MOU was established, USCG managed the lighthouse and 10 acres of the site. With the exception of a dilapidated stairway to Cobble Beach, BLM did not have any structures or facilities on the headland and only one seasonal employee was present during the spring and summer months. At this time the public was accessing many of the cliff edges and rocks within the refuge, frequently disturbing harbor seals and preventing seabirds from nesting in these areas.

Since establishment of the MOU, BLM has developed the headland for wildlife viewing, photography, interpretation and environmental education. In addition, BLM has added permanent staff on site as well as seasonal employees and volunteers. Complex staff members have worked with BLM's employees and volunteers to identify life history information on seabirds and harbor seals to share with the visiting public, and also to identify and prevent human disturbance to wildlife. In recent years, the Refuge Complex has begun stationing refuge volunteers at YHONA in spring and summer to assist BLM in interpreting the natural resources of the headland and adjacent refuge rocks. Working in concert with Complex staff members, BLM has restricted and enforced where the public is allowed to go on the headland to protect wildlife and visitors.

Working in close cooperation with BLM over the past two decades has resulted in the protection of existing seabird colonies and a harbor seal haulout site, and has provided for dramatic population increases in nesting seabirds and the colonization of new sites on the mainland and refuge rocks. Public use of YHONA is high, exceeding 350,000 visitors annually and this site is now one of the premier seabird viewing locations in the country, providing the public opportunities for wildlife resource interpretation and environmental education.

The Coquille Point Unit is open to public use. One of the purposes for acquisition of Coquille Point was to provide opportunities for public use, and the site is popular with both local wildlife enthusiasts and out of town visitors. Existing wildlife-dependent public uses include wildlife observation, photography, interpretation, and environmental education. Onsite facilities managed

Yaquina Head Outstanding Natural Area (YHONA). (Roy W. Lowe/USFWS)

by the Complex include an orientation kiosk; a self-guided, accessible, paved hiking trail; two sets of stairs that provide beach access from the headland; a parking lot and interpretive panels. Coquille Point receives over 300,000 visitors annually and this number is growing. In 2007, refuge volunteers whose task was to provide interpretation to the visitors on off-site locations, devoted 6,422 hours and personally spoke to more than 122,000 people about refuge resources. Wildlife observation and photography opportunities are available to visitors from the self-guided trail, the parking lot, and the south coast stairs. Complex staff members, the Friends of the Southern Oregon Coast Refuges, and refuge volunteers also provide environmental education programs to local schools that request the programs.

The Crook Point Unit is closed to public use to prevent disturbance to nearby off-shore wildlife habitat that harbors tens of thousands of colonial burrow-nesting seabirds and a number of loafing pinnipeds, and to protect sensitive cultural resources and rare native plants.

5.2.1.2 Three Arch Rocks NWR

The refuge is closed to public use to protect seabirds, pinnipeds and their habitat from human disturbance. However, wildlife observation, photography, and interpretation are existing public uses of the refuge that occur off-site at Cape Meares State Scenic Viewpoint and Oceanside Beach State Recreation Area. Interpretation of the refuge is conducted through two interpretive panels,

one located at each of the two sites identified above. In 2007, more than 300,000 people participated in at least one of the three public use opportunities offered off-site.

5.2.1.3 Cape Meares NWR

The Cape Meares Refuge partially surrounds Cape Meares Lighthouse and State Scenic Viewpoint which offers almost 500,000 yearly visitors a variety of activities. The refuge itself is mainly closed to public use except for two hiking trails that traverse through a section of the refuge. Existing wildlife-dependent public uses on the refuge's hiking trails include wildlife observation and photography. In turn, wildlife photography, observation, and interpretation are existing public uses that occur off-site on Cape Meares State Scenic Viewpoint. The Complex has improved the public use facilities at the State's Scenic Viewpoint to facilitate off-site, wildlife-dependent public use with the goal of minimizing wildlife disturbance on refuge lands and enhancing the public's understanding of the sensitivity of coastal wildlife to human disturbance. Off-refuge facilities include a parking lot, two accessible viewing decks, interpretive panels, and a welcoming kiosk. To offer personalized interpretation, volunteer wildlife interpreters are stationed on the north viewing deck annually from May through August. The volunteers orient visitors, help them to become aware of the wildlife resources using the rocks and islands, and educate them as to how they can reduce negative wildlife/human interactions. In the past five years, volunteers have annually dedicated more than 400 hours to speaking with more than 10,000 visitors about the refuge's wildlife.

5.2.2 Annual refuge visitation

Visitation numbers for the refuges gathered from the 2007 Refuge Annual Performance Plan are discussed in the following paragraphs. It is notable that the majority of public use on the refuges occurs between May and September.

5.2.2.1 Oregon Islands NWR

Of the three marine refuges, Oregon Islands Refuge receives the most visitation. Most of the public use occurs off-site on the mainland. Annual visitation increases by a minimum of 5% annually. In 2007, more than two million people participated in at least one of the four public use opportunities offered off-site. The Coquille Point Unit received over 300,000 visitors. Coast wide refuge volunteers whose task it is to provide interpretation to the visitors at off-site locations, devoted 6,422 hours and personally spoke to more than 122,000 people about refuge resources.

5.2.2.2 Three Arch Rocks NWR

All public use occurs at two off-site locations: Cape Meares State Scenic Viewpoint and Oceanside Beach State Recreation Area. Approximately 300,000 people participated in at least one of the three public use activities offered off-site.

5.2.2.3 Cape Meares NWR

Visitation to Cape Meares NWR and State Scenic Viewpoint continues to increase by 10% annually. Visitation was at 490,000 in 2007 with most of the visitors participating in wildlife observation and interpretation. Approximately 5% of those visitors engaged in wildlife photography. All of these public uses occur off-site on the adjacent OPRD lands within Cape

Meares State Scenic Viewpoint. In 2007, two volunteers dedicated 438 hours to speaking one-on-one with over 10,500 visitors about the refuge's wildlife.

5.2.3 Open and closed areas

5.2.3.1 Three Arch Rocks NWR

The refuge is closed to public use.

5.2.3.2 Oregon Islands NWR

All refuge rocks, reefs and islands are closed to public use. The Coquille Point Unit is open to public use year-round, daylight hours only. The Crook Point Unit is closed to all public use.

5.2.3.3 Cape Meares NWR

The refuge is closed to public use except for the trail system (see 5.1 C) which traverses a section of the refuge.

5.2.4 Accessibility of recreation sites and programs for people with mobility limitations

5.2.4.1 Oregon Islands NWR

The Coquille Point Unit provides a half-mile self-guided interpretive trail that is accessible for people with disabilities. In 2003 the Refuge Complex provided the funding for a much-needed upgrade to the visitor use facilities at Simpson Reef Overlook, located within Shore Acres State Park. The upgrade, which included a redesign of the parking lot and the viewing deck, made the facilities accessible for people with disabilities.

5.2.4.2 Cape Meares NWR

The Refuge Complex provided the funding to improve the parking lot and construct two viewing decks at Cape Meares State Scenic Viewpoint. These upgrades and new construction increased the amount of parking and made these facilities accessible.

5.2.5 Public use opportunities and recreation trends on the Oregon Coast

Oregon's abundant outdoor recreation opportunities contribute both to the state's quality of life by providing accessible outdoor experiences, and to the economy by stimulating demand for local services, thereby creating jobs and income. Hiking, fishing, whale watching, tidepool exploring, photography, storm-watching, birding, cycling, kite flying, scuba diving, clamming, crabbing, camping, surfing, and beachcombing are among some of the outdoor activities that draw people to the Oregon coast. Residents and non-residents engage in these outdoor recreation opportunities which form the basis for a growing tourist industry, especially in rural areas.

Comparing the 1986 -1987 Pacific Northwest Outdoor Recreation Study to the 2003-2007 Oregon State Comprehensive Outdoor Recreation Plan (SCORP) shows that the most significant

participation growth activities in the state of Oregon include nature/wildlife observation (over 170 percent growth), golf, RV/trailer camping, and sightseeing/driving for pleasure.

In terms of tourism on the coast, the north and central coast of Oregon receives the most visitors. Easy accessibility from larger urban areas along the I-5 corridor makes these two regions very popular with sightseers. The Oregon south coast is associated with more active pursuits of fishing and motorized off-road sports. Two of the state's best fishing destinations, the Umpqua and Rogue rivers, are located in this region. Scenic areas also make the south coast a sightseeing destination, but the area is relatively distant from urban areas and Interstate 5, resulting in fewer sightseers visiting these areas as compared to the north and central coast.

National Wildlife Refuges in Oregon provide the public with opportunities to view and photograph wildlife in their natural habitats in a variety of ecosystems. In 2007, over 2 million people visited National Wildlife Refuges in Oregon. The majority of those viewed the seals, sea lions, and seabirds of the Oregon Islands NWR (OPRD 2003). A study issued by the Service reported that traveling visitors seek new outdoor recreational opportunities and opportunities for solitude. Visitors felt that many of the popular federal land management agencies' facilities were too crowded and regulated. The refuges in Oregon and other states are starting to attract visitors seeking solitude and new outdoor recreational opportunities. This follows a trend discovered during data collection for the 2003-2007 SCORP where the public is asking land managers to place an increasing emphasis on protecting streams, fish, wildlife habitat, and threatened and endangered species. They are also asking land managers to manage for amenities including quiet, natural places, natural appearing settings, and information and education.

5.2.6 Impact of illegal uses

5.2.6.1 Oregon Islands

Aerial disturbance to seabird and pinniped colonies on rocks, reefs, islands and headlands is of concern all along the Oregon coast. Disturbance events can be caused by a wide range of powered and non-powered aircraft. Seabirds and pinnipeds are highly vulnerable to aerial disturbance and large numbers of eggs and young can be destroyed during a single disturbance event. Although not allowed as a public use and considered trespass on the refuge, rock climbers, anglers, and sightseers illegally access certain rocks and islands which are easily accessible at low tides. It is likely that this type of trespass will increase over the next decade and a half as the Oregon coast's population increases. Individuals accessing the near shore by boat, swimming, or surfboards may be interested in approaching the rocks and islands to get good views of the refuge's wildlife. Legal activities occurring on land and in the air and waters surrounding Oregon Islands NWR which have the potential to impact nesting wildlife include surfing, tide pool exploration, beachcombing, recreational diving, commercial filming, commercial and sport fishing, and aircraft flying at low altitudes over the ocean.

The Coquille Point Unit has been negatively affected by graffiti, vandalism, waste dumping, and overnight camping. Illegal uses persist partly due to limited law enforcement capability and lack of public awareness of the sensitivity of the wildlife to human disturbance. Activities occurring on beaches surrounding Coquille Point and adjacent to the nearby coastal rocks and islands that can impact refuge wildlife include surfing, kayaking, fishing, bait collection, skimboarding, jogging, kite flying, driftwood fires, and uncontrolled dogs. These lands are managed by OPRD; therefore,

the Complex works cooperatively with OPRD to minimize the negative impacts from these uses on refuge resources.

5.2.6.2 Three Arch Rocks NWR

The wildlife using the Three Arch Rocks Refuge experience disturbance by boaters and pilots; seabirds and pinnipeds are highly vulnerable to disturbance, and large numbers of eggs and young can be lost during a single event. Thus, activities occurring in the waters within 500 feet of these islands have a high potential for disturbing wildlife. Disturbance by boaters has decreased since the 1994 ruling by the Oregon State Marine Board that established a 500-foot seasonal closure (Buffer Zone) of the waters surrounding the refuge to reduce breeding season impacts from disturbance events caused by boats.

5.2.6.3 Cape Meares NWR

Due to high public use and the almost daily presence of refuge and OPRD volunteers, illegal activity at Cape Meares is minimal. Off-site public use facilities, provided with Service funds, have been vandalized and stolen on only two occasions in the past 14 years. It is anticipated that an increase in law enforcement presence would further reduce the incidence of illegal activity.

5.3 Historic Properties and Cultural History

5.3.1 Oregon Coast human history

Prior to the arrival of Euro-Americans, Native American Tribes occupied many locations along the Oregon coast. It is estimated that Native Americans first came to the Oregon Coast 12,000 years ago to hunt, fish, and gather food in the coast's bountiful forests and waters. It was largely subsistence based living and the archaeological evidence left behind is limited due to the fact that 12,000 years ago the shoreline was 20 miles west of its current location thus inundating use sites of the time. Several researchers (Berreman 1944, Chase 1873, Ross 1977, Schumacher 1877a, 1877b) noted the association of offshore rocks with large mainland village sites in Oregon. Fish and wildlife populations on or associated with the rocks and islands were of great economic importance to Native American Indians. Some of the rocks and islands in Oregon were occupied by native people at least seasonally. Archaeological sampling of a large midden in 1989 found shellfish remains to be the most common items along with some pinniped, fish and seabird bones (Gard 1990, 1992). Cultural material found on several offshore rocks suggests that these rocks were occupied at least seasonally. At YHONA, archaeological investigations of midden sites on the mainland, revealed the presence of seabird bones including cormorants, gulls, albatross and loons.

The evidence from these midden sites indicates a healthy human population utilizing a myriad of natural resources. Perhaps as early as the 16th century the native populations began to decline precipitously. Largely from diseases that arrived with European explorers. By the late 19th century the remaining populations were forcibly relocated to centralized reservations (Gard 1990). Descendants of the original coastal inhabitants are found in the current major tribes of the Oregon coast, the Confederated Tribes of Grand Ronde; the Confederated Tribes of Siletz Indians; Confederated Tribes of the Coos, Lower Umpqua and Siuslaw Indians; Coquille Indian Tribe and the Clatsop-Nehalem Confederated Tribes.

European exploration of the Oregon Coast began in the 18th century with Spanish explorers, and the British soon followed, both laying claim to the Northwest Coast. The American Robert Gray visited the Oregon Coast via the sea in 1788 and 1792 and came back with furs (Center for the Study of the Pacific Northwest 2008). After the Louisiana Purchase, Lewis and Clark reached the Oregon Coast in 1804 and staked the United States' claim to the territory. They returned east with furs, and this led John Jacob Astor to set up the first permanent white settlement in Oregon. The post, called Astoria, was at the mouth of the Columbia River.

Oregon achieved statehood in 1859, and the completion of railroads through the Coast Range Mountains encouraged land development along the ocean shore. In 1874, the Oregon State Land Board began selling public tidelands to private landowners. Resorts grew up around the beaches at Seaside, Newport, and Rockaway, and the newly completed railroads brought tourists from the population centers of the Willamette Valley for weekend vacations. In 1911, Governor Oswald West was elected on the promise to reclaim Oregon's beaches as public land (OPB 2008). The legislature favored the privatization of these lands, but West was able to make an argument for public ownership based on the need for transportation. The 1913 legislature declared the entire length of the ocean shore from Washington to California as a state highway. Legislators also created the State Highway Commission, which began the construction of Highway 101 (OPB 2008). The OPRD bought land for 36 state parks along the coastal highway, an average of one every 10 miles. With the completion of the highway and parks system, coastal tourism came of age (NOAA 1998).

5.3.1.1 Oregon Islands NWR

The offshore rocks and islands of the Oregon Islands NWR have known cultural resources of significance to Native American Tribes whose ancestors used the islands and harvested wildlife for thousands of years. The rocks and islands were also targeted by Euro-Americans as early as 1892. They exploited common murre colonies along the southern Oregon coast for food. An article in the Port Orford Tribune newspaper on May 17, 1892, states that Asa Carey and Charles Anderson, two local men, were starting a business to harvest murre eggs from rocks off of Humbug Mountain. The article also stated “The murre, which a few years ago was not known to exist north of Cape Mendocino are now to be found off Humbug by thousands.” Apparently, murre colonies on Island Rock and Redfish Rocks west of Humbug Mountain were the targets of this harvest, with the eggs being sent to San Francisco by ship. Articles in the Port Orford Tribune on June 11, 1901 talk of simultaneous harvest of murre eggs on Island Rock and Blanco Reef (probably Orford Reef off Cape Blanco). Charles and Will Strahan were the owners of the company. This apparently did not end murre egging in this area as The Port Orford Tribune reported on June 9, 1909, that the crew of the boat Ranger had gathered 170 dozen eggs in one forenoon’s work. An article in the Centennial Edition of the Coos Bay Times on May 3, 1947, indicated that in the early days, an average of 700 dozen murre eggs was gathered each year at Island Rock and Redfish Rocks. It appears that by the turn of the century, thousands of murres nested on the rocks and islands near Port Orford and supported commercial harvesting of eggs for at least a decade (Manuwal et al. 2001). Both the Coquille Point and Crook Point units contain Native American cultural resources and sites of significance to the Coquille Indian Tribe and the Confederated Tribes of the Siletz Indians.

On July 7, 1992, a perpetual easement with Eternity at Sea was established for privately-owned Tillamook Rock. The easement states the rock is to be known as the Tillamook Rock Lighthouse Unit of the Oregon Islands National Wildlife Refuge and is to be managed as a seabird nesting

and habitat area in perpetuity and as a non-visiting columbarium/cemetery and historic lighthouse. The lighthouse is listed in the National Registry of Historic Places.

5.3.1.2 Three Arch Rocks NWR

There are no historic properties associated with the Three Arch Rocks Refuge. This refuge has the distinction of being the first National Wildlife Refuge established west of the Mississippi River. The need to designate the refuge as a protected wildlife area was brought to the attention of President Theodore Roosevelt by two pioneer naturalists and conservationists from Oregon, William L. Finley and Herman Bohlman. Finley and Bohlman visited the wind and sea-swept rocks in June of 1901 and 1903 to photograph the unique wildlife. To reach the rocks, they loaded up a dory with food, a tent, water, clothing and photographic equipment and rowed toward the rocks. Shag Rock, the westernmost large rock, was the only rock with a landing spot and the men unloaded their equipment. They camped on Shag Rock for two weeks during which time they took some of the first photographs of nesting seabirds, collected eggs and specimens for study, and documented some of the life history of the birds. During the first expedition they witnessed a tugboat filled with target shooters circling the rocks blasting seabirds for sport every Sunday. Throughout the week they further witnessed other boats carrying gunners who were shooting Steller sea lions for their skins and oil. They knew they had to put a stop to this slaughter as the seabird and sea lion colonies could not survive much longer. After the expedition, Finley traveled across the country to Washington, D.C. for a personal audience with the President. After four additional years of lobbying, the President designated Three Arch Rocks as the first National Wildlife Refuge west of the Mississippi River on October 14, 1907 (Sharp 1926).

5.3.1.3 Cape Meares NWR

There are no historic properties or known cultural resources associated with this refuge. Cape Meares Lighthouse is listed in the National Register of Historic Places; however, it is located on the adjacent State Scenic Viewpoint and is not included in the MOU for management of the refuge and state park.

5.3.2 Special designation areas

5.3.2.1 Oregon Islands NWR

Bird Rocks, Blanco Reef, Coquille Point Rocks, Goat Island, Mack Reef, Orford Reef, Redfish Rocks, Table Rocks, Two Arches Rock, Whaleshead Island, and the islands surrounding YHONA are all designated as Important Bird Areas (IBAs). A portion of the refuge rocks and islands were designated as a National Wilderness Area in 1970 and the remaining rocks and islands, except Tillamook Rock, were designated in 1978 and 1996. The wilderness is named Oregon Islands Wilderness. The Crook Point Unit is designated by the Oregon Natural Heritage Advisory Council and registered as a Natural Heritage Conservation Area by the State Land Board because of its significant species and natural resource values.

5.3.2.2 Three Arch Rocks NWR

The refuge is designated as an IBA. Oregon's Important Bird Area program recognizes sites of outstanding importance to birds in the state. Sites with IBA designation are extremely important to Oregon's birds, though the IBA program by itself does not ensure the continued productivity of

selected sites and certainly cannot guarantee continued avian diversity throughout the state. Most species of birds within IBAs are at least partially migratory, and most of the waterfowl, shorebirds and seabirds of Oregon's IBAs are highly migratory, or at least make extensive flights between the recognized IBAs and other areas. The refuge was designated as a National Wilderness Area on October 11, 1978, and is known as Three Arch Rocks Wilderness.

5.3.2.3 Cape Meares NWR

The refuge (except for the hiking trail) was designated a Research Natural Area (RNA) on June 11, 1987. Research Natural Areas are part of a nationwide network of ecological areas set aside for both research and education. Cape Meares refuge was designated a RNA to further protect its unique vegetation, geology, and wildlife habitat in a naturally functioning ecosystem. The goals and objectives for Cape Meares NWR as a RNA are: (1) to preserve an example of a significant natural ecosystem for comparison with those influenced by humans; (2) to provide an educational and research area for ecological and environmental studies; and (3) to preserve gene pools of typical and endangered plants and animals.

5.4 Social and Economic Conditions

The Oregon coast stretches 362 miles and includes seven counties: Clatsop, Tillamook, Lincoln, Lane, Douglas, Coos, and Curry. Measured from the crest of the Coast Range Mountains, the coastal area of Oregon encompasses 7,800 square miles. One in three acres along the Oregon coast is federally owned (1000 Friends 2008).

5.4.1 Population demographics

The Oregon coast is home to one in every 15 Oregonians or roughly 6.5% of the state's population (DLCD website). These 225,000 residents are scattered along the coast, with 60% living in the coast's 32 incorporated communities and 40% living in unincorporated communities or in rural parts of the seven counties. The five largest cities are Coos Bay, North Bend, Newport, Lincoln City, and Astoria. The Oregon coast gained 20,000 new residents in the 1990's (USCB 2000).

The coast's population is older than the state average, and includes many retirees. According to the 2000 Census, one-third of all coastal residents are over the age of 55, and the median age on the coast is 40, compared with the state's median age of 36. The coast is ethnically homogenous with 91% of coastal residents listed as Caucasian (USCB 2000).

5.4.2 Economy and employment

Over 100,000 people work on the coast, 80% of whom work for private businesses. Tourism is the leading employer on the entire coast employing 23,000 people. In 2002, tourism spending on the Oregon coast exceeded $1.3 billion, an 80% increase over the previous 10 years. Spending by visitors generates sales in lodging, food services, recreation, transportation, and retail businesses. These sales support jobs for Oregon residents and contribute tax revenue to local and state governments.

The growth in tourism has partially offset a decline in the coastal timber and fishing industries. Yet the coast remains one of the largest producers of timber in Oregon and in 2002 the coast

accounted for more than a quarter of all timber production in the state. Agriculture is important in many parts of the Oregon coast. In 2001, gross farm sales on the Oregon coast totaled more than $175 million. Dairy products brought in nearly $95 million in sales during that same year. Tillamook County produces $85 million in dairy products annually. Some regions produce specific agriculture products including farms in Curry County that account for 90 percent of the nation's Easter lily bulbs, and 35 million pounds of cranberries grown on acidic soils in and around Bandon (1000 Friends 2008).

Despite growth in some areas, the coast's economy lags behind the rest of the state. While statewide employment grew by 23% from 1990 to 2000, coastal jobs increased by only 13%. Unemployment has also been higher on the coast (Cowden 2003). From 1996 to 2001 the average unemployment rate on the coast was more than 7%, compared with 5.7% for the state. Using an index based on employment and income figures, the Oregon Economic and Community Development Department considers four coastal counties (Coos, Douglas, Lane—outside of Dunes City, and Lincoln) to be economically distressed, along with seven communities outside of the economically distressed coastal counties of Astoria, Brookings, Garibaldi, Gold Beach, Nehalem, Port Orford, and Tillamook (Oregon Economic Development Council 2008).

Income on the Oregon coast has also lagged behind other parts of Oregon, and poverty has been higher. Coastal per capita income is $24,000 a year, 15% below the state average. And the 2000 Census found 13% of coastal residents live in poverty, compared with 10.6% statewide. Children First for Oregon reports nearly half of all children on the coast (46%) live in or near poverty levels, compared with 37% statewide (U.S. Bureau of Economic Analysis 2001).

5.4.3 Transportation

Highway 101 is a designated National Scenic Byway and All American Road that runs the length of the coast, acting both as a highway and a main street through many coastal communities. With a growth in population, traffic has become more congested on Highway 101 and the Oregon Department of Transportation data show the average daily flow of traffic increased by 10% from 1993 to 2003. The influence of seasonal tourism on Highway 101 is also evident, as traffic volumes in August are an average of 59% higher than traffic volumes in January (ODOT 2008).

5.4.4 The beach

In 1967, the Oregon Legislature passed the Beach Bill, which guaranteed public access to all Oregon beaches. Today, 90% of Oregon's beaches are accessible to the public via 1,150 beach access points, an average of three access points per mile of coastline (1000 Friends 2008).

5.4.5 Diversity

According to the 2005 OPRD SCORP in Oregon, as in the United States as a whole, minority populations are increasing at a rate well above total population growth. As a result, recreation providers in the state of Oregon must consider the needs of an ethnically mixed population when planning for outdoor recreation opportunities. Resource management agencies under the Department of the Interior and the Department of Agriculture including the U.S. Forest Service, the Bureau of Land Management, and the National Park Service are responding to some demographic changes by initiating recreation research to learn more about ethnic recreation

behavior. For example, studies have established that African Americans are less likely than European Americans to pursue recreation in dispersed settings or to travel to regional recreation areas. Also, Hispanic visitors tend to be more family and group-oriented when visiting outdoor recreation areas. The Service will be consulting this growing literature base to assist in satisfying the recreation needs of an increasingly diverse population.

5.5 Environmental Consequences

The purpose of this section is to describe the social and economic effects, and the significance of the anticipated effects associated with implementing various management actions as related to public use prescribed under the alternatives described in chapter 2. The alternatives are compared "side by side" under each topic, to facilitate comparison. Both adverse and beneficial effects of implementing each alternative are described.

Table 5.5 provides an overview of the anticipated social and economic effects on public use activities under the two alternatives by indicator. Effects are described in terms of the change from current conditions. Alternative 1, the no-action or current management alternative has a neutral effect because no changes to management programs would occur under this alternative. The analysis shows that implementation of Alternative 2 is not expected to result in a significant effect to the human environment, however, some positive and some negative effects are expected. The terms intermediate, minor, and slight, are used to describe the magnitude of the effect. To interpret these terms, "intermediate" is a higher magnitude than "minor," which is a higher magnitude than "slight." The word "neutral" is used to describe a negligible or unnoticeable effect compared to the current situation.

Adverse effects to opportunities for recreational public uses would be considered significant if a proposed action resulted in a substantial displacement of a wildlife-dependent public use or a substantial reduction in the quality of the wildlife-dependent experience. "Significant displacement" in this document is defined as termination of the activity at one of the Service's offsite visitor facilities, either lost altogether or moved to a geographically distant area, or termination of the activity altogether as associated with the Complex's refuges. A "substantial reduction in the quality" will be defined as an increase in visitation to greater than a level supported by the existing facility, or manageable with existing resources, or substantial anticipated losses of wildlife or habitat supporting the experience.

Positive effects to opportunities for recreational public uses would be considered significant if a proposed action resulted in substantial increase in opportunity for or quality of a wildlife-dependent public use. A "substantial increase in opportunity" will be defined as the opening of an existing facility to a new wildlife-dependent public use, the creation of a major offsite viewing facility where no comparable facility currently exists within a reasonable driving distance, or the improvement in the quality of an existing facility including parking, interpretation opportunities, and other public amenities, such that the facility condition moves from primitive to fully developed and managed.

Table 5.5 Summary of social and economic effects on public use of ccp alternatives

Social Effects	Alternative 1 Current Management	Alternative 2 Enhance Wildlife and Habitat, Maintain Public Use
Overall Visitation (on/off-refuge land)	Neutral Effect	Intermediate positive effect
Opportunities for Quality Wildlife Observation	Neutral Effect	Minor positive effect
Opportunities for Quality Wildlife Photography	Neutral Effect	Minor positive effect
Opportunities for Quality Environmental Education	Slightly Negative Effect	Intermediate positive effect
Opportunities for Quality Interpretation	Neutral Effect	Intermediate positive effect
Effects to Cultural and Historic Resources	Neutral effect	Slight positive effect
Amount of Illegal Use	Neutral effect	Intermediate positive effect
Economic Effects	Neutral Effect	Minor positive effect

5.5.1 Projected user numbers and outdoor recreation demands in 2015

As an overview to assessing the social and economic effects of Alternatives 1 and 2, it is important to understand the broader context of the refuges within the region and how recreational demand and public use is expected to change over time. A growing visitor presence on the refuges can be expected in the future. Many of the public use opportunities currently provided at the refuges are very popular within the state, and are forecasted to attract increasing amounts of participants in the coming years. A 2008 report by OPRD (2008) estimates the percent of change in the number of people participating in recreational activities in the future compared to current levels. According to the study, visitors aged 40 and older reported they are likely to expect an increase rather than a decrease in their outdoor recreation activities. On average across all activities, visitors 40 years of age and older, expect to spend 28% more days recreating by 2015 than they currently do. The top five activities that visitors participated in the most in a year, included walking, bird watching, jogging, sightseeing and bicycling.

In the age group of 5-18 years old there has been a steady decline in the amount of time children spend outdoors and an increase in the amount of time spent indoors. This disconnect from nature is projected to have serious long term implications for the health and well-being of the state's population and to the future stewardship of our public lands. Research has shown that people who do not participate in outdoor recreation as youth are less likely to participate in those activities as adults. Exposing children to outdoor recreation activities can provide children a variety of benefits including physical, social, emotional and spiritual benefits (OPRD 2008). The Service has launched a nationwide initiative "Connecting Children with Nature" to encourage refuges to implement strategies that serve to increase the amount of time children spend outdoors, especially on our refuges. Thus, the Oregon coast refuges anticipate an increase in the amount of students participating in environmental education.

The 2006, Banking on Nature report (Caudill 2006) focused on the employment, income, and tax revenue effects that recreational visitors to national wildlife refuges have on the economies of local regions. Additionally, it measured the impact of "ecotourism" which was defined as large numbers of people traveling substantial distances to take part in non-consumptive uses of the natural environment. Ecotourism is on the rise around the world and it is one method that can be used to derive economic benefits to a community from the conservation of wildlife and habitat. In 2006,

34.8 million people visited a National Wildlife Refuge in the lower 48 states for recreational purposes. Their spending placed nearly $1.7 billion into regional economies from sales. These sales helped employ approximately 27,000 people. Approximately 82% of total expenditures are generated by non-consumptive activities on refuges nationwide. The Refuge Complex hosted over 1,000,000 visitors in 2007. More than 97% participated in nonconsumptive uses on the refuges and the remaining 3% participated in hunting and fishing (RAPP 2007).

It is important to consider the amount of population growth forecast for the Oregon coast between now and 2015. Population growth is expected to increase in all Oregon coast counties except Clatsop and Coos (USCB 2000). Regardless of which alternative is selected, population growth and increasing recreational demand, particularly in nature activities, is expected to increase the demand for outdoor recreation on the refuges.

5.5.2 Opportunities for quality wildlife observation and photography

No significant adverse effects are expected under either of the alternatives, because none of the alternatives would displace any wildlife observation or photography activities. Visitation is expected to increase under both alternatives, mostly due to population increases and the growing popularity of wildlife observation. None of the alternatives are expected to result in increasing crowding by more than half of the current use or in substantial anticipated losses of wildlife or habitat supporting the wildlife viewing or photography experience.

5.5.2.1 Alternative 1

Only facility maintenance would occur under this alternative. Effects on opportunities for wildlife observation and photography would be neutral or slightly negative, because growth in population and recreational demand means that more visitors would arrive at the refuges, but the number of facilities available to accommodate the visitors under these alternatives would remain the same. Currently, wildlife photography and observation opportunities available to the public primarily occur on off-refuge sites owned and managed by city, county, state and federal agencies. To facilitate this off-site public use, the Refuge Complex has enhanced wildlife viewing opportunities on several mainland areas that overlook refuge rocks and islands at sites managed by these agencies. For example, the Complex used a variety of funding sources and worked with partners to upgrade and repave the parking lot and sidewalk and to construct wildlife viewing decks with accompanying interpretive panels at Shore Acres State Park's Simpson Reef Overlook. Under this alternative, the Complex will continue to work cooperatively to maintain these facilities but will not upgrade or add any new facilities to improve opportunities for wildlife observation and photography.

5.5.2.2 Alternative 2

Facilities to improve opportunities for wildlife observation and wildlife photography would be upgraded and enhanced under this alternative, resulting in a minor positive effect for wildlife observation opportunities and a slightly positive effect for photography. Habitat improvements including the removal of invasive species under Alternative 2, would make it reasonable to assume that these improvements would create a minor increase in wildlife viewing and photography opportunities for some species. As stated above under Alternative 1, most wildlife photography and observation opportunities available to the public occur at off-refuge sites owned and managed by city, county, state and federal agencies. Under this alternative, the Complex will continue to

work cooperatively to maintain these facilities and will look to upgrade and/or add new facilities to improve opportunities for wildlife observation and photography. It benefits the Complex's natural resources to continue to work with partners like OPRD and BLM, because as they improve or maintain visitor facilities, it provides an opportunity to get the wildlife conservation message delivered to more visitors in a manner that minimizes disturbance to wildlife. Under this alternative we will also look to establish partnerships with the Oregon Coast Aquarium and Sea Lion Caves to develop interpretive panels on their lands or within their visitor facilities. Each partnership between the Complex and another private or public group will be formalized in a MOU to ensure the goals and objectives of both the cooperator and the Complex are delineated and that the roles and responsibilities of each agency or group are clear.

5.5.3 Opportunities for quality environmental education

No significant adverse effects are expected under either of the alternatives, because neither would displace any environmental education activities. Neither of the alternatives would result in substantial anticipated losses of wildlife or habitat supporting the environmental education experience.

5.5.3.1 Alternative 1

With limited staff time available, the only way the Complex can currently offer a high quality environmental education program coast-wide is by annually hiring temporary staff through national service programs like Northwest Service Academy's AmeriCorps. Under the No Action Alternative, the Complex would continue to coordinate and cooperate with school districts and the Northwest Service Academy to annually hire at least one AmeriCorps member to provide environmental education if funding allows. The uncertainty associated with availability of annual funding to hire temporary environmental education staff results in a slightly negative effect to opportunities for environmental education under this alternative, since in any given year the environmental education program could be suspended if funding is unavailable.

5.5.3.2 Alternative 2

Under this alternative, either an Environmental Educator (GS-7/9) or temporary staff would be hired to expand the environmental education program for the Complex, resulting in an intermediate positive effect. Specifically, under this alternative, the Complex would develop a quality environmental education program focusing on seabirds and other wildlife of Oregon Islands and Three Arch Rocks NWRs. The Complex would pursue partnerships to develop, fund, and implement a seabird education module for coastal schools. The Complex would develop an MOU with school districts to implement environmental education along the Oregon coast, including strategies to secure long-term funding for bus transportation to support school participation in environmental education programs. Expansion of environmental education opportunities in cooperation with OPRD would also take place offsite under this Alternative. Specifically, the Complex would work with OPRD and Friends of Cape Meares to develop and implement an environmental education program and an evening campground program at Cape Lookout State Park. The Complex would seek grant opportunities to cover program expenses.

The positive effects under Alternative 2 would not be considered significant because the proposed actions will not create a new environmental education program where none existed before, nor will they open the refuges to a new wildlife-dependent public use.

5.5.4 Opportunities for quality interpretation

Both alternatives provide existing opportunities for visitors to encounter interpretive signs, refuge brochures and publications, and refuge interpretive volunteers. No significant adverse effects are expected under any of the alternatives, because neither of the alternatives would displace existing interpretive activities. None of the alternatives would result in substantial anticipated losses of wildlife or habitat supporting the interpretation experience.

Under Alternative 2, the positive effects to opportunities for quality interpretation resulting from an increase in interpretive signage and expanded coverage by refuge interpretive volunteers would not be considered significant because the proposed actions will not open an existing facility to a new wildlife-dependent public use nor create a major offsite interpretive opportunity where no comparable opportunity currently exists within a reasonable driving distance.

5.5.4.1 Alternative 1

The Complex currently partners with OPRD and BLM to provide quality wildlife viewing opportunities at sites they own and manage. Under this alternative the Complex will continue to station interpretive volunteers on these lands where public visitation is high and wildlife can be easily viewed. The Complex will work to ensure that as part of this partnership the cooperating agencies continue to provide the volunteers with a full hook-up site for a Recreational Vehicle at a nearby state park campground and in return the Complex will recruit, train and provide viewing equipment and uniforms for the volunteers. However, no additional coastal sites overlooking refuge lands will be added to the interpretive program (i.e., adding volunteers on these sites) under this alternative nor will any additional interpretive facilities (i.e., viewing decks, interpretive panels, brochures) be added.

5.5.4.2 Alternative 2

As part of Alternative 2, the preferred alternative, the Complex would maintain and grow existing partnerships and establish new partnerships to develop public use facilities that enhance interpretation, resulting in an intermediate positive effect. As mentioned above, the Complex designed and installed interpretive and regulatory panels at offsite locations with the dual purpose of explaining the natural history of the wildlife living on the rocks and islands and communicating to visitors the regulations protecting these species. Under the Preferred Alternative, the Complex would maintain all existing interpretive panels and would develop new interpretive panels to be placed at additional public access sites along the coast. Under this alternative, each partnership between the Complex and another public agency, including OPRD and BLM, would be formalized in a MOU to ensure the goals and objectives of both the cooperator and the Complex are delineated and that the roles and responsibilities of each agency or partner are clear.

Due to an increase in the number of visitors to the Oregon coast, there is a need to expand the Complex's wildlife interpretation program, by stationing volunteer interpreters seven days per week from April through September, and adding volunteer locations. Under this alternative the volunteer wildlife interpretation program would be expanded to include new sites that have been identified as high priority for interpretation. As the Refuge Complex volunteer program grows, more work would be placed on an already limited staff. Therefore, hiring a full-time GS 7/9 volunteer coordinator would be pursued. The coordinator would manage a program that annually

utilizes volunteers to control invasive species, maintain public use facilities, lead environmental education field trips, and conduct wildlife interpretation, as well as assist with biological tasks.

5.5.5 Effects to cultural and historic resources

The National Historic Preservation Act (NHPA) of 1966, as amended, establishes the Federal Government's policy on historic preservation and the programs through which that policy is implemented. An impact to cultural resources would be considered significant if it adversely affects a resource listed in or eligible for listing in the National Register of Historic Places (NRHP). In general, an adverse effect may occur if a cultural resource would be physically damaged or altered, isolated from the context considered significant, or affected by project elements that would be out of character with the significant property or its setting. Title 36 CFR Part 800 defines effects and adverse effects on historic resources. To avoid adverse effects to cultural resources a cultural resource survey would be conducted prior to implementing any restoration activities. Any new cultural resources identified during the survey would be recorded and evaluated for eligibility to the NRHP. If any sites are determined to be eligible to the NRHP, the restoration plans would be assessed for potential effects to the historic property. If effects are possible, the proposal would be reviewed to ensure that the effects have the least impact to original materials and are in conformance with the Secretary of the Interior's Standards for the Treatment of Historic Properties. Changes that comply with the Secretary's Standards would have no adverse affect on historic properties. Once an assessment has been completed, the findings would be forwarded to the State Historic Preservation Officer (SHPO) for concurrence.

5.5.5.1 Alternative 1

There would be a neutral effect on refuge cultural resources under this alternative. Native American Tribes and federal agencies would continue to be essential partners under Alternative 1. Complex staff members would continue to go through the process listed above and coordinate with Native American Tribes when conducting ground-disturbing activities, particularly in the preplanning stage for projects involving significant ground disturbing activities.

5.5.5.2 Alternative 2

There would be no significant impacts to cultural resources as a result of human activity within the refuges under this alternative. The changes in public use and to wildlife habitat that would occur under this alternative would not alter the protection of any known sites and would not diminish the historic character of these sites. Under this alternative, the Complex would continue to work with Native American Tribes to locate, characterize and protect cultural resource sites on refuge lands and maintain secrecy and security of sites. In addition, the Complex would seek the Tribes' assistance to identify and characterize significant archaeological sites and plan for their protection in accordance with provisions of the Archaeological Resource Protection Act of 1979. A refuge GIS layer would be developed for archaeological sites, burial sites and sacred areas, and would contain "constraint for use" conditions to protect sensitive information. In accordance with the Native American Graves Protection and Repatriation Act of 1990, Refuge Complex protocol and procedures would be established for handling inadvertent discoveries of human remains, burial objects, sacred objects, and objects of cultural patrimony.

5.5.6 Amount of illegal use

Human disturbance (via aircraft, boat or foot trespass) to seabird colonies and pinniped rookeries; vandalism; and garbage dumping occurs on the Refuges. Both alternatives include measures to deter illegal uses of the refuge, however, Alternative 2 provides more aggressive measures to curb illegal activities and create a safe environment for visitors. Under this alternative, a primary focus for the Complex's full-time permanent law enforcement officer would be to establish cooperative arrangements with other local, state and federal enforcement agencies to enforce refuge and wildlife regulations and laws, and eliminate illegal trespass on closed areas of refuge. The officer would also work to establish partnerships with state and local agencies to ensure the accuracy of refuge and wildlife regulations in their publications. The actions would result in intermediate positive effects to opportunities for recreational public uses, but they would not be significant because they would likely not result in a substantial increase in the opportunity for quality of any wildlife-dependent public uses. The actions would also result in intermediate positive benefits to natural resources due to the reduction in trespass and refuse dumping.

5.5.7 Economic effects

In 2007, visitors spent more than $1.37 billion in travel related expenses on the Oregon coast (Runyan 2007). These visitors stated sightseeing and wildlife watching as two of the five primary reasons for their visit to the Oregon coast (OPRD 2003). Oregon Islands, Three Arch Rocks, and Cape Meares NWRs provide these two opportunities to visitors and thus have an impact on the economies of the Oregon coast. Furthermore, the Complex receives an annual budget that supports employee salaries, the refuges' operations and maintenance costs, and wildlife habitat and public use programs for all six refuges within the Complex. The Complex is sometimes allocated funding for capital improvements such as improving roads and parking lots, construction of viewing decks, boardwalks, and kiosks. All of these activities require spending by the Service, which results in effects on the local economy.

The Refuges also provide an indirect economic impact to the coastal economy through the many recreational activities that they support. These activities currently include wildlife observation, photography, environmental education, and interpretation. These activities will continue under both alternatives, thus, the visitors that participate in these activities will contribute to the health of the coastal economy through the purchase of goods and services (e.g., food, lodging, fuel, equipment).

Refuge Complex recreational programs and facilities would vary by alternative with more programs and facilities being developed under Alternative 2. The addition is mostly due to projected increases in interpretation and environmental education programs. Overall, recreational visitation is expected to be slightly higher under Alternative 2 than under Alternative 1 because of the greater emphasis in this alternative for an expanded number of interpretive and environmental education programs. As a result, Alternative 2 would result in the highest number of local jobs and have the highest degree of local economic effect stemming from the recreational expenditures of refuge visitors.

The economic contributions resulting from the recreational opportunities offered by the Oregon coast refuges are very small within the context of the overall tourist/recreation economic picture along Oregon's coast. Refuge Complex operational expenditures would vary by alternative based

on staffing levels and programs associated with each alternative, and each alternative would result in a different degree of economic effect. Alternative 2 requires the highest level of staffing and expenditure and would have a greater effect on the local economy as compared to the no action alternative. However, effects to the local economy under either alternative are not considered significant since the gain or loss in total personal income stemming from expenditures associated with the refuges do not constitute a significant portion of the total recreational incomes of the counties in the economic influence area.

5.5.8 Cumulative effects

The term "cumulative effects" is defined in the Council of Environmental Quality's (CEQ) regulations in 40 CFR Part 1508.7, as: "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions." Direct and indirect effects are addressed in the resource-specific sections of chapters 3, 4, and 5. It should be noted that since direct and indirect effects associated with implementing the various alternatives have been evaluated in a comprehensive manner, the cumulative effects analysis is largely complete. The analyses in the following section primarily focuses on effects associated with reasonably foreseeable future events and/or actions regardless of what entity undertakes that action.

As described in Chapters 3, 4, and 5, cumulatively, there has been very little change to the rocks, reefs, and islands along the Oregon coast. However, there has been substantial modification to all native mainland habitats including headland forests and coastal prairie, two habitats which exist in limited acreage within these refuges. A variety of government agencies including OPRD, BLM, USFS, and the Service have protected a large number of natural areas along the coast, however, modification and loss of native habitats and human pressure on protected areas continues at a regional scale due to a growing coastal population and the increase in coastal tourism. Loss of old-growth forest structure and the introduction of invasive species into habitat have altered ecosystem processes along the coast, and global climate change and associated changes to the marine environment will have additional impacts on coastal habitats.

As protected areas, Oregon Islands, Three Arch Rocks, and Cape Meares NWRs, though relatively small in size, are extremely important to the persistence of coastal wildlife. Under both alternatives, the Complex would protect and maintain its coastal habitats and their associated wildlife and plant species. Invasive species are likely to become more prevalent on surrounding lands, but on the Refuges, active efforts would be made to reduce their populations, especially under the Preferred Alternative. Under alternative 2 the Complex would emphasize working closely with partners to research, design, and implement cooperative studies that would directly contribute toward understanding and maintaining or restoring the biological integrity, diversity, and environmental health of the refuges. The Complex would improve the availability and quality of wildlife-dependent recreation under both alternatives, but would expand public use programs under Alternative 2. Under both alternatives, the Complex would continue to promote and preserve the wilderness characteristics of Oregon Islands and Three Arch Rocks Wilderness areas, though under Alternative 2, there would be a greater emphasis placed on reducing the effects of human disturbance to wildlife, and increasing awareness of the refuges and appreciation for natural resources of the area through partnerships. Because it is anticipated that human population growth along the Oregon Coast will result in continuing loss and degradation of wildlife

habitats and open space, refuge habitats, in concert with other protected lands will become increasingly important in their role of conserving resident and migratory wildlife species over the life of the CCP and providing places where the public can enjoy and appreciate nature. Implementing the CCP would have overall beneficial effects to habitats and species, but in the context of all of the factors (both natural and human-caused) which adversely affect habitats and species (e.g., food availability, marine currrents, marine debris, human disturbance, ocean pollution, etc.) the positive contributions associated with CCP implementation do not represent a significant beneficial effect.

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Appendix A: Acronyms

Act	National Wildlife Refuge System Improvement Act of 1997 (also Improvement Act or NWRSIA)
ADA	Americans with Disabilities Act
AGL	Above Ground Level
AHPA	Archaeological and Historic Preservation Act
ARPA	Archaeological Resources Protection Act
BLM	Bureau of Land Management
CCEP	California Current Ecosystems Program
CCP	Comprehensive Conservation Plan
CFR	Code of Federal Regulations
EA	Environmental Assessment
EE	Environmental Education
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FMP	Fire Management Plan
FWS	U.S. Fish and Wildlife Service (also, Service, USFWS)
GAP	Gap Analysis Program
GIS	Geographic Information System
HMP	Habitat Management Plan
IPM	Integrated Pest Management
LE	Law Enforcement
MMPA	Marine Mammal Protection Act
MMS	Maintenance Management System
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
NAGPRA	Native American Graves Repatriation Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NRDA	Natural Resource Damage Assessment
NRHP	National Register of Historic Places
NWAC	Northwest Area Committee
NWR	National Wildlife Refuge
NWRS	National Wildlife Refuge System
NWRSIA	National Wildlife Refuge System Improvement Act of 1997
ODFW	State of Oregon Department of Fish and Wildlife
OPRD	State of Oregon Parks and Recreation Department
OSMB	Oregon State Marine Board
OSP	Oregon State Police
OSU	Oregon State University
PFT	Permanent full time
PIF	Partners in Flight
R1	Region 1 of the FWS (WA, OR, CA, HI, NV, ID)
RNA	Research Natural Area
RONS	Refuge Operating Needs System

SCORP	Statewide Comprehensive Outdoor Recreation Plan
SEA	Shoreline Education for Awareness
TNC	The Nature Conservancy
USCG	U.S. Coast Guard
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
YHONA	Yaquina Head Outstanding Natural Area
Complex	Oregon Coast National Wildlife Refuge Complex

Appendix B. Master List of Species Names in CCP

Plants

Beach layia (*Layia camosa*)
Beach strawberry (*Fragaria chiloensis*)
Beach wormwood (*Artemisia pycnocephala*)
Broadleaf lupine (*Lupinus latifolius*)
Canada thistle (*Cirsium arvense*)
Coast eriogonum (*Eriogonum latifolium*)
Coastal sagewort (*Artemisia pycnocephala*)
Common yarrow (*Achillea millefolium*)
Coyote bush (*Baccharis pilularis*)
Dock (*Rumex spp.*)
English ivy (*Hedera helix*)
European beachgrass (*Ammophila arenaria*)
Evergreen huckleberry (*Vaccinium ovatum*)
Field horsetail (*Equisetum arvense)*
Gorse (*Ulex europaeus*)
Himalayan blackberry (*Rubus discolor*)
Hooker willow (*Salix hookeriana*)
Kinnikinnick (*Arctostaphylos uva-ursi*)
Large-flowered goldfields (*Lasthenia macrantha)*
Leatherleaf licorice fern (*Polypodium scouleri*)
Pacific sedum (*Sedum spathulifolium*)
Pink sand verbena (*Abronia umbellate*)
Plantain (*Plantago lanceolata*)
Powdery dudleya (*Dudleya farinosa*)
Purdy's stonecrop (*Sedum spathulifolium*)
Red alder (*Alnus rubra)*
Red fescue (*Festuca rubra*)
Roemer's fescue (*Festuca roemerii*)
Rush (*Juncus spp.)*
Salal (*Gaultheria shallon*)
Salmonberry (*Rubus spectabilis*)
San Francisco bluegrass (*Poa unilateralis*)
Scotch broom (*Cytisus scoparius*)
Sea fig (a.k.a. Ice plant) (*Carpobrotus chilensis*)
Seaside daisy (*Erigeron glaucus*)
Seaside goldfields (*Lasthenia maritima*)
Selfheal (*Prunella vulgaris*)
Shore pine (*Pinus contorta)*
Sitka spruce (*Picea sitchensis)*
Swordfern (*Polystichum munitum*)
Tansy ragwort (*Senecio jacobaea*)
Vine maple (*Acer circinatum*)
Wax myrtle (*Myrica cerifera*)
Western blue violet *(Viola adunca)*

Western brackenfern (*Pteridium aquilinum*)
Western hemlock (*Tsuga heterophylla*)
Wolf's evening primrose (*Oenothera wolfii*)
Wood sorrel (*Oxalis oregana*)

Birds

Aleutian cackling goose (*Branta hutchinsii leucopareia*)
Aleutian tern (*Sterna aleutica*)
Ancient murrelet (*Synthliboramphus antiquus*)
Arctic tern (*Sterna paradisaea*)
Bald eagle (*Haliaeetus leucocephalus*)
Barn owl (*Tyto alba*)
Black oystercatcher (*Haematopus bachmani*)
Black-vented shearwater (*Puffinus opisthomelas*)
Brandt's cormorant (*Phalacrocorax penicillatus*
Brown creeper (*Certhia americana*)
Brown pelican (*Pelecanus occidentalis*)
Cassin's auklet (*Ptychoramphus aleuticus*)
Common murre (*Uria aalge*)
Craveri's murrelet (*Synthlibocamphus craveri*)
Fork-tailed storm-petrel (*Oeanodroma furcata*)
Great horned owl (*Bubo virginianus*)
Hermit warbler (*Dendroica occidentalis*)
Killdeer *(Charadrius vociferous)*,
Kittlitz's murrelet (*Brachyramphus brevirostris)*
Leach's storm-petrel (*Oceanodroma leucorhoa*)
Manx shearwater (*Puffinus puffinus*)
Marbled murrelet (*Brachyramphus marmoratus*)
Northern spotted owl (*Strix occidentalis caurina*)
Pelagic cormorant (*Phalacrocorax pelagicus)*
Peregrine falcon (*Falco peregrinus*)
Pigeon guillemot (*Cepphus columba*)
Pileated woodpecker (*Dryocopus pileatus*)
Red crossbill (*Loxia curvirostra*)
Rhinoceros auklet (*Cerorhinca monocerata*)
Savannah sparrow (*Passerculus sandwichensis*)
Snowy plover *(Charadrius alexandrinus)*
Swainson's thrush *(Catharus ustulatus)*
Tufted puffin (*Fratercula cirrhata*)
Varied thrush (*Ixoreus naevius*)
Vaux's swift (*Chaetura vauxi*)
Western gulls (*Larus occidentalis*)

Mammals

Black bear (*Ursus americanus)*
Black-tailed deer (*Odocoileus hemionus*)

Bushy-tailed wood rat (*Neotoma* cinerea)
California red-backed vole (*Clethrionomys californicus*)
California sea lion *(Zalophus californianus)*
Coyote (*Canis latrans)*
Deer mouse (*Peromyscus maniculatus)*
Feral cat (*Felis catus*)
Gray fox (*Urocyon cinereoargenteus*)
Harbor seal *(Phoca vitulina)*
Long-tailed vole (*Microtis longicaudus*)
Marsh shrew (*Sorex bendirii*)
Mink (*Mustela vison*)
Mountain lion (*Felis concolor*)
Northern elephant seal (*Mirounga angustirostris)*
Northern flying squirrel (*Glyucomys sabrinus*)
Norway rat (*Rattus norvegicus*)
Oregon meadow mouse (*Microtus oregoni*)
Oregon vole (*Microtis oregoni*)
Pacific jumping mouse (*Zapus trinotatus*)
Pacific shrew (*Sorex pacificus*)
Pocket gopher (*Geomys bursarius*)
Raccoon (*Procyon lotor*)
Red fox (*Vulpes vulpes*)
Red tree mouse (*Phenacomys longicaudus*)
River otter (*Lutra canadensis*)
Roof rat (*Rattus rattus*)
Roosevelt elk (*Cervus canadensis roosevelti*)
Sea otter (*Enhydra lutris*)
Short and long-tailed weasel (*Mustela* spp.)
Shrew-mole (*Neurotrichus gibbsii*)
Spotted skunk *(Mephitis mephitis*)
Steller sea lion (*Eumetopias jubatus*)
Striped skunk (*Spilogale putorius)*
Townsend's chipmunk (*Tamias townsendi*)
Trowbridge's shrew (*Sorex trowbridgii*)

Amphibians

Clouded salamander (*Aneides ferreus*)
Ensatina salamander (*Ensatina eschscholtzii oregonensis)*
Long-toed salamander (*Ambystoma macrodactylum)*
Pacific giant salamander (*Dicamptodon tenebrosus*)
Pacific tree frog (*Pseudacris regilla)*
Roughskin newt (*Taricha granulose*)
Torrent salamander (*Rhyacotriton spp.*)
Western red-backed salamander (*Plethodon vehiculum*)

Invertebrates

Gorse spider mite (*Tetranychus lintearius*)
Oregon silverspot butterfly *(Speyeria zerene hyppolyta)*

Fish

Coastal cutthroat trout (*Oncorhynchus clarkia*)

Appendix C. Statement of Compliance

Statement of Compliance for Implementation of the Oregon Islands, Three Arch Rocks and Cape Meares National Wildlife Refuges Comprehensive Conservation Plan and Oregon Islands and Three Arch Rocks Wilderness Stewardship Plan

The following executive orders and legislative acts have been reviewed as they apply to implementation of the Oregon Islands, Three Arch Rocks, and Cape Meares National Wildlife Refuges Comprehensive Conservation Plan.

National Environmental Policy Act (1969). The planning process has been conducted in accordance with National Environmental Policy Act Implementing Procedures, Department of the Interior and Service procedures, and has been performed in coordination with the affected public. The requirements of the National Environmental Policy Act (42 U.S.C. '4321 et seq.) and its implementing regulations in 40 CFR Parts 1500-1508 have been satisfied in the procedures used to reach this decision. These procedures included: the development of a range of alternatives for the CCP; analysis of the likely effects of each alternative; and public involvement throughout the planning process.

An environmental assessment (EA) was prepared for the project that integrated the CCP management objectives and alternatives into the NEPA document and process. The Draft CCP and EA shall be released for a 30-day public comment period. The affected public shall be notified of the availability of these documents through a Federal Register notice, news releases to local newspapers, the Service's refuge planning website, and a planning update. Copies of the Draft CCP/EA and/or planning updates shall be distributed to an extensive mailing list. The CCP shall be revised based on public comment received on the draft documents.

National Historic Preservation Act (1966). The implementation of the CCP should not affect cultural resources. The proposed action does not meet the criteria of an effect or adverse effect as an undertaking defined in 36CFR800.9 and Service Manual 614FW2. The Service will comply with the National Historic Preservation Act if any management actions have the potential to affect any historic properties which may be present.

Executive Order 12372. Intergovernmental Review. Coordination and consultation with affected Tribal, local and State governments, other Federal agencies, and the landowners has been completed through personal contact by the Service's regional office and refuge staff.

Executive Order 13175. Consultation and Coordination with Indian Tribal Governments. As required under Secretary of the Interior Order 3206 American Indian Tribal Rights, Federal-Tribal Responsibilities, and the Endangered Species Act, the Project Leader consulted and coordinated with The Coquille Indian Tribe, Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians, Confederated Tribes of the Siletz Indians, and Confederated Tribes of the Grand Ronde regarding the proposed action. Specifically, the Service coordinated with throughout the Service's planning process over the past three years while developing the Refuge's Comprehensive Conservation Plan.

Executive Order 12898. Federal Actions to Address Environmental Justice in Minority and Low-Income Populations. All Federal actions must address and identify, as appropriate, disproportionally high and adverse human health or environmental effects of its programs, policies, and activities on minority populations, low-income populations, and Indian Tribes in the United States. The CCP was evaluated and no adverse human health or environmental effects were identified for minority or low-income populations, Indian Tribes, or anyone else.

Wilderness Act. All of the rocks, reefs and islands within Three Arch Rocks and Oregon Islands NWRs, with the exception of Tillamook Rock, have already been designated as wilderness. The Service has evaluated the suitability of Tillamook Rock and the two headland units of Oregon Islands NWR, Coquille Point and Crook Point, as well as Cape Meares NWR and Research Natural Area, for wilderness designation. Because of the highly altered nature of Tillamook Rock and the presence of buildings and concrete covering much of it, Tillamook Rock does not satisfy minimum wilderness suitability criteria. The determination was made that the Coquille Point Unit does not satisfy minimum wilderness suitability criteria because of the small size and highly altered and developed nature of the headland. The Crook Point Unit does not satisfy minimum wilderness suitability criteria because of the small size and developed nature of the southern portion of this unit. While Cape Meares NWR contains excellent examples of once common but now rare habitat types, the small acreage, discontinuous refuge lands, and the presence of heavily used roads on and adjacent to the refuge results in a determination that Cape Meares National Wildlife Refuge does not satisfy minimum wilderness suitability criteria.

A Minimum Requirement Analysis (MRA) was prepared consistent with the spirit and intent of the Wilderness Act of 1964 (16 U.S.C. 1131-1136). The MRA clarifies the need for and determines the potential impacts of a proposed action to wilderness resources. The Oregon Coast National Wildlife Refuge Complex will authorize an activity within designated wilderness only if it is demonstrated that the activity meets the minimum requirement for administering the area as wilderness and accomplishes the purposes for which the refuge was established, including Wilderness Act purposes.

National Wildlife Administration Act of 1966, as amended by The National Wildlife Refuge System Improvement Act of 1997 (16 U.S.C. 668dd-668ee). During the CCP process the Refuge Manager evaluated all existing and proposed refuge uses at Oregon Islands, Three Arch Rocks, and Cape Meares Refuges. Priority wildlife-dependent uses (hunting, fishing, wildlife observation and photography, environmental education and interpretation) are considered automatically appropriate under Service policy and thus exempt from appropriate uses review. Compatibility determinations have been prepared for the following uses: wildlife observation and photography; environmental education and interpretation. Appropriate Use findings and Compatibility Determinations have been prepared for the following uses: research and dog walking. All of these uses were found to be compatible with Refuge purposes and the System mission with stipulations specified in each of the compatibility determinations.

EO 13186. Responsibilities of Federal Agencies to Protect Migratory Birds. The CCP is consistent with Executive Order 13186 because the CCP and NEPA analyses evaluate the effects of agency actions on migratory birds.

Endangered Species Act. This Act provides for the conservation of threatened and endangered species of fish, wildlife, and plants by Federal action and by encouraging the establishment of state programs. Section 7 of the Act requires consultation before initiating projects which affect or may affect endangered species. Consultation for Steller sea lion research conducted on refuge lands is covered by NOAA as part of their ongoing multi-state research program. The most recent biological opinion for Steller seal lion and northern fur seal research activities on the west coast including OR is dated June 2007. Other research and monitoring activities conducted by refuge staff or partners avoid going near areas where steller sea lions, brown pelicans, or marbled murrelets reside and therefore should not affect these threatened and endangered (T&E) species or their habitat. Law enforcement and educational activities aimed at reducing human disturbance to refuge wildlife including T&E species will maintain a low human disturbance environment on the refuges. For more information see Chapter 4, Section 4.42C.
Future implementation of research and assessment actions that may affect marbled murrelets or brown pelicans will be the subject of separate Endangered Species Act (ESA) section 7 consultations prior to commencement.

Coastal Zone Management Act, Section 307. Section 307(c)(1) of the Coastal Zone Management Act of 1972 as amended, requires each Federal agency conducting or supporting activities directly affecting the coastal zone, to conduct or support those activities in a manner which is, to the maximum extent practicable, consistent with approved state coastal management programs. The implementation of the Oregon Islands, Three Arch Rocks, and Cape Meares NWRs CCP will not have an affect upon land or water use within the purview of the State's management program.

Executive Order 11990. Protection of Wetlands. The CCP is consistent with Executive Order 11990 because CCP implementation would protect existing wetlands.

Executive Order 11988. Floodplain Management. Under this order Federal agencies "shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by flood plains." The CCP is consistent with Executive Order 11988 because CCP implementation would protect floodplains from adverse impacts as a result of modification or destruction.

_____ _____

Chief, Division of Planning, Visitor Services, and Transportation — Date

Appendix D. Appropriate Use Determinations

Introduction

Under the Appropriate Refuge Uses Policy, 603 FW 1, (2006) refuge managers are directed to determine if a new or existing public use is an appropriate refuge use. If an existing use is not appropriate, the refuge manager is directed to modify the use to make it appropriate or terminate it, as expeditiously as practicable. If a new use is not appropriate, the refuge manager will deny the use without determining compatibility. If a use is determined to be appropriate, then a compatibility determination should be developed to determine whether the use can be allowed. For purposes of this CCP an "appropriate use" must meet at least one of the following three conditions.

- The use is a wildlife-dependent recreational use as identified in the Refuge Improvement Act.
- The use involves the take of fish and wildlife under State regulations.
- The use has been found to be appropriate as specified in section 1.11 of the policy and documented on FWS Form 3-2319.

During the CCP process the refuge manager evaluated all existing and proposed non priority wildlife-dependent refuge uses at Oregon Islands, Three Arch Rocks and Cape Meares Refuges using the following guidelines and criteria as outlined in the policy:

- Do we have jurisdiction over the use?
- Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?
- Is the use consistent with applicable Executive orders and Department and Service policies?
- Is the use consistent with public safety?
- Is the use consistent with goals and objectives in an approved management plan or other document?
- Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?
- Is the use manageable within available budget and staff?
- Will this be manageable in the future within existing resources?
- Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?
- Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife dependent recreation into the future?

Using this process and these criteria, and as documented on the following pages, the refuge manager determined the following refuge uses were appropriate, and directed that compatibility determinations be completed for each use.

Research
Dog Walking

Finding of Appropriateness of a Refuge Use

Refuge Name: _____**Oregon Islands NWR**_____

Use: _____**Research**_____

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	YES	NO
(a) Do we have jurisdiction over the use?	**X**	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	**X**	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	**X**	
(d) Is the use consistent with public safety?	**X**	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	**X**	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	**X**	
(g) Is the use manageable within available budget and staff?	**X**	
(h) Will this be manageable in the future within existing resources?	**X**	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	**X**	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	**X**	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will generally not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ___
No ___

When the refuge manager finds the use **appropriate** based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate_____ Appropriate__X___

Refuge Manager:_____
Date:_____

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.
If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.
If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor:_____ Date:_____

A compatibility determination is required before the use may be allowed.

FINDING OF APPROPRIATENESS OF A REFUGE USE: ATTACHMENT 1

Use: Research

Supplemental information for Decision Criteria (e) and (i):

(e) Is the use consistent with goals and objectives in an approved management plan or other document?

The primary goals of the refuge are to (a) provide a diversity of habitats and maintain sanctuary status on coastal rocks, islands and reefs along the Oregon coast sufficient to support nesting seabird populations and breeding and loafing pinniped populations, and (b) protect, restore, and develop a diversity of native habitats for migratory birds, indigenous fish, wildlife, invertebrate, and plant species of the Oregon coastal ecosystem. One of the refuge objectives listed in the 1987 Refuge Management Plan is "to cooperate with other agencies, institutions of higher education, private organizations, and individuals in providing research opportunities." The Complex believes that appropriate, compatible research activities will contribute to, and are essential to accomplishing, the enhancement, protection, conservation, and management of native wildlife populations and their habitats on the Refuge.

(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?

The Service believes that wildlife and habitat conservation and management on the Refuge Complex should be based upon statistically viable scientific research combined with long-term monitoring. The information gained through appropriate, compatible research on refuge lands will be beneficial to the refuge's natural resources through application of this information into adaptive management strategies. The Refuge Complex will also distribute any information gained to the public, which will allow them to better understand and appreciate the refuge resources and the need for protecting them.

Finding of Appropriateness of a Refuge Use

Refuge Name: _____**Three Arch Rocks NWR**_____

Use: _____**Research**_____

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	YES	NO
(a) Do we have jurisdiction over the use?	**X**	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	**X**	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	**X**	
(d) Is the use consistent with public safety?	**X**	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	**X**	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	**X**	
(g) Is the use manageable within available budget and staff?	**X**	
(h) Will this be manageable in the future within existing resources?	**X**	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	**X**	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	**X**	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will generally not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ___
No ___

When the refuge manager finds the use **appropriate** based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate_____ Appropriate__X___

Refuge Manager:_____
Date:_____

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.
If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.
If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor:_____Date:_____

A compatibility determination is required before the use may be allowed.

FINDING OF APPROPRIATENESS OF A REFUGE USE: ATTACHMENT 1

Use: Research

Supplemental information for Decision Criteria (e) and (i):

(e) Is the use consistent with goals and objectives in an approved management plan or other document?

The primary goals of the refuge are to (a) provide a diversity of habitats and maintain sanctuary status on coastal rocks, islands and reefs along the Oregon coast sufficient to support nesting seabird populations and breeding and loafing pinniped populations, and (b) protect, restore, and develop a diversity of native habitats for migratory birds, indigenous fish, wildlife, invertebrate, and plant species of the Oregon coastal ecosystem. One of the refuge objectives listed in the 1987 Refuge Management Plan is "to cooperate with other agencies, institutions of higher education, private organizations, and individuals in providing research opportunities." The Complex believes that appropriate, compatible research activities will contribute to, and are essential to accomplishing, the enhancement, protection, conservation, and management of native wildlife populations and their habitats on the Refuge.

(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?

The USFWS believes that wildlife and habitat conservation and management on the Refuge Complex should be based upon statistically viable scientific research combined with long-term monitoring. The information gained through appropriate, compatible research on refuge lands will be beneficial to the refuge's natural resources through application of this information into adaptive management strategies. The Refuge Complex will also distribute any information gained to the public, which will allow them to better understand and appreciate the refuge resources and the need for protecting them.

Finding of Appropriateness of a Refuge Use

Refuge Name: _____**Cape Meares NWR**_____

Use: _____**Research**_____

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	YES	NO
(a) Do we have jurisdiction over the use?	**X**	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	**X**	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	**X**	
(d) Is the use consistent with public safety?	**X**	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	**X**	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	**X**	
(g) Is the use manageable within available budget and staff?	**X**	
(h) Will this be manageable in the future within existing resources?	**X**	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	**X**	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	**X**	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will generally not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ___
No ___

When the refuge manager finds the use **appropriate** based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate_____ Appropriate__X___

Refuge Manager:_____ Date:_____

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.
If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.
If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor:_____Date:_____

A compatibility determination is required before the use may be allowed.

FINDING OF APPROPRIATENESS OF A REFUGE USE: ATTACHMENT 1

Use: Research

Supplemental information for Decision Criteria (e) and (i):

(e) Is the use consistent with goals and objectives in an approved management plan or other document?

The primary goals of the refuge are to (a) provide a diversity of habitats and maintain sanctuary status on coastal rocks, islands and reefs along the Oregon coast sufficient to support nesting seabird populations and breeding and loafing pinniped populations, and (b) protect, restore, and develop a diversity of native habitats for migratory birds, indigenous fish, wildlife, invertebrate, and plant species of the Oregon coastal ecosystem. Cape Meares is also a designated Research Natural Area, and one of the approved goals for this refuge is to "provide an educational and research area for ecological and environmental studies." In addition, one of the refuge objectives listed in the 1987 Refuge Management Plan is "to cooperate with other agencies, institutions of higher education, private organizations, and individuals in providing research opportunities." The Complex believes that appropriate, compatible research activities will contribute to, and are essential to accomplishing, the enhancement, protection, conservation, and management of native wildlife populations and their habitats on the Refuge.

(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?

The USFWS believes that wildlife and habitat conservation and management on the Refuge Complex should be based upon statistically viable scientific research combined with long-term monitoring. The information gained through appropriate, compatible research on refuge lands will be beneficial to the refuge's natural resources through application of this information into adaptive management strategies. The Refuge Complex will also distribute any information gained to the public, which will allow them to better understand and appreciate the refuge resources and the need for protecting them.

Finding of Appropriateness of a Refuge Use

Refuge Name: _____**Coquille Point Unit of Oregon Islands NWR**_____

Use: _____**Dog Walking**_____

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	YES	NO
(a) Do we have jurisdiction over the use?	**X**	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	**X**	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	**X**	
(d) Is the use consistent with public safety?	**X**	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	**X**	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	**X**	
(g) Is the use manageable within available budget and staff?	**X**	
(h) Will this be manageable in the future within existing resources?	**X**	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	**X**	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	**X**	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will generally not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ___
No ___

When the refuge manager finds the use **appropriate** based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate_____ Appropriate__X___

Refuge Manager:_____ Date:_____

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.
If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.
If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor:_____Date:_____

A compatibility determination is required before the use may be allowed.

FINDING OF APPROPRIATENESS OF A REFUGE USE: ATTACHMENT 1

Use: Dog Walking

Supplemental information for Decision Criteria (e), (i), and (j):

(e) Is the use consistent with goals and objectives in an approved management plan or other document?

One of the primary purposes of the Coquille Point Unit is to provide a high quality opportunity along the Oregon coast for wildlife observation and environmental education. By drawing the public to the onsite interpretive facilities, and allowing dogs to be walked on leash while visiting these facilities, the site serves the wildlife dependent public use needs and functions effectively as a buffer zone to keep people and pets away from sensitive wildlife and seabird habitat on adjacent offshore rocks and islands. Dog walking at this location is a secondary use and takes place in conjunction with wildlife dependent uses, constituting a management strategy which is consistent with approved goals and objectives for the unit.

(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?

The Refuge Complex would not encourage or promote non-wildlife dependent public uses of the Coquille Point Unit. However, for many visitors, the Coquille Point Unit interpretive trail may provide a first or unique look at a wildlife refuge. The Refuge Complex will use this opportunity to reach out to non-traditional Refuge user groups and to encourage people walking their dog on the interpretive trail to observe wildlife and to learn about the National Wildlife Refuge, thus increasing their understanding and appreciation of the refuge's natural resources.

(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality compatible, wildlife-dependent recreation into the future?

The Refuge Complex proposes to allow people to walk dogs on a leash using the established paved interpretation trail at the Coquille Point Unit while engaging in one or more of the existing wildlife dependent public uses including wildlife observation, photography, and interpretation. Leashed dogs on the designated trail would be allowed concurrent with other public use on a year-round basis during daylight hours. By providing and maintaining the facilities and enforcement to accommodate this use, and by limiting it to the developed portion of the Coquille Point headland (only the established interpretive trail, stairways and parking lot), this use can be accommodated without impairing existing or future wildlife-dependent recreational uses on the Coquille Point Unit of Oregon Islands NWR.

Appendix E. Compatibility Determinations for Oregon Islands, Three Arch Rocks, and Cape Meares NWRs

Introduction

The compatibility determinations (CDs) developed during the CCP planning process evaluate uses as projected to occur under Alternative 2, the Preferred Alternative in the CCP/EA for the Oregon Islands, Three Arch Rocks and Cape Meares CCP (CCP/EA). The evaluation of funds needed for management and implementation of each use also assumes implementation as described under Alternative 2. Chapter 5 of the CCP/EA also contains analysis of the impacts of public uses to wildlife and habitats. That portion of the document is intended to be incorporated through reference into this set of CDs.

A. Uses evaluated at this time

The following section includes full CDs for all Refuge uses that are required to be evaluated at this time. According to Service policy, compatibility determinations will be completed for all uses proposed under a CCP. Existing wildlife-dependent recreational uses must also be reevaluated and new CDs prepared during development of a CCP. According to the Service's compatibility policy, uses other than wildlife-dependent recreational uses are not explicitly required to be reevaluated in concert with preparation of a CCP, unless conditions of the use have changed or unless significant new information relative to the use and its effects have become available or the existing CDs are more than 10 years old. However, the Service planning policy recommends preparing CDs for all individual uses, specific use programs, or groups of related uses associated with the proposed action. Accordingly, the following CDs are included in this document for public review.

Refuge Use	Compatible	Year Due for Re-evaluation
Wildlife Observation, Photography, Environmental Education and Interpretation – Coquille Point Unit of Oregon Islands NWR	yes	2023
Wildlife Observation, Photography – Cape Meares NWR	yes	2023
Dog Walking – Coquille Point Unit of Oregon Islands NWR	yes	2018
Research – Oregon Islands NWR	yes	2018
Research – Three Arch Rocks NWR	yes	2018
Research – Cape Meares NWR	yes	2018

B. Compatibility - Legal and Historical Context

Compatibility is a tool Refuge managers use to ensure that recreational and other uses do not interfere with wildlife conservation, the primary focus of Refuges. Compatibility is not new to the Refuge System and dates back to 1918, as a concept. As policy, it has been used since 1962. The

Refuge Recreation Act of 1962 directed the Secretary of the Interior to allow only those public uses of Refuge lands that were "compatible with the primary purposes for which the area was established."

Legally, Refuges are closed to all public uses until officially opened through a compatibility determination. Regulations require that adequate funds be available for administration and protection of Refuges before opening them to any public uses. However, wildlife-dependent recreational uses (hunting, fishing, wildlife observation and photography, and environmental education and interpretation) are to receive enhanced consideration and cannot be rejected simply for lack of funding resources unless the Refuge has made a concerted effort to seek out funds from all potential partners. Once found compatible, wildlife-dependent recreational uses are deemed the priority public uses at the Refuge. If a proposed use is found not compatible, the Refuge manager is legally precluded from approving it. Economic uses that are conducted by or authorized by the Refuge also require compatibility determinations.

Under compatibility policy, uses are defined as recreational, economic/commercial, or management use of a refuge by the public or a non-Refuge System entity. Uses generally providing an economic return (even if conducted for the purposes of habitat management) are also subject to compatibility determinations. The Service does not prepare compatibility determinations for uses when the Service does not have jurisdiction. For example, the Service may have limited jurisdiction over refuge areas where property rights are vested by others; where legally binding agreements exist; or where there are treaty rights held by tribes. In addition, aircraft overflights, emergency actions, some activities on navigable waters, and activities by other Federal agencies on "overlay Refuges" are exempt from the compatibility review process.

New compatibility regulations, required by the National Wildlife Refuge System Improvement Act of 1997 (Improvement Act), were adopted by the Service in October, 2000 (http://Refuges.fws.gov/policymakers/nwrpolicies.html). The regulations require that a use must be compatible with both the mission of the System and the purposes of the individual Refuge. This standard helps to ensure consistency in application across the Refuge System. The Act also requires that compatibility determinations be in writing and that the public have an opportunity to comment on most use evaluations.

The Refuge System mission emphasizes that the needs of fish, wildlife, and plants must be of primary consideration. The Improvement Act defined a compatible use as one that ". . . in the sound professional judgment of the Director, will not materially interfere with or detract from the fulfillment of the mission of the System or the purposes of the Refuge." Sound professional judgment is defined under the Improvement Act as ". . . a finding, determination, or decision, that is consistent with principles of sound fish and wildlife management and administration, available science and resources . . ." Compatibility for priority wildlife-dependent uses may depend on the level or extent of a use.

Court interpretations of the compatibility standard have found that compatibility is a biological standard and cannot be used to balance or weigh economic, political, or recreational interests against the primary purpose of the Refuge (Defenders of Wildlife v. Andrus [Ruby Lake Refuge]).

The Service recognizes that compatibility determinations are complex. For this reason, refuge managers are required to consider "principles of sound fish and wildlife management" and "best

available science" in making these determinations (House of Representatives Report 105-106). Evaluations of the existing uses on Oregon Islands, Three Arch Rocks and Cape Meares Refuges are based on the professional judgment of Refuge and planning personnel including observations of Refuge uses and reviews of appropriate scientific literature.

In July 2006, the Service published its Appropriate Refuge Uses Policy (603 FW1). Under this policy, existing and proposed non-wildlife dependent uses must also undergo an Appropriateness Review prior to determining compatibility. These reviews are included at the end of this Appendix. Uses excepted from the policy include the six priority wildlife-dependent public uses and uses under reserved rights—see policy for more detail. Appropriateness reviews and subsequent compatibility determinations are included here for research and dog walking. Compatibility determinations are also included for wildlife observation and photography, interpretation and environmental education.

References

Defenders of Wildlife v. Andrus (Ruby Lake Refuge I). 11 Envtl. Rptr. Case 2098 (D.D.C. 1978), p. 873.

House of Representatives Report 105-106 (on NWRSIA) - http://refuges.fws.gov/policyMakers/mandates/HR1420/part1.html

Compatibility regulations, adopted by the Service in October, 2000: (http://refuges.fws.gov/policymakers/nwrpolicies.html)

DRAFT Compatibility Determination

Use: E1. Wildlife Observation and Photography

Refuge Name

Cape Meares National Wildlife Refuge

Establishing and Acquisition Authorities

Originally named Cape Meares Migratory Bird Refuge, Cape Meares NWR was established "as a refuge and breeding ground for migratory birds and other wildlife" by Executive Order 7957, dated August 19, 1938 and signed by President Franklin Roosevelt. The name and land status, but not the purpose, was changed to Cape Meares National Wildlife Refuge by Executive Order 2416, signed July 25, 1940. On June 11, 1987, the U.S. Fish and Wildlife Service designated the Refuge (excluding the hiking trail) a Research Natural Area (RNA) to further protect its unique vegetation, geology, and wildlife habitat in a naturally functioning ecosystem. Authority to designate RNAs on National Wildlife Refuges is delegated to the USFWS Director by the National Wildlife Refuge Administration Act of 1966.

Refuge Purposes

Established: 1938

- "…as a refuge and breeding ground for migratory birds or other wildlife…." Executive Order No. 7957, August 19, 1938

- "…use of Cape Meares National Wildlife Refuge for State Park Purposes." Memorandum of Agreement between U.S. Fish and Wildlife Service and State of Oregon Parks and Recreation Division. February 21, 1986.

- "…to further protect its unique vegetation, geology, and wildlife habitat in a naturally functioning ecosystem." Research Natural Area designation, June 11, 1987, authority delegated to USFWS director by the National Wildlife Refuge System Administration Act of 1966.

National Wildlife Refuge System Mission

"The mission of the National Wildlife Refuge System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans" (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd-668ee]).

Description of Use

Wildlife observation and wildlife photography are non-consumptive, wildlife-dependent public uses with similar elements and so are considered together in this compatibility determination. Cape Meares NWR partially surrounds Cape Meares Lighthouse and State Scenic Viewpoint. The Complex has improved the public use facilities at Cape Meares State Scenic Viewpoint to facilitate off-site, wildlife-dependent public uses of Three Arch Rocks NWR, Oregon Islands NWR and Cape Meares NWR. Offsite uses include wildlife photography, observation, and interpretation. The Complex improved the public use facilities at the State Scenic Viewpoint with the goal of minimizing wildlife disturbance on refuge lands and enhancing the public's understanding of the sensitivity of coastal wildlife to human disturbance. Public use activities taking place on offsite facilities at the State Scenic Viewpoint will not be analyzed for compatibility through this document since they do not occur on refuge lands.

Wildlife observation and wildlife photography at Cape Meares NWR take place from an existing hiking trail which is part of the larger Oregon Coast Trail (OCT) system. Under this CCP, these uses will continue to occur on the same OCT trail segment, which traverses the eastern half of the north refuge unit (see map, Figure X). The only portion of Cape Meares NWR that is open to public use is the OCT segment; all other lands within the refuge are closed to public use. There are three public entrances to the refuge: one allows vehicular and bicycle access, and two are accessible only to pedestrians. The vehicular access road (Lighthouse Drive) is located to the west of the Three Capes Scenic Loop. The road is maintained by OPRD and provides access to both the Cape Meares State Scenic Viewpoint and the refuge. The main pedestrian access point (OCT trail entrance) is located at the entrance to Cape Meares State Scenic Viewpoint and is accessed from Lighthouse Drive. The other pedestrian access to the refuge is via the OCT at the south end of 5th Street in the community of Cape Meares, through county lands that lie north of the refuge.

The hiking trail within Cape Meares NWR is primarily an uneven, dirt-surfaced, narrow trail and is not accessible to people with disabilities. From the access point at Lighthouse Drive, the trail segment branching west is approximately ¼ mile and ends at the State Champion giant Sitka Spruce. The trail segment branching to the east from Lighthouse Drive is approximately two miles in length. From the trailhead it winds in a northerly direction through old growth Sitka spruce and western hemlock forest and through a red alder riparian area, and ends on a county road south of the community of Cape Meares. Approximately 6600 linear feet of pedestrian trail is located on refuge lands.

The refuge (except for the hiking trail) was designated a Research Natural Area (RNA) on June 11, 1987. Research Natural Areas are part of a nationwide network of ecological areas set aside for both research and education. Cape Meares refuge was designated a RNA to further protect its unique vegetation, geology, and wildlife habitat in a naturally functioning ecosystem. The goals and objectives for Cape Meares NWR as a Research Natural Area are 1) to preserve an example of a significant natural ecosystem for comparison with those influenced by humans, 2) to provide an educational and research area for ecological and environmental studies, 3) to preserve gene pools of typical and endangered plants and animals. Activities on RNAs are limited to research, study, observation, monitoring, and educational activities that are non-destructive, non-manipulative, and maintain unmodified conditions.

Visitors are allowed to bring dogs but they must be kept leashed. Dog walking, and potential impacts from dog walking, is addressed in a separate Appropriateness Finding and Compatibility Determination.

Availability of Resources:

Wildlife observation and photography on the hiking trails at Cape Meares NWR require minimal resources. The trail is occasionally hiked by Complex staff during the course of bald eagle surveys, or following significant storm events to check for fallen trees, erosion, or other damage to the trail. Maintenance for the existing trail has been accomplished by State Park staff in the past and no change in this arrangement is expected nor proposed under this CCP.

Anticipated Impacts of the Use:

Human-wildlife conflict can be viewed in two contexts: 1) Wildlife behavior conflicting with human goals (e.g., safety, satisfaction, property), or 2) human behavior conflicting with wildlife safety and well-being (e.g., harassment, noise, direct mortality due to hunting, destruction of habitat). Any impacts on wildlife at Cape Meares NWR would be classified as indirect impacts. These impacts occur wherever and whenever recreational use occurs. Much of these indirect impacts occur through normal recreation activities such as hiking, dog walking, biking (Kline et al). Through these activities, recreationists have the potential to degrade the land, water, and wildlife resources that support their activities by introducing invasive plant species, increasing animal mortality, displacing and disturbing wildlife, and impacting wildlife habitat (Boyle and Samson, 1985). The type of recreation activity, its location and spatial extent, the severity or magnitude of impact, and its timing (interval, frequency and predictability) all shape the characteristics and magnitude of recreation impact. Cole (2004) suggests the following factors as most important in determining recreation impacts: amount of use, type and behavior of use, timing of use, resistance and resilience of the environment, and the spatial distribution of use. These variables equally contribute to the 'big picture" by providing a description of who, what, when, and where regarding recreation use.

Wildlife observation is often goal oriented. Specialized wildlife viewers, particularly birders, seek out specific and often rare species. Because these activities may occur during sensitive times of the year (e.g., nesting), and because they often involve close approaches to wildlife for purposes of identification or photography, there is a potential for negative effects (Knight and Cole, 1995). As refuges face an increasing demand for wildlife viewing; the need to identify, monitor, and manage wildlife viewers continues to grow.

<u>Disturbance from People</u>: Numerous studies have confirmed that people on foot can cause a variety of disturbance reactions in wildlife, including flushing or displacement (Fraser et al 1985; Freddy 1986), heart rate increases (MacArthur et al 1982), altered foraging patterns (Burger and Gochfeld, 1991), and even, in some cases, diminished reproductive success (Boyle and Samson 1985). These studies and others have shown that the severity of the effects depends upon the distance to the disturbance and its duration, frequency, predictability, and visibility to wildlife (Knight and Cole 1991). Wildlife photographers tend to have larger disturbance impacts than those viewing wildlife since they tend to approach animals more closely (Dobb 1998).

Effect of human proximity: Other researchers have looked at the question of proximity. At what distance do humans on foot elicit a disturbance response? From an examination of the available studies, it appears that the distance varies dramatically from species to species. For example, elk in Yellowstone National Park were disturbed when people were at average distances of 573m (Cassirer 1990). These elk temporarily left the drainage and their home range core areas and moved to higher elevations, steeper slopes, and closer to forested areas. Average return time to the drainage was two days.

An analysis of over 4,000 human activity events near bald eagle nests in Central Arizona (Grubb and King 1991) found distance to disturbance to be the most important classifier of bald eagle response, followed in decreasing order of discriminatory value by duration of disturbance, visibility, number of units per event, position relative to affected eagle, and sound.

Breeding bald eagles in north-central Minnesota (Fraser et al. 1985) flushed at an average distance of 476m at the approach of a pedestrian. Skagen (1980), also studying bald eagles in northwest Washington, found a statistically significant decrease in the proportion of eagles feeding when human activity was present within 200m of the feeding area in the previous 30 minutes. A statistically significant between-season variation occurred in the use of feeding areas relative to human presence, which correlated with food availability. Eagles appeared more tolerant of human activity in the season of low food availability.

Refuge Specific Impacts: At Cape Meares Refuge, people using the pedestrian trail are generally in small groups of one to three people year-round with heavier use in the summer months. Disturbance to wildlife, such as flushing a nesting bird, is inherent to these activities; however, the disturbance is temporary and generally not malicious. Any unreasonable harassment would be grounds to close the area to these uses or restrict the uses to minimize harm.

The most likely impact to the Refuges' soil and vegetative resources from viewing and photography would be from erosion caused by normal trail usage. The forested areas adjacent to the trail are not conducive to hikers straying off the path as the trailsides are often steep forested slopes with extremely dense salal understory.

Bald eagles may be found at Cape Meares year-round with heaviest use occurring during the breeding season from March 1 through August 31. Concentrated use occurs on the north unit. At any one time there have been 4 to 5 known nest trees, only one of which is used each year by the nesting pair from 1985-2007. These nest sites are located approximately 1/2 mile northeast of the trail access point on Lighthouse Drive. In 2005, the eagle pair established a new nesting site southeast of the parking lot, on land owned by OPRD, where they successfully nested in 2005 and 2007. The 2007 nest tree blew down in the December 2007 storms and nest survey was not conducted in 2008. Bald eagles are most sensitive to human activities during all phases of nesting, including courtship, nest building, egg laying and incubation, and hatching, and to a lesser degree during the nestling period (USFWS 2006). Disruptive human activities in the flight path between nesting and roosting sites and important foraging areas can also interfere with feeding, and nesting bald eagles may fail to adequately feed their young if the adults are prevented or discouraged from feeding at preferred sites.

The trail through Cape Meares NWR was once much longer than the present configuration. The trial extended from the Community of Cape Meares up to Lighthouse Road as it currently does,

then continued around the east, north, and west sides of the north unit of the refuge, terminating in the parking lot of the Cape Meares Scenic Viewpoint. From January 5-9, 1990, Cape Meares was pounded by a series of powerful Pacific storms resulting in significant blowdown of trees and landslides. Approximately, 200' of the trail on the north slide was lost in a slide. Prior to rebuilding or relocating the trail it was discovered that the local bald eagle (threatened species at the time) pair had relocated their nest to within 15' of the trail with the tree canopy extending over the trail. In addition, detections of threatened marbled murrelets occurred in this same area the previous two breeding season. Due to the concern for disturbance impacts to nesting bald eagles, marbled murrelets and other listed species the trail was temporarily closed in 1990. In January1991, the Refuge Complex consulted with wildlife experts from Oregon State University, ODFW and the U.S. Forest Service and subsequently prepared an Intra-Service Section 7 Evaluation (dated March 14, 1991). The conclusion of the Section 7 Evaluation was to permanently close this section of the trail to provide maximum protection to threatened and endangered species.

Impacts to threatened and endangered species: Threatened marbled murrelets have not been documented nesting at Cape Meares but they were observed within the refuge forest during dawn and dusk surveys in conducted in 1989 and 1990 (Kim Nelson Memorandum, January 18, 1991). Marbled murrelet nesting habitat is present in the old-growth forest on refuge lands and the adjacent OPRD lands, and this in addition to observations of murrelets flying through the forest in 1989 and 1990 indicate the headland may be a potential nesting area. There is no designated marbled murrelet critical habitat on the refuge. The hiking trail where two wildlife-dependent public uses occur, passes through old-growth forest which contains trees potentially large enough to support a nest, but is not within the area where murrelet detections have been made. In addition, public use of the hiking trail is permitted during daylight hours only and not at dawn and dusk which would be the active time for marbled murrelet use in the area (USFWS, 2006).

Most studies cited above have demonstrated immediate, rather than long term responses to disturbance. Long term responses are inherently more difficult and expensive to determine. Given that wildlife observation is not typically a loud or intense kind of activity, the area of habitat within a known distance of human activity centers (public use area, trails, EE sites, overlooks) is considered a reasonable indicator to evaluate the disturbance effects of public uses on Refuge wildlife.

Public Review and Comment

This Compatibility Determination was prepared concurrent with the Oregon Islands, Three Arch Rocks and Cape Meares CCP/EA. Open houses were held and written comments were solicited from the public during the scoping period for the CCP/EA. Public review and comment were solicited during the draft CCP/EA comment period.

Determination

_____ The use is not compatible.
___X__ The use is compatible with the following stipulations.

Stipulations Necessary to Ensure Compatibility

User stipulations:

- Visitors will be required to stay on trails and designated roadways throughout the year.
- Use is restricted to daylight hours only.
- Pets must be kept leashed at all times.

Administrative stipulations:

- Regulations will be available to the public through a Refuge brochure.
- A directional, informational and interpretive sign will be maintained to help keep visitors on the trail and help educate the public on minimizing wildlife and habitat disturbance.
- Monitor human use levels in coordination with OPRD.

Justification

Wildlife observation and photography are two of the six wildlife-dependent recreational uses of the National Wildlife Refuge System as stated in the National Wildlife Refuge System Administration Act of 1997, as amended. The Act declares that compatible wildlife-dependent recreational uses are legitimate and appropriate priority general public uses of the Refuge System. The six uses--hunting, fishing, wildlife observation and photography, and environmental education and interpretation--are to receive enhanced consideration in planning and management over all other general public uses of the Refuge System. When compatible, these wildlife-dependent recreational uses are to be strongly encouraged. By limiting these activities to a small percentage of the Refuge (only the established trail) and by providing wildlife sanctuary from human disturbance in the remainder of the Refuge through closure to public access, these programs will not interfere with the Refuge achieving its purposes of providing a *refuge and breeding ground for migratory birds and other wildlife*. Although there are minor impacts from these activities, the wildlife observation and photography programs complement the Refuge purpose, vision and goals and the NWRS Mission.

Mandatory 10- or 15-year Re-evaluation Date

Provide month and year for "allowed" uses only.
____X__ Mandatory 15-year re-evaluation date (for wildlife-dependent public uses).
_____ Mandatory 10-year re-evaluation date (for all uses other than wildlife-dependent public uses).

NEPA Compliance for Refuge Use Decision

_____ Categorical Exclusion without Environmental Action Statement
_____ Categorical Exclusion and Environmental Action Statement
_____ Environmental Assessment and Finding of No Significant Impact
_____ Environmental Impact Statement and Record of Decision.

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Signature Page for E1. Wildlife Observation and Photography

Refuge Determination

Refuge Manager/
Project Leader Approval: _____ _____
(Signature) (Date)

Concurrence

Refuge Supervisor:

_____ _____
(Signature) (Date)

Regional Chief:

_____ _____
(Signature) (Date)

DRAFT Compatibility Determination

Use: E2. Research

Refuge Name

Cape Meares National Wildlife Refuge

Establishing and Acquisition Authorities

Originally named Cape Meares Migratory Bird Refuge, Cape Meares NWR was established "as a refuge and breeding ground for migratory birds and other wildlife" by Executive Order 7957, dated August 19, 1938 and signed by President Franklin D. Roosevelt. The name and land status, but not the purpose, was changed to Cape Meares National Wildlife Refuge by Executive Order 2416, signed July 25, 1940. On June 11, 1987, the USFWS designated the Refuge (excluding the hiking trail) a Research Natural Area (RNA) to further protect its unique vegetation, geology, and wildlife habitat in a naturally functioning ecosystem. Authority to designate RNAs on National Wildlife Refuges is delegated to the USFWS Director by the National Wildlife Refuge Administration Act of 1966.

Refuge Purposes

Established: 1938

- "… as a refuge and breeding ground for migratory birds or other wildlife…." Executive Order No. 7957, August 19, 1938
- "… use of Cape Meares National Wildlife Refuge for State Park Purposes." Memorandum of Agreement between U.S. Fish and Wildlife Service and State of Oregon Parks and Recreation Division. February 21, 1986.
- "…to further protect its unique vegetation, geology, and wildlife habitat in a naturally functioning ecosystem." Research Natural Area designation, June 11, 1987, authority delegated to USFWS director by the **National Wildlife Refuge System Administration Act of 1966.**

National Wildlife Refuge System Mission

"The mission of the National Wildlife Refuge System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans" (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd-668ee]).

Description of Use

The Oregon Coast NWR Complex receives periodic requests to conduct scientific research on Cape Meares NWR. Research is not considered a priority public use by NWRS policy. However, two provisions of the National Wildlife Refuge Improvement Act are to "maintain biological integrity, diversity and environmental health" and to conduct "inventory and monitoring." In addition, Cape Meares NWR is a designated Research Natural Area (RNA) in which natural processes are allowed to predominate without human intervention. Activities on RNAs are limited to research, study, observation, monitoring, and educational activities that are non-destructive, non-manipulative, and maintain unmodified conditions.

Wildlife and habitat conservation and management on the Refuge Complex should be based upon statistically viable scientific research combined with long-term monitoring. Some research will be used to address refuge-specific wildlife conservation questions, such as determining use of refuge habitat by threatened marbled murrelet and other old-growth-dependent and late successional migratory and resident focal avian species. Other research has broader applicability, such as investigating the role of downed wood in nutrient cycling, and habitat suitability for target species in Pacific Northwest old-growth Sitka spruce forest. Still other research efforts can aid in understanding the causes of reduced or declining wildlife or plant populations, developing tools and techniques to aid recovery of threatened or endangered species in similar habitats, and documenting and predicting impacts associated with climate change and global warming. Refuge plans and actions based on research and monitoring provide an informed approach to habitat, wildlife, and public use programs.

Priority would be given to studies that contribute to the enhancement, protection, preservation, and management of native Refuge plant and wildlife populations and their habitats. Priority would also be given to research that documents the understanding and impacts associated with climate change and global warming. Research applicants must submit a detailed proposal that would outline:

1) objectives of the study;
2) justification for the study;
3) detailed methodology and schedule;
4) potential impacts to Refuge wildlife or habitat, including disturbance (short and long term), injury, or mortality. This includes a description of measures the researcher will take to reduce disturbance or impacts;
5) personnel required;
6) costs to the Refuge Complex, if any, including staff time and equipment;
7) expected outcomes or results; and
8) a time line for submitting progress reports and final products (i.e., reports, theses, dissertations, publications).

Research proposals would be reviewed by Refuge staff and others as appropriate, to weigh the anticipated impacts versus the benefits of the research activity to Refuge management and understanding of natural systems. This would form the basis for allowing the project to proceed or be denied. If the proposal is approved, the Project Leader would issue a Special Use Permit(s) which would set the terms and conditions of the study to avoid and/or minimize the impacts on

Refuge resources, public use activities, and Refuge field operations. All research projects would be assessed during implementation to ensure that impacts remain within acceptable levels.

Research would not be allowed on refuge lands if one or more of the following criteria apply to a project proposal:

- Research that conflicts with other ongoing research, monitoring, or management programs will not be granted.
- Highly intrusive or manipulative research is generally not permitted in order to protect native bird and marine mammal populations and wilderness values
- Research projects that can be accomplished off the Refuge are less likely to be approved.
- Research which causes undue disturbance or is more than minimally intrusive is not likely to be granted.
- The level and type of disturbance will be carefully evaluated when considering a request. Strategies to minimize disturbance through study design, including location, timing, scope, number of permittees, study methods, number of study sites, etc., will be required.
- If staffing or logistics make it impossible for Complex staff to monitor the researcher, the permit is likely to be denied.
- If the activity is in a sensitive area, the research request may be denied, depending on the specific circumstances.

Availability of Resources

Complex staff responsibilities for projects by non-USFWS entities will be primarily be limited to the following: review of proposals, prepare SUP(s) and other compliance documents (e.g., Section 7, Section 106 of the National Historic Preservation Act), monitor project implementation to ensure that impacts and conflicts remain within acceptable levels (compatibility) over time. Additional administrative support, logistical and operational support may also be provided depending on each specific request. Estimated costs for one-time (e.g., prepare SUP) and annually re-occurring tasks by refuge staffs and other Complex employees will be determined for each project. Limited funds for the Complex's administration of these projects (estimated $2,500 per requested project) may be available within the general operating budget of the Oregon Coast Refuge Complex, which administers Cape Meares NWR and RNA. In some cases, the Complex staff may act as a cooperator on research projects. The funding for these projects may be cost-shared and in some cases, specially designated funds may be utilized for the operation and administration of the projects.

The Complex has following staffing and funding to administratively support and monitor research that is currently taking place on refuge lands (see table below). Any substantial increase in the number of projects would create a need for additional resources to oversee the administration and monitoring of the investigators and their projects. Any substantial additional costs above those

itemized below will result in finding a project not compatible unless expenses are offset by the investigator(s), sponsoring agency, or organization.

Activity or Project	*One Time Expense*	*Recurring Expense*
Administration (Evaluation of Applications, Management of Permits, Oversight)	$1,000	
Monitoring and participation	$1,500	
Totals	**$2,500**	

Anticipated Impacts of the Use

Use of Cape Meares NWR and RNA to conduct research will generally benefit plant populations, wildlife and habitats. The impacts of research activities would be project and site-specific, and would vary depending on the scope and type of research conducted. Scientific findings gained through these projects provide important information regarding life-history needs of species and species groups as well as identify or refine management actions to achieve resource management objectives in refuge management plans (especially CCPs). Reducing uncertainty regarding wildlife and habitat responses to refuge management actions in order to achieve desired outcomes reflected in resource management objectives is essential for adaptive management in accordance with 522 DM 1.

If project methods impact or conflict with refuge resources, other public-uses, other high-priority research, and refuge management programs, then it must be clearly demonstrated that its scientific findings will be essential to resource management and that the project cannot be conducted off refuge lands for the project to be compatible. The investigator(s) must identify methods/strategies in advance required to minimize or eliminate the potential impact(s) and conflict(s). If unacceptable impacts cannot be avoided, then the project will not be compatible.

Impacts would be project- and site-specific, where they will vary depending upon nature and scope of the field work. Data collection techniques will generally have negligible animal mortality or disturbance, habitat destruction, no introduction of contaminants, or no introduction of non-indigenous species. In contrast, projects involving the collection of biotic samples (plants or animals) or requiring intensive ground-based data or sample collection will have short-term impacts. To reduce impacts, the minimum number of samples (e.g., water, soils, vegetative litter, plants, macroinvertebrates, vertebrates) will be collected for identification and/or experimentation and statistical analysis.

Some level of disturbance is expected with all research activities since most researchers will be entering areas that are normally closed to the public and, depending on specific research activities, may also be collecting samples or handling wildlife. However, minimal impact to Refuge wildlife and habitats will be expected with research studies because Special Use Permits will include conditions to ensure that impacts to wildlife and habitats are kept to a minimum (see discussion above).

Direct damage or alteration to the habitat from researchers would be minor due to the research proposal evaluation process and stipulations imposed through the Special Use Permit. However, some increase in invasive plants is possible from ground disturbance and/or transportation of source seed on research equipment and personnel, and rodents and disease organisms could potentially be transferred from boats and trapping equipment. Likewise, there could be localized and temporary effects resulting in direct impacts of vegetation trampling, collecting of soil and plant samples, or trapping and handling of wildlife. Other potential, but localized and temporary, effects would include wildlife disturbance, which is expected with some research activities. Researcher disturbance could result in altering wildlife behavior. However, only research with reasonably certain short term effects from disturbance would be permitted. Only the minimum of samples (e.g., water, soils, vegetative litter, plants, macroinvertebrates, tissue etc) required for identification and/or experimentation and statistical analysis would be permitted.

Required state and federal collecting permits will also ensure minimal impacts to fish, wildlife, plants, and their habitats. If after incorporating the above strategies, projects will not be compatible if they will result in long-term or cumulative effects. A Section 7 consultation under the Endangered Species Act (16 U.S.C. 1531-1544, 87 Stat. 884, as amended by P.L. 93-205) will be required for activities that may affect a federally listed species and/or critical habitat. Only projects which have no effect or will result in not likely to adversely affect determinations will be considered compatible.

At least 6 months before initiation of field work (unless an exception is made by prior approval of the Project Leader), project investigator(s) must submit a detailed proposal using the format provided in Attachment 1. Project proposals will be reviewed by refuge staff and others, as needed, to assess the potential impacts (short, long-term, and cumulative) relative to benefits of the investigation to refuge management issues and understanding of natural systems. This assessment will form the primary basis for allowing or denying a specific project. Projects which result in unacceptable refuge impacts will not be found compatible. After approval, all projects also will be assessed during implementation to ensure impacts and conflicts remain within acceptable levels.

If the proposal is approved, then the Project Leader will issue a SUP(s) with required stipulations (terms and conditions) of the project to avoid and/or minimize potential impacts to refuge resources as well as conflicts with other public-use activities and refuge field management operations. After approval where necessary, projects also are monitored during implementation to ensure impacts and conflicts remain within acceptable levels.

The combination of stipulations identified above and conditions included in any SUP(s) will ensure that proposed projects contribute to the enhancement, protection, conservation, and management of native wildlife populations and their habitats on the refuge(s). As a result, these projects will help fulfill refuge purposes; contribute to the Mission of the NWRS; and maintain the biological integrity, diversity, and environmental health of the refuge.

Projects which are not covered by the CCP (objectives under Goals 5 and 9 [Gathering scientific information]) will require additional NEPA documentation.

Spread of invasive plants and/or pathogens is possible from ground disturbance and/or transportation of project equipment and personnel, but it will be minimized or eliminated by

requiring proper cleaning of investigator equipment and clothing as well as quarantine methods, where necessary. If after all practical measure are taken and unacceptable spread of invasive species is anticipated to occur, then the project will be found not compatible.

There also could be localized and temporary effects from vegetation trampling, collecting of soil and plant samples, or trapping and handling of wildlife. Some level of disturbance is expected with these projects, especially if investigator(s) enter areas closed to the public and collect samples or handle wildlife. However, wildlife disturbance (including altered behavior) will be localized and temporary in nature. Where long-term or cumulative unacceptable effects cannot be avoidable, the project will not be found compatible. Project proposals will be reviewed by Complex staff and others, as needed, to assess the potential impacts (short, long-term, and cumulative) relative to benefits of the investigation to refuge management issues and understanding of natural systems. This assessment will form the primary basis for allowing or denying a specific project.

Public Review and Comment

This Compatibility Determination was prepared concurrent with the Oregon Islands, Three Arch Rocks and Cape Meares CCP/EA. Open houses were held and written comments were solicited from the public during the scoping period for the CCP/EA. Public review and comment were solicited during the draft CCP/EA comment period.

Determination

_____ The use is not compatible.
___X__ The use is compatible with the following stipulations.

Stipulations Necessary to Ensure Compatibility

If the proposed research methods would impact or potentially impact refuge resources (habitat or wildlife), it must be demonstrated that the research is essential (i.e., critical to survival of a species; refuge islands provide only or critical habitat for a species; contributes significantly to understanding of impacts from climate change; or assessment and/or restoration after cataclysmic events), and the researcher must identify the issues in advance of the impact. Highly intrusive or manipulative research is generally not permitted in order to protect native wildlife populations and comply with Research Natural Area goals and objectives.

Each project will require a SUP. Annual or other short-term SUPs are preferred; however, some permits will be a longer period, if needed, to allow completion of the project. All SUPs will have a definite termination date in accordance with 5 RM 17.11. Renewals will be subject to Project Leader review and approval based timely submission of and content in progress reports, compliance with SUP stipulations, and required permits. Other stipulations and provisions would include the following:

- Potential researchers must submit a written, detailed research proposal to the Project Leader at least 6 months prior to start of field work. The required proposal format would be provided to researchers (see Attachment 1).

- Researchers are responsible for acquiring and/or renewing any necessary State and Federal permits prior to beginning or continuing their project.

- A Section 7 consultation under the Endangered Species Act would be required for research activities that may affect a federally threatened, endangered, or proposed species.

- Research that does not involve birds generally will only be allowed outside of the breeding season of avian species using the specific island(s), unless it can be demonstrated that there likely will be no impact to breeding seabirds. If a research project can only be conducted during the breeding season, such studies will only be permitted where there are specific protocols to minimize disturbance.

- Research will adhere to scientifically defensible protocols for data collection, where available and feasible.

- Approved research projects will be conducted under a Complex-issued Special Use Permit which will have additional project-specific stipulations.

- Annual or other short term Special Use Permits are preferred; however some permits will be a longer period, if needed, to facilitate the research. All Special Use Permits will have a definite termination date in accordance with 5 RM 17.11. Renewals will be subject to Project Leader review of research data, status reports, compliance with compatibility determination and permit stipulations, and permits.

- If unacceptable impacts or issues arise or be noted by the Complex staff, then the Project Leader can suspend/modify conditions/terminate on-refuge research that is already permitted and in progress.

- Research progress reports are required at least annually, and final reports are due within one year of the completion of the project, unless negotiated otherwise.

- The Complex staff will be provided with copies of all publications developed from Refuge research projects.

- The USFWS and the Refuge Complex will be appropriately cited and acknowledged in all written and oral presentations resulting from the research on the Refuge.

- Where appropriate, the Complex staff reserves the right to be co-author(s) on any reports or publications resulting from the study conducted on the Refuge. Authorship is appropriate where justifiable based upon participation in the project over the course of implementation (field work, data analyses, write-up).

- Upon completion of the project or annually, research sites must be cleaned up to the Project Leader's satisfaction and all physical markers removed. For long-term projects, conditions for clean-up, and removal of equipment and physical markers would be stipulated in the Special Use Permit.

- At any time, Complex staff may accompany the researchers.

Justification

Research, scientific collecting, and surveys on refuge lands are inherently valuable to the USFWS because they will expand scientific information available for resource management decisions. In addition, only projects which directly or indirectly contribute to the enhancement, protection, use, preservation, and management of refuge wildlife populations and their habitats generally will be authorized on refuge lands. In many cases, if it were not for the Complex staff providing access to refuge lands and waters along with some support, the project would never occur and less scientific information would be available to the USFWS to aid in managing and conserving the refuge resources. By allowing the use to occur under the stipulations described above, it is anticipated that wildlife species which could be disturbed during the use would find sufficient food resources and resting places so their abundance and use will not be measurably lessened on the refuge. Additionally, it is anticipated that monitoring, as needed, will prevent unacceptable or irreversible impacts to fish, wildlife, plants, and their habitats. As a result, these projects will not materially interfere with or detract from fulfilling refuge purposes; contributing to the Mission of the NWRS; and maintaining the biological integrity, diversity, and environmental health of the refuges.

Mandatory 10- or 15-year Re-evaluation Date

Provide month and year for "allowed" uses only.
_____ Mandatory 15-year re-evaluation date (for wildlife-dependent public uses).
____X_ Mandatory 10-year re-evaluation date (for all uses other than wildlife-dependent public uses).

NEPA Compliance for Refuge Use Decision
_____ Categorical Exclusion without Environmental Action Statement
_____ Categorical Exclusion and Environmental Action Statement
_____ Environmental Assessment and Finding of No Significant Impact
_____ Environmental Impact Statement and Record of Decision.

Signature Page for E2. Research

Refuge Determination

Prepared by: _____ _____
(Signature) (Date)

Refuge Manager/
Project Leader Approval: _____ _____
(Signature) (Date)

Concurrence

Refuge Supervisor:
_____ _____
(Signature) (Date)

Regional Chief, National
Wildlife Refuge System:
_____ _____
(Signature) (Date)

Attachment 1

FORMAT FOR PROPOSALS TO CONDUCT RESEARCH OR LONG-TERM ECOLOGICAL STUDY

Title

Principal Investigator(s) and background

Provide the name(s) and affiliation(s) of all principal investigator(s) that will be responsible for implementation of the research and/or long-term monitoring described in the proposal. In addition, provide a brief description of expertise for principal investigator(s) germane to work described in the proposal.

Background and justification

In a narrative format, describe the following as applicable:

- The conservation issue (e.g., decline in *Pisonia* rainforest) and/or knowledge gap regarding ecological function that currently exists with any available background information.
- Benefit of research/study findings (e.g., management implications) to resources associated with refuge purposes
- Potential consequences if the conservation issue and/or knowledge gap regarding ecological function is not addressed.

Objectives

Provide detailed objective(s) to be evaluated by the proposed research or study.

Methods and Material

Provide a detailed description of the methods and materials associated with field work to be conducted for the research and/or ecological study. Methods should include the following:

- study area(s)
- number of samples;
- sampling dates and locations
- sampling techniques
- data analyses including **statistical tests** and **significance levels**.

Previously published methods should be cited without explanation; whereas, new or modified techniques should be described in detail. Include number of personnel as well as all facilities and equipment (e.g., vehicles, boats, structures, markers) required to collect samples/data. Provide a clear description of the relationships among study objectives, field methods, and statistical analyses.

Permits

Identify all state and federal permits required if applicable. If appropriate, assess the impact on the species population if animals or eggs are to be sacrificed or collected. Note any official status of the species involved (e.g., threatened or endangered).

Compatibility and Section 7 Assessments

In order for a research and/or long-term ecological monitoring project to be compatible, it must not materially interfere with or detract from refuge purposes (protect and manage the natural resources of Palmyra Atoll) or System mission. Describe potential impacts to threatened or endangered species as well as other refuge plants, wildlife, and fish species that could result from the implementation of project activities on the refuge if applicable. Consider the cumulative impacts associated with this project in relationship to other on-going or proposed research and/or long-term monitoring.

Animal Welfare Plan

If appropriate, attach a copy of animal welfare plans that are required by the supporting research affiliate.

Partnerships and funding sources

List other participating institutions, agencies, organizations, or individuals as well as the nature and magnitude of their cooperative involvement (e.g., funding, equipment, personnel).

Project schedule

Provide estimated initiation and completion dates for field sampling, laboratory work, data analyses, and report/manuscript preparation. If the study is divided into phases to be accomplished separately, provide initiation and completion dates for each phase.

Reports and Raw Data

Establish a schedule for annual progress and final reports; include adequate time for peer review for the final report/manuscript. Copies of annual progress reports must be submitted to the Project Leader by January 1 during each year that the study is in progress. Draft reports/manuscripts should be submitted to the Project Leader for review prior to submission for consideration of publication. At the conclusion of a research study (manuscripts accepted for publication), an electronic copy of the data (e.g., GIS vegetation layers, animal species composition and numbers, genetics) should be provided to the Project Leader. For long-term monitoring projects, the USFWS may request raw data for management and planning purposes for the refuges.

Publications

Describe the ultimate disposition of study results as publications in scientific journals, presentation at professional symposiums, or final reports.

Disposition of samples

If the project entails the collection of biotic and/or abiotic (e.g., sediment) samples, then describe their storage. Although the samples may be in the possession of scientists for the purposes of conducting research in accordance with the special use permit, the USFWS retains ownership of all samples collected on refuge lands. If the samples will be used for subsequent research activities that are not described within the original proposal, an addendum to the original proposal must be submitted to the Project Leader to obtain a new special use permit before initiation of the follow-up project. After conclusion of the research activities, consult with the Project Leader regarding the final disposition of the samples.

DRAFT Compatibility Determination

Use: E3. Interpretation, Environmental Education, Wildlife Observation, and Photography

Refuge Name

Coquille Point Unit of Oregon Islands National Wildlife Refuge

Establishing and Acquisition Authorities

The Coquille Point Unit was established in 1991. Authority for this acquisition was through the Fish and Wildlife Act of 1956 (16 U.S.C. 742f-a-5), using funds made available through the Land and Water Conservation Fund Act of 1965, and through the Recreational Use of Conservation Areas Act of 1962, as amended (16 USC 460k-1). The 1991 *Environmental Assessment for a Proposed Addition to Oregon Islands NWR, Coos County, Oregon* covered this acquisition.

Refuge Purposes

- "…suitable for: incidental fish and wildlife-oriented recreational development; protection of natural resources; conservation of endangered or threatened species; carrying out at least two of these purposes on lands adjacent to or within the conservation areas." **Refuge Recreation Act of 1962/Recreational Use of Conservation Areas Act of 1962**, as amended (16 USC 460k-1).

- "To provide a buffer zone between mainland development and the coastal rocks and islands; protect the bluff zone for wildlife species; and provide one of the best opportunities along the Oregon coast for wildlife observation and environmental education." Recreational Use of Conservation Areas Act of 1962, as amended (16 USC 460k-1) and *Environmental Assessment, Proposed Addition to Oregon Islands NWR, Coos County, Oregon (*1991).

National Wildlife Refuge System Mission

"The mission of the National Wildlife Refuge System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans" (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd-668ee]).

Description of Use

In the NWRS Improvement Act, the United States Congress declared wildlife observation and photography, and environmental education and interpretation as four of six priority wildlife-dependent public uses of the NWRS. These four uses are non-consumptive, wildlife-dependent public uses with similar elements and are considered together in this compatibility determination.

There are four entrances to the Coquille Point Unit of the refuge. Two of the entrances permit vehicular parking and foot access. The primary Unit entrance is located at the western end of NE 11th Street in the City of Bandon. The Complex maintains a parking lot for visitors at the primary entrance and a second, unofficial entrance (dirt path) is located at the western end of NE 8th Street and is managed by the City of Bandon. Two staircases are accessed from the primary Unit entrance that provides non-ADA pedestrian access to the adjacent OPRD- managed ocean shore.

Existing wildlife dependent public uses include wildlife observation, photography, interpretation, and environmental education. Coquille Point is open to public use year-round during daylight hours. Existing public use facilities that are involved in these uses include an orientation kiosk; a ½ mile self-guided, accessible, paved hiking trail; two sets of stairs that provide beach access from the headland; a parking lot; and interpretive panels on the headland. In 2007 Coquille Point received more than 300,000 visitors and this number is growing. Visitors engage in wildlife observation and photography while walking the self-guided trail, sitting on observation benches, in the scenic overlook parking lot, and from both sets of stairs. Complex staff members, the Friends of the Southern Oregon Coast Refuges, and refuge volunteers provide environmental education programs on the scenic headland or the adjacent beach that views the offshore wildlife habitat of rocks, reefs and islands to local schools on a request basis. Interpretation is provided of the wildlife resources and habitat by along the trail interpretation panels and during on-site events by refuge friends, volunteers and staff.

Visitors are allowed to bring dogs to the refuge unit, but they must be kept leashed. Dog walking, as a specific use on its own, is treated separately in an Appropriateness Finding and Compatibility Determination.

Availability of Resources

The following funding/annual costs would be required to administer and manage wildlife observation, photography, interpretation and environmental education activities as described above.

Activity or Project	***One Time Expense***	***Recurring Expense***
Maintenance of Trails, Parking Areas, Other (1/8 to ¼ PFT of a GS 5/7 maintenance worker)		$15,000.00
Signs/Interpretive Panels	$ 25,000.00	
Resurface asphalt trail	$ 300,000.00	
Law Enforcement (DL estimates LE at the point will take 10% of the LE position, + overhead)		$ 7,000.00
Monitoring & Administration (The South Coast Refuge Manager spends approximately 20% of his time and effort on this area)		$ 16,000.00
Totals	$ 325,000.00	$ 38,000.00

Anticipated Impacts of the Use

The Coquille Point Unit is the only unit of Oregon Islands NWR with a specific on-site wildlife dependent public use purpose. To support the purposes for acquiring the unit, the Refuge Complex invested in the development of habitat restoration and public use facilities at this site during the early and mid 1990's. Native plant and soil restoration, together with invasive species control has occurred on the headland unit, and the site receives consistent and frequent visitor use. This constant public use renders the overall value of the headland to breeding wildlife as low. As a result of habitat restoration efforts, the coastal bluffs and headland now harbor several species of coastal headland plants that are restricted in range. By providing a paved trail, stairways and parking area for the public, the developed portion of the Coquille Point Unit serves the public's needs for wildlife dependent recreation and functions effectively as an open space buffer zone, keeping people and pets away from sensitive wildlife and seabird habitat on adjacent offshore rocks and islands.

The presence of people observing or photographing wildlife at the Coquille Point Unit has the potential to cause limited disturbance to wildlife such as nesting and loafing species that use the adjacent coastal rocks and islands. Human activities on the paved interpretation trail and at other access stair areas may result in direct effects on wildlife through harassment, a form of disturbance that can cause physiological effects or varying levels of behavioral modification (Smith and Hunt 1995). Various studies have shown that the severity of the effects depends upon the distance to the disturbance and its duration, frequency, predictability, and visibility to wildlife (Knight and Cole 1991). The variables found to have the greatest influence on wildlife behavior are a) the distance from the animal to the disturbance and b) the duration of the disturbance. Animals also show greater flight response to humans moving unpredictably than to humans following a distinct path (Gabrielsen and Smith 1995). These wildlife disturbance considerations were folded into the design of the interpretive trail which helps keep people and pets on a path to reduce off trail walking, and assists in keeping human activities away from bluff edges.

Of the wildlife dependent public uses proposed, wildlife photographers at the Coquille Point Unit tend to have the largest disturbance impacts (Klein 1993, Morton 1995, Dobb 1998). While wildlife observers frequently stop to casually view species, wildlife photographers are more likely to approach wildlife (Klein 1993) to get that perfect photograph. Even slow approach by wildlife photographers tends to have behavioral consequences to wildlife species (Klein 1993). Other compounding factors include the potential for photographers to remain close to wildlife for extended periods of time in an attempt to habituate the wildlife subject to their presence (Dobb 1998) and the tendency of casual photographers, with low-power lenses, to get much closer to their subjects than other activities would require (Morton 1995), including wandering off trails. This usually results in increased disturbance to wildlife and habitat, including trampling of plants. The development of the paved interpretation trail and the stairs on the headland at Coquille Point restricts photographers' accessibility to areas where their actions would not disturb wildlife or trample sensitive headland vegetation.

Refuge-specific impacts:

The primary function of the Coquille Point Unit's public use with regard to wildlife and plant resources is as a buffer zone to keep urban development associated with the adjacent City of Bandon from impacting sensitive wildlife and seabird habitat on adjacent offshore rocks and

islands associated with Oregon Islands NWR. The efforts of the Complex to establish a natural open space buffer to protect wildlife using coastal rocks and islands are integrated into the design and management of the headland habitat through the importation of top soil, establishment of native vegetation, and the development of the paved interpretative trail and associated parking area and beach access points (e.g., stairs). This non-intrusive and wildlife sensitive facility development reduces the potential of having public uses negatively impacting wildlife and habitat, while at the same time meeting the purpose of the Unit as an open space buffer area to protect offshore seabird colonies from the effects of urban development.

Impacts from the wildlife dependent public uses of wildlife observation and photography are contained effectively and mitigated within the overall design of the headland unit by providing a clearly defined, paved interpretation trail within the additional areas designated for public use (e.g., stairways, parking lot) and requesting that visitors restrict their use to those areas. This strategy will continue to be implemented under the CCP/EA. The Complex is aware that some visitors already disregard signs along the trail requiring visitors to stay within the public use developed areas. These visitors leave the trail and make unauthorized routes to get closer to the bluffs nearby or create trails to the adjacent state managed beach. Such unauthorized use of the headland creates the potential for greater disturbance to wildlife than that expected to occur from use of the designated trail, and additionally pose a safety risk for visitors as the bluffs are unstable and in places steep. These off trail excursions could also contribute to direct damage of sensitive headland habitat, although currently the vegetation lining the bluff tops is transforming from invasive gorse which is not of concern to the Complex since it provides little to no wildlife habitat value, to a more natural and less fire prone native plant community. In areas where trail or parking lot surfaces will need to be maintained or upgraded to repair damage due to age and weathering, best management practices (e.g., careful planning for temporary rerouting of pedestrian traffic, avoidance of any native plant restoration sites, and avoidance of inadvertently routing visitors closer to the bluffs) would negate or minimize impacts.

The other two wildlife dependent public use programs, interpretation and environmental education, use the existing public facilities, including the parking area, trail, interpretive panels, and wildlife observation accommodations. Impacts from these uses would not be additive with regard to impacts from wildlife observation and photography, and no new facilities would be constructed for these uses under the CCP/EA.

Public Review and Comment

This Compatibility Determination was prepared concurrent with the Oregon Islands, Three Arch Rocks and Cape Meares CCP/EA. Open houses were held and written comments were solicited from the public during the scoping period for the CCP/EA. Public review and comment were solicited during the draft CCP/EA comment period.

Determination

_____ The use is not compatible.
___X_ The use is compatible with the following stipulations.

Stipulations Necessary to Ensure Compatibility

User stipulations:

- Visitors will be discouraged from straying off-trail and requested to confine their use to the paved interpretation trail, stairways and parking lot only throughout the year.
- Use is restricted to daylight hours only.
- Pets must be leashed at all times.

Administrative stipulations:

- Regulations will be available to the public through a Refuge brochure.
- A directional, informational and interpretive sign will be maintained to direct visitors to stay on the trail and educate the public on minimizing wildlife and habitat disturbance.
- The condition of public use facilities will be monitored and repairs scheduled as needed to maintain universal accessibility.

Justification

Wildlife observation, photography, environmental education and interpretation are priority wildlife-dependent public uses of the NWR System as stated in the National Wildlife Refuge System Improvement Act of 1997, as amended. Self-guided wildlife observation and photography, and interpretation by volunteers and through interpretive panels, provide an excellent forum for increasing public understanding of the Complex's natural resources. The environmental education program is intended to foster a better understanding of Oregon coastal ecosystems and wildlife resources, and will in turn help build a public that is more knowledgeable about, and involved in, resource stewardship. The stipulations outlined above, as well as the best management practices identified, would minimize potential impacts relative to wildlife/ human interactions.

By providing and maintaining the facilities to encourage these uses and to limit them to the developed portion of the Coquille Point headland (only the established trail, stairways and parking lot), these uses will not interfere with fulfilling the purposes of the Coquille Point Unit which are to *provide a buffer zone between mainland development and the coastal rocks and islands; protect the bluff zone for wildlife species; and provide one of the best opportunities along the Oregon coast for wildlife observation and environmental education*. Although there exists the potential for minimal impacts to refuge resources from these activities, these uses, when carried out as specified in the stipulations above, complement the Refuge purposes, vision and goals and the NWRS Mission.

Mandatory 10- or 15-year Re-evaluation Date

Provide month and year for "allowed" uses only.
___X__ Mandatory 15-year re-evaluation date (for wildlife-dependent public uses).
_____ Mandatory 10-year re-evaluation date (for all uses other than wildlife-dependent public uses).

NEPA Compliance for Refuge Use Decision
_____ Categorical Exclusion without Environmental Action Statement
_____ Categorical Exclusion and Environmental Action Statement
_____ Environmental Assessment and Finding of No Significant Impact
_____ Environmental Impact Statement and Record of Decision.

References

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Signature Page for E3. Interpretation, Environmental Education, Wildlife Observation, and Photography

Refuge Determination

Refuge Manager/
Project Leader Approval: _____ _____
(Signature) (Date)

Concurrence

Refuge Supervisor:

_____ _____
(Signature) (Date)

Regional Chief:

_____ _____
(Signature) (Date)

DRAFT Compatibility Determination

Use: E4. Dog Walking (Use of refuge by pets other than dog trials or hunting)

Refuge Name

Coquille Point Unit of Oregon Islands National Wildlife Refuge

Establishing and Acquisition Authorities

The Coquille Point Unit was established in 1991. Authority for this acquisition was through the Fish and Wildlife Act of 1956 (16 U.S.C. 742f-a-5), using funds made available through the Land and Water Conservation Fund Act of 1965, and through the Recreational Use of Conservation Areas Act of 1962, as amended (16 USC 460k-1). The 1991 *Environmental Assessment for a Proposed Addition to Oregon Islands NWR, Coos County, Oregon* covered this acquisition.

Refuge Purposes

- "…suitable for: incidental fish and wildlife-oriented recreational development; protection of natural resources; conservation of endangered or threatened species; carrying out at least two of these purposes on lands adjacent to or within the conservation areas." **Refuge Recreation Act of 1962/Recreational Use of Conservation Areas Act of 1962**, as amended (16 USC 460k-1).

- "To provide a buffer zone between mainland development and the coastal rocks and islands; protect the bluff zone for wildlife species; and provide one of the best opportunities along the Oregon coast for wildlife observation and environmental education." Recreational Use of Conservation Areas Act of 1962, as amended (16 USC 460k-1) and *Environmental Assessment, Proposed Addition to Oregon Islands NWR, Coos County, Oregon (*1991).

National Wildlife Refuge System Mission

"The mission of the National Wildlife Refuge System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans" (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd-668ee]).

Description of Use

The Refuge Complex proposes to allow people to walk dogs on a leash using the established paved interpretation trail at the Coquille Point Unit while engaging in one or more of the existing wildlife dependent public uses including wildlife observation, photography, and interpretation. Leashed dogs (pets) on the designated trail would be allowed concurrent with other public use on a year-round basis during daylight hours. Dogs would not be allowed off the paved trail corridor. Visitors walking their pets on leash would be required to pick up after their pet(s) and remove all

feces from the Refuge. Existing refuge facilities that are involved in this use include a ½ mile self-guided, accessible, paved hiking trail; two sets of stairs that provide beach access from the headland; and a parking lot on the headland. Both sets of stairways provide access to the state-owned beach where dogs are allowed.

The Coquille Point Unit, located within the city limits of Bandon, receives over 300,000 visitors annually and visitation is expected to grow in the coming years. Dog walking is a popular use of the Coquille Point interpretation trail, often occurring in conjunction with wildlife-dependent public uses. The Cod of Federal Regulations states that no dog shall be permitted to roam at large on refuge lands (50 CFR 26.21(b). The City of Bandon municipal codes require dogs to be under complete control by an adequate leash within the corporate limits of the city (City of Bandon; Municipal Code 6.12.030. In addition, no person owning or in charge of any dog shall allow the dog to soil, defile, or defecate on public sidewalks or paths within the City and they are required to immediately remove and dispose of all feces deposited by the dog in a sanitary manner (City of Bandon; Municipal Code 6.12.040). The Refuge Complex, in cooperation with the city of Bandon, would clearly post the leash and "pick up after your dog" ordinances at the entry to the trail, and would enforce these regulations through warnings and ticketing by the Complex officer. Dog walking and any potential impacts from this public use would be monitored continually to ensure it does not interfere with compatible, wildlife-dependent uses or impact wildlife resources. This CD would be revised within 10 years of this CCP/EA or sooner, to incorporate additional data and new information.

Availability of Resources

The following funding/annual costs would be required to administer and manage dog walking as described above.

Activity or Project	***One Time Expense***	***Recurring Expense***
Installation and maintenance of pet waste removal stations	$2,000.00	$500.00/yr
Installation and maintenance of Leash Law Signs	$750.00	$250.00
Clean up after noncompliant pet walkers' pets	unknown	unknown
Law Enforcement ($320/day x 13 days/yr)		$4,160.00/yr
Monitoring & Administration ($320/day x 13 days/yr)		$4,160.00/yr
Totals	$2,750.00	$ 9,070.00/yr

Anticipated Impacts of the Use

The Coquille Point Unit is the only unit of Oregon Islands NWR with a specific on-site public use purpose. Initially the Unit served to protect headland and beach access, and it now serves as a buffer from human activities that would disturb wildlife. The public comes to Coquille Point with several objectives: 1) to view wildlife; 2) to walk their dogs while enjoying the open wildlands and wildlife on the interpretive paved trail; and 3) to access the beach using the refuge stairs. To support the purposes for acquiring the unit, the Refuge Complex invested in the development of

public use facilities at this site. Native plant restoration has occurred on the headland unit but the site receives consistent and frequent visitor use, rendering the overall value of the open space to wildlife as low. By drawing the public to these onsite interpretive facilities, the site serves the wildlife dependent public use needs and functions effectively as a buffer zone, keeping people and pets away from sensitive wildlife and seabird habitat on adjacent offshore rocks and islands.

A report prepared for the California Department of Fish and Game found that dog harassment of wildlife is opportunistic, and is associated with the concentration of wildlife in a given area (Jones & Stokes 1977). A followup study exploring the effects of dog density and wildlife abundance on the frequency of dog-induced wildlife flushes in an area of low vegetative cover suggests that dog-induced wildlife flushes in this type of habitat are a function of (a) dog / human densities, and (b) wildlife concentration (as indicated by raptor / egret abundances), among other variables (Abraham, 2001).

Although the City of Bandon municipal codes and Refuge regulations require dogs to be under complete control by an adequate leash within the corporate limits of the city (City of Bandon; Municipal Code 6.12.030), qualitative observations have shown that a substantial percentage of dogs on the Coquille Point trail are unleashed. Despite thousands of years of domestication, dogs were bred for and still maintain instincts to hunt and chase. Given the appropriate stimulus, those instincts can be triggered in most all dogs. Dogs that are unleashed or not under the control of their owners may disturb or potentially harm wildlife. In effect, off-leash dogs increase the radius of negative human influence or disturbance to wildlife beyond what it would be in the absence of a dog. To reduce this effect on wildlife dog-walkers will be required to maintain control (e.g., leashed or restrained) of their animal while on the Refuge.

The role of dogs in wildlife diseases is poorly understood. However, dogs are known to be host to endo- and ectoparasites and can contract diseases from, or transmit diseases to wildlife (Sime 1999). In addition, dog waste is known to transmit diseases that may threaten the health of some wildlife and other domesticated animals. To reduce this effect on wildlife and people, pet owners will be required to pick up their pet's feces and dispose of it properly.

Refuge-specific impacts:

Impacts from walking dogs can be contained most effectively, mitigating the overall effect on Refuge wildlife and on visitors engaged in wildlife-dependent uses, by ensuring that dogs are always on leash and remain on the paved interpretive trail and within the areas designated for public use (e.g., parking lot, stairs). This public use management strategy will continue to be implemented under the CCP/EA. The Refuge is aware that some visitors already disregard state, county, and city ordinances and refuge regulations requiring dogs to be on leash and the requirement of dog owners to remove and dispose of their pet's feces from public property. Dog walking and any potential impacts from this public use would be monitored by refuge law enforcement to ensure it does not interfere or have any negative impacts to compatible, wildlife-dependent uses or wildlife resources.

The relatively low wildlife value and sparse vegetative cover surrounding the interpretive trail at Coquille Point indicate that disturbance to wildlife from dogs on leash is likely to be low. Coquille Point Unit's primary purposes as a buffer area for the offshore wildlife habitat and as a wildlife

dependent public use site would not be substantially impacted by leashed dogs using the interpretive trail, parking lot and beach access stairs.

Public Review and Comment

This Compatibility Determination was prepared concurrent with the Oregon Islands, Three Arch Rocks and Cape Meares CCP/EA. Open houses were held and written comments were solicited from the public during the scoping period for the CCP/EA. Public review and comment were solicited during the draft CCP/EA comment period.

Determination

_____ The use is not compatible.
___x__ The use is compatible with the following stipulations.

Stipulations Necessary to Ensure Compatibility

User stipulations:

- Dogs will be required to stay on the interpretive trail, stairways and parking lot only.
- Use is restricted to daylight hours only.
- Dogs must be kept leashed (8 feet or less) and under the control of their owner at all times.
- Visitors walking a dog on the refuge trail, stairs or parking lot will be required to pick up and dispose of their dog(s)' feces in a sanitary manner.

Administrative stipulations:

- Regulations will be available to the public through a Refuge brochure
- A directional, informational and interpretive sign will be maintained to help keep visitors on the trail and help educate the public on regulations concerning dogs.
- The Refuge Complex will install a pet waste removal station in the area of the interpretive trail and parking lot, maintain it, and keep it stocked with the necessary equipment to facilitate its use, including a trash can. !
- Monitor condition of facilities and schedule repairs and maintenance as needed to maintain universal accessibility.

Justification

Dog walking is not a wildlife dependent use of the Refuge, as defined by statute (16 U.S.C. 668dd et seq.). However, this use of the Coquille Point Unit public use facilities is a secondary use and is conducted in conjunction with the wildlife dependent uses of wildlife observation, photography,

and interpretation. Potential for wildlife disturbance is minimal when the use is conducted as required by the stipulations, including restricting the use to the established interpretive trail.

The Refuge Complex would not encourage or promote non-wildlife dependent public uses of the Coquille Point Unit. However, the Refuge Complex will use this opportunity to reach out to non-traditional Refuge user groups and to encourage people walking their dog to observe wildlife and to learn about the National Wildlife Refuge System. For many of these people, the Coquille Point Unit interpretive trail may provide a first or unique look at a wildlife refuge.

By providing and maintaining the facilities and enforcement to accommodate this use, and by limiting it to the developed portion of the Coquille Point headland (only the established interpretive trail, stairways and parking lot), this use will not interfere with fulfilling the purposes of the Coquille Point Unit which are to *provide a buffer zone between mainland development and the coastal rocks and islands; protect the bluff zone for wildlife species; and provide one of the best opportunities along the Oregon coast for wildlife observation and environmental education*. Although there exists the potential for minimal impacts to refuge resources from this use, when carried out as specified in the stipulations above, it will not detract from fulfilling the Refuge purposes, vision and goals and the NWRS Mission.

Mandatory 10- or 15-year Re-evaluation Date

Provide month and year for "allowed" uses only.
_____ Mandatory 15-year re-evaluation date (for wildlife-dependent public uses).
___X___ Mandatory 10-year re-evaluation date (for all uses other than wildlife-dependent public uses).

NEPA Compliance for Refuge Use Decision
_____ Categorical Exclusion without Environmental Action Statement
_____ Categorical Exclusion and Environmental Action Statement
_____ Environmental Assessment and Finding of No Significant Impact
_____ Environmental Impact Statement and Record of Decision.

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Signature Page for E4. Dog Walking

Refuge Determination

Refuge Manager/
Project Leader Approval: _____ _____
(Signature) (Date)

Concurrence

Refuge Supervisor:

_____ _____
(Signature) (Date)

Regional Chief:

_____ _____
(Signature) (Date)

DRAFT Compatibility Determination

Use: E5 Research and Long-Term Ecological Monitoring

Refuge Name

Oregon Islands National Wildlife Refuge and Oregon Islands Wilderness;
Three Arch Rocks National Wildlife Refuge and Wilderness

Establishing and Acquisition Authorities

Oregon Islands National Wildlife Refuge was established by Executive Order (E.O.) 7035, dated May 6, 1935. Additional islands, located in Clatsop, Tillamook, Lincoln, Lane, Coos and Curry Counties, Oregon, were established by Public Land Order 4395 of April 1, 1968, Public Law 95-450 of October 11, 1978, and Public Land Order 6287 of June 16, 1982. Additional lands were added under the Migratory Bird and Conservation Act (16 U.S.C. 715-715r), as amended, and the Fish and Wildlife Act of 1956 (16 U.S.C. 742 (a)-754), as amended in 1991 and 1992.

On October 14, 1907 President T. Roosevelt signed Executive Order (E.O.) 699 establishing the Three Arch Rocks Reservation to protect existing habitat for native birds and animals. The name and land status, but not the purpose, were changed to the Three Arch Rocks National Wildlife Refuge by E.O. 2413 signed July 25, 1940.

Refuge Purposes

Oregon Islands National Wildlife Refuge
Established: 1935

- "… for recreational purposes or for the creation of permanent reservations of such rocks or islands as have long been occupied by breeding waterfowl and other native birds." Executive Order No. 4364, January 7, 1926. Withdrawals of specific islands and rocks "pending the passage of legislation to provide for the permanent reservation of the islands and rocks." This E.O. was partially revoked by Public Land Order 4395 (1968) which then added these islands and rocks to the existing Oregon Islands NWR.

- "…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. 715, February 18, 1929 (Migratory Bird Conservation Act of 1929). All units.

- "… as a refuge for the protection of sea lions…" Executive Order No. 5702, September 1, 1931. Withdrew "the rocks constituting Port Orford, Blanco, and Rogue River Reefs" from settlement, location, sale or entry and reserved same as a refuge. This E.O. was revoked by Public Land Order 4395 (1968) which added these lands to the existing Oregon Islands NWR. Port Orford Reef was previously included in Oregon Islands NWR by P.L.O. 4395 as amended by P.L.O. 4475.

- "…as a refuge and breeding ground for wild birds and animals." Executive Order 7035, May 6, 1935. All units.

- "…for the development, advancement, management, conservation, and protection of fish and wildlife resources" 16 U.S.C. 742f(a)(5) (**Fish and Wildlife Act of 1956**). Coquille Point Unit.

- "…for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude" 16 U.S.C. 742f(b)(1) **(Fish and Wildlife Act of 1956).**

- "A wilderness… an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain. An area… without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions…." **Wilderness Act of 1964** (PL 88-577). The islands within Oregon Islands NWR in 1970 (and Three Arch Rocks NWR) were accorded wilderness status 10/23/1970 by Public Law 91-504, and the balance of the islands added to the refuge in the intervening years were designated wilderness in 1996 through Public law 104-333. Covers all rocks, reefs and islands within Oregon Islands NWR with the exception of Tillamook Rock. Does not include Coquille Point or Crook Point Units.

- "…suitable for: incidental fish and wildlife-oriented recreational development; protection of natural resources; conservation of endangered or threatened species; carrying out at least two of these purposes on lands adjacent to or within the conservation areas." **Refuge Recreation Act of 1962 / Recreational Use of Conservation Areas Act of 1962**, as amended (16 USC 460k-1). Covered the Coquille Point Unit, purchased in 1991 using **Land and Water Conservation Fund** monies under authority of the Fish and Wildlife Act of 1956.

- "To provide a buffer zone between mainland development and the coastal rocks and islands; protect the bluff zone for wildlife species; and provide one of the best opportunities along the Oregon coast for wildlife observation and environmental education." Recreational Use of Conservation Areas Act of 1962, as amended (16 USC 460k-1) and *Environmental Assessment, Proposed Addition to Oregon Islands NWR, Coos County, Oregon (*1991). Covered the acquisition of the Coquille Point Unit.

- "… suitable for seabird nesting and habitat, and the recognized theme and spirit of this Indenture is to offer nesting protection for these seabirds that annually nest here while not affecting the sensitivity of the current and projected ongoing usage as a non-visiting columbarium/ cemetery and historic lighthouse, which must remain the primary purpose of the land for which this Indenture is granted." U.S. Fish and Wildlife Service Grant of Easement for Tillamook Rock (1992). Covers the Tillamook Rock Lighthouse Unit only.

- " ...provide permanent protection to one of the few remaining undisturbed headlands on the Oregon coast, resulting in increased protection to major nearshore seabird breeding colonies and pinniped pupping and haulout sites within the Oregon Islands Refuge. It would also protect unique geological formations, rare plants and cultural resource sites on

the mainland, and a relatively undisturbed intertidal zone." *Categorical Exclusion, Crook Point Acquisition (7/99).* Covered the Crook Point Unit.

Three Arch Rocks National Wildlife Refuge
Established: 1907

- "…as a preserve and breeding ground for native birds and animals." E.O. 699, 10/14/1907.

- "A wilderness…an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain. An area…without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions…." **Wilderness Act of 1964** (PL 88-577). Three Arch Rocks NWR was accorded wilderness status 10/23/1970 by Public Law 91-504. Covers all of Three Arch Rocks NWR.

- "….the Wilderness Act provides that the establishment of a refuge wilderness area is 'supplemental' to the purpose for which a unit of the wildlife refuge system was established in the first place, so that protection of wildlife would only be strengthened." *(additional note from public hearing records on wilderness proposal)*

National Wildlife Refuge System Mission

"The mission of the [National Wildlife Refuge] System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans" (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd-668ee]).

Description of Use

The Oregon Coast NWR Complex receives periodic requests from non-Service entities (e.g., universities, state agencies, other federal agencies, NGOs) to conduct research, scientific collecting, and surveys on refuge lands, all of which are closed to public use with the exception of Coquille Point Unit of Oregon Islands NWR. These projects can involve a wide range of natural and cultural resource as well as public-use management issues including habitat use and life-history requirements for specific species/species groups, practical methods for habitat restoration, extent and severity of environmental contaminants, techniques to control or eradicate pest species, effects of climate change on environmental conditions and associated habitat/wildlife response, identification and analyses of paleontological specimens, wilderness character, modeling of wildlife populations, and assessing response of habitat/wildlife to disturbance from public uses. Projects may be species specific, refuge-specific, or evaluate the relative contribution of the refuge to larger landscape (e.g., ecoregion, region, flyway, national, international) issues and trends.

Research is a specialized use (603 FW1) and, therefore, it is not considered a priority public use by NWRS policy. However, two provisions of the National Wildlife Refuge Improvement Act of 1997 are to "maintain biological integrity, diversity and environmental health" and to conduct "inventory and monitoring." Refuge plans and actions based on research and monitoring provide an informed approach to habitat, wildlife, and public use management programs. Seabird and

pinniped conservation and management at the Complex are based upon best available scientific information from research combined with long-term monitoring. Some research is used to address specific wildlife conservation questions, such as understanding the causes of reduced or declining seabird and/or pinniped populations and development of tools and techniques to aid recovery of threatened or endangered species. Other research has broader applicability, such as using a suite of seabird species as indicators of ocean health conditions, and to document change in the larger marine environment and associated impacts associated with climate change and global warming.

The Service's Research and Management Studies (4 RM 6) and Appropriate Refuge Uses policies (603 FW1.10D(4)) indicate priority for scientific investigatory studies that contribute to the enhancement, protection, use, preservation, and management of native wildlife populations and their habitat as well as their natural diversity. Projects that contribute to refuge-specific and/or wilderness management, where applicable, would be given a higher priority over other requests. Priority would also be given to research that documents the understanding and impacts associated with climate change and global warming. Research applicants must submit a detailed proposal that would outline:

1) objectives of the study;
2) justification for the study;
3) detailed methodology and schedule;
4) potential impacts on Refuge wildlife or habitat, including disturbance (short and long term), injury and/or mortality. This includes a description of measures the researcher will take to reduce disturbance or impacts;
5) personnel required;
6) costs to the Refuge Complex, if any, including staff time and equipment;
7) expected outcomes or results; and
8) a time line for submitting progress reports and final products (i.e., reports, theses, dissertations, publications).

Research proposals would be reviewed by Complex staff and others as appropriate, to weigh the anticipated impacts versus the benefits of the research activity to refuge management and understanding of natural systems. This would form the basis for allowing the project to proceed or be denied. If the proposal is approved, the Project Leader would issue a Special Use Permit(s) which would set the terms and conditions of the study to avoid and/or minimize the impacts on Refuge resources, public use activities, and Refuge field operations. All research projects would be assessed during implementation to ensure that impacts remain within acceptable levels.

Research would not be allowed on refuge lands if one or more of the following criteria apply to a project proposal:

- Research that conflicts with other ongoing research, monitoring, or management programs will not be granted.

- Highly intrusive or manipulative research is generally not permitted in order to protect native bird and marine mammal populations and wilderness values

- Research projects that can be accomplished off the Refuge are less likely to be approved.

- Research which causes undue disturbance or is more than minimally intrusive is not likely to be granted.

- The level and type of disturbance will be carefully evaluated when considering a request. Strategies to minimize disturbance through study design, including location, timing, scope, number of permittees, study methods, number of study sites, etc., will be required.

- If staffing or logistics make it impossible for Complex staff to monitor the researcher, the permit is likely to be denied.

- If the activity is in a sensitive area, the research request may be denied, depending on the specific circumstances.

Availability of Resources

Complex staff responsibilities for projects by non-Service entities will be primarily be limited to the following: review of proposals, prepare SUP(s) and other compliance documents (e.g., Section 7, Section 106 of the National Historic Preservation Act), monitor project implementation to ensure that impacts and conflicts remain within acceptable levels (compatibility) over time. Additional administrative support, logistical and operational support may also be provided depending on each specific request. Estimated costs for one-time (e.g., prepare SUP) and annually re-occurring tasks by refuge staffs and other Complex employees will be determined for each project. Limited funds for the Complex's administration of these projects (estimated $2,500 per requested project) may be available within the general operating budget of the Oregon Coast Refuge Complex, which administers Oregon Islands and Three Arch Rocks NWRs and Wilderness Areas. In some cases, the Complex staff may act as a cooperator on research projects. The funding for these projects may be cost-shared and in some cases, specially designated funds may be utilized for the operation and administration of the projects.

The Complex has following staffing and funding to administratively support and monitor research that is currently taking place on refuge lands (see table below). Any substantial increase in the number of projects would create a need for additional resources to oversee the administration and monitoring of the investigators and their projects. Any substantial additional costs above those itemized below will result in finding a project not compatible unless expenses are offset by the investigator(s), sponsoring agency, or organization.

Activity or Project	***One Time Expense***	***Recurring Expense***
Administration (Evaluation of Applications, Management of Permits, Oversight)	$1,000	
Monitoring and participation	$1,500	
Totals	**$2,500**	

Anticipated Impacts of the Use

Use of Oregon Islands and Three Arch Rocks NWRs and Wilderness Areas to conduct research will generally benefit plant populations, wildlife and habitats. The impacts of research activities would be project and site-specific, and would vary depending on the scope and type of research conducted. Scientific findings gained through these projects provide important information regarding life-history needs of species and species groups as well as identify or refine management actions to achieve resource management objectives in refuge management plans (especially CCPs). Reducing uncertainty regarding wildlife and habitat responses to refuge management actions in order to achieve desired outcomes reflected in resource management objectives is essential for adaptive management in accordance with 522 DM 1.

If project methods impact or conflict with refuge resources, other public-uses, other high-priority research, and refuge management programs, then it must be clearly demonstrated that its scientific findings will be essential to resource management and that the project cannot be conducted off refuge lands for the project to be compatible. The investigator(s) must identify methods/strategies in advance required to minimize or eliminate the potential impact(s) and conflict(s). If unacceptable impacts cannot be avoided, then the project will not be compatible.

Impacts would be project- and site-specific, where they will vary depending upon nature and scope of the field work. Data collection techniques will generally have negligible animal mortality or disturbance, habitat destruction, no introduction of contaminants, or no introduction of non-indigenous species. In contrast, projects involving the collection of biotic samples (plants or animals) or requiring intensive ground-based data or sample collection will have short-term impacts. To reduce impacts, the minimum number of samples (e.g., water, soils, vegetative litter, plants, macroinvertebrates, and vertebrates) will be collected for identification and/or experimentation and statistical analysis.

Some level of disturbance is expected with all research activities since most researchers will be entering areas that are normally closed to the public and, depending on specific research activities, may also be collecting samples or handling wildlife. However, minimal impact to Refuge wildlife and habitats will be expected with research studies because Special Use Permits will include conditions to ensure that impacts to wildlife and habitats are kept to a minimum (see discussion above).

Direct damage or alteration to the habitat from researchers would be minor due to the research proposal evaluation process and stipulations imposed through the Special Use Permit. However, some increase in invasive plants is possible from ground disturbance and/or transportation of source seed on research equipment and personnel, and rodents and disease organisms could potentially be transferred from boats and trapping equipment. Likewise, there could be localized and temporary effects resulting in direct impacts of vegetation trampling, collecting of soil and plant samples, or trapping and handling of wildlife. Other potential, but localized and temporary, effects would include wildlife disturbance, which is expected with some research activities. Researcher disturbance could result in altering wildlife behavior. However, only research with reasonably certain short term effects from disturbance would be permitted. Only the minimum of samples (e.g., water, soils, vegetative litter, plants, macroinvertebrates, tissue etc) required for identification and/or experimentation and statistical analysis would be permitted.

Required state and federal collecting permits will also ensure minimal impacts to fish, wildlife, plants, and their habitats. If after incorporating the above strategies, projects will not be compatible if they will result in long-term or cumulative effects. A Section 7 consultation under the Endangered Species Act (16 U.S.C. 1531-1544, 87 Stat. 884, as amended by P.L. 93-205) will be required for activities that may affect a federally listed species and/or critical habitat. Only projects which have no effect or will result in not likely to adversely affect determinations will be considered compatible.

At least 6 months before initiation of field work (unless an exception is made by prior approval of the Project Leader), project investigator(s) must submit a detailed proposal using the format provided in Attachment 1. Project proposals will be reviewed by refuge staff and others, as needed, to assess the potential impacts (short, long-term, and cumulative) relative to benefits of the investigation to refuge management issues and understanding of natural systems. This assessment will form the primary basis for allowing or denying a specific project. Projects which result in unacceptable refuge impacts will not be found compatible. After approval, all projects also will be assessed during implementation to ensure impacts and conflicts remain within acceptable levels.

If the proposal is approved, then the Project Leader will issue a SUP(s) with required stipulations (terms and conditions) of the project to avoid and/or minimize potential impacts to refuge resources as well as conflicts with other public-use activities and refuge field management operations. After approval where necessary, projects also are monitored during implementation to ensure impacts and conflicts remain within acceptable levels.

The combination of stipulations identified above and conditions included in any SUP(s) will ensure that proposed projects contribute to the enhancement, protection, conservation, and management of native wildlife populations and their habitats on the refuge(s). As a result, these projects will help fulfill refuge purposes; contribute to the Mission of the NWRS; and maintain the biological integrity, diversity, and environmental health of the refuge.

Projects which are not covered by the CCP (objectives under Goals 5 and 9 [Gathering scientific information]) will require additional NEPA documentation.

Spread of invasive plants and/or pathogens is possible from ground disturbance and/or transportation of project equipment and personnel, but it will be minimized or eliminated by requiring proper cleaning of investigator equipment and clothing as well as quarantine methods, where necessary. If after all practical measure are taken and unacceptable spread of invasive species is anticipated to occur, then the project will be found not compatible.

There also could be localized and temporary effects from vegetation trampling, collecting of soil and plant samples, or trapping and handling of wildlife. Some level of disturbance is expected with these projects, especially if investigator(s) enter areas closed to the public and collect samples or handle wildlife. However, wildlife disturbance (including altered behavior) will be localized and temporary in nature. Where long-term or cumulative unacceptable effects cannot be avoidable, the project will not be found compatible. Project proposals will be reviewed by Complex staff and others, as needed, to assess the potential impacts (short, long-term, and cumulative) relative to benefits of the investigation to refuge management issues and

understanding of natural systems. This assessment will form the primary basis for allowing or denying a specific project.

Public Review and Comment

This Compatibility Determination was prepared concurrent with the Oregon Islands, Three Arch Rocks and Cape Meares CCP/EA. Open houses were held and written comments were solicited from the public during the scoping period for the CCP/EA. Public review and comment were solicited during the draft CCP/EA comment period.

Determination

_____ The use is not compatible.
__X__ The use is compatible with the following stipulations.

Stipulations Necessary to Ensure Compatibility

If the proposed research methods would impact or potentially impact refuge resources (habitat or wildlife), it must be demonstrated that the research is essential (i.e., critical to survival of a species; refuge islands provide only or critical habitat for a species; contributes significantly to understanding of impacts from climate change; or assessment and/or restoration after cataclysmic events), and the researcher must identify the issues in advance of the impact. Highly intrusive or manipulative research is generally not permitted in order to protect native bird and marine mammal populations and wilderness values.

Each project will require a SUP. Annual or other short-term SUPs are preferred; however, some permits will be a longer period, if needed, to allow completion of the project. All SUPs will have a definite termination date in accordance with 5 RM 17.11. Renewals will be subject to Project Leader review and approval based timely submission of and content in progress reports, compliance with SUP stipulations, and required permits. Other stipulations and provisions would include the following:

- Potential researchers must submit a written, detailed research proposal to the Project Leader at least 6 months prior to start of field work. The required proposal format would be provided to researchers (see Attachment 1).

- Any proposed research by the Service or their agents within wilderness would have to comply with the provisions of the existing Minimum Requirements Analysis (Appendix F). Anyone not acting as an agent of the Service and requesting to conduct research in wilderness (all islands) must prepare an MRA consistent with FWS Policy and adhere to the requirements of the Wilderness Act of 1964 (16 U.S.C. 1131-1136).

- Researchers are responsible for acquiring and/or renewing any necessary State and Federal permits prior to beginning or continuing their project.

- A Section 7 consultation under the Endangered Species Act would be required for research activities that may affect a federally threatened, endangered, or proposed species.

- Research that does not involve birds generally will only be allowed outside of the breeding season of avian species using the specific island(s), unless it can be demonstrated that there likely will be no impact to breeding seabirds. If a research project can only be conducted during the breeding season, such studies will only be permitted where there are specific protocols to minimize disturbance.

- Research will adhere to scientifically defensible protocols for data collection, where available and feasible.

- Approved research projects will be conducted under a Complex-issued Special Use Permit which will have additional project-specific stipulations.

- Annual or other short term Special Use Permits are preferred; however some permits will be a longer period, if needed, to facilitate the research. All Special Use Permits will have a definite termination date in accordance with 5 RM 17.11. Renewals will be subject to Project Leader review of research data, status reports, compliance with compatibility determination and permit stipulations, and permits.

- If unacceptable impacts or issues arise or be noted by the Complex staff, then the Project Leader can suspend/modify conditions/terminate on-refuge research that is already permitted and in progress.

- Research progress reports are required at least annually, and final reports are due within one year of the completion of the project, unless negotiated otherwise.

- The Complex staff will be provided with copies of all publications developed from Refuge research projects.

- The Service and the Refuge Complex will be appropriately cited and acknowledged in all written and oral presentations resulting from the research on the Refuge.

- Where appropriate, the Complex staff reserves the right to be co-author(s) on any reports or publications resulting from the study conducted on the Refuge. Authorship is appropriate where justifiable based upon participation in the project over the course of implementation (field work, data analyses, write-up).

- Upon completion of the project or annually, research sites must be cleaned up to the Project Leader's satisfaction and all physical markers removed. For long-term projects, conditions for clean-up, and removal of equipment and physical markers would be stipulated in the Special Use Permit.

- At any time, Complex staff may accompany the researchers.

Justification

Research, scientific collecting, and surveys on refuge lands are inherently valuable to the Service because they will expand scientific information available for resource management decisions. In

addition, only projects which directly or indirectly contribute to the enhancement, protection, use, preservation, and management of refuge wildlife populations and their habitats generally will be authorized on refuge lands. In many cases, if it were not for the Complex staff providing access to refuge lands and waters along with some support, the project would never occur and less scientific information would be available to the Service to aid in managing and conserving the refuge resources. By allowing the use to occur under the stipulations described above, it is anticipated that wildlife species which could be disturbed during the use would find sufficient food resources and resting places so their abundance and use will not be measurably lessened on the refuge. Additionally, it is anticipated that monitoring, as needed, will prevent unacceptable or irreversible impacts to fish, wildlife, plants, and their habitats. As a result, these projects will not materially interfere with or detract from fulfilling refuge purposes; contributing to the Mission of the NWRS; and maintaining the biological integrity, diversity, and environmental health of the refuges.

Mandatory 10- or 15-year Re-evaluation Date

Provide month and year for "allowed" uses only.
_____ Mandatory 15-year re-evaluation date (for wildlife-dependent public uses).
____X__ Mandatory 10-year re-evaluation date (for all uses other than wildlife-dependent public uses).

NEPA Compliance for Refuge Use Decision

_____ Categorical Exclusion without Environmental Action Statement
_____ Categorical Exclusion and Environmental Action Statement
_____ Environmental Assessment and Finding of No Significant Impact
_____ Environmental Impact Statement and Record of Decision.

Signature Page for E5. Research and Long-Term Ecological Monitoring

Refuge Determination

Prepared by: _____ _____
(Signature) (Date)

Refuge Manager/
Project Leader Approval: _____ _____
(Signature) (Date)

Concurrence

Refuge Supervisor:

_____ _____
(Signature) (Date)

Regional Chief, National
Wildlife Refuge System:

_____ _____
(Signature) (Date)

Attachment 1

FORMAT FOR PROPOSALS TO CONDUCT RESEARCH OR LONG-TERM ECOLOGICAL STUDY

Title

Principal Investigator(s) and background

Provide the name(s) and affiliation(s) of all principal investigator(s) that will be responsible for implementation of the research and/or long-term monitoring described in the proposal. In addition, provide a brief description of expertise for principal investigator(s) germane to work described in the proposal.

Background and justification

In a narrative format, describe the following as applicable:

- The conservation issue (e.g., decline in *Pisonia* rainforest) and/or knowledge gap regarding ecological function that currently exists with any available background information.
- Benefit of research/study findings (e.g., management implications) to resources associated with refuge purposes
- Potential consequences if the conservation issue and/or knowledge gap regarding ecological function is not addressed.

Objectives

Provide detailed objective(s) to be evaluated by the proposed research or study.

Methods and Material

Provide a detailed description of the methods and materials associated with field work to be conducted for the research and/or ecological study. Methods should include the following:

- study area(s)
- number of samples;
- sampling dates and locations
- sampling techniques
- data analyses including **statistical tests** and **significance levels**.

Previously published methods should be cited without explanation; whereas, new or modified techniques should be described in detail. Include number of personnel as well as all facilities and equipment (e.g., vehicles, boats, structures, markers) required to collect samples/data. Provide a clear description of the relationships among study objectives, field methods, and statistical analyses.

Permits

Identify all state and federal permits required if applicable. If appropriate, assess the impact on the species population if animals or eggs are to be sacrificed or collected. Note any official status of the species involved (e.g., threatened or endangered).

Compatibility and Section 7 Assessments

In order for a research and/or long-term ecological monitoring project to be compatible, it must not materially interfere with or detract from refuge purposes (protect and manage the natural resources of Palmyra Atoll) or System mission. Describe potential impacts to threatened or endangered species as well as other refuge plants, wildlife, and fish species that could result from the implementation of project activities on the refuge if applicable. Consider the cumulative impacts associated with this project in relationship to other on-going or proposed research and/or long-term monitoring.

Animal Welfare Plan

If appropriate, attach a copy of animal welfare plans that are required by the supporting research affiliate.

Partnerships and funding sources

List other participating institutions, agencies, organizations, or individuals as well as the nature and magnitude of their cooperative involvement (e.g., funding, equipment, personnel).

Project schedule

Provide estimated initiation and completion dates for field sampling, laboratory work, data analyses, and report/manuscript preparation. If the study is divided into phases to be accomplished separately, provide initiation and completion dates for each phase.

Reports and Raw Data

Establish a schedule for annual progress and final reports; include adequate time for peer review for the final report/manuscript. Copies of annual progress reports must be submitted to the Project Leader by January 1 during each year that the study is in progress. Draft reports/manuscripts should be submitted to the Project Leader for review prior to submission for consideration of publication. At the conclusion of a research study (manuscripts accepted for publication), an electronic copy of the data (e.g., GIS vegetation layers, animal species composition and numbers, genetics) should be provided to the Project Leader. For long-term monitoring projects, the Service may request raw data for management and planning purposes for the refuges.

Publications

Describe the ultimate disposition of study results as publications in scientific journals, presentation at professional symposiums, or final reports.

Disposition of samples

If the project entails the collection of biotic and/or abiotic (e.g., sediment) samples, then describe their storage. Although the samples may be in the possession of scientists for the purposes of conducting research in accordance with the special use permit, the Service retains ownership of all samples collected on refuge lands. If the samples will be used for subsequent research activities that are not described within the original proposal, an addendum to the original proposal must be submitted to the Project Leader to obtain a new special use permit before initiation of the follow-up project. After conclusion of the research activities, consult with the Project Leader regarding the final disposition of the samples.

Appendix F. Wilderness Documentation

Introduction

U.S. Fish and Wildlife Service policy (Part 610, Wilderness Stewardship) provides guidance for managing, as well as planning for management of, wilderness areas within national wildlife refuges. 610 FW 3 Exhibit 1 outlines the required components of a Wilderness Stewardship Plan, which is required for every wilderness area under Service management.

610 FW 3 describes a Wilderness Stewardship Plan (WSP) as a step-down management plan that guides the preservation, stewardship and use of a particular wilderness area. The policy states that where the majority of a refuge is designated wilderness, we may prepare a detailed CCP that incorporates the required elements of a WSP rather than preparing a separate WSP." This CCP incorporates the required elements of a WSP.

The following wilderness documents are included in Appendix F:

1. Wilderness Stewardship Plan (WSP)–Components within CCP/WSP/EA
2. Wilderness Study Proposal for Three Arch Rocks (1967)
3. Wilderness Study Proposal for Oregon Islands (1972)
4. Wilderness Study Report – additional Oregon Islands (1991)
5. Wilderness Reviews completed for CCP
6. Minimum Requirements Analysis

Wilderness Stewardship Plan Outline *(Exhibit 1, 610 FW 3)*

Location of WSP elements within Oregon Islands, Three Arch Rocks, and Cape Meares National Wildlife Refuges Comprehensive Conservation Plan, Oregon Islands and Three Arch Rocks Wilderness Stewardship Plan, and Associated Environmental Assessment.

I. Introduction.

A. Information on wilderness establishment for the Oregon Islands and Three Arch Rocks Wilderness Areas, including contents of pertinent laws, date(s) of establishment, and boundary or other legal changes, can be found in Chapter 1. Pertinent committee report discussion and special provisions can be found in other supporting documentation including congressional hearing records and all other documents relating to wilderness designation, which are available at the Complex office and incorporated by reference into this CCP/ EA/WSP.

B. The goals and objectives for the establishment of these wilderness areas, and their relationship to the refuge's purposes and Refuge System mission and goals, are summarized in Chapter 1, section 1.8.

II. Description of the Wilderness Area.

A. The legal and narrative descriptions of the two wilderness areas are contained in chapter 3, section 3.3.

B. Maps displaying Service refuge boundaries, wilderness area boundaries, and other relevant legal, administrative, and natural boundaries are located within Chapter 1 (see Figures 1-1, 1-2, 1-3)

C. Descriptions of baseline wilderness resource conditions existing at the time of designation, including a description of the wilderness area, natural conditions, cultural resources and values, stewardship activities, existing facilities, and public use levels and activities. are contained in three documents which are included in this Appendix: (1) the original Wilderness Study proposal for Three Arch Rocks and Oregon Islands (Goat Island only); (2) the original Wilderness Study proposal from 1972, which proposed designating "56 islands and island groups totaling 459 acres" as Oregon Islands Wilderness and combining it with Three Arch Rocks Wilderness; and (3) the Oregon Islands Wilderness Study Area II – Wilderness Study Report (1991) which proposed adding an additional 1200 islands. Current wilderness resource conditions are contained in Chapter 3 (Physical Environment), Chapter 4 (Refuge Biology and Habitat), and Chapter 5 (Social and Economic Environment).

III. Interagency and Tribal Coordination and Public Involvement. A description of coordination with States, other Federal agencies, and tribes, as well as a summary of public involvement activities, are contained in Chapter 1, section 1.10. Appendix I (not specific to wilderness) includes greater detail on agency, tribal and public involvement as well as a summary and analysis of comments received and how the plan responds to them.

IV. Stewardship.

A. A description of stewardship strategies (administrative, natural and cultural resources, public recreation, interpretation and education, and commercial services) required to adequately administer the area can be found in Chapter 2, Goal 7.

B. Minimum requirement analyses (MRAs) and documentation of National Environmental Policy Act (NEPA) compliance for all refuge management activities and commercial services necessary to administer the area are found in Appendix F.

C. Not Applicable: Descriptions of how we will manage existing private rights, existing rights-of-way, activities associated with valid mineral rights, and congressionally authorized uses to protect wilderness values.

D. Not Applicable: An explanation of how we will coordinate with adjoining wilderness units so that the wilderness character and natural and cultural resources and values are managed in a complementary manner that minimizes the impediments to visitors traveling from one wilderness area to another. (Both wilderness areas are entirely closed to public entry)

V. Research. Descriptions of past and current research, and identification of research needs, are discussed in Chapter 2, Goal 4. Other potential areas of research are mentioned throughout Chapter 4. The Appropriateness Finding for Research is in Appendix D**.** Compatibility determinations for research, including wilderness-specific stipulations, are in Appendix E. An MRA for an activity directly related to a specific research project on Oregon Islands NWR is found in **Appendix F**. All the aforementioned documents include discussion of relevant

partnerships, funding, and staffing requirements, also included in a larger discussion within Appendix G.

VI. Funds and Personnel. A discussion of staff and funds needed to administer the wilderness is included in Appendix G, Implementation Plan.

VII. Monitoring. To determine if we are meeting our wilderness stewardship objectives and other refuge management objectives in wilderness, a WSP is required to identify monitoring requirements; associated protocols; partnership, funding, and staffing needs; indicators of change in resource conditions; standards for measuring that change; and desired conditions or thresholds that will trigger management actions to reduce or prevent impacts on the wilderness. Monitoring requirements are listed in Chapter 2, Goal 7 *Objective 7.e.* Specific details with regard to protocols, indicators of change and standards for measuring change, and desired conditions and thresholds triggering management actions will be detailed in a step-down Wilderness Monitoring plan following completion and approval of this CCP.

VIII. Implementation Schedule. A schedule of implementation, prioritization of action items, staff assignments, and funding requirements to adequately administer the area is contained in **Appendix G, Implementation plan.**

IX. Appropriateness and Compatibility Determinations are found in Appendices D and E.

X. Review and Approval.

XI. Appendix. All of the supporting documentation below (A. – F.) is available at the Complex office and incorporated by reference into this CCP:

A. A copy of the legislation establishing, modifying the boundary of, or making other changes to the wilderness areas. Relevant legislation is also summarized in Chapter 1, Section 1.8.

B. Wilderness study reports for Three Arch Rocks and Oregon Islands Wilderness (also attached as part of this Appendix).

C. NEPA documentation for wilderness establishment.

D. Public hearing record from the wilderness study and record of review of comments received from States, other Federal agencies, tribes, and the public:

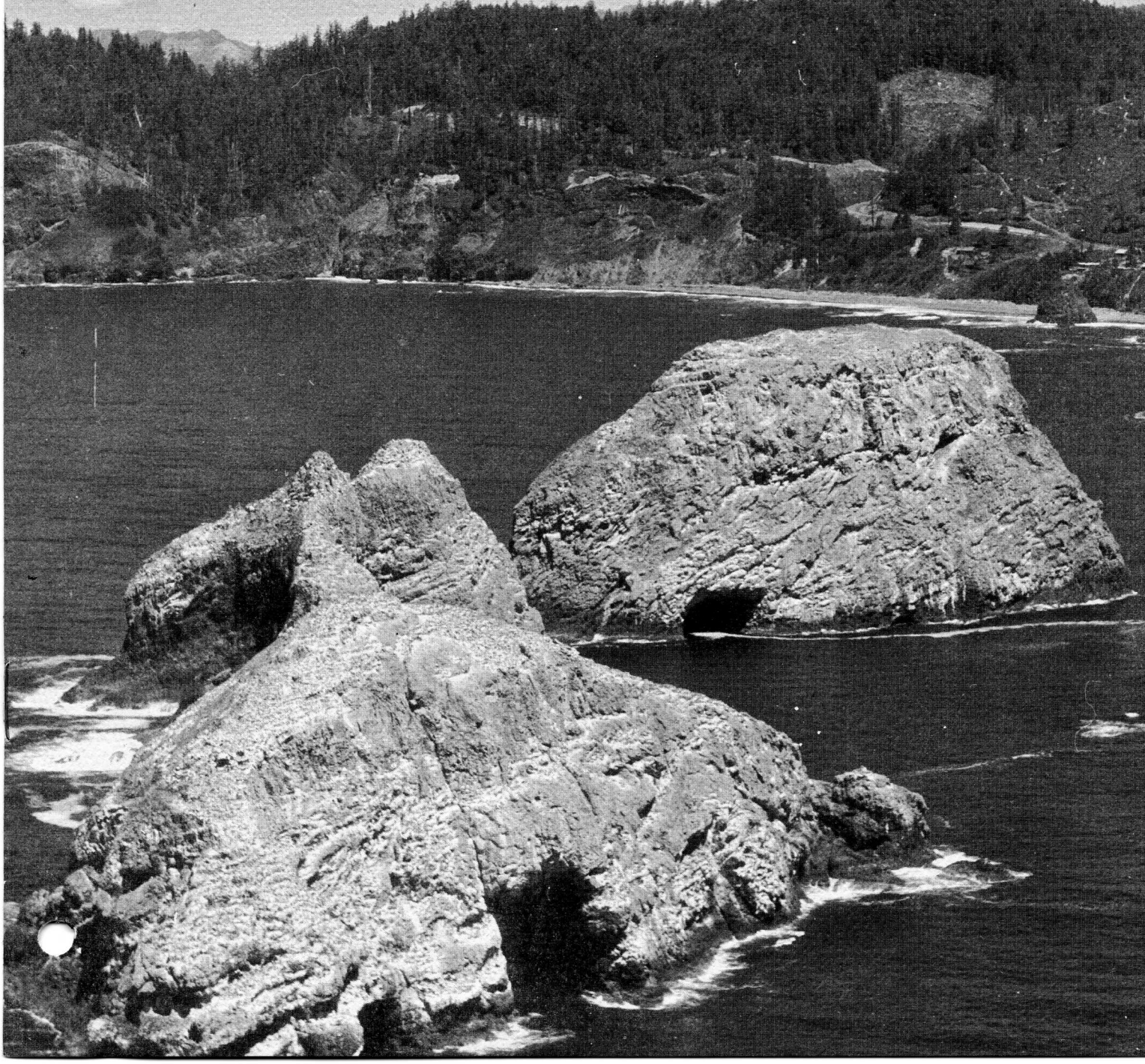
E. Congressional hearing record.

F. Congressional committee report accompanying the authorizing legislation.

WILDERNESS STUDY AREAS

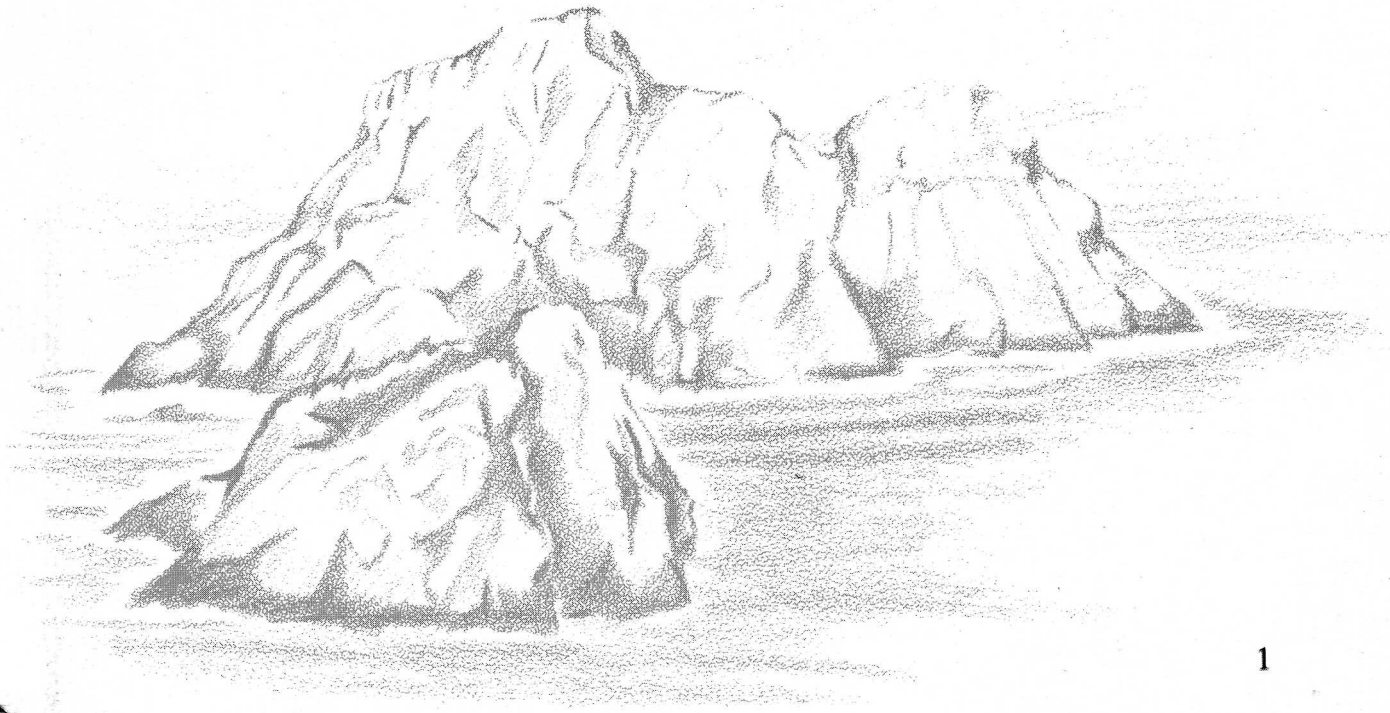
THREE ARCH ROCKS • OREGON ISLANDS

National Wildlife Refuges, Oregon



THE WILDERNESS ACT

On September 3, 1964, the Wilderness Act (P.L. 88-577) became law. It established a National Wilderness Preservation System, a complex of federal lands to be held for all time in a primitive and undeveloped condition. Under Wilderness Act regulations, a wilderness evaluation must be made of every roadless area of 5,000 acres or more and every roadless island, within the National Wildlife Refuge System. This brochure contains a summary of findings for two Oregon refuge study areas.



THREE ARCH ROCKS STUDY AREA

Three Arch Rocks National Wildlife Refuge was established by executive order of Theodore Roosevelt on October 14, 1907. It includes a group of small islands widely known for their wave-eroded arches and spectacular colonies of sea birds. The refuge is uninhabited and seldom visited.

HISTORY

Although located only one-half mile off the Oregon coast, few visits have ever been made to the refuge rocks. Only the most adventurous will risk the angry Pacific surf to land on these precipitous ocean crags. Their history consists of a description by Captain John Meares in 1788, designation as a wildlife reservation in 1907, and a few reports of widely-spaced visits between 1901 and present.

LOCATION AND DESCRIPTION

Three Arch Rocks Refuge is located in the Pacific Ocean near Oceanside, Tillamook County, Oregon. It consists of nine small rocks totalling approximately 17 acres. The larger three rise 200-300 feet; the others may be topped by waves during rough weather. Vegetation is limited to sparse growth wherever a little soil clings.

Rainfall averages about 100 inches annually, coming mostly during winter. Temperatures are moderate, seldom falling below 35°F or rising above 65°F. Fog and strong winds are year-round features.

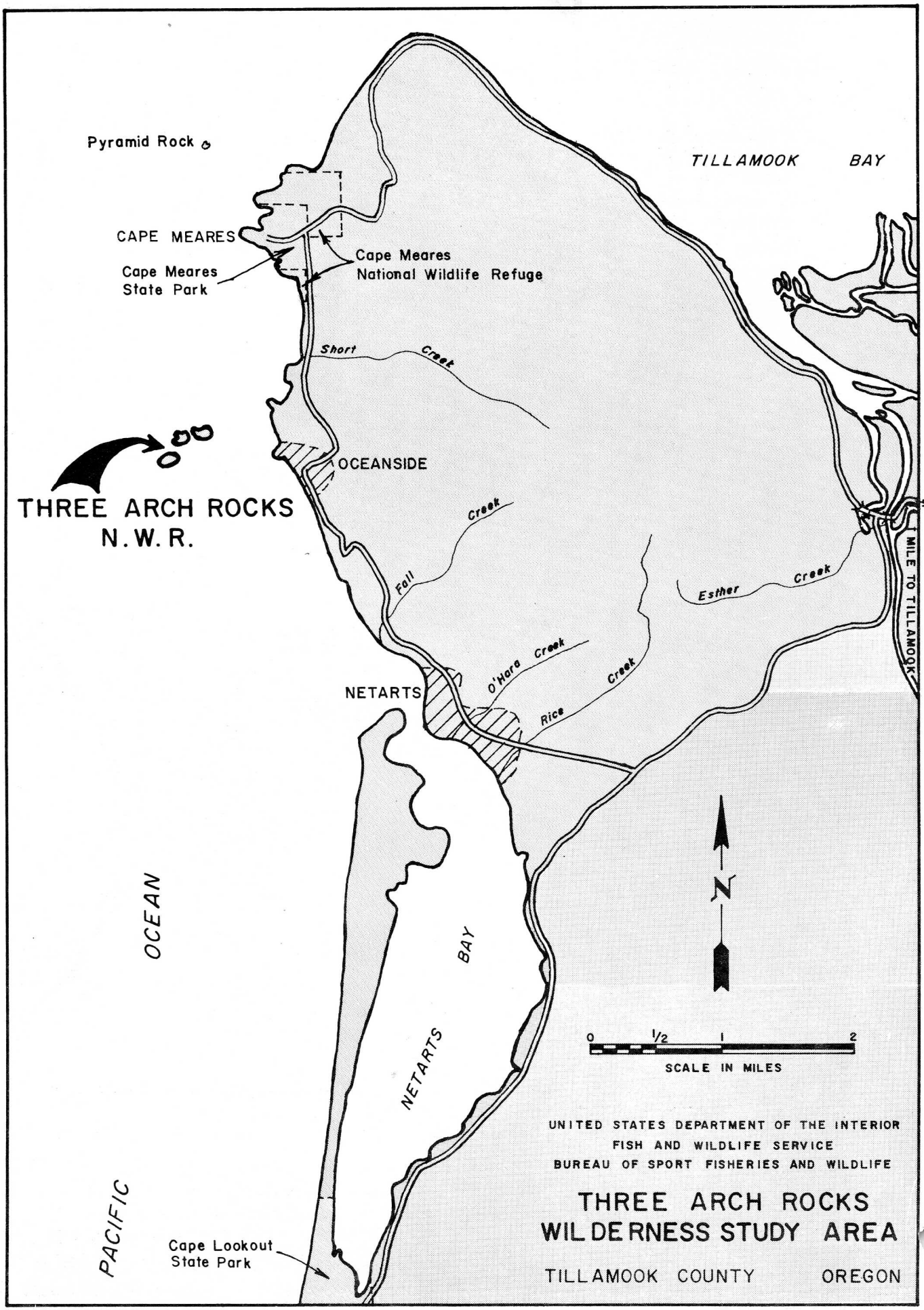
RESOURCES

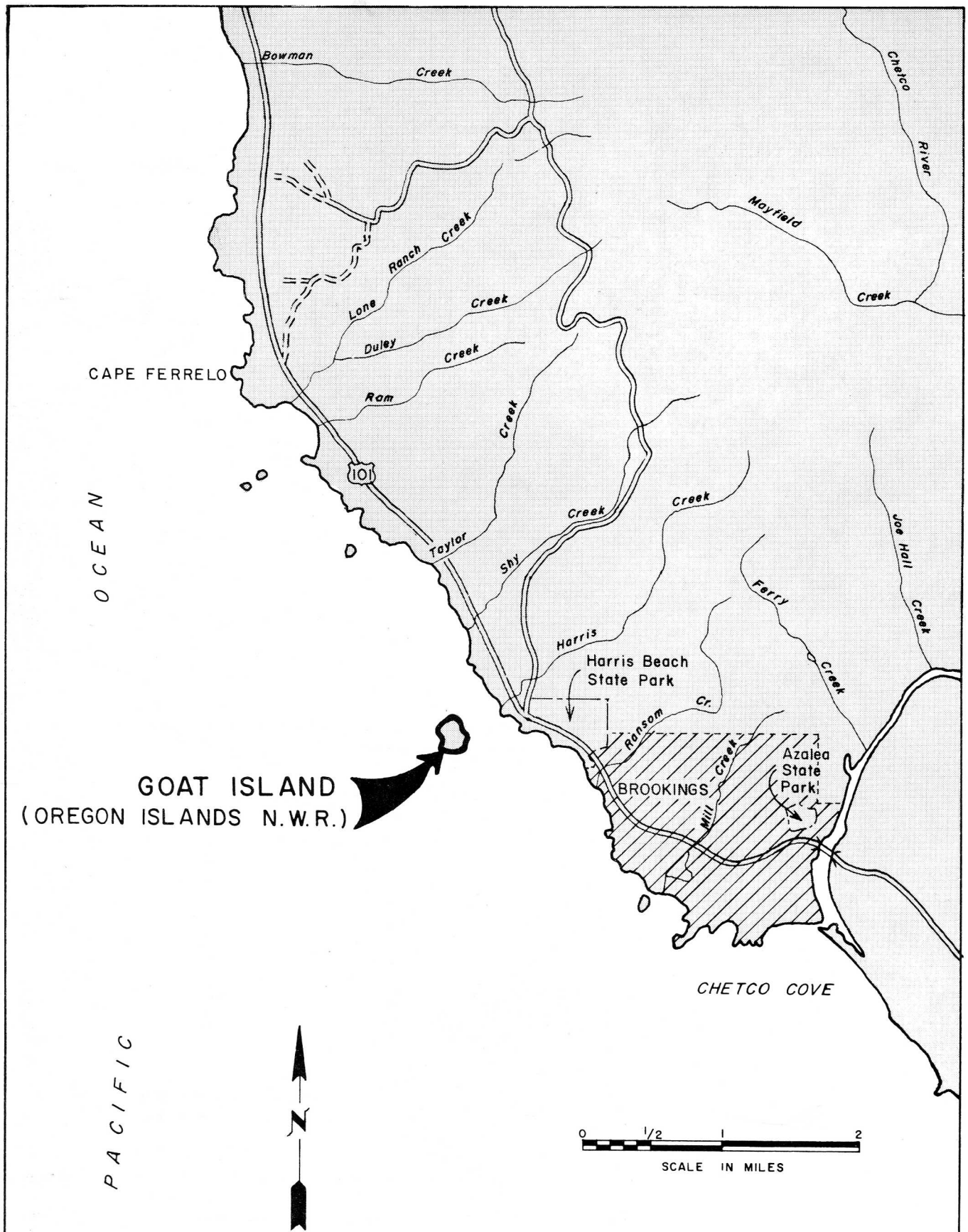
Refuge islands serve as an important breeding area for several species of sea birds. Most abundant are common murres, which nest on every available rock ledge. During late summer there may be more than 100,000 using the refuge. Cormorants, gulls, petrels, puffins and guillemots also breed.

Sea lions are often seen on the lower rocks.

No commercially valuable minerals are found on the refuge.

common murres


Pyramid Rock
TILLAMOOK BAY
CAPE MEARES
Cape Meares State Park
Cape Meares National Wildlife Refuge
Short Creek
OCEANSIDE
THREE ARCH ROCKS N.W.R.
Fall Creek
Esther Creek
1 MILE TO TILLAMOOK
O'Hara Creek
Rice Creek
NETARTS
OCEAN
NETARTS BAY
PACIFIC
Cape Lookout State Park
N
0 1/2 1 2
SCALE IN MILES
UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE
THREE ARCH ROCKS
WILDERNESS STUDY AREA
TILLAMOOK COUNTY OREGON



UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE

OREGON ISLANDS WILDERNESS STUDY AREA

CURRY COUNTY OREGON

RECREATIONAL USE

Public use is seldom possible. Entry during sea bird breeding periods could cause much disturbance and do great damage. Landings at any time of year are always difficult, often dangerous, and sometimes impossible.

RELATIONSHIP OF THE REFUGE TO SURROUNDING AREAS

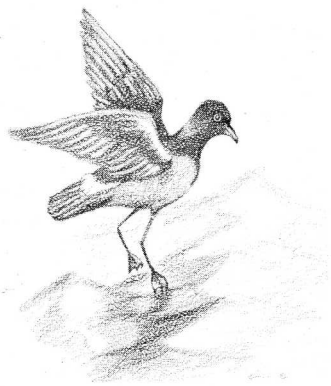
Three Arch Rocks Refuge is a well-known local attraction, and many visitors come to the area to observe the scenic arches, birds and sea lions. Most viewing takes place from shore.

Although the refuge has not changed in hundreds of years, the nearby mainland is experiencing considerable growth. Within view are ocean shore communities, heavily used public beaches, and scars of logging and road building. Fishing boats often seek shelter between the refuge and shore.

Only islands are included in the refuge; surrounding waters are controlled by the State of Oregon. Under present circumstances, the U.S. Bureau of Sport Fisheries and Wildlife has no authority over non-wilderness activities that might occur near the refuge.

PLANNED DEVELOPMENT AND MANAGEMENT

The refuge is serving its best purpose now as an undisturbed sea bird colony. Management will be restricted to biological investigations and prevention of disturbance to wildlife.



OREGON ISLANDS STUDY AREA

Oregon Islands National Wildlife Refuge (originally called Goat Island Reservation) was established by executive order of Franklin D. Roosevelt in 1935. It provides a breeding area for hundreds of thousands of petrels and other sea birds. Like Three Arch Rocks, it is seldom visited.

HISTORY

Chetco Indians apparently once made trips to Goat Island to gather birds' eggs. Over the years, few others have followed their footsteps. Today, there is virtually no sign of man's presence.

LOCATION AND DESCRIPTION

The study area consists of Goat Island, a 21-acre area located in the Pacific Ocean one-half mile from Brookings, Curry County, Oregon. High rocky cliffs surround it, but upper reaches are gently sloping, with a good cover of soil and low vegetation. Highest point is 184 feet above sea level.

Climate is similar to that of the Three Arch Rocks area.

RESOURCES

Leach's petrels occupy almost every square foot of soil on Goat Island. Over 500,000 of these small, burrowing, night-flying sea birds use the island in summer. Also present are cormorants, gulls, murres, puffins, and related species.

Vegetation is low growing and of no economic value. No important mineral deposits are known.

RECREATIONAL USE

Public use is seldom possible. Reaching the island is always difficult and often dangerous. Disturbance to breeding birds can be great if visits are not carefully planned.

RELATIONSHIP OF THE REFUGE TO SURROUNDING AREAS

Goat Island is not well known. It is not particularly scenic, and most of the wildlife is not readily visible. Although it is a very important bird refuge, it will probably never receive much local attention.

As is the case at Three Arch Rocks, the refuge itself is undeveloped, but the nearby mainland shows abundant signs of man's presence. A city of 3,000 people, a heavily-used State park, and the scars of an ocean-edge highway are within view. Lack of jurisdiction over nearby ocean waters is a problem here, also.

DEVELOPMENT AND MANAGEMENT

Nothing is planned beyond scientific study and wildlife protection.

SUMMARY

These refuges are uninhabited and show no evidence of visits by man. They are important sea bird breeding areas. Three Arch Rocks Refuge is a well-known scenic attraction.

Inaccessibility and need to restrict public use combine to make the refuges unavailable for recreation. Wilderness values are lessened because of abundant human activity on nearby shores.

Future plans are to maintain these areas in an undeveloped condition.

Goat Island

Created in 1849, the Department of the Interior—a department of conservation—is concerned with the management, conservation, and development of the nation's water, fish, wildlife, mineral, forest, and park and recreational resources. It also has major responsibilities for Indian and Territorial affairs.

As the nation's principal conservation agency, the Department works to assure that nonrenewable resources are developed and used wisely, that park and recreational resources are conserved for the future, and that renewable resources make their full contribution to the progress, prosperity, and security of the United States—now and in the future.

UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE

January, 1967

OREGON ISLANDS

Oregon Islands National Wildlife Refuge
Oregon

WILDERNESS PROPOSAL

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF SPORT FISHERIES AND WILDLIFE

This report was prepared pursuant to the Wilderness Act, Public Law 88-577. Publication of the findings and recommendations herein should not be construed as representing either the approval or disapproval of the Secretary of the Interior. The purpose of this report is to provide information and alternatives for further consideration by the Bureau of Sport Fisheries and Wildlife, Secretary of the Interior, and other Federal agencies.

PREFACE

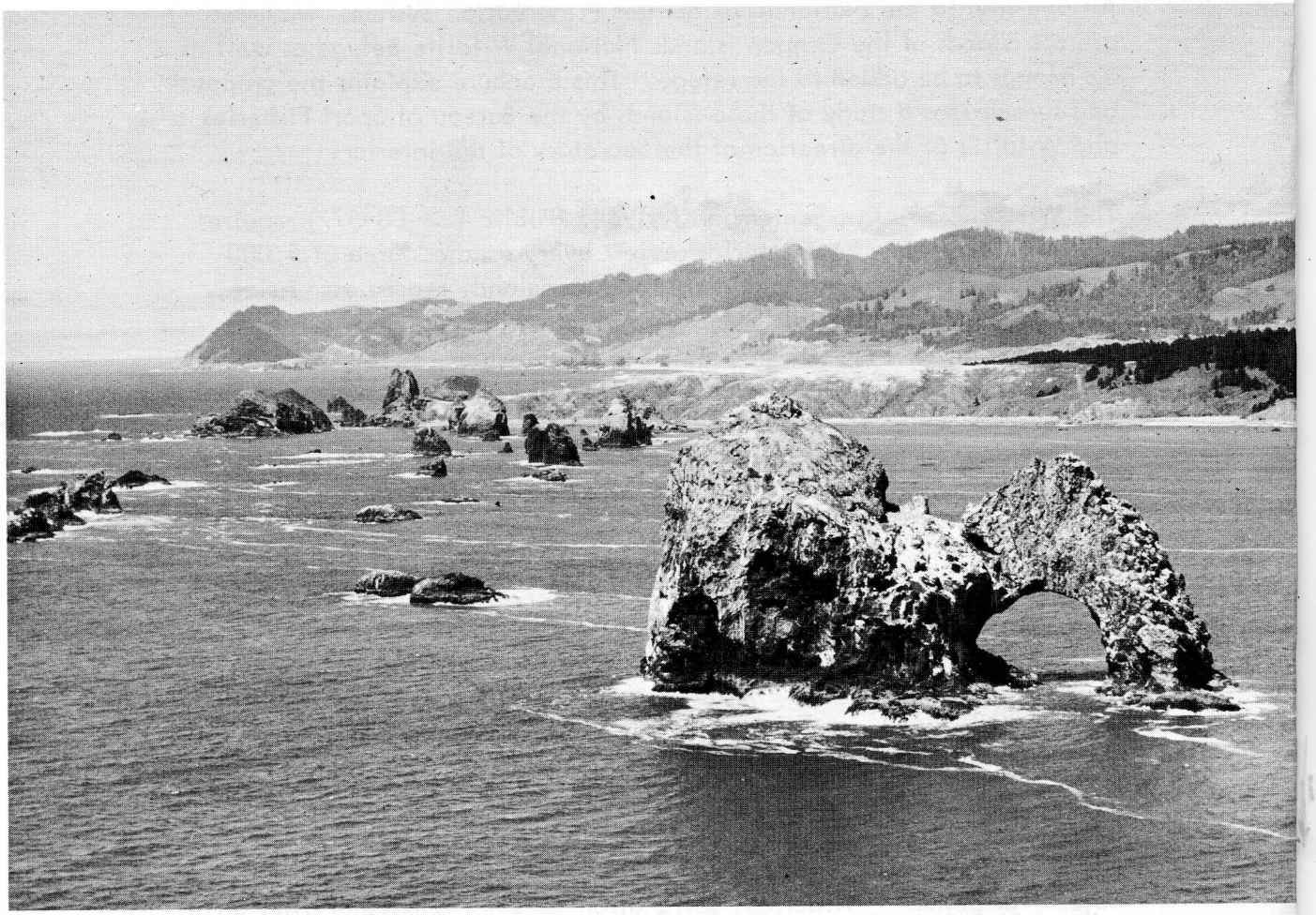
Fifty-six islands and island groups along the Oregon Coast are proposed for addition to the National Wilderness Preservation System. Included are all islands of the Oregon Islands National Wildlife Refuge as well as 28 islands to be added to the refuge. This brochure explains the proposal and summarizes a study of those islands by the Bureau of Sport Fisheries and Wildlife at the direction of the Secretary of the Interior.

The Wilderness Act of September 3, 1964, (Public Law 88-577) requires that the Secretary of the Interior review every roadless area of 5,000 contiguous acres or more and every roadless island, regardless of size, within the National Wildlife Refuge System within ten years after the effective date of the Act, and report to the President of the United States his recommendations as to the suitability or nonsuitability of each such area or island for preservation as wilderness. A recommendation of the President for designation as wilderness does not become effective unless provided by an Act of Congress.

In defining wilderness, the Act also included areas of less than 5,000 acres that are of sufficient size to make preservation and use in an unimpaired condition practicable.

Sections 4(a) and (b) of the Wilderness Act provided that: (1) the Act is to be within and supplemental to the purposes for which National Wildlife Refuges are established; and (2) wilderness areas shall be administered so as to preserve their wilderness character and shall be devoted to the public purposes of recreational, scenic, scientific, educational, conservation and historical use insofar as primary refuge objectives permit. Wilderness designation does not remove or alter an area's status as a National Wildlife Refuge.

MACK ARCH - MACK REEF



INTRODUCTION

The Oregon Islands National Wildlife Refuge is one of two units of the National Wildlife Refuge System established for the protection and management of colonial nesting bird habitat on coastal islands along the Oregon Coast. The first, Three Arch Rocks Refuge was created in 1907 and consists of a group of nine rocks located one-half mile off Oceanside, Oregon. This refuge was reviewed and subsequently established as the Three Arch Rocks Wilderness in 1970.

The initial Oregon Islands Refuge was established by Executive Order in 1935 and consisted solely of 21-acre Goat Island located one-half mile from Brookings, Oregon. It was also reviewed and established as the Oregon Islands Wilderness in 1970. Following this review, 28 additional islands and island groups were added to the Oregon Islands Refuge. All meet the minimum criteria for mandatory review under the Wilderness Act.

Along with these 28 islands, 28 additional islands are proposed for inclusion in the Wilderness Preservation System. Two of the additional 28 are currently administered by the Bureau of Sport Fisheries and Wildlife, but are not officially a part of either the Three Arch Rocks or Oregon Islands Refuges. The remaining 26 are being considered for withdrawal as additions to the Oregon Islands Refuge.

The wilderness proposal described in this brochure will be known as the Oregon Islands Wilderness, and will include the presently existing wilderness areas known as the Three Arch Rocks Wilderness and the Oregon Islands Wilderness. It will also include 28 islands recently added to the Oregon Islands Refuge, two islands administered by the Bureau of Sport Fisheries and Wildlife but not within the refuge and 26 islands proposed for addition to the refuge.

As wilderness these islands would continue to serve their primary objectives, namely to preserve and maintain habitat for nesting colonies of native marine birds and to further man's understanding and appreciation of wildlife and wildlands and his role within this environment.

SEA LIONS ON SEAL ROCK, ORFORD REEF

HISTORY

In the sixteenth century, European explorers making landfall on the Oregon coast found the lands and waters in possession of several Indian groups. The Lower Columbia was occupied by the Chinooks; the Tillamooks were on the north coast; the Alsea, Siuslaw, Umpqua and Coos on the central coast; and the Tututni and Tolowa along the southern coast.

Indians made extensive use of the sea and its coastal islands in their quest for food. The rocky islands were regularly visited for eggs, shellfish and sea lions.

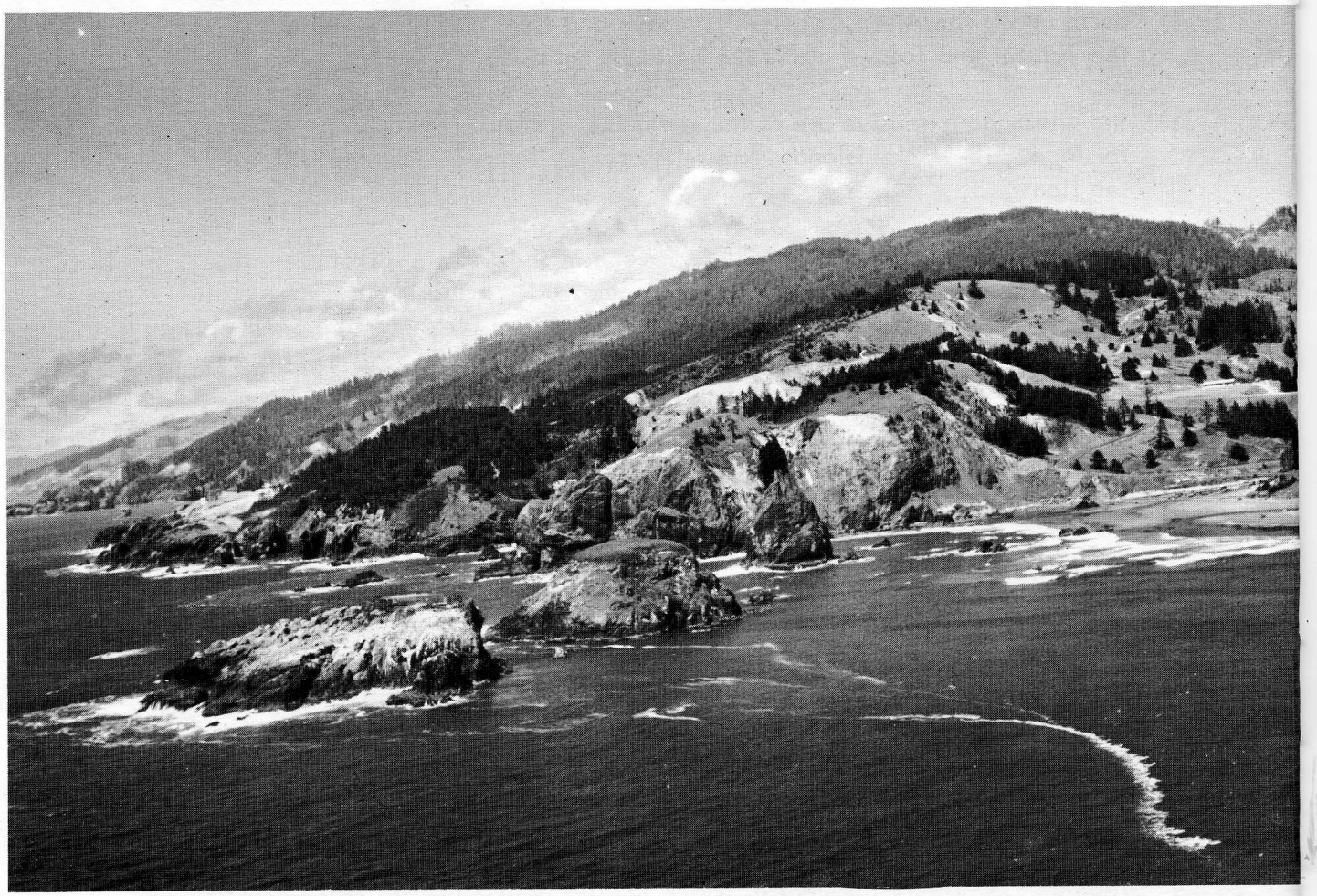
Following Juan Rodegriz Cabrillo's voyage in 1542, a parade of Spanish, British, and finally American explorers and traders began plying the coastal waters of the Northwest. Stimulated by the search for the mythical "Northwest Passage" and further encouraged by the sea otter fur trade, their travels gradually revealed the mysteries of this rugged coast.

The first American settlement was the short-lived Fort Astoria Trading Post established in 1811 at the mouth of the Columbia. But development was concentrated near Fort Vancouver, at present-day Portland and along the Willamette Valley. In 1843, the opening of the Oregon Trail brought great numbers of settlers and in the ensuing years, settlement of the Oregon Territory progressed at an accelerated rate.

Early Oregon history says very little about the coastal islands. An exception is a reputed Indian massacre of an unknown number of white men on Whalehead Island in 1856. Although the islands were undoubtedly visited by Indians and later by local residents, the first visit of a scientific nature was made to Three Arch Rocks in 1901.

The need to protect the coastal island habitat so essential to colonial nesting sea birds was officially recognized with the establishment in 1907 of the Three Arch Rock Refuge by President Theodore Roosevelt. This was followed by the Oregon Islands National Wildlife Refuge in 1935.

WHALEHEAD ISLANDS



PHYSICAL DESCRIPTION

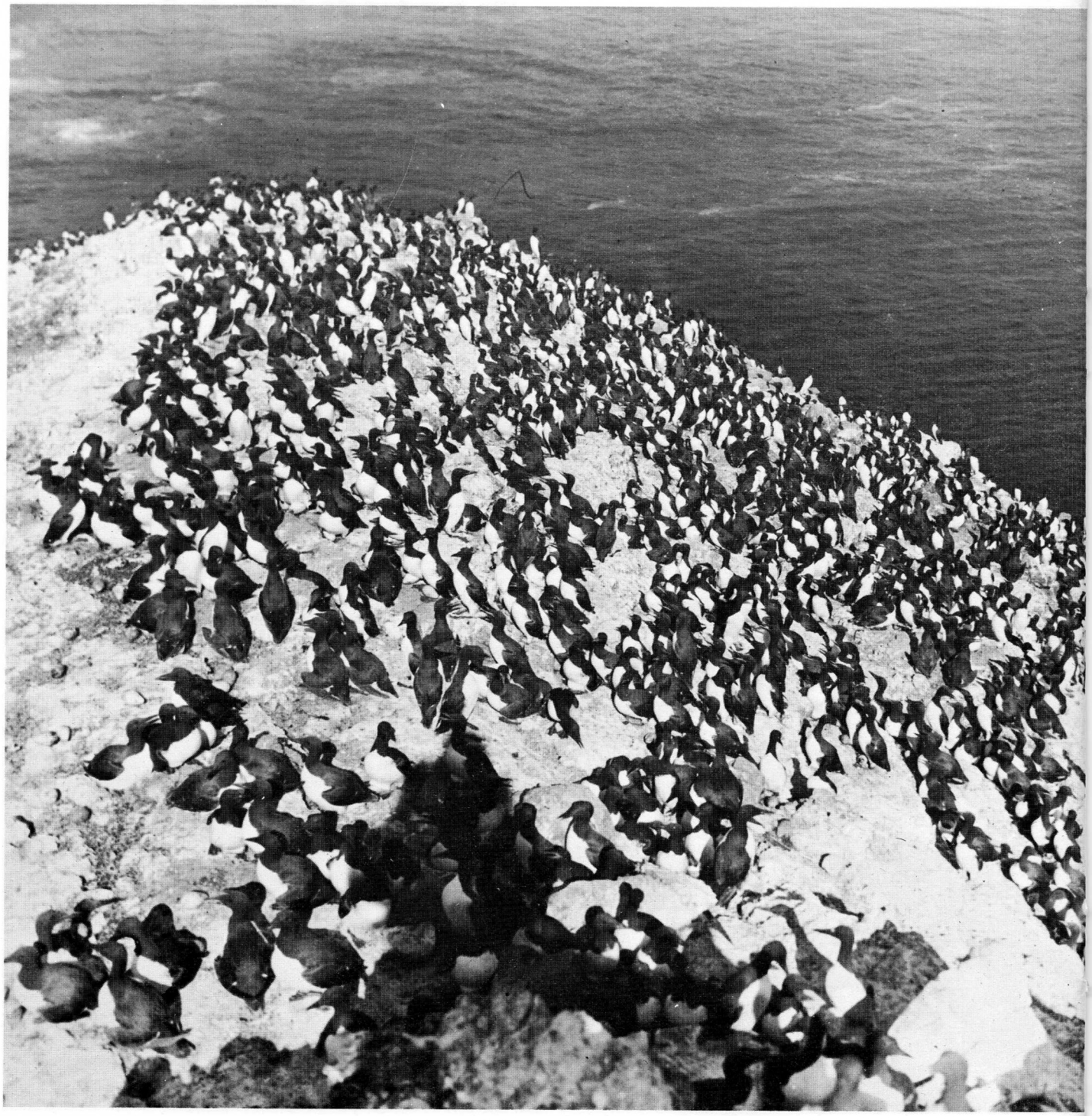
The 367-acre Oregon Islands National Wildlife Refuge embraces 29 islands and island groups along nearly the full length of the Oregon coastline. Interspersed with these are 28 additional islands totaling 113 acres proposed for inclusion in wilderness. All 56 islands and island groups totaling 459 acres appear suitable for addition to the National Wilderness Preservation System.

The rugged islands, rocks and reefs that constitute this proposal dominate and greatly enhance the scenic attraction of the Oregon Coast. They vary greatly in size and shape. Many exceed a hundred feet in height, others are almost constantly awash by the surf. Some are flat-topped or tilted masses, others almost vertical rock pinnacles. Many support a cover of low-growing vegetation, others are bare.

The Coquille River marks a geologic boundary between the Coast Ranges and the Klamath Mountains Physiographic Provinces. North of this line, land masses and their adjacent islands are composed primarily of sedimentary rock. Topography is generally of low relief. To the south, granite, quartz, and various metamorphic materials are the rule. The shores are more abrupt, with occasional basaltic headlands evident.

The narrow coastal "fog belt" is almost free of winter frost and remains cold and damp even in summer. The climate remains remarkably regular through the year with an annual rainfall of 80 to 100 inches.

The continental shelf of Oregon is a very specialized ecosystem supporting large numbers of marine organisms. The birds and animals that use the off-shore islands and rocks are an integral part of this complex web of life.



COMMON MURRES

RESOURCES

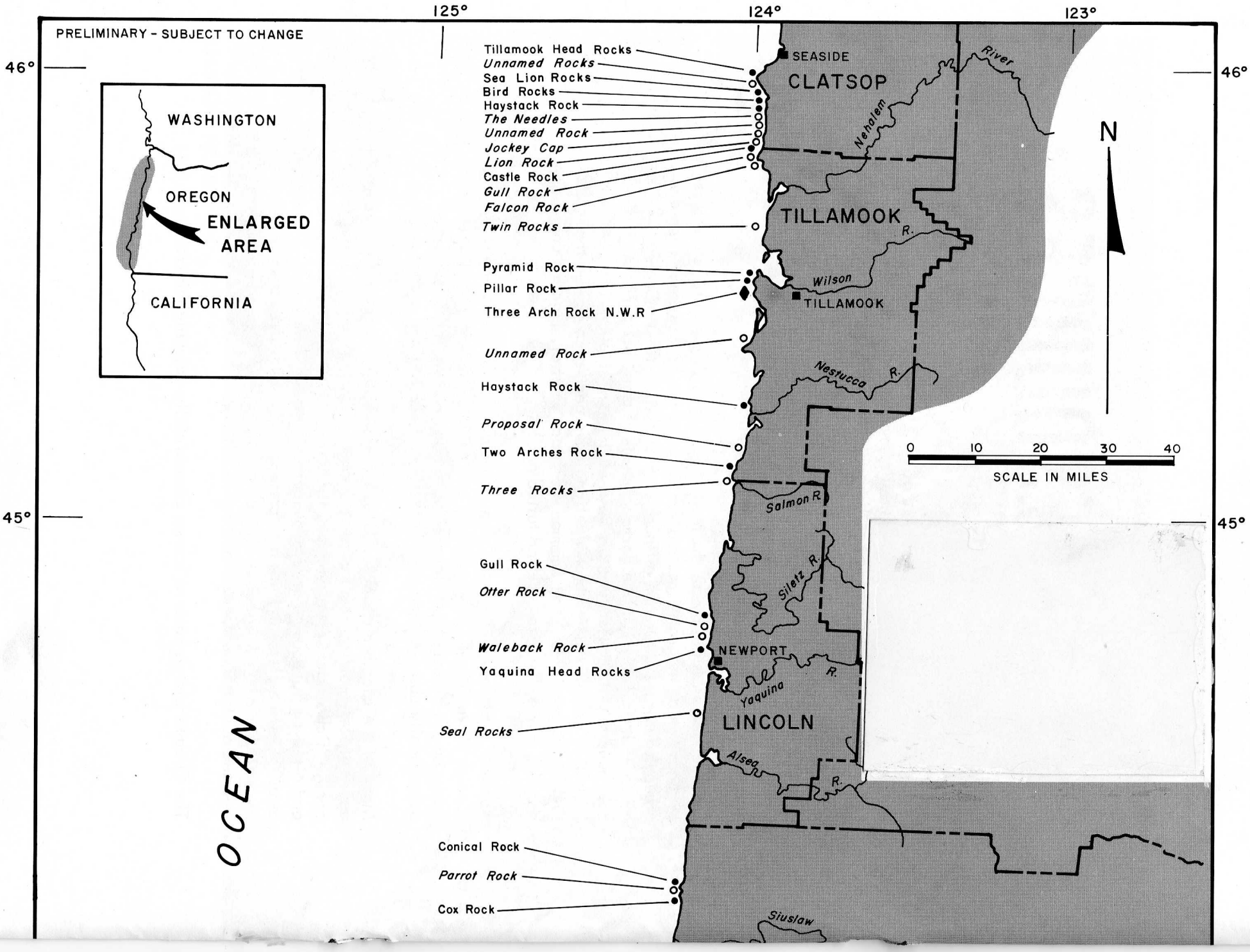
With the exception of sea lions and seals, mammals are scarce on the islands. Northern sea lions, California sea lions, harbor seals and an occasional fur seal on spring migration haul out on many of the rocks and reefs. About 1,000 northern sea lions, the most abundant species, are observed annually on these islands. Sea otter, a rare mammal, was reintroduced to Oregon Coastal waters in 1970 after an absence of nearly 100 years. Gray whales are found in surrounding waters during migration.

Colonial sea birds are by far the most abundant birds present. Some three decades ago an estimated two million colonial sea birds were nesting and otherwise using the Oregon offshore rocks. Today, their numbers have declined--due primarily to the encroachments of man, but the islands still host hundreds of thousands of sea birds each year. Eighteen colonial species including the endangered brown pelican have been recorded on the islands. Over half nest here. Most common are Leach's petrel, Brandt's cormorant, common murre, western gull and tufted puffin.

About 17 other sea birds--not colonial nesters--are known along with 7 species of waterfowl, 10 shorebirds, and a variety of small land birds that occur on the adjacent mainland. The endangered peregrine falcon is occasionally observed and may still nest on some of these islands.

Many of the islands contain soil of sufficient depth to support a varied cover of low-growing vegetation common to the sitka spruce coastal forest zone, which stretches the length of the Washington-Oregon Coast. Grasses and a few herbaceous plants predominate, but a few evergreens, frequently dwarfed by the elements, are also present. Wherever deeper soils are present, burrow nesting sea birds such as tufted puffins, petrels, murrelets and auklets find suitable nesting conditions.

The Oregon Islands have no known commercially valuable mineral resources.


PRELIMINARY - SUBJECT TO CHANGE
125°
124°
123°
46°
45°
WASHINGTON
OREGON
ENLARGED AREA
CALIFORNIA
Tillamook Head Rocks
Unnamed Rocks
Sea Lion Rocks
Bird Rocks
Haystack Rock
The Needles
Unnamed Rock
Jockey Cap
Lion Rock
Castle Rock
Gull Rock
Falcon Rock
Twin Rocks
Pyramid Rock
Pillar Rock
Three Arch Rock N.W.R
Unnamed Rock
Haystack Rock
Proposal Rock
Two Arches Rock
Three Rocks
Gull Rock
Otter Rock
Waleback Rock
Yaquina Head Rocks
Seal Rocks
Conical Rock
Parrot Rock
Cox Rock
OCEAN
SEASIDE
CLATSOP
Nehalem
River
TILLAMOOK
R.
Wilson
TILLAMOOK
Nestucca
R.
Salmon R.
Siletz R.
NEWPORT
Yaquina
R.
LINCOLN
Alsea
R.
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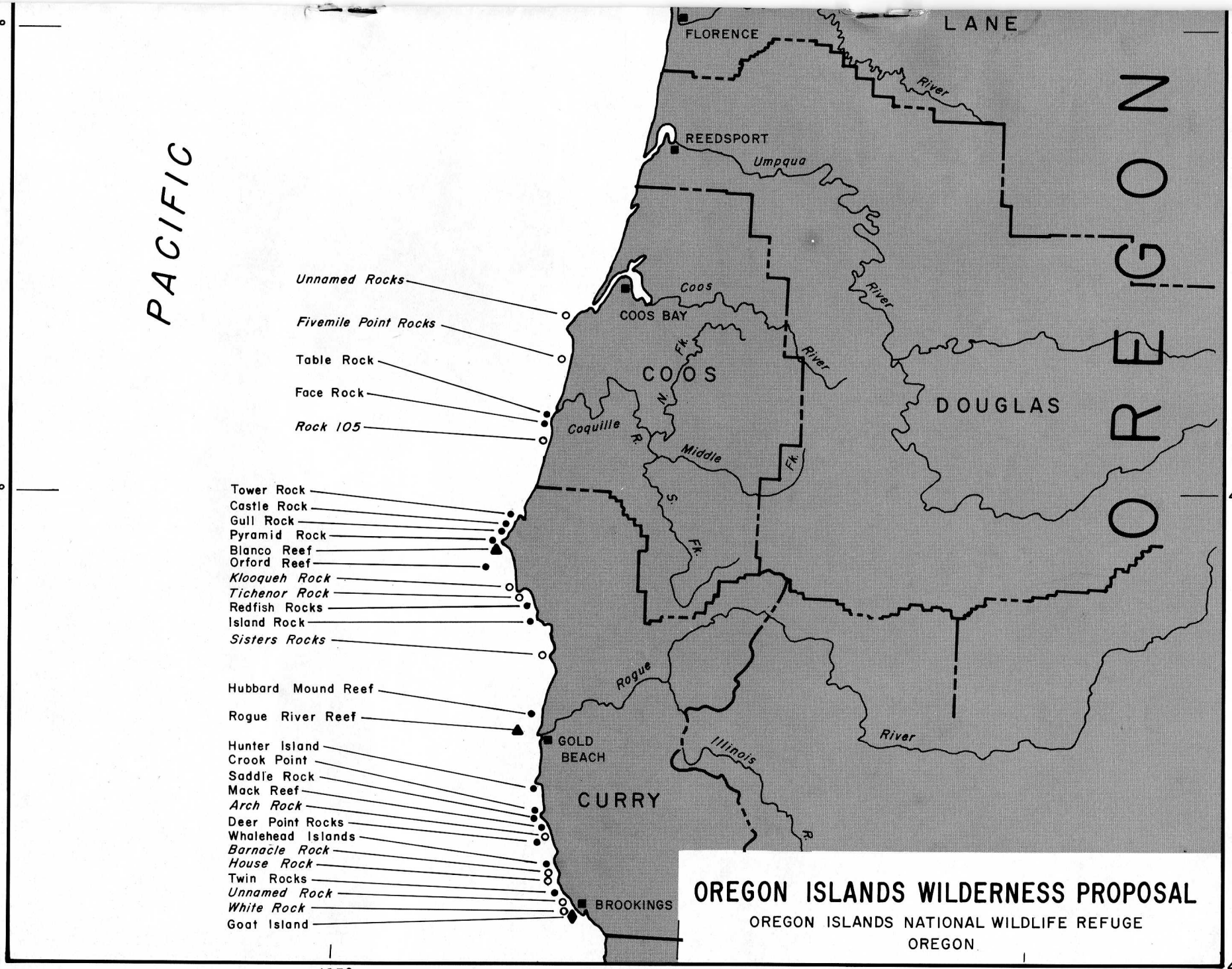
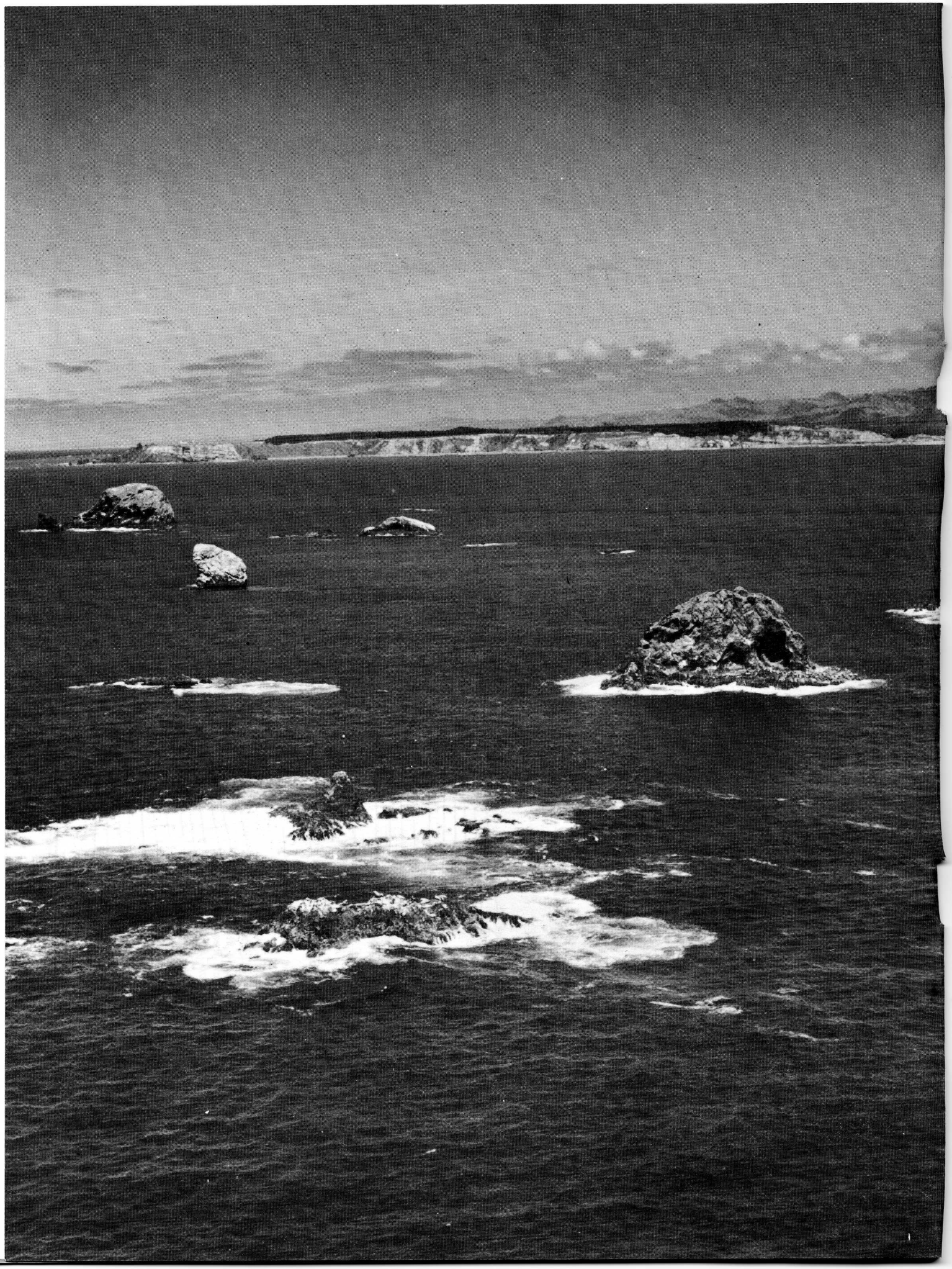
N
0 10 20 30 40
SCALE IN MILES



OREGON ISLANDS WILDERNESS PROPOSAL

OREGON ISLANDS NATIONAL WILDLIFE REFUGE

OREGON



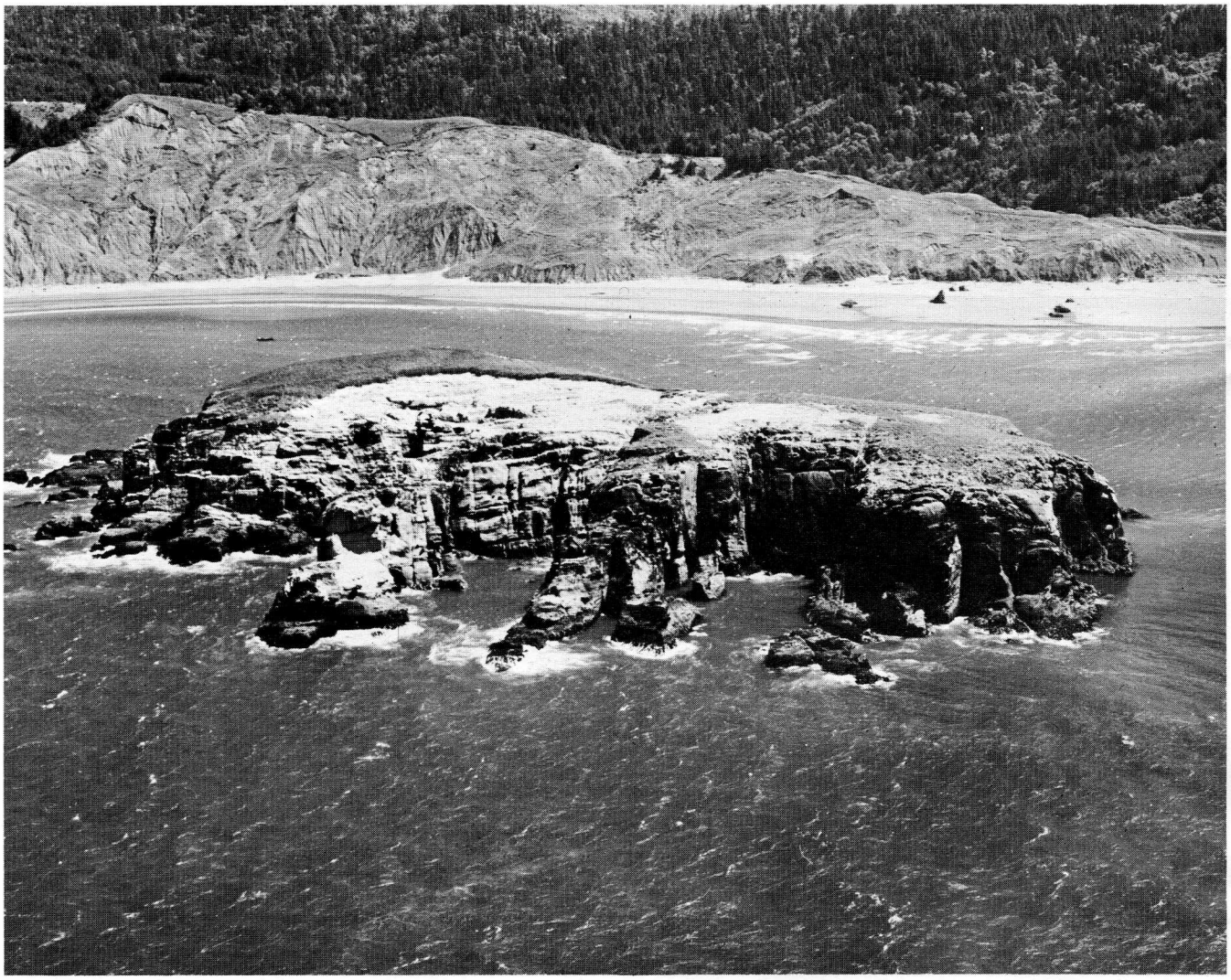
PUBLIC USE

The greatest and most important use made of the islands has been the indirect use by the viewing public from the nearby shoreline--people who are attracted by the abundance and variety of bird and marine mammal life associated with the islands and by the islands' rugged beauty. The scenic attractiveness of the Oregon Coast is nationally renowned.

In recent times, the majority of the rocks and islets have probably been rarely, if ever, visited by man-and then only for brief periods.

Public use of the more accessible islands, such as Haystack Rock and Yaquina Head, has become an increasing problem in recent years, in terms of physical disturbance and the disturbance to wildlife using the islands. Management controls have been required in some cases and additional controls will probably be necessary in the future.

Public access to the islands is not allowed, but access for scientific purposes is permitted under careful regulation.



HUNTER ISLAND

MANAGEMENT & DEVELOPMENT

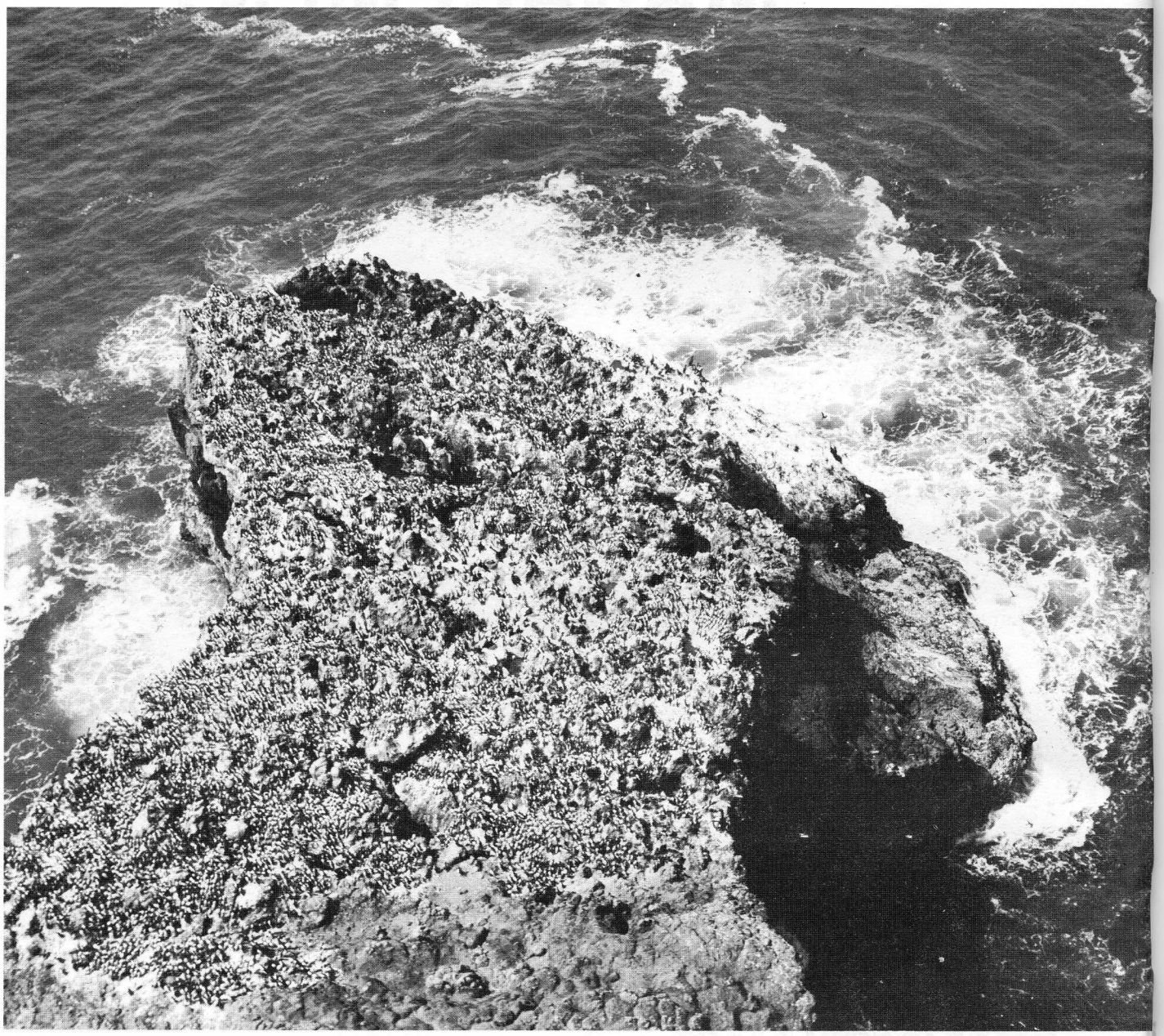
The islands which have refuge status are managed essentially as sanctuaries for wildlife, with emphasis on protection and preservation of those natural qualities inherent to their value to wildlife. The islands are all undeveloped and no future developments are planned.

Management involves periodic patrol, informational and regulatory signing, routine biological inventories, and a public information program. Visits to the islands are timed to avoid conflicts with nesting birds. Landings during the breeding season are made only when long-range scientific or management benefits outweigh potential short-term harm.

Those islands proposed for addition to the refuge are also undeveloped and are not actively managed at this time. If added to the refuge, they will be managed as other refuge islands currently are.

Federal ownership and authority extend only to the line of mean high tide. Lands and waters below that point are under the jurisdiction of the State of Oregon.

Several islands were withdrawn for navigational purposes as early as 1867. Precise information on these withdrawals is not available, but primary jurisdiction rests with the U. S. Coast Guard. As recreational boating increases, aids to navigation may be needed. At present, however, no aids are planned in this area.



ROOKERY ON TWO ARCHES ROCK

SOCIAL & ECONOMIC CONSIDERATIONS

The Oregon Coastal islands are a reflection of America's rich island heritage. Historically associated with the culture of aboriginal people and early European exploration and settlement of the Pacific Northwest, the islands figure prominently in local legend and lore--of seal hunts and fur traders, of ship wrecks and buried treasure. Though the nearby mainland is replete with the signs of human activities, the islands retain their exceptional natural beauty.

While wilderness designation may generate a few additional boat trips to view them, it would have no significant impact upon local or regional economies.

Consolidation of these islands with the present Oregon Islands and Three Arch Rocks Wilderness into one wilderness would provide for a truly significant Oregon offshore island wilderness area.

COASTAL ESCARPMENT

CONCLUSIONS

All of the 56 Oregon coastal islands and island groups discussed in this proposal appear suitable for inclusion in the National Wilderness Preservation System. Although they contain no potential for on-site recreational opportunities, they do have important historical, biological, ecological, educational and scenic values of regional and national importance.

The 30 islands currently administered by the Bureau of Sport Fisheries and Wildlife are proposed for designation as wilderness. An additional 26 islands are proposed for wilderness designation as they are added to the refuge.

It is further proposed that all 56 islands along with the existing Three Arch Rocks and Oregon Islands Wilderness areas be consolidated into one wilderness area to be known as the Oregon Islands Wilderness.

Alternatives to the proposed action have been explored, and an Environmental Impact Statement prepared for review by the Council of Environmental Quality as required by the Environmental Quality Act of 1969 (Public Law 90-190).

Persons interested in the proposal are encouraged to inspect the Oregon Islands. Additional information may be obtained from the Refuge Manager, William L. Finley National Wildlife Refuge, Route 2, Box 208, Corvallis, Oregon, 97330, or from the Regional Director, Bureau of Sport Fisheries and Wildlife, P. O. Box 3737, Portland, Oregon, 97208.

As the Nation's principal conservation agency, the Department of the Interior has basic responsibilities for water, fish, wildlife, mineral, land, park, and recreational resources. Indian and Territorial affairs are other major concerns of America's "Department of Natural Resources."

The Department works to assure the wisest choice in managing all our resources so each will make its full contribution to a better United States—now and in the future.

April 1972

OREGON ISLANDS WILDERNESS STUDY AREA

STUDY II

OREGON ISLANDS NATIONAL WILDLIFE REFUGE
OREGON

WILDERNESS STUDY REPORT

NOVEMBER 1991

U. S. DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE

NATIONAL WILDLIFE REFUGE SYSTEM

I. THE STUDY AREA

1,200 islands, rocks, and reefs; 95 acres.

The Oregon Islands National Wildlife Refuge contains approximately 575 acres and is made up of over 1,400 islands, rocks and reefs scattered along the Oregon coast. The refuge was established primarily for the protection and management of colonial nesting seabird and marine mammal habitat.

Four hundred-eighty acres of the Oregon Islands National Wildlife Refuge along with the 17 acres of Three Arch Rocks National Wildlife Refuge currently constitute the Oregon Islands Wilderness as designated by Public Law No. 91-504 dated October 23, 1970. The purpose of this study was to review those areas within the Oregon Islands National Wildlife Refuge not presently within the National Wilderness Preservation System, and to determine whether these remaining areas should be designated as additions to the Oregon Islands Wilderness.

The Oregon Islands Wilderness Study Area II (WSA II) consists of 1200 islands, rocks, and reefs comprising about 95 acres lying within 3 miles of the coast and located above mean high water. These islands extend along 307 miles of the Oregon coast from Tillamook Head 20 miles south of the Columbia River to the rocks just north of the California state line.

A few of these units are small and widely scattered rocks that are not located near other large or named rocks. The remaining islands, rocks, and reefs in this study are found in close association with the islands shown on the enclosed map.

These islands, rocks, and reefs are small and extremely rugged in appearance. Soil cover is scanty and shallow. Vegetation, when present, consists primarily of low-growing grasses and herbaceous plants. The islands, rocks, and reefs are primarily valuable as nesting, roosting, and foraging habitat for colonial seabirds and shorebirds, and are also of special importance as loafing and breeding areas for 4 species of pinnipeds.

Federal ownership and refuge authority extends only to the line of mean high tide, with water and lands below that under the jurisdiction of the state of Oregon. The Oregon State Game Commission was granted authority and management responsibility for all non-game animals on September 9, 1971, and acted to prohibit the taking of sea lions and seals off the Oregon coast from that date. Thus, the state is now in a position to effectively protect and manage all wildlife resources associated with marine lands. The Federal Marine Mammal Protection Act, Endangered Species Act, and Migratory Bird Treaty Act also provide protection.

II. RECOMMENDATION AND RATIONAL

The remaining 95 acres of Oregon Islands National Wildlife Refuge without wilderness status is recommended for wilderness. Zero acres are recommended for nonwilderness status.

The recommendation for the Oregon Islands WSA II is to designate 1,200 islands, rocks, and reefs comprising 95 acres as wilderness.

This recommendation would help preserve the Oregon coastal islands as a reflection of America's rich island heritage. They are closely associated with the culture of aboriginal coastal people and early European exploration and settlement of the Pacific Northwest.

Marine mammal use of Oregon Islands National Wildlife Refuge and the area included in the WSA II is quite extensive. Four species of pinnipeds are found here including: Steller (northern) sea lion (Eumetopias jubatus), California sea lion (Zalophus californianus), Pacific harbor seal (Phoca vitulina richardsi), and northern elephant seal (Mirounga angustirostris). Data on pinniped occurrence was obtained from Robin Brown, Marine Mammal Coordinator for the Oregon Department of Fish & Wildlife. This information was supplemented with observations by the Coastal Biologist, Western Oregon Refuges, and others.

The most abundant pinniped in the state is the harbor seal with a population size ranging as high as 7,000 animals. Data obtained over the last 8 years indicates that the population is expanding at an average annual rate of 6-8%. This expanding population will undoubtedly result in increased use of the WSA II and establishment of new haul-out/pupping areas.

Counts of threatened northern sea lion along the Oregon coast range as high as 3,000. Eight of the 10 major haul-out sites for these animals are already part of Oregon Islands Wilderness, but small numbers of northern sea lions haul out at various sites throughout the WSA II.

California sea lions move north along the Oregon, Washington, and British Columbia coasts after leaving breeding areas in southern California and Mexico. The peak number of California sea lions in Oregon is estimated at 4,000-6,000. Six of the 9 major haul-out sites for these animals are within existing Oregon Islands Wilderness, but small numbers of the animals also use the WSA II

The northern elephant seal occurs in Oregon in small numbers. The peak count to date occurred on May 10, 1990 when 60 animals were seen hauled out on the Simpson Reef unit of the Oregon Islands NWR. Simpson Reef is the only area where elephant seals commonly

occur in the state and is already part of the Oregon Islands Wilderness area. However, as elephant seal populations continue to recover, the number of animals occurring in Oregon and use of the WSA II is expected to increase.

Oregon Islands NWR provides extremely important habitat for colonial nesting seabirds. Over 1.15 million seabirds comprising 13 species were estimated to be breeding along the Oregon coast in 1990. A large percentage of the colonies are on the larger islands already within the Oregon Islands Wilderness area. However, many of the smaller islands, rocks, and reefs within the WSA II are in close association with the colony islands and serve as important loafing and roosting areas.

The WSA II is also important to several Federally listed threatened and endangered species during at least part of the year. Almost the entire Aleutian Canada goose (Branta canadensis leucopareia) population migrates along the Oregon coast on its way to the wintering area in California. During spring migration, some of these birds utilize vegetated rocks and islands within the WSA II. In most cases the use is confined to a few days or weeks as the birds move north.

Large numbers of California brown pelicans (Pelecanus occidentalis californicus) spend the late spring, summer and early fall along the Oregon coast after leaving breeding areas in California and Mexico. Many of the rocks and islands within the WSA II serve as diurnal and nocturnal roost sites for these birds. Coastwide aerial surveys conducted in September 1987 and 1990 revealed that peak populations of pelicans along the Oregon coast ranged from 1,686 to 3,600.

An increasing number of peregrine falcons (Falco peregrinus) are being observed along the Oregon coast signalling a comeback for this species. The islands, rocks, and reefs within the study area will have increased importance as roosts and foraging areas for expanding peregrine populations in the future.

Bald eagles (Haliaetus leucocephalus) are also occasionally observed foraging within the WSA II.

Northern sea lions (Eumetopias jubatus) are now Federally listed as threatened species due to drastic declines in the Alaska populations. The number of these animals in Oregon has remained stable and serves as an important reservoir for the total population.

Though nearby mainland areas are replete with the signs of human activities and developments, the islands, rocks, and reefs within the WSA II retain their exceptional natural beauty. Offshore in their pristine ocean environment they impart a sense of timelessness. Perhaps this latter quality, a certain detachment

from the realities of the modern world, provides a key to their special attraction to contemporary Americans.

These rugged, highly scenic islands contribute to the feeling of tranquility and solitude that one so often experiences at the edge of the sea. Designation of the islands, rocks, and reefs as wilderness would not, in itself, preserve the opportunity for such an experience, as it would not extend protection to state-owned lands and waters below the line of mean high tide. However, the State of Oregon has adequate authority and has demonstrated a definite interest in protecting the natural values of these lands.

III. CRITERIA CONSIDERED IN DEVELOPING THE WILDERNESS RECOMMENDATIONS

A. **Naturalness:**

The Oregon Islands WSA II is managed essentially as a sanctuary for wildlife with emphasis on protecting and preserving those natural qualities making it valuable wildlife habitat. The study area is completely undeveloped, and no future development is planned. So, as coastal development continues to spread, these islands, rocks, and reefs serve as a welcome oasis free from human encroachment.

Soil and vegetation development is limited or absent on these areas, but they remain as critical habitat for wildlife. Some of the rocks within the WSA serve as breeding sites for seabirds such as western gulls, pelagic cormorants, pigeon guillemots and black oystercatchers. They are also used as feeding and resting sites by shorebirds and endangered species such as brown pelicans. The islands, rocks and reefs within the WSA are also valuable as haul-outs for 3 species of marine mammals (pinnipeds).

B. **Solitude**

The Oregon Islands WSA II is closed to public entry for wildlife protection so the undeveloped, wilderness aspects of the islands, rocks, and reefs cannot be experienced first-hand. However, having an expanse of wild and rugged islands in view from shore would certainly add to a feeling of peace and solitude experienced so infrequently by humans in an increasingly crowded world.

C. **Special Features**

These islands, rocks, and reefs have a diverse and very rugged topography which combines with the crashing surf and abundant wildlife of the Pacific Ocean to give them a high scenic value.

Ledges and flat, rocky areas provide roosting and feeding habitat for shorebirds and haul-outs for marine mammals. Other areas serve as loafing and foraging habitats for colonial seabirds as well as the federally listed peregrine falcon, bald eagle, brown pelican, and Aleutian Canada goose.

The islands,rocks, and reefs within the WSA II are an important part of Oregon's history from the earliest human inhabitants to present day. The islands figure prominently in local legend and lore of seal hunts, fur traders, shipwrecks and buried treasure.

MANAGEABILITY

(The area must be capable of being managed to preserve its wilderness character)

The Oregon Islands Wilderness Study Area II is capable of being managed to preserve its wilderness character.

Management would involve periodic law enforcement patrols to protect island resources from human intrusions; informational and regulatory signing; routine biological inventories; analysis as a basis for the development of effective management programs; and an information program designed to promote general public awareness and appreciation for refuge values.

Visits to the islands would be restricted to avoid impacts to seabirds, marine mammals, and threatened and endangered species. Landings during the breeding season would occur only when long-range scientific or management benefits would outweigh potential short-term harm.

Federal ownership and refuge authority extends only to the line of mean high tide, with water and lands below that point under the jurisdiction of the State of Oregon.

ENERGY AND MINERAL RESOURCE VALUES

A mineral survey has not been done on the Oregon Islands Wilderness Study Area II. Mineral resources are thought to be absent or of little value.

LOCAL SOCIAL AND ECONOMIC CONSIDERATIONS

Natural attractions along the coast (State Parks and Visitor Centers) have received a visitation increase from between 2-23% from 1985 to 1989 (average 8.2%) and the trend is expected to continue. Visitation to Yaquina Head alone is proposed to double reaching 500,000 visits by the year 2000. This major visitation growth clearly demonstrates the attraction of wilderness areas and the human need to be near them. Wilderness status for the

remaining Oregon Islands would achieve two goals: bolstering the coastal economy by continuing to provide a significant attraction, and further protection for areas that run the risk of being loved too much.

SUMMARY OF WILDERNESS STUDY AREA II PUBLIC COMMENTS

A 45 day public comment period was required as part of the wilderness recommendation process. Copies of the Environmental Assessment and Wilderness Study Report II were sent to public libraries in Astoria, Bandon, Coos Bay, Corvallis, Curry County, Eugene, Jackson County, Lincoln City, Milwaukie, Newport, North Bend, Portland, Port Orford, Reedsport, Salem, Siuslaw, and Tillamook. Public hearings were scheduled for Cannon Beach, Coos Bay, and Brookings, Oregon.

A copy of the Environmental Assessment and Wilderness Study Report II was also sent to 29 individuals and groups on the refuge mailing list. A copy of the documents was also sent to Oregon Senators Mark Hatfield and Bob Packwood, and Representatives Les AuCoin and Peter DeFazio.

News releases advertising the hearings and document availability were sent to the following papers: The Daily Astorian, the Bandon Western World, the Curry Coastal Pilot, the Coos Bay World, the Corvallis Gazette-Times, the Eugene Register-Guard, the Florence Siuslaw News, the Gold Beach Curry County Reporter, the Lincoln City News-Guard, the Newport News-Times, The Oregonian, the Port Orford News, the Reedsport Courier, the Salem Statesman-Journal, the Seaside Signal, and the Tillamook Headlight-Herald. A copy of these news releases is enclosed.

PUBLIC HEARINGS

The Service held public hearings in Cannon Beach, Oregon, on September 18, in Coos Bay, Oregon, on September 19, and in Brookings, Oregon, on October 10 for comment on the proposal to add 95 acres to the Oregon Islands Wilderness. Two people attended the Cannon Beach meeting, 13 attended the Coos Bay meeting, and 11 were in attendance at Brookings. A total of 11 people made oral statements and/or submitted written comments.

Nine of the statements received at the hearings were in favor of alternative 2 - the recommendation to designate all 1,200 islands, rocks, and reefs in the study area as wilderness. Representatives of the following organizations made statements in favor of alternative 2: Friends of Haystack Rock, Kalmiopsis Audubon Society, South Slough Estuarine Research Reserve, the Oregon South Coast Fishermen, and the Curry County Anadromous Fishermen.

Some of the statements expressed supporting wilderness concerned: the need to preserve habitat for declining seabird and marine mammal populations; concern for the subtidal communities associated with the islands; the need to manage total ecosystems rather than artificial boundaries; and the need to set undeveloped lands aside for the future.

Individuals representing the Coos Bay commercial salmon fishermen and crabbers, and the Brookings area charter fishermen delivered statements against the wilderness recommendation. The main concern of both groups was that wilderness status for these areas would eventually lead to tighter restrictions on the fishing industry. Other comments concerned fears that a wilderness designation would lead to creation of protective buffers around the islands limiting fishing areas.

A complete transcript of the public hearings is on file in the Western Oregon Refuges Complex office at Corvallis, Oregon.

WRITTEN COMMENTS

Fourteen written comments were received concerning the wilderness recommendation during the public comment period that extended from September 1 through October 15. Individuals and groups represented included: Phyllis Cottingham, Mr. and Mrs. Steven Confer, Neal Maine, William P. Russell, the Audubon Society of Portland, The Wilderness Society, the National Wildlife Federation, the National Wildlife Refuge Association, Defenders of Wildlife, Greenpeace, the Oregon South Coast Fishermen, the Oregon Department of Land Conservation and Development, the Oregon Natural Resources Council, and Friends of the Earth.

Thirteen written comments were in favor of designating the 1,200 islands, rocks, and reefs in the study area as wilderness. The written arguments expressed in support of wilderness status for the area were very similar to those given in the oral statements.

The Oregon South Coast Fishermen wrote in favor of alternative 3. They felt that this alternative would give greatest protection to the wildlife found within the 3-mile territorial sea.

SUMMARY

The Service received 25 comments, both oral and written, on the Oregon Islands WSA II during the formal comment period. Most comments (23) favored wilderness designation for this area.

Appendix F: Wilderness Documents

4. Wilderness Reviews

A wilderness review is the process used to determine whether or not to recommend lands or waters in the National Wildlife Refuge System to Congress for designation as wilderness. The Service is required by policy to conduct a wilderness review for each refuge as part of the CCP process (603 FW 2). Lands or waters that meet the minimum criteria for wilderness are identified in a CCP and further evaluated to determine whether they merit recommendation to the U.S. Congress for inclusion in the National Wilderness Preservation System (NWPS).

According to the Wilderness Act of 1964, as amended (16 USC 1131-1136), "An area of wilderness is further defined to mean in this Act an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value."

Oregon Islands National Wildlife Refuge and Wilderness

Oregon Islands National Wildlife Refuge contains three distinct units as follows:

Rocks, Reefs and Islands Unit. This unit of the refuge contains all but one of the rocks, reefs and islands along the Oregon coast that are separated from the mainland and extend above the surface of the sea at mean high tide. Chief's Island at Gregory Point is the only rock or island not included within the refuge as it is currently administered by the U.S. Coast Guard. A footbridge connects Chief's Island to the mainland and a lighthouse is present on the island. The Rocks, Reefs and Islands Unit of the refuge is comprised of 1,853 rocks, reefs and islands ranging in size from small pinnacles just above the sea surface to 21-acre Goat Island near Brookings. All of the Refuge's rocks, reefs and islands were designated as wilderness in 1970, 1978 or 1996 with the exception of Tillamook Rock. In 1879, construction of a lighthouse and associated structures began on Tillamook Rock. The top 30 feet of the rock was blasted away to make a level foundation area for construction, which was completed in 1881. The lighthouse remained operational until 1957 when the light was extinguished. The rock and lighthouse were sold to a private individual in 1959 and remain in private ownership today. The lighthouse currently serves as a columbarium where the cremated remains of humans are placed. Although still in private ownership, Tillamook Rock was added to Oregon Islands Refuge in perpetuity in 1992 by Conservation Easement.

All of the Refuge's rocks, reefs and islands, with the exception of Tillamook Rock, have already been designated as wilderness. Because of the highly altered nature of Tillamook Rock and the presence of buildings and concrete covering much of it, we have determined that Tillamook Rock does not satisfy minimum wilderness suitability criteria.

Coquille Point Unit. The Coquille Point Unit of Oregon Islands NWR was established in 1991, as the first mainland unit of the refuge. A total of 36 acres has been acquired. This small headland had been heavily impacted by human uses over the past century. Most of the upper terrace of the headland had been leveled and structures built on the area. At the time of acquisition all that remained of the buildings was a single foundation. Most of the topsoil was gone from the site and the area was either barren or covered with invasive plant species. A deteriorated gravel parking area was present along with a concrete public stairway to the beach. A large two-story hotel was built within the authorized refuge boundary and dominates the area. The northern dune and lowland area is covered by invasive gorse and European beachgrass with a heavily used sand road running through it. Following acquisition, the refuge developed the terrace area for intensive public use including wildlife observation, environmental education and interpretation. A paved parking area and trail system was constructed on the headland along with two stairways to the beach. Topsoil was imported and native vegetation planted while control of invasive plant species is ongoing throughout the unit. A kiosk and interpretive panels have been installed. Entrance to the dune and lowland area on the north end of the property has been blocked to prevent further driving on the area and efforts to control invasive plants are on going here.

Because of the small size and highly altered and developed nature of the headland we have determined Coquille Point does not satisfy minimum wilderness suitability criteria.

Crook Point Unit. The Crook Point Unit was acquired in 2000 as the second mainland addition to Oregon Islands NWR. The 133-acre headland is located at Crook Point 5 miles south of Cape Sebastian in Curry County. The purposes for acquiring Crook Point were to protect seabird nesting colonies and marine mammal haulout sites within Oregon Islands NWR immediately adjacent to the headland and to provide permanent protection to one of the few remaining relatively undisturbed headlands on the Oregon coast. The headland contains unique geological formations, rare plants and cultural resource sites. Due to the sensitivity of the resources to disturbance and destruction, this unit of the refuge is closed to public access. The unit is bordered on the south and east by private property and on the north by Pistol River State Park. A gravel/dirt road runs through the property from south to north and terminates at the barren headland at Crook Point. An abandoned residence, barn and out structure are located along this road along with a powerline servicing this portion of the property. When funding becomes available, these buildings and their associated utilities will be replaced with RV pads, a tent platform, septic system and domestic water well for management purposes. The southern 10 acres of the unit was retained for private use under a 75-year lease as a condition of purchase. The 10-acre lease area contains a gravel access road, residence and garage.

Because of the small size and developed nature of the southern portion of this unit, we have determined Crook Point does not satisfy minimum wilderness suitability criteria.

Three Arch Rocks National Wildlife Refuge and Wilderness

All of Three Arch Rocks National Wildlife Refuge was designated as wilderness in 1970. At 15 acres in size, Three Arch Rocks Wilderness is one of the smallest wilderness areas in the United States.

Cape Meares National Wildlife Refuge

Cape Meares National Wildlife Refuge contains a total of 138.5 discontinuous acres comprised of north and south units. The two units of the refuge are separated by lands administered by the OPRD as Cape Meares State Scenic Viewpoint. The State Scenic Viewpoint receives more than 400,000 visitor use-days annually and contains numerous improvements including a paved access road and parking lot, restrooms, paved trails, viewing decks, a operational historic lighthouse, a gift shop and picnic areas. The larger north unit of Cape Meares NWR is bisected by a county road known as the Three Capes Scenic Route and receives heavy automobile use by tourists and residents of the nearby communities of Oceanside and Netarts. The eastern portion of the paved entrance road to the State Scenic Viewpoint passes through this unit of the refuge. In addition, a segment of the Oregon Coast Trail, maintained by the OPRD through a Memorandum of Agreement, is located in the eastern portion of this unit west of the Three Capes Scenic Route and north of the entrance road. The smaller south unit is bordered on the north by the State Scenic Viewpoint, on the south by private lands, and along the east by a narrow strip of private land adjacent to the Three Capes Scenic Route. The refuge consists of vertical sea cliffs, rock outcroppings, remnant coastal old growth coniferous forest, old growth blowdown in early seral stage forest, and shrubland. The rareness and exceptional quality of these habitat types led to the entire refuge (except the hiking trail and road) being designated a Research Natural Area in 1987.

While the refuge contains excellent examples of once common but now rare habitat types, the small acreage, discontinuous refuge lands, and the presence of heavily used roads on and adjacent to the refuge results in a determination that Cape Meares National Wildlife Refuge does not satisfy minimum wilderness suitability criteria.

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MINIMUM REQUIREMENTS DECISION GUIDE

". . . except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act..."

– the Wilderness Act, 1964

Programmatic MRA -
Research, Monitoring, and Management

Oregon Islands and Three Arch Rocks Wilderness Areas

Step 1: Determine if any administrative action is necessary.

Briefly describe the situation that may prompt action:

Oregon Islands and Three Arch Rocks NWRs and Wilderness Areas contain the majority of the seabird nesting colonies and pinniped haulout/pupping sites along the Oregon coast. Approximately half of all the seabirds breeding along the west coast of the conterminous United States nest in Oregon (Naughton et al. 2007) and approximately 66% of the common murre population breeding in western North America south of Alaska is found in Oregon (Carter et al. 2001). Two rookeries within Oregon Islands Wilderness constitute the largest pupping area for threatened Steller sea lions in U.S. waters south of Alaska (National Marine Fisheries Service 2008). The Oregon Coast NWR Complex proposes to conduct research, monitoring, and appropriate management actions within the Oregon Islands and Three Arch Rocks Wilderness. There is a need to determine: (1) if this action is necessary in wilderness and, (2), if so, what is the minimum required activity (tools and techniques).

Research, monitoring, and management actions conducted by the Oregon Coast NWR Complex staff and their agents, including Oregon Department of Fish and Wildlife (ODFW), NOAA Fisheries, and universities, contribute to regional, national, and international conservation efforts for these marine-dependent species. Access to wilderness areas by USFWS employees or their agents is highly regulated and minimized. The refuge wilderness areas are closed to all public access to protect sensitive wildlife from human disturbance and to prevent trampling and destruction of habitats. Research and monitoring are essential to document the life history requirements and needs of the seabirds and pinnipeds, monitor population trends, determine anthropogenic and natural events that effect the populations and develop appropriate management strategies and actions. Failure to conduct adequate research and monitoring would leave refuge wildlife populations vulnerable to adverse impacts and undetected population declines that may be preventable or mitigated if detected sooner.

Research on refuge lands is inherently valuable to the USFWS because it expands scientific information available for resource management decisions. Scientific findings gained through these projects provide important information regarding life-history needs of species and species groups. Some research proposes to address specific wildlife conservation questions, such as understanding the causes of reduced or declining seabird and/or pinniped populations and assessing response of habitat/wildlife to disturbance from public uses adjacent to wilderness. Other research has broader applicability, such as using a suite of seabird species as indicators of ocean health conditions, and to document change in the larger marine environment and associated impacts associated with climate change and global warming. Projects may be species-specific, refuge-specific, or evaluate the relative contribution of the refuge to larger landscape (e.g., ecoregion, region, flyway, national, international) issues and trends.

The management strategy for Oregon Island Wilderness and Three Arch Rocks Wilderness is to allow natural processes to occur unimpaired by human actions except for the treatment of invasive species. Monitoring is crucial for early detection and development of management strategies to control these invasive species. Invasive mammals that reach the rocks, reefs, and islands can quickly impact hundreds to thousands of nesting birds, destroying whole colonies. Invasive plants eliminate native vegetation, alter native flora communities and can eliminate breeding habitat for burrow-nesting seabird species. Since seabirds, pinnipeds and native plants are the primary natural resource components of Oregon Islands Wilderness and Three Arch Rocks Wilderness, declines or losses of populations would significantly reduce the wilderness character and result in the loss of wilderness public purposes including scientific, educational and conservation. A rapid and aggressive approach to the control or eradication of invasive species is necessary to maintain biological integrity and wilderness character.

Management actions for these wilderness areas include installation and maintenance of informational, regulatory, and interpretive signs at a variety of off site locations adjacent to wilderness, such as headlands, state parks, ports, and trailheads. At some locations, trespass is a serious and recurring problem, necessitating the placement of boundary and regulatory signs just above the intertidal zone near accessible rocks and islands. Installation of these signs is necessary for informing the public of the sensitivity of these areas and that they are closed to public access. The signs are not located within the boundaries of the wilderness.

To determine if administrative action is <u>necessary</u>, answer questions A – F.

A. Describe Options Outside of Wilderness

Is action necessary <u>within</u> wilderness? **<u>Yes</u>**

While much of the research and monitoring activity occurs physically outside of wilderness (e.g. from boats or aircraft), the subjects of the research and monitoring are within wilderness. Opportunities to research or monitor these species outside of wilderness are almost non-existent because the majority of the nesting colonies and haulout sites are within wilderness. The majority of the nesting seabirds and pinnipeds on the Oregon coast occur within the refuge wilderness areas, therefore, some research and monitoring cannot be conducted at other non-wilderness locations.

Currently, the USFWS allows threatened Steller sea lion research by NOAA Fisheries and ODFW to take place on the Rogue Reef within Oregon Islands Wilderness, through a Special Use Permit. This research includes maintenance of a remote camera which was installed at a high

point on the island. The camera allows researchers to monitor and track individual marked animals without disturbing them. Research is also being conducted by the University of Oregon, Oregon Institute of Marine Biology on Leach's storm-petrels. This research has required the installation of temporary structures to traverse the island and survey nesting birds without crushing burrows. The information on these species is essential and cannot be obtained from a location outside of wilderness. The remote camera and temporary structures were determined through a previous MRA (Saddle Rock Leach's Storm-Petrel Research Project, Oregon Islands Wilderness, 2004) to be the minimum tools necessary to accomplish the objectives safely and successfully.

Although some methods of monitoring (e.g., overflights, remote sensing) and control from outside wilderness exist (e.g., aerial spraying, release of biological controls, quarantine protocols), these methods may trammel the wilderness area (e.g., pesticide falling within wilderness and resulting death of target and non-target organisms), result in a loss of naturalness (e.g., new nonnative biological control organisms in the ecosystem), compromise refuge purposes through adverse impacts on non-target organisms, or unduly disturb wildlife. The USFWS cannot meet its affirmative responsibilities under EO 13112 to monitor for, detect and rapidly control, or research invasive species solely from outside the wilderness area. Nor can native ecosystems impacted by invasive species be solely restored from outside of the wilderness area.

B. Describe Valid Existing Rights or Special Provisions of Wilderness Legislation

Is action necessary to satisfy valid existing rights or a special provision in wilderness legislation (the Wilderness Act of 1964 or subsequent wilderness laws) that allows consideration of the Section 4(c) prohibited uses? **Yes**

Special Provision – from The Wilderness Act of 1964, as amended (16 U.S.C. 1131-1136) Section 4(b): Except as otherwise provided in this Act, each agency administering any area designated as wilderness shall be responsible for preserving the wilderness character of the area and shall so administer such area for such other purposes for which it may have been established as also to preserve its wilderness character. Except as otherwise provided in this Act, wilderness areas shall be devoted to the public purposes of recreational, scientific, educational, conservation, and historical use.

Prohibited Uses – from The Wilderness Act of 1964, as amended (16 U.S.C. 1131-1136)Section 4(c): "Except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act (including measures required in emergencies involving the health and safety of persons within the area), there shall be no temporary road, no use of motor vehicles, motorized equipment or motorboats, no landing of aircraft, no other form of mechanical transport, and no structure or installation within any such area."

C. Describe Requirements of Other Legislation

Is action necessary to meet the requirements of other laws? **Yes**

The National Wildlife Refuge System Administration Act of 1966, as amended, in section 4(a)(4)(B) directs the FWS to 1) provide for the conservation of fish, wildlife, and plants, and their habitats within the NWRS; 2) ensure the biological integrity, diversity, and environmental health of the NWRS are maintained (see 610 FW 3); and 3) monitor the status and trends of

fish, wildlife, and plants in each refuge. These requirements cannot be fully met through conducting research and monitoring actions outside the proposed wilderness area.

Research is a specialized use (603 FW1) and, therefore, it is not considered a priority public use by NWRS policy. However, two provisions of the National Wildlife Refuge Improvement Act of 1997 are to "maintain biological integrity, diversity and environmental health" and to conduct "inventory and monitoring."

The FWS and NOAA Fisheries, along with all other Federal agencies, have affirmative responsibilities under the Endangered Species Act of 1973 to conserve endangered and threatened species at Section 2(c)(1). Federal agencies are also responsible for cooperating with the States to the maximum extent practicable in conserving listed species, under Section 6(a). The USFWS currently authorizes NOAA Fisheries, acting as an agent of the USFWS and following the conditions of a Special Use Permit, to enter the Refuge wilderness area to conduct research on threatened Steller sea lions as required under the 2008 Final Steller Sea Lion Recovery Plan.

Executive Order 13112 directs Federal agencies to: "subject to the availability of appropriations, and within Administration budgetary limits, use relevant programs and authorities to: (i) prevent the introduction of invasive species; (ii) detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner; (iii) monitor invasive species populations accurately and reliably; (iv) provide for restoration of native species and habitat conditions in ecosystems that have been invaded; (v) conduct research on invasive species and develop technologies to prevent introduction and provide for environmentally sound control of invasive species; and (vi) promote public education on invasive species and the means to address them".

D. Describe Other Guidance

Is action necessary to conform to direction contained in agency policy, unit and wilderness management plans, species recovery plans, or agreements with tribal, state and local governments or other federal agencies? **Yes**

Currently refuge staff are not actively conducting research, however it is anticipated that in the next 15 years there would be additional seabird research related to the recently completed Pacific Region Seabird Conservation Plan (USFWS 2005). The Service currently authorizes NOAA Fisheries, via a special use permit, to enter the Refuge wilderness area to conduct research on threatened Steller sea lions as required under the 2008 Final Steller Sea Lion Recovery Plan.

The USFWS's Research and Management Studies policy (4 RM 6) and Appropriate Refuge Uses policy (603 FW1.10D(4)) indicate priority for scientific investigatory studies that contribute to the enhancement, protection, use, preservation, and management of native wildlife populations and their habitat as well as their natural diversity. Projects that contribute to refuge-specific and/or wilderness management, where applicable, would be given a higher priority over other requests.

E. Wilderness Character

Is action necessary to preserve one or more of the qualities of wilderness character including: untrammeled, undeveloped, natural, outstanding opportunities for solitude or a primitive and

unconfined type of recreation, or unique components that reflect the character of this wilderness area?

Untrammeled: **Yes**

Oregon Islands Wilderness and Three Arch Rocks Wilderness values include supporting more than one million nesting seabirds and tens of thousands of pinnipeds, and functioning as a botanical reserve for native plants. Protecting the untrammeled character of these wilderness areas requires protecting the flora and fauna found within them, and the ecological system in which these species and communities exist. Introduced plant species pose serious ecological problems, forming vast monospecific zones, lowering biodiversity, outcompeting native plants, and eliminating habitat for burrow-nesting seabird species. Invasive red foxes have been documented on rocks at Coquille Point in Coos County, damaging and destroying nesting seabird colonies. These and other mammalian predators have the potential for devastating impacts to nesting seabirds within Oregon Islands Wilderness. The Complex staff has concluded that maintenance of the untrammeled quality necessitates removal of selected plants and animals when it is determined that their presence is negatively impacting the wilderness ecological system and processes in a manner that will cause irreversible harm to the native species. Initiation of management actions to control, and where possible eliminate, invasive species requires monitoring to document infestations and evaluate success of control actions.

Undeveloped: **Yes**

The undeveloped refuge rocks, reefs and islands within Oregon Islands Wilderness and Three Arch Rocks Wilderness provide a dramatic natural setting along the Oregon coast. Millions of annual visitors to the Oregon coast appreciate the scenic natural beauty and the ecological values associated with the abundant marine wildlife populations these wilderness areas protect. All of Oregon Islands Wilderness and Three Arch Rocks Wilderness are closed to public access at all times to prevent disturbance to sensitive seabirds and pinnipeds and to prevent destruction of native plants and habitats. Many of the rocks, reefs and islands are accessible from land during low tides and therefore, trespass is an issue throughout the Oregon coast. Management actions for these wilderness areas include installation and maintenance of informational, regulatory, and interpretive signs at a variety of off site locations adjacent to wilderness, such as headlands, state parks, ports, and trailheads. Installation of these signs is necessary for informing the public of the sensitivity of these areas and that they are closed to public access. Therefore this management action, albeit immediately outside wilderness boundary, is necessary to preserve the undeveloped quality of wilderness.

In some cases, refuge management or research activities may require the use of temporary structures or equipment to prevent impacts to the wildlife and habitat while conducting the activities. In addition, helicopter transport to certain rocks and islands, including a brief landing to offload passengers and equipment, is occasionally determined to be necessary as it is the only safe and effective means of accessing certain steep-sided and otherwise inaccessible rocks and islands to conduct mission-critical research, monitoring and management activities. Both of these actions have the potential to degrade the undeveloped quality because they involve generally prohibited uses; however, the desired information is essential and cannot be obtained from a location outside of wilderness, and the methods used are the minimum tool necessary to accomplish the objective safely and successfully. The impossibility of conducting the specific research or management activity by another means

renders it necessary to utilize these tools to preserve the undeveloped quality of the wilderness areas.

Natural: **Yes**

Many of the rocks and islands within Oregon Islands Wilderness are located immediately adjacent to the shoreline, an area receiving ever-increasing pressure for residential housing and commercial development. Monitoring the wilderness ecological systems (plant and animal species and communities) and evaluating impacts from internal and external forces is critical for attempting to maintain conditions substantially free from the effects of modern civilization. Because the "natural" quality also refers to the abundance, distribution, or number of invasive non-indigenous species, there is a need to monitor the natural quality of these wilderness areas with respect to invasive species, and develop management strategies to control them. Control of plant and animal invasive species, with the intent of manipulating habitats and correcting conditions resulting from human influence, is necessary to preserve the natural quality of these wilderness areas.

Outstanding opportunities for solitude or a primitive and unconfined type of recreation: **Not Applicable**

All rocks, reefs and islands within Oregon Islands and Three Arch Rocks Wilderness areas are closed to public entry to protect sensitive wildlife and habitat.

Other unique components that reflect the character of this wilderness: **No**

F. Describe Effects to the Public Purposes of Wilderness

Is action necessary to support one or more of the public purposes for wilderness (as stated in Section 4(b) of the Wilderness Act) of recreation, scenic, scientific, education, conservation, and historical use?

Recreation: **No**

Oregon Islands and Three Arch Rocks Wilderness Areas are closed to public entry.

Scenic: **Yes**

Control of invasive plant and animal species and the subsequent preservation of seabird and pinniped colonies will maintain the scenic value of the wilderness.

Scientific: **Yes**

Scientific research is necessary to support management actions to protect wilderness values and achieve refuge purposes. Examples include studying health and life history parameters of threatened Steller sea lions, development of non-intrusive survey methods for burrow-nesting seabirds, and study of best control methods for pest plants and animals. Research supplies necessary information to determine population status and trend for sensitive and listed species. Results of the research project will be published and shared with the scientific community.

Education: **Yes:**

Education about the sensitivity of the wildlife and habitats within these wilderness areas is necessary for their continued protection, to garner support to further their protection and management, and to "bring the wilderness" to the public without actually allowing entry and disturbing sensitive wildlife and habitats. For example, education about the effects of disturbance and invasive species on these wilderness resources, information gained through research and monitoring and encapsulated in regulatory and interpretive signage, may encourage the public to change their behaviors while visiting the coast and cause them to be less likely to trespass on rocks and islands. The results of research projects will be incorporated into the Complex's environmental education and interpretation programs and will be used in Oregon and neighboring states.

Conservation: **Yes**

This area cannot be successfully conserved, including its wilderness values, without administrative action within the wilderness area. The USFWS cannot fully meet its affirmative responsibilities for endangered and threatened species, invasive species, refuge purposes, wilderness management objectives, and the NWRS mission without controlling invasive species to reduce trammeling and assisting in endangered species recovery to recover naturalness.

Historical use: **No**

Step 1 Decision: Is any administrative action necessary in wilderness? **Yes**

Research, monitoring, and management of vulnerable refuge wildlife and habitats are actions necessary to achieve and document progress towards fulfillment of the purposes of these refuges as "...a preserve and breeding ground for native birds and animals"; "...as a refuge and breeding ground for wild birds and animals"; maintain the wilderness wildlife values on the refuges; and help to fulfill the mission of the National Wildlife Refuge System.

If action is necessary, proceed to Step 2 to determine the minimum activity.

Step 2: Determine the <u>minimum</u> activity.

Description of Alternatives

For each alternative, describe what methods and techniques will be used, when the activity will take place, where the activity will take place, what mitigation measures are necessary, and the general effects to the wilderness resource and character.

<u>Alternative # 1: No Management Activity</u>

Description:

Under alternative 1, no management activity whatsoever is conducted in wilderness. Some expected results are described under Step 1 above.

Effects:

Wilderness Character

"Untrammeled" - No human manipulation to trammel the area; however, the unchecked increase in invasive species is likely to negatively impact the wilderness ecological system and processes in a manner that will cause irreversible harm to the native species.

"Undeveloped" - Maximized. There would be no further installation of signs or temporary research structures.

"Natural" - Minimized. Invasive species continue to displace native species.

"Outstanding opportunities for solitude or a primitive and unconfined type of recreation" - N/A. Areas remain closed to public entry.

Heritage and Cultural Resources - N/A

Maintaining Traditional Skills –N/A

Special Provisions - N/A

Economic and Time Constraints - N/A

Additional Wilderness-specific Comparison Criteria - N/A

Safety of Visitors, Personnel, and Contractors - N/A

Alternative # 2: No Generally Prohibited Uses

Description:

Research and Management
Option #2 would involve the elimination of aerial surveys, motorized boat surveys, and temporary facilities and equipment used for research and monitoring. Only the rocks and islands closest to shore could be used for research and monitoring purposes using spotting scopes and binoculars from the mainland or from non-motorized boats. Use of non-motorized boats for monitoring purposes or for island access would be confined to nearshore areas due to human safety concerns, limiting the scope of work that could be accomplished.

Effects:

Wilderness Character

"Untrammeled" - Minimal human manipulation to trammel the area. Most rocks and islands are inaccessible for monitoring and invasive species control without the use of aircraft and motorized boats. Without access and management to control invasive species, the unchecked increase in invasives is likely to negatively impact the wilderness ecological system and processes in a manner that will cause irreversible harm to the native species.

"Undeveloped" - Minimized. There would be no temporary placement of facilities or equipment. The ability of the USFWS to conduct research, monitoring, and management activities would be greatly diminished through elimination of tools to access rocks and islands. Educational opportunities would be lost in the absence of ability to place new regulatory and interpretive signage where the need exists.

"Natural" - Minimized. Wildlife disturbance from USFWS activities would be less than in Alternative #1; however, research and monitoring opportunities from the mainland are very limited in scope, location, and the species that can be studied. The ability of the USFWS to conduct research, monitoring, and management activities would be greatly diminished, threatening the integrity and biological diversity of the refuges. Information gathered would be extremely limited and the ability to effectively monitor and document seabird and pinniped population trends would be lost. The most important pinniped rookeries and many of the larger seabird colonies occur on rocks, reefs, and islands located farther from the mainland where there is less disturbance from humans and predators. Consequently, the most important wildlife units of the refuges would not be monitored if staff did not use aircraft and motorized boats. Undetected wildlife population declines and the subsequent development of management options to reverse those declines would negatively impact the wildlife and other values of the refuge wilderness areas.

"Outstanding opportunities for solitude or a primitive and unconfined type of recreation" - N/A. Areas remain closed to public entry.

Heritage and Cultural Resources - N/A

Maintaining Traditional Skills –N/A

Special Provisions - N/A

Economic and Time Constraints - N/A

Additional Wilderness-specific Comparison Criteria - N/A

Safety of Visitors, Personnel, and Contractors - The use of non-motorized boats in the Pacific Ocean along the Oregon coast poses unacceptable human safety concerns to USFWS employees.

Alternative # 3: Research, Monitoring and Management Utilizing Some Generally Prohibited Uses

Description:

Research

Refuge Complex staff is not currently conducting independent research within the refuge wilderness areas, primarily due to limited staff and funding. It is anticipated that in the next 15 years increases in staff and funding will allow refuge staff to conduct important research projects on the highest priority species and issues. Research being conducted by refuge agents includes threatened Steller sea lion study by NOAA Fisheries and ODFW, Leach's storm-petrels research led by the University of Oregon, Oregon Institute of Marine Biology, and common murre research led by Oregon State University. These research projects are controlled through Special Use Permits that contain various restrictions and stipulations to ensure that impacts to wildlife and habitats are kept to a minimum. The following is a set of criteria that will be used, in part, to determine if research will be permitted to occur within refuge wilderness areas.

Research Criteria:

- Research that focuses on conservation, management and protection of refuge species of concern such as seabirds and pinnipeds, control or eradication of invasive plants and animals, and research that provides an understanding of island ecology, ecosystem function and climate change impacts.
- Research will be conducted by USFWS employees or their agents.
- Prohibited uses, per Section 4(c) of the Wilderness Act, will not occur unless they are necessary to meet minimum requirements for the administration of these areas.
- Disturbance to wildlife will be minimized and not adversely affect populations.

The Refuge Manager occasionally receives requests from universities and others to conduct additional research within the refuge wilderness areas. Each of these situations is considered on a case-by-case basis and is evaluated to determine expected benefits of the research to knowledge and/or management of refuge flora and fauna as well as possible impacts to the resources, habitats and wilderness character resulting from research activities. This type of research is covered under a Compatibility Determination (see Appendix E) and prospective non-USFWS researchers will be required to prepare a separate MRA for proposed activities within the wilderness areas. The Wilderness Act does not allow outside researchers and others who are not direct agents of the USFWS to gain exemptions to the prohibited uses provisions (Section 4(c) of the Act).

Several generally prohibited uses are necessary to facilitate critical research being conducted by agents of the USFWS. On rare occasions, access by rotary-winged aircraft may be necessary due to human safety concerns and logistics. The landings are extremely brief and only involve

transfer of personnel and supplies. Access by aircraft is very rare and has only occurred three times in the past 38 years. In addition, in order to protect sensitive island habitat, minimize disturbance to wildlife, and for human safety purposes, it may occasionally be necessary to erect temporary unobtrusive structures such as a boardwalk, remote video monitoring system etc., and use of some motorized equipment may be necessary. An MRA was completed in 2004 for installation of the temporary structures as well as brief helicopter landings to facilitate the Leach's storm-petrel research.

Monitoring

Monitoring is conducted by refuge staff and refuge agents in order to determine wildlife population status and trends; document wildlife disturbances; document the occurrences of invasive species, and evaluate the results of control actions. Most monitoring occurs from off-refuge and outside of the wilderness area from boats or from mainland areas. This is done to minimize disturbance to wildlife and to the wilderness area. Seabird and pinniped trend surveys are conducted using fixed-wing and rotor-winged aircraft generally at an altitude of 1,000 feet or more, but occasionally as low as 500 feet up to 10 times a year. On some occasions, refuge staff and agents will enter the refuge wilderness area to obtain data on seabirds, pinnipeds and other wildlife and/or survey for invasive species. The wilderness rocks, reefs, and islands are accessed by foot at low tide; by swimming from the mainland; and from small boats at sea. At some locations, effective monitoring can require utilization of several generally prohibited uses including access by rotary-winged aircraft and construction of temporary unobtrusive structures such as a boardwalk or remote video monitoring system. Use of some motorized equipment may be necessary.

In all cases the minimum activity and tools will be used to accomplish the work in fulfilling the purposes of the refuge and to protect the wilderness character and value. Currently, only a minimum amount of monitoring is being conducted by the refuge due to limited staff and funding. It is anticipated that within 15 years of the completion of the Comprehensive Conservation Plan increases in staff and funding will allow refuge staff to initiate and maintain important seabird monitoring projects in accordance with the Regional Seabird Conservation Plan (USFWS 2005a) and monitoring of the highest priority species.

Management

The management strategy for Oregon Island Wilderness and Three Arch Rocks Wilderness is to allow natural processes to occur unimpaired by human actions. The exception to this management strategy is the treatment of invasive species. Refuge staff and agents will conduct a rapid and aggressive approach to control or eradicate invasive plants and animals. Invasive mammals can quickly eliminate entire colonies of nesting seabirds. Treatment of invasive mammals will be conducted in accordance with the provisions described in the Environmental Assessment prepared for this work (USFWS 2005b). Invasive plants eliminate native vegetation and can alter native flora communities. The spread of some invasive plants such as ice plant (*Carpobrotus chilensis*) can eliminate breeding habitat for burrow-nesting seabird species.

Invasive plant control or eradication will be accomplished using integrated pest management techniques including hand pulling and digging of plants. Control of invasive mammalian predators will be undertaken according to the approved Predator Damage Management Plan and EA (USFWS 2004). With the exception of motorized boat access or rare helicopter landings, no generally prohibited tools are expected to be used to control invasive species within these wilderness areas.

Effects:

Wilderness Character

"Untrammeled" - There is some wildlife disturbance associated with aircraft overflight surveys, boat surveys passing near or around the islands, and occasional entry into the wilderness. The distance to wildlife, timing, and frequency of efforts are all carefully considered to minimize impacts to wildlife while maximizing the data obtained. The ODFW conducts aerial surveys of pinnipeds over the wilderness areas and this work is done in accordance with provisions contained in the Special Use Permit issued for this work. Since their coordinated aerial surveys combined with those of the USFWS occur on only a few days annually, the impacts to wilderness values are negligible.

"Undeveloped" - The majority of the research and monitoring is conducted with the researchers and observers located outside of the wilderness area viewing either from the mainland or from small boats. During the infrequent visits to some of the rocks and islands in the wilderness areas wildlife disturbance is minimized, sensitive habitats are protected and no permanent structures or equipment are erected. In a very limited number of cases it may be necessary to erect temporary facilities and equipment such as boardwalks to prevent destruction of seabird burrow-nesting habitat during research activities or to install a remote video monitoring system. In these cases the minimum tool will be used and temporary facilities will minimize impacts to the refuge and to the wildlife; protect wilderness character; and leave no trace once removed.

"Natural" - Because the most important pinniped rookeries and many of the larger seabird colonies occur on rocks, reefs, and islands located farther from the mainland where disturbance from humans and predators is less, the use of aircraft and motorized boats will facilitate effective monitoring. Any wildlife population declines could be monitored, and development of management options to reverse them would be possible, thus maintaining the natural quality.

"Outstanding opportunities for solitude or a primitive and unconfined type of recreation" - The rocks, reefs, and islands of these two refuge wilderness areas are not open to the public; however, they are extremely important to the recreational experience of shoreline viewers numbering in the millions of visitors annually. In addition, a number of visitors also view these areas from boats. Because the duration and frequency of research, monitoring and management efforts are limited; there are many rocks, reefs and islands (1,862) in the two wilderness areas; and both of the Refuges and associated wilderness areas are closed to public use, the impacts to solitude are negligible.

Heritage and Cultural Resources - N/A

Maintaining Traditional Skills –N/A

Special Provisions - N/A

Economic and Time Constraints - N/A

Additional Wilderness-specific Comparison Criteria - N/A

Safety of Visitors, Personnel, and Contractors - The use of motorized boats to access islands will greatly reduce human safety concerns for Complex staff and researchers.

Step 2 Decision: What is the Minimum Activity?

Selected alternative:

The option selected is Alternative # 3.

Rationale for selecting this alternative (including documentation of safety criterion, if appropriate):

Research, monitoring and management of the refuge wilderness rocks, reefs and islands require occasionally accessing these areas. Access may be on foot at low tide; by swimming from the mainland; from small boats at sea and on very rare occasions by rotary-winged aircraft (e.g. 3 times in the past 38 years). Observations conducted from the water in motorized boats outside of the wilderness areas; infrequent aerial surveys above the wilderness; and erection of unobtrusive temporary structures and equipment are essential tools needed to conduct research, monitoring and management activities in support of the Refuges. The minor amount of wildlife disturbance caused by research, monitoring and management is minimal compared to the importance of collecting data that directly contributes to species conservation. When conducted only when absolutely necessary, these activities are all considered the minimum tools needed to accomplish refuge purposes including wilderness values. They preserve wilderness character and only minimally impact human solitude while benefiting the wildlife values of the wilderness.

NEPA Compliance and Public Review: This MRA is being prepared in association with the Cape Meares, Oregon Islands, and Three Arch Rocks NWRs Draft Comprehensive Conservation Plan; Oregon Islands and Three Arch Rocks Wilderness Plan; and Associated Environmental Assessment (CCP/WSP/EA). It will be available for public review and comment at the same time as the Draft CCP/WSP/EA.

List any Wilderness Act Section 4(c) uses approved in this alternative:

1. temporary structure or installation
2. motorized equipment
3. landing of aircraft
4. motorboats

Record and report any authorizations of Wilderness Act Section 4(c) uses according to agency procedures.

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Appendix G: Implementation

G.1 Overview

The Comprehensive Conservation Plan proposes numerous projects to be implemented over the next 15 years. Implementation of the CCP will require increased funding, which will be sought from a variety of sources. This plan will depend on additional Congressional allocations, partnerships and grants. There are no guarantees that additional federal funds will be made available to implement any of these projects. Other sources of funds will need to be obtained (both public and private). Activities and projects identified will be implemented as funds become available. Priority status assigned to projects listed in the tables below is not indicative of the project's overall importance to the station; rather, the assignment of Tier 1, 2 or 3 is used to indicate that the Service anticipates implementing them during the first, second, or third, five-year period of the approximately 15-year life of the CCP.

Many of these projects are included in either the Refuge Operational Needs System (RONS) or Service Asset Maintenance and Management System (SAMMS), both of which are used to document funding needs and request funding from Congress. The RONS database tracks proposed new projects to implement the CCP to meet Refuge goals and objectives and legal mandates. The SAMMS database documents and tracks repairs, replacements and maintenance of facilities and equipment. Smaller proposed projects will be implemented as funding allows, and funding will be sought for these projects through a variety of sources.

G.1.1 Monitoring

Monitoring activities will be conducted on a percentage of all new and existing projects and activities to document wildlife populations and changes across time, habitat conditions and responses to management practices. General monitoring activities are discussed in Chapter 2 under Goals 4 and 9, which address the collection of scientific information (inventories, monitoring, feasibility studies, assessments, and research) to support adaptive management decisions on Oregon Islands and Three Arch Rocks (Goal 4) and Cape Meares (Goal 9).

Monitoring of wilderness is required by policy (610 FW 3) to determine if the Complex is meeting wilderness stewardship objectives, to identify indicators of change in resource conditions and standards for measuring that change; and desired conditions or thresholds that will trigger management actions to reduce or prevent impacts on the wilderness. In this CCP/EA, wilderness monitoring is addressed specifically in Chapter 2 under Goal 7, which identifies key wilderness characteristics and proposes strategies to monitor whether those characteristics are being maintained.

G.2 Costs to Implement CCP

The following sections detail both one time and recurring costs for various projects. One time costs reflect the initial costs associated with a project, such as the purchase of equipment, contracting services, construction, etc. Recurring costs reflect the future operational and maintenance costs associated with the project. The following tables primarily document projects with a physically visible, trackable "on-the-ground" component, such as visitor and interpretive facilities, structures, habitat restoration, research, and monitoring and surveys. The scope and

costs for "administrative" activities such as MOUs, reporting, and establishment of partnerships are difficult to estimate in advance and thus are not accounted for in the tables below. Cost estimates are in 2009 dollars.

A. One time costs

One time costs are project costs that have a start up cost associated with them, such as purchasing a new vehicle for wildlife and habitat monitoring, or designing and installing an interpretive sign. Some are full project costs for those projects that can be completed in 3 years or less. One time costs can include the cost of temporary or term salary associated with a short term project. Salary for existing and new positions, and operational costs, are reflected in operational (or recurring) costs.

Funds for one time costs will be sought through increases in Refuge base funding, special project funds, and grants. Projects listed below in Table G-1 show one time costs, such as those associated with building and facility needs including offices, public use facilities, road improvements, and new signs. One time costs are also associated with projects such as habitat restoration, invasive plant and animal control, and research. New research projects, because of their short term nature, are considered one time projects and include costs of contracting services or hiring a temporary for the short term project. Some project costs are taken from 2009 RONS or SAMMS proposals; others are not yet in any project database and their costs have been estimated, particularly if the scope of the project is unknown at this time due to lack of baseline data.

Table G-1. One time costs for inventories, surveys and monitoring; research and assessments, habitat management and restoration; regulatory and enforcement actions; and public use-related actions.

Project description	Priority (Tier ½/3)	CCP Goal	Alt 1 Cost est. (K)	Alt 2 Cost est. (K)	Potential fund source*
Surveys, inventories and monitoring:					
Conduct biodiversity surveys	1	4,9	--	149	RONS FY08-5429, 5583, 5550
Develop web-based Seabird Colony database	1	1	--	60	RONS FY08-5731
Establish plant herbariums and digital photographic library for habitats	2	9	--	20	RONS FYO8-5022
Research, design, and implement GIS-based inventory and monitoring programs for plants and wildlife on headlands and offshore islands	1	4, 9	11	46	RONS FY08-5424, 5014 CCS
Subtotal			**11**	**275**	
Research and assessments:					
Facilitate and cooperate in specific research projects to benefit refuge resources	1	4, 9	8	256	RONS FY08-5451, 5584
Install remote camera on Three Arch Rocks for monitoring wildlife	3	4	--	88	RONS FY08-5587
Subtotal			8	**344**	

Habitat management and restoration:					
Boundary survey and post – Crook Point, Coquille Point, Cape Meares	1	2, 3, 8	--	128	RONS FY08-5430, 5026 SAMMS 00100889
Develop RV hook-up site at Crook Point for a resident volunteer	1	5	--	407	SAMMS 97100900
Habitat restoration – Coquille Point	2	3	--	40	RONS
Restore native coastal prairie at Crook Point Unit of Oregon Islands	2	2	--	192	RONS FY08-5031
Subtotal			--	**767**	
Regulatory and enforcement actions:					
Develop annual training presentation and materials for US Coast Guard stations	1	5	3	5	1261
Develop informational signage and pilot tear sheets to place in airports to reduce aerial disturbance of wildlife	1	5	2	4	1263
Produce new publications to reduce wildlife disturbances from watercraft and aircraft	2	1	--	20	1261, grants
Replace existing deteriorating regulatory buoys and rigging; deploy to delineate seasonal 500 foot watercraft exclusion buffer around TAR	2	1	--	37	RONS FY08-5563
SIGNS, regulatory: to keep public off rocks at high tide; no fires; boundaries, TAR buffer zone	1	1, 6	4	6	RONS, VFE 98122576 98122575
Subtotal			**9**	**72**	
Public use opportunities and education:					
Construct bicycle parking at Cape Meares	3	10	--	2	1261
Construct bicycle parking at Coquille Pt.	2	5	--	4	SAMMS, Refuge Roads
Construct	1	5	--	30	Grants, 1261
Develop EE program on seabirds for K-12 students	1	5	--	40	1263
In partnership with OPRD – design and build wildlife viewing decks at Harris Beach, Ecola State parks	3	5	--	300	VFE
Partner with BLM and Oregon Coast Aquarium to acquire and install a wildlife viewing camera at YHONA	3	5	--	70	grants
Partner with City of Bandon to install trash and recycling receptacles and pet clean-up station	2	5	--	2	Grant, 1261
Redesign and upgrade Coquille Point parking lot to add spaces, and fence east boundary	1	5	--	935	SAMMS, Refuge Roads 2006539532
Rehabilitate paved accessible trail at Coquille Point	1	5	--	175	SAMMS 05138338 (VFE)
SIGNS, interpretive panels: new and /or improved @ YHONA, boat launches and other coastal access points, Ecola SP, Oregon Coast Aquarium, Oceanside Beach	1	5, 6	--	75	RONS, VFE
Subtotal			**--**	**1,633**	
Total of all one-time project costs by alternative:			**28K**	**3,091K**	

* Potential fund sources:

- RONS = Refuge Operating Needs System
- VFE = Visitor Facility Enhancement
- SAMMS = Service Asset Management and Maintenance System

B. Annual Operational (recurring) costs

Operational costs reflect Refuge spending of base funds allocated each year. These are also known as recurring costs and are usually associated with day to day operations and projects that last longer than three years. Operational costs use base funding in Service fund code 1260.

Table G-2 displays projected annual operating costs under the CCP No Action and Preferred Alternatives. The Preferred Alternative would require increased funding for new or expanded public uses and facilities, habitat restoration and conservation activities, and new monitoring needs. This table includes such things as salary, operational expenditures such as travel, training, supplies, utilities and maintenance costs. Project costs listed in Table G-2 include permanent and seasonal staff needed year after year to accomplish each project; these staffing costs are not isolated in this table but are included as part of the entire project cost.

Table G-2. Annual operational (recurring) costs

Activity description	CCP Goals	Alt 1 Cost est (K)	Alt. 2 Cost est (K) -	Potential fund source
Surveys, inventories and monitoring: Aerial photographic surveys; boat-based and land surveys; joint wildlife surveys with ODFW; implement GIS-based inventory and monitoring programs for plants and wildlife on refuge headlands and offshore islands; mammalian predator monitoring and control; monitor biodiversity trends; provide administrative and material support for all biological activities.	4, 7, 9	195	256	1261; RONS FY08-5550, 5429, 5583, 5752
Research and assessments: Facilitate and cooperate in specific research projects to benefit refuge resources.	4, 9	13	33	1261; grants; RONS FY08-5451, 5584, 5587
Habitat management and restoration: Post boundaries as surveyed – Crook Point, Coquille Point, Cape Meares; inventory, remove, control and prevent new establishment of invasive, non-native plants and treat infestations with IPM.	2, 3, 8, 9	52	60	1261; RONS FY08-5424, 5014
Regulatory and enforcement actions: patrol coastline, enforce regulations and educate visitors as to sensitivity of wildlife resources; annually deploy warning buoys to delineate seasonal 500 foot watercraft exclusion buffer around TAR; Replace boundary, regulatory signage as needed.	1, 2	43	63	1264; RONS FY08-5563
Public use opportunities and education: Provide funding for and manage a variety of both onsite and offsite facilities for hundreds of thousands of visitors to view wildlife; maintain Oregon Islands NWR interpretive panels, located on private, city, county, state and federal lands to offer interpretation through a self-guided experience; utilize volunteers on both a seasonal and year-round basis to assist with site-specific interpretation programs and environmental education for targeted audiences; station volunteer wildlife interpreters at several key viewing locations on the coast; expand volunteer interpretation program including logistical and financial support.	5	191	248	1263; RONS FY08-5771, 5762
Facilities Maintenance: Maintain and make minor repairs on Complex-funded interpretive panels, regulatory signage and other visitor facilities at coastal viewing locations; maintain boats, heavy equipment, vehicles, and tools for use as needed.	5	9	11	1262; RONS FY08-5753
Total Annual Recurring Costs by Alternative		**504 K**	**671 K**	

C. Maintenance costs

The maintenance need over the next fifteen years is defined as funds needed to repair or replace buildings, equipment and facilities. Maintenance includes preventative maintenance; cyclic maintenance; repairs; replacement of parts, components, or items of equipment; adjustments, lubrication, and cleaning (non-janitorial) of equipment; painting; resurfacing; rehabilitation; special safety inspections; and other actions to assure continuing service and to prevent breakdown. Maintenance costs include the maintenance "backlog" – maintenance needs that have come due but are as yet unfunded, as well as the increased maintenance need associated with new facilities.

The facilities and equipment associated with Oregon Islands, Three Arch Rocks and Cape Meares NWRs which require maintenance include a paved trail, interpretive panels, regulatory and directional signs, two stairways to the beach, and a kiosk. Two viewing decks, located at Cape Meares and at Cape Arago, were constructed with USFWS funds on state park lands and are jointly maintained by the Complex and OPRD. Because most of these facilities are relatively new, and small repairs and maintenance work is often accomplished by OPRD, it is estimated that maintenance costs incurred by USFWS over the 15 year life of the CCP would be minimal. Approximately 10% of operational (non-project) maintenance funding for the Oregon Coast NWR Complex is expended on the three refuges covered under this CCP (also see Table G-2) ; the other approximately 90% is used to maintain the majority of facilities, including buildings and equipment, which are located on the other three Complex Refuges and are not included in this Implementation Plan.

D. Staffing

Current (2008) staffing and proposed staffing are shown in Table G-4. The positions below serve all six Refuges within the Oregon Coast NWR Complex; because there is no separate budget for the individual refuges, we have chosen to present the entire Complex staff in table G-3. Approximately 40% of Complex staff time is expended on the three refuges covered under this CCP; the other approximately 60% of staff time is expended on the three estuarine refuges. The columns to the right of the annual salary cost shows the estimated 40% expenditure on these three refuges, by alternative, in FY09 dollars.

Table G-3. Current and Proposed Staffing

Position	GS & grade	Annual Salary cost (K)	Alt 1 x 40 %	Alt 2 x 40 %	RONS project #
Project Leader	GS- 0485-13	115.7 [1]	46.2	46.2	N/A
Deputy Project Leader	GS-0485-12	103.3 [1]	41.3	41.3	N/A
South Coast Refuge Manager	GS-0485-12	109.6 [1]	43.8	43.8	N/A
Supervisory Park Ranger	GS-0025-11	79.5 [1]	31.8	31.8	N/A
Wildlife Biologist	GS-0486-11	83.6 [1]	33.4	33.4	N/A
Facility Operations Specialist	GS-1640-09	74.6 [1]	29.8	29.8	N/A
Administrative Officer	GS-0341-09	75.6 [1]	30.2	30.2	N/A

Position	GS & grade	Annual Salary cost (K)	Alt 1 x 40 %	Alt 2 x 40 %	RONS project #
Geographer	GS-0150-11	74.9 [1]	30.0	30.0	N/A
Park Ranger – Refuge LE	GS-0025-09	78.6 [1]	31.4	31.4	N/A
Volunteer Coordinator	GS- 0301-07/09	46.9 [2]	--	18.8	FY08-5771
Wildlife Biologist	GS-0486-09/11	57.3 [2]	--	22.9	FY08-5752
EE Specialist	GS-1710-07/09	46.9 [2]	--	18.8	FY08-5762
Maintenance Worker	WG-4749-05/07	46.5 [2]	--	18.6	FY08-5753
Total annual staffing cost for Oregon Islands, Three Arch Rocks and Cape Meares NWRs, by Alternative			**317.9 K**	**397.0 K**	

* source for cost estimates:

[1] = FY 2009 FTE Utilization Table for Oregon Coast NWR Complex

[2] = OPM General Schedule FY 2009 plus 40% benefits

The proposed chart shows a 4.0 full-time-equivalent (FTE) increase in staffing over current levels. Proposed additions for these three refuges include a Volunteer Coordinator, Wildlife Biologist, Environmental Education Specialist, and Maintenance Worker.

The Volunteer Coordinator will expand, oversee and manage the Refuge Complex volunteer program. The Refuge Complex already makes extensive use of volunteers with over 15,000 hours donated annually. Responsibilities will include increased coordination with State Park and other agency partners to recruit and share volunteers and train them with a consistent "wildlife first" message.

The Wildlife Biologist will coordinate and implement the overall biological program for the southern portion of Oregon Islands NWR. This position will facilitate increased coordination with other Federal agencies, State agencies, and Tribes, and will greatly improve the Complex's ability to address the biological complexity of the Complex's six refuges.

The EE Specialist position will develop and guide coast wide environmental education programs throughout the Refuge Complex. The position is needed to establish and maintain relationships and programs with school districts, and would be responsible for designing, coordinating and implementing wildlife based EE programs to schools, conducting teacher workshops, and developing and managing a seabird education module.

The Maintenance Worker position will provide significant and immediate improvements in both habitat management and maintenance of facilities and equipment on the southern refuges of the Oregon Coast Refuge Complex. In concert with the Facilities Operations Specialist and other future staff Maintenance Workers, this position will also assist with larger projects for the entire refuge complex as well as provide regular maintenance of boats, heavy equipment, vehicles, and tools for these refuges.

E. Budget summary

Table G-4 summarizes the data from tables G-1 and G-2and displays the overall funding need for the Oregon Coast NWR Complex to implement the CCP in full.

Table G-4, Budget Summary – One-time projects and annual funding needs for Oregon Islands, Three Arch Rocks and Cape Meares NWR as identified in the CCP

Budget Category	Alt 1 (Current Management)		Alt 2 (Preferred Alternative)	
	One-time cost (K)	Annual Recurring cost (K)	One-time cost (K)	Annual Recurring cost (K)
Surveys, inventories and monitoring	11	56	275	95
Research and assessments	8	2	344	8
Habitat management and restoration	--	6	767	16
Regulatory and enforcement actions	9	11	72	14
Public use opportunities and education	--	6	1,633	10
Totals	**28 K**	**81 K**	**3,091 K**	**143 K**

Appendix H. CCP Team Members

The CCP was developed primarily by the core team members. The team sought expert advice and review from other professionals from several different agencies and organizations. Extended team members provided critical input during field reviews early in the process and continued to provide review and comment as the document evolved. Core and extended team members are listed below. In addition to the team members listed below, U.S. Fish and Wildlife Service staff members Steve Moore, Ben Harrison, Fred Paveglio, and Mike Marxen were of particular assistance in critical review of the plan. Khemarith So developed the CCP maps.

Core Planning Team (*those preparing the plan*)

Name and title	CCP Responsibilities
Roy Lowe, Project Leader	Decision-making; public involvement; writer/reviewer; refuge vision; research/analysis; visitor services and compatibility determinations; compliance with NEPA, ESA, NHPA, etc.; Federal and State agency, and Tribal coordination.
Rebecca Chuck, Deputy Project Leader	Responsible for overall coordination and development of the CCP; public involvement including planning updates and outreach plan; refuge vision; writer/reviewer; research/analysis: socioeconomics, cultural resources, visitor services, compatibility determinations and Appropriateness Findings; maintaining planning record files; Fire Management Plan integration.
Shawn Stephensen, Refuge Complex Biologist (on staff 10/07)	Writer/reviewer; research/analysis: habitats, wildlife; rare plants and plant communities, invasive plants; compatibility determinations.
Dave Ledig, South Coast Refuge Manager	Public involvement; writer/reviewer; refuge vision; research/analysis: habitats, wildlife, socioeconomics, cultural resources, visitor services, rare plants and plant communities; vegetation descriptions; invasive plants; Predator Management Plan integration; assistance with production of working maps; compatibility determinations.
Dawn Grafe, Supervisory Park Ranger	Public involvement including planning updates and outreach plan; writer/reviewer; refuge vision; research/analysis: socioeconomics, visitor services; compatibility determinations.
Ben Harrison, Regional Refuge Planner	Planning team leader responsible for Regional office coordination and process guidance for development of the Administrative Draft CCP; public involvement; planning record; principal NEPA advisor and document reviewer; document format and layout; refuge purposes and vision statement development.
Jane Bardolf, Regional Refuge planner	Planning team leader responsible for Regional office coordination and process guidance for development of the CCP from the Regional Office Review of Administrative Draft CCP stage through Public Draft CCP and finalization.
David Pitkin, Refuge Complex Biologist (departed USFWS 5/07)	Research/analysis: habitats, wildlife. Refuge vision.

Extended Team (*those who attended periodic planning meetings and reviewing information, including Mig Birds, State F&W, and Regional Biologist*)

Name and Title	Responsibilities
Pam Johnson, Administrative Officer	Public involvement; building and maintaining CCP mailing list and assist with planning record files; refuge vision
Khem So, Geographer	GIS advice; GIS data layer development and assistance with production of working maps for CCP/EA, planning updates, agency/public involvement; refuge vision
Jim Johnson, Facilities Operations Specialist	Field trip transportation; public involvement; refuge vision; reality check for planned projects
Fred Paveglio, Branch Chief, Refuge Biology	CCP Advisor, Conservation targets, HMP, habitat goals and objectives, CD review
Kevin Killbride, Wildlife Biologist/ Regional IPM Coordinator	IPM advice, data, and review; assist with development of objectives and strategies for invasive species control
Robin Brown, Marine Mammal Biologist	ODFW contact for CCP coordination and official comment
Herman Biederbeck, Wildlife Biologist North Coast Watershed (CM, TAR, OI)	ODFW contact for CCP coordination and official comment
Doug Cottam, Wildlife Biologist North Coast Watershed (Lincoln County / OI)	ODFW contact for CCP coordination and official comment
Stuart Love, Wildlife Biologist Umpqua Watershed (Coos County / OI))	ODFW contact for CCP coordination and official comment
Clayton Barber, Wildlife Biologist Rogue Watershed (Curry County / OI)	ODFW contact for CCP coordination and official comment
Joe Asher, Manager Yaquina Head Outstanding Natural Area	BLM contact for CCP coordination and official comment
Calum Stevenson, South Coast Coordinator for Natural Resources (OPRD)	OPRD contact for CCP coordination and official comment
Pete Marvin –Cape Lookout State Park & Cape Meares State Scenic Viewpoint (OPRD)	OPRD/ Cape Meares contact for CCP coordination and official comment

Contact Specialists (*for specific planning needs*)

Name and title	Responsibilities
Scott Aikin, Tribal Liaison	Identification of and coordination with Indian Tribes
Anan Raymond, Archeologist	Cultural resources advice, data, and review; SHPO consultation, if needed
Maura Naughton, Seabird Biologist	Advice on seabirds, applicable goals from regional bird plans
Dave Drescher, Branch Chief, Refuge Information	GIS coordination and oversight, mapping and cartography; review
Georgia Shirilla, Branch Chief, Refuge Acquisition	Realty issues; review
Betsy Rosenbaum, Zone Law Enforcement Officer	Identification of potential LE issues and coordination of LE assistance and agreements
Mike Marxen, Chief, Visitor Services	CCP Advisor, layout graphics design, public use goals and objectives; public involvement assistance, CD review

Reviewers (*RO personnel including Refuge Supervisors and Division Chiefs*)

Name and title	Responsibilities
Robyn Thorson, Regional Director	Decision-maker, CCP/EA approval
Carolyn Bohan, Regional Chief of Refuges	Major decisions on CCP direction
Forrest Cameron, Refuge Supervisor Linda Watters, Assistant Refuge Supervisor	Refuge workload assistance; reviewer; decision-maker
Chuck Houghten, Division Chief of Refuge Planning	CCP Advisor for planning policy and guidance; reviewer; coordination with other divisions and WO.
Dave Lescalleet, Division Chief, Refuge Law Enforcement	Reviewer
Steve Moore, Division Chief, Natural and Cultural Resources	CCP Advisor, purposes, wilderness review, policy, CD review
Cathy Sheppard, Division Chief, Realty and Refuge Information	CCP Review
Kay Kier-Haggenjos, technical writer/editor	Editing of CCP/EA and related documents.
External Affairs	Assist in developing public involvement/communication plan; potential public involvement assistance

Appendix I. Public Involvement

Public involvement was sought throughout the development of the Draft CCP. In the spring of 2006, several face-to-face meetings were held with key state and federal agency representatives to inform them of the upcoming CCP process, solicit early input and determine the appropriate contacts for continued coordination. During the initial public scoping phase in the summer of 2006, outreach efforts included a Planning Update to announce the process and solicit public participation; five public open house meetings in different coastal communities; additional meetings with key state and federal agency representatives; and written communication with tribal governments and federally elected officials. After initial public scoping, preliminary alternatives were presented in a second Planning Update, and additional agency coordination occurred. The Service also initiated news releases and gave presentations at several Friends Group meetings to inform refuge supporters, invite discussion and solicit feedback. Below is a brief summary of the meetings and other outreach tools that were used in our public involvement efforts.

Federal and State Elected Officials or their Aides

In September 2006, letters were sent to Congressional Representatives from each of the three Congressional Districts/six counties in which the affected Refuge lands are located, informing them of the CCP process and inviting their participation. Planning Updates were also sent to these offices.

- U.S. Senator Ron Wyden (OR)
- U.S. Senator Gordon Smith
- U.S. Representative Darlene Hooley (5th District, OR)
- U.S. Representative Peter DeFazio (4th District, OR)
- U.S. Representative David Wu (1st District, OR)
- State Senator Joanne Verger (OR District 5)
- State Senator Jeff Kruse (OR District 1)
- State Senator Betsy Johnson (OR District 16)
- Representative Wayne Krieger (OR House District 1)
- Representative Deborah Boone (OR House District 32)
- Representative Alan Brown (OR House District 10)
- Representative Arnie Roblan (OR House District 9)

The staffs of the following elected officials were also briefed in person in Washington DC:

- U.S. Rep. DeFazio - April 2008 & Feb 2009
- U.S. Rep. Hooley - April 2008
- U.S. Rep. Kurt Schrader (5th District of Oregon) - Feb 2009
- U.S. Senator Smith - April 08
- U.S. Senator Wyden - Feb 2009
- U.S. Senator Merkley - Feb 2009

Tribal Governments

In March and April 2006, phone calls were made to representatives of several Tribes that have worked closely with the Complex in the past, to determine the appropriate contact for participation in the CCP process. In September 2006, letters were sent to representatives of four federally recognized Tribes informing them of the CCP process and inviting their participation. These Tribes included the Coquille Indian Tribe; Confederated Tribes of the Siletz Indians; Confederated Tribes of Grand Ronde; and Confederated Tribes of the Coos, Lower Umpqua and Siuslaw Indians. Follow up calls were made to encourage participation. A follow-up letter asking if the Tribes wished to participate in the planning process and/or had comments to send us was sent along with Planning Update #1 in October, 2006. Planning Update #2 was also sent to the Tribes in April 2007.

State Agency Representatives

Oregon Department of Fish and Wildlife:

North Coast Watershed District
Newport Field Office
Charleston Field Office
Gold Beach Field Office
Fish Division/ Marine Mammals

- March through May, 2006. Phone calls to ODFW contacts to inform of the upcoming CCP process to begin in summer 2006 and to determine the appropriate staff to participate in the process.
- September, 2006. Phone calls followed by official letters to invite participation as Extended Team members.
- February, 2007. Mailed copies of preplanning and scoping reports to all ODFW representatives.
- March, 2008. Met with all ODFW representatives in Newport to present preliminary alternatives for discussion and input.
- September, 2008. Phone calls followed by mailed or delivered copy of Internal Review Draft to all ODFW representatives.

Oregon Parks and Recreation Department:

South Coast Watershed District
Cape Lookout State Park

- September, 2006. Phone calls followed by letters to invite participation as Extended Team members.
- February, 2007. Mailed copies of preplanning and scoping reports to both OPRD representatives.
- March, 2008. Met with one OPRD representative in Newport to present preliminary alternatives for discussion and input. Phone call with the other OPRD representative who could not attend.

- September, 2008. Phone calls followed by mailed or delivered copy of Internal Review Draft to all OPRD representatives.

Federal Agency Representatives

Bureau of Land Management:

Yaquina Head Outstanding Natural Area

- September, 2006. Phone call followed by letter to invite participation as Extended Team member.
- February, 2007. Mailed copy of preplanning and scoping reports.
- September, 2008. Phone call followed by mailed copy of Internal Review Draft.

U.S. Fish and Wildlife Service Coordination

The core planning team coordinated frequently among themselves during the planning process. The core team also relied on specialists from various Service programs for their expertise. Additional coordination occurred with the Regional Office Management and the Washington Office at key phases in the process including:

Washington Office briefings

- Scoping briefing statement sent January 2007 and approved March 2007
- Alternatives briefing statement sent May 2008 and approved May 2008

R1, Pacific Regional Office Management Reviews

- Preplanning Briefing meeting October 2006
- Alternatives Briefing meeting December 2007
- Administrative draft Briefing meeting October 2008

Public Open House Sessions

- November 1, 2006, Newport High School, Newport, OR
  Presented preliminary management options and took comments

- November 2, 2006, Oceanside Community Center, Oceanside, OR
  Presented preliminary management options and took comments

- November 8, 2006, Cannon Beach Elementary School, Cannon Beach, OR
  Presented preliminary management options and took comments

- November 14, 2006, Brookings High School, Brookings, OR
  Presented preliminary management options and took comments

- November 15, 2006, Bandon High School, Bandon, OR
  Presented preliminary management options and took comments

Planning Updates

A mailing list of approximately 280 persons and organizations is maintained at the Refuge and was used to distribute planning updates. Additional hardcopy planning updates were made available to refuge office visitors, handed out or available at meetings, and mailed to additional interested parties. Electronic copies are posted and available for downloading on the Service's Region 1 planning website and on the Complex website.

1. October 2006– Background information on the refuges, preliminary issues and goals, and invitation to public open house meetings.

2. March 2007 – Results of initial scoping, preliminary management options, and tentative schedule for CCP process.

3. May 2009 – Draft CCP, in progress

Media Outreach and Press Coverage

A press release advertising the public meetings was distributed to 16 western Oregon newspapers and one south coast radio station, approximately one week before each meeting scheduled in the respective area of the coast. Refuge staff made follow-up calls to maximize likelihood of press coverage. Press coverage included the following.

News release #1: Initial Scoping

- *Tillamook Headlight Herald October 2006*
- *Bandon Western World October 2006*
- *Newport News Times October 2006*

News release#2: Draft CCP, in progress

Federal Register Notices

- Notice of Intent to prepare a Comprehensive Conservation Plan and Environmental Assessment published – October 26, 2006
- Notice of Availability of a Draft Comprehensive Conservation Plan, Wilderness Stewardship Plan, and Environmental Assessment – in progress

Appendix J. Biological Integrity, Diversity, and Environmental Health Tables and Resources of Concern Tables for Cape Meares, Oregon Islands, and Three Arch Rocks National Wildlife Refuges

Table J-1. Biological Integrity, Diversity and Environmental Health (BIDEH) for Cape Meares NWR

Habitats (plant communities) that Represent Existing BIDEH	**Population/Habitat Attributes** (Age class, structure, seral stage, species composition)	**Natural processes responsible for these conditions**	**Limiting Factors**
Old-growth sitka spruce/salal association (giant forest alliance) Note: Cape Meares RNA/NHCA is one of two ONHP representative cells for this association	Old-growth sitka spruce (*Picea sitchensis)* forest in various stages of decay, including large, hollow snags >68 cm (27 in.) dbh and > 25m (82 ft.) tall with >/= 60% canopy closure	Well-developed soils; moderate to steep slopes; natural fire regime which prevents build-up of excessive fuels, resulting in more frequent and less intense fires	Logging; Fire suppression (leading to build-up of excessive fuels, resulting in infrequent but catastrophic fires)
Late-successional sitka spruce/salal association (giant forest alliance)	Late seral stage sitka spruce (*Picea sitchensis)* forest with tree/snag densities >18/ha and >46 cm (18 in.) dbh	Well-developed soils; moderate to steep slopes; natural fire regime which prevents build-up of excessive fuels, resulting in more frequent and less intense fires	Logging; Fire suppression (leading to build-up of excessive fuels, resulting in infrequent but catastrophic fires)
Late-successional sitka spruce/salal association (giant forest alliance)	Late seral stage conifer forest with tree densities >18/ha (7/ac) and >46 cm (18 in.) dbh with >/= 2 trees >60 cm (24 in.) dbh	Well-developed soils; moderate to steep slopes; natural fire regime which prevents build-up of excessive fuels, resulting in more frequent and less intense fires	Logging; Fire suppression (leading to build-up of excessive fuels, resulting in infrequent but catastrophic fires)
Late-successional Sitka spruce/salal association (giant forest alliance)	Unmanaged late-successional forest with large snags and defective live trees with >70% canopy closure providing >/= 5 nest snags per 10 ha (2 per 10 ac)	Well-developed soils; moderate to steep slopes; natural fire regime which prevents build-up of excessive fuels, resulting in more frequent and less intense fires	Logging; Fire suppression (leading to build-up of excessive fuels, resulting in infrequent but catastrophic fires)
Late-successional sitka spruce/salal--salmonberry association (giant forest alliance)	Mature forest with >70% canopy closure, high stem density, multiple tree layers, relatively open low understory and forest floor with much soft, loose debris, decomposing woody material and berry-producing shrubs	Well-developed soils; moderate to steep slopes; natural fire regime which prevents build-up of excessive fuels, resulting in more frequent and less intense fires	Logging; Fire suppression (leading to build-up of excessive fuels, resulting in infrequent but catastrophic fires)

Habitats (plant communities) that Represent Existing BIDEH	**Population/Habitat Attributes** (Age class, structure, seral stage, species composition)	**Natural processes responsible for these conditions**	**Limiting Factors**
Late-successional forest (old-growth and mature) riparian zone	Old-growth and late-successional forest supporting streams with medium to steep gradient, step-pool morphologies	Seeps and springs; basalt parent geology; moderate to steep slopes; well-developed soils; natural fire regime which prevents build-up of excessive fuels, resulting in more frequent and less intense fires	Logging; Fire suppression (leading to build-up of excessive fuels, resulting in infrequent but catastrophic fires)
Coastal bluffs and cliffs	Very steep or vertical basalt rock faces extending in elevation from mean high tide to 300' above sea level, including vegetated and unvegetated ledges pockets of vegetated soil, stunted trees and shrubs, seeps	Volcanic and tectonic forces; wind, waves and other forms of erosion;	Mean sea level; residential and commercial development; erosion

Table J-2. Biological Integrity, Diversity and Environmental Health (BIDEH) for Oregon Islands NWR

Habitats (plant communities) that Represent Existing BIDEH	**Population/Habitat Attributes** (Age class, structure, seral stage, species composition)	**Natural processes responsible for these conditions**	**Limiting Factors**
Vegetated and unvegetated offshore rocks greater than 30 feet above mean high tide (Described as "Offshore rocks, not awash at high tide, with soil and vegetation" in Oregon Natural Heritage Plan, 2003)	Basalt, metasedimentary or sandstone rocks with or without sandy soils and vegetation	Mean sea level, volcanic and tectonic activity. For vegetated rocks, erosion and wind deposition lead to soil development; further soil development occurs from guano deposits left by seabirds.	Mean sea level; volcanic and tectonic activity; wind, waves and other erosive forces; presence of seabirds
Offshore rocks above mean high tide (Described as "Offshore rocks, not awash, unvegetated" in Oregon Natural Heritage Plan 2003	Basalt, metasedimentary or sandstone rocks	Mean sea level, volcanic and tectonic activity.	Mean sea level; volcanic and tectonic activity; wind, waves and other erosive forces.
South Coast Headland Prairie/South Coast Headland Grassland (SCHP/SCHG). Exceedingly rare habitat type; currently unclassified by NVCS. Closest existing alliance is Festuca rubra coastal	Windswept areas generally dominated by early seral stage species including Roemer's fescue and native forbs, with some invasion by native shrubs and trees, and smaller areas dominated by red fescue	Regular disturbance, including wind, grazing or mowing, and periodic burning	Succession leading to later seral stages in the absence of wind, fire, grazing or mowing; conversion to agriculture; residential or commercial

Habitats (plant communities) that Represent Existing BIDEH	**Population/Habitat Attributes** (Age class, structure, seral stage, species composition)	**Natural processes responsible for these conditions**	**Limiting Factors**
headland herbaceous vegetation (G2S1)	with up to 60-70% cover		development
Juncus breweri – Festuca rubra south coast headland grassland (unnamed, unique and significant habitat currently undescribed in NVCS)	Windswept, gently to moderately sloping areas on exposed headlands dominated by early seral stage species including dune rush and red fescue	Regular disturbance, including wind, grazing or mowing, and periodic burning	Succession leading to later seral stages in the absence of wind, fire, grazing or mowing; conversion to agriculture; residential or commercial development
Open South Coast Headland erosion forblands and dunes. Not well described, and not included in NVCS. Found at only two sites in Oregon.	Exposed, windswept marine terrace headland composed of sandstone, forbs, and isolated low dunes, including an unusual mix of early seral stage plant communities and four primary dune types: (1) *Juncus breweri – Fragaria chiloensis* dominated dunes with significant amounts of *Erigeron glaucus, Lupinus littoralis,* and *Festuca rubra*; (2) *Festuca rubra* dominated dunes with *Fragaria chiloensis, Hypochaeris radicata, Erigeron glaucus,* and *Achillea millefolium*; (3) *Fragaria chiloensis* dominated dunes with *Lupinus littoralis*; and (4) *Lupinus littoralis* dominated dunes with some *Festuca rubra.*	disturbance, including wind, grazing or mowing, and periodic burning	Succession leading to later seral stages in the absence of wind, fire, grazing or mowing; conversion to agriculture; residential or commercial development
Steep, rocky cliffs	Very steep, windswept, largely-unvegetated cliffs.	Volcanic and tectonic activity; erosion and other persistent forms of disturbance	Volcanic and tectonic activity; erosion and other persistent forms of disturbance
Steep, coastal, erosion bluffs	Steep, windswept, cliffs and talus/rocky slopes with significant early seral stage plant cover situated above the ocean	Volcanic and tectonic activity; erosion; slides; other forms of disturbance	Volcanic and tectonic activity; erosion; lack of disturbance leading to successional changes

Habitats (plant communities) that Represent Existing BIDEH	**Population/Habitat Attributes** (Age class, structure, seral stage, species composition)	**Natural processes responsible for these conditions**	**Limiting Factors**
Headland Riparian Shrublands / Stream Mouth Coastal Riparian	Stream channel and mouth with associated riparian corridor including a diverse channelside mix of native shrubs with moist openings dominated by early and mid-seral stage species, including Carex obnupta and patches of dwarf sitka spruce, red alder, Hooker willow, grasses and forbs associated with the stream mouth	Year-round or seasonal stream, bordered by moderately to well-developed soils; relatively undisturbed rooting zone	Water availability or seasonality; disturbance regime; successional changes
Picea sitchensis / Gaultheria shallon coastal forest (G3,S1)	Relatively young (<50 y.o.) stands of sitka spruce and salal invading former grassland habitats	Absence of burning, grazing or mowing; proximity to forested areas	Fire regime; logging; conversion to agriculture; residential or commercial development
Picea sitchensis regenerating forest	Young spruce forest with dense, closed canopy and exceedingly depauperate understory represented by fern species, salal, *Maianthemum dilatatum* and huckleberry	Absence of burning, grazing or mowing; proximity to forested areas	Fire regime; logging; conversion to agriculture; residential or commercial development

Table J-3. Biological Integrity, Diversity and Environmental Health (BIDEH) for Three Arch Rocks NWR

Habitats (plant communities) that Represent Existing BIDEH	**Population/Habitat Attributes** (Age class, structure, seral stage, species composition)	**Natural processes responsible for these conditions**	**Limiting Factors**
Vegetated and unvegetated offshore rocks greater than 30 feet above mean high tide. (Described as "Offshore rocks, not awash at high tide, with soil and vegetation" Oregon Natural Heritage Plan ONHP 2003)	Basalt, metasedimentary or sandstone rocks with or without sandy soils and vegetation	Mean sea level, volcanic and tectonic activity. For vegetated rocks, erosion and wind deposition lead to soil development; further soil development occurs from guano deposits left by seabirds	Mean sea level; volcanic and tectonic activity; wind, waves and other erosive forces; guano input (vegetated rocks)
Offshore rocks above mean high tide (Described as "Offshore rocks, not awash, unvegetated" ONHP 2003	Basalt, metasedimentary or sandstone rocks	Mean sea level, volcanic and tectonic activity.	Mean sea level; volcanic/tectonic activity; wind, waves and other erosive forces.

Table J-4. Resources of Concern – Cape Meares NWR

Focal Species	Habitat Type	Habitat Structure	Life History Requirement	Other Benefiting Species
Vaux's Swift	Old-growth sitka spruce / salal association (giant forest alliance) Note: Cape Meares RNA/NHCA is one of two ONHP representative cells for this association	Old-growth sitka spruce (*Picea sitchensis)* forest in various stages of decay, including large, hollow snags >68 cm (27 in.) dbh and > 25m (82 ft.) tall with >/= 60% canopy closure	Breeding Roosting	Birds: Marbled murrelet, American bald eagle, band-tailed pigeon, pileated woodpecker, hairy woodpecker, brown creeper, red-breasted nuthatch, chestnut-backed chickadee, red-breasted sapsucker, northern pygmy owl Mammals: American marten, Pacific fisher, California myotis, fringed myotis, hoary bat, long-eared myotis, long-legged myotis, Pacific western big-eared bat, silver-haired bat, Townsend's big-eared bat, Yuma myotis, dusky tree vole, red tree vole, white-footed vole, ringtail, western gray squirrel
Brown creeper	Late-successional sitka spruce/salal association (giant forest alliance)	Late seral stage sitka spruce (*Picea sitchensis)* forest with tree/snag densities >18/ha and >46 cm (18 in.) dbh	Breeding Foraging	Birds: Marbled murrelet, American bald eagle, band-tailed pigeon, red-breasted nuthatch, golden-crowned kinglet, chestnut-backed chickadee, hermit warbler, pine siskin, red crossbill, pileated woodpecker, hairy woodpecker, red-breasted sapsucker, Vaux's swift Mammals: American marten, Pacific fisher, California myotis, fringed myotis, hoary bat, long-eared myotis, long-legged myotis, Pacific western big-eared bat, silver-haired bat, Townsend's big-eared bat, Yuma myotis, dusky tree vole, red tree vole, white-footed vole, ringtail, western gray squirrel
Red crossbill	Late-successional sitka spruce/salal association (giant forest alliance)	Late seral stage conifer forest with tree densities >18/ha (7/ac) and >46 cm (18 in.) dbh with >/= 2 trees >60 cm (24 in.) dbh	Breeding Foraging Roosting	Marbled murrelet, band-tailed pigeon, brown creeper, red-breasted nuthatch, golden-crowned kinglet, hermit warbler, pine siskin, evening grosbeak, purple finch
Pileated woodpecker	Late-successional Sitka spruce/salal association	Unmanaged late-successional forest with large snags and defective live	Breeding Foraging	Marbled murrelet, American bald eagle, band-tailed pigeon, hairy woodpecker, red-breasted sapsucker, northern pygmy owl, Vaux's swift, red-breasted nuthatch, brown creeper,

Focal Species	Habitat Type	Habitat Structure	Life History Requirement	Other Benefiting Species
	(giant forest alliance)	trees with >70% canopy closure providing >/= 5 nest snags per 10 ha (2 per 10 ac)		chestnut-backed chickadee, northern saw whet owl Mammals: American marten, California myotis, fringed myotis, hoary bat, long-legged myotis, silver-haired bat, Townsend's big-eared bat, red tree vole
Varied thrush	Late-successional sitka spruce / salal -- salmonberry association (giant forest alliance)	Mature forest with >70% canopy closure, high stem density, multiple tree layers, relatively open low understory and forest floor with much soft, loose debris, decomposing woody material and berry-producing shrubs	Breeding Foraging	Birds: Warbling vireo, Wilson's warbler, hermit thrush, Swainson's thrush Amphibians: clouded salamander, Cope's giant salamander, northern red-legged frog Invertebrates: Broadwhorl tightcoil (snail), Oregon megomphix (snail), Oregon plant bug, Spotted taildropper (slug), Tillamook westernslug, warty jumping-slug
Columbia torrent salaman-der, coastal tailed frog	Late-successional forest (old-growth and mature) riparian zone	Old-growth and late-successional forest supporting streams with medium to steep gradient, step-pool morphologies and basalt parent geology	Breeding Foraging	Cope's giant salamander, clouded salamander, coastal cutthroat trout (Oregon coast ESU)
Pelagic cormor-ant, American peregrine falcon, black oyster-catcher	Coastal bluffs and cliffs	Very steep or vertical basalt rock faces extending in elevation from mean high tide to 300' above sea level, including vegetated and unvegetated ledges pockets of vegetated soil, stunted trees and shrubs, seeps	Breeding Foraging Roosting	Tufted puffin, western/glaucous winged-gull, common mure, cliff swallow,

Table J-5. Resources of Concern – Oregon Islands NWR

Focal Species	Habitat Type	Habitat Structure	Life History Requirement	Other Benefiting Species
Common murre	Offshore Rocks >30 feet above mean high tide (Described as "Offshore rocks, not awash at high tide, with soil and vegetation" ONHP 2003)	Level or gently-sloping bare rock surfaces; rock ledges	Breeding	Brandt's cormorant, double-crested cormorant, western/glaucous-winged gull,
Brandt's cormorant		Level or gently-sloping bare rock surfaces; wide ledges; soil-covered slopes with short vegetation		Double-crested Cormorant
Pelagic cormorant		Ledges on very steep or vertical rock surfaces		Peregrine falcon, common murre
Pigeon guillemot		Rock cavities and crevices		Cassin's Auklet
Tufted puffin Cassin's auklet		Relatively steep, seaward-facing slopes with deep soils and relatively sparse vegetation		Rhinoceros Auklet, Cassin's Auklet, Purdy's stonecrop (Sedum spathulofolium)
Leach's Storm-Petrel		Deep, sandy soils dominated by grasses, rushes, or other low and/or sparse vegetation; crevices		Fork-tailed Storm-Petrel, Oregon Vole, Acmon Blue Butterfly, Coast microseris (Microseris bigelovii), Purdy's stonecrop (Sedum spathulofolium), San Francisco bluegrass (Poa unilateralis)
Western Gull		Relatively level, bare rock and vegetated surfaces; grassy slopes; intertidal areas	Breeding, Foraging, Loafing, Roosting (Year-Round)	San Francisco bluegrass (Poa unilateralis)
Black Oystercatcher		Lower elevation bare rock surfaces; intertidal areas		Harlequin Duck, Black Turnstone, Surfbird, Ruddy Turnstone, Rock Sandpiper, Sanderling, Wandering Tattler, Spotted Sandpiper, Glaucous-winged Gull, Herring Gull, California Gull, Heermann's Gull, Ring-billed Gull
Peregrine Falcon		Vertical rock faces; vegetated and unvegetated ledges; upper elevation bare rock surfaces		Cliff Swallow
Bald Eagle		Open, sparsely-vegetated upper elevations areas and grassy slopes	Foraging, Loafing (Year-Round)	

Focal Species	Habitat Type	Habitat Structure	Life History Requirement	Other Benefiting Species
California Brown Pelican		Bare rock surfaces; sparsely-vegetated and grassy slopes	Loafing, Roosting (Summer Fall)	
Aleutian Cackling Goose		Grassy slopes; areas of short vegetation	Foraging, Roosting (Spring/Fall Migration; Winter)	Western Canada goose, Dusky Canada goose
Steller Sea Lion	Offshore rocks above mean high tide. (Described as "Offshore rocks, not awash, unvegetated" (ONHP 2003)	Flat or gently-sloping rocky surfaces	Breeding, Haulout (Year-Round)	California Sea Lion
Roemer's fescue *(Festucca roemeri)*	South Coast Headland Prairie (unclassified by NVCS); exceedingly rare. Closest existing alliance is Festuca rubra coastal headland herbaceous vegetation (G2S1)	Windswept areas generally dominated by Roemer's fescue and native forbs, with some invasion by native shrubs and trees, and smaller areas dominated by red fescue with up to 60-70% cover	All	*Fragaria chiloensis, Equisetum arvense, Achillea millefolium, Prunella vulgaris, Luzula* sp., *Pteridium aquilinum, Lupinus latifolius, Erigeron glaucus*
Large-flowered Goldfields *(Lasthenia macrantha* ssp. *Prisca)* (G3T2, S2)	*Juncus breweri – Festuca rubra* south coast headland grassland (unnamed, unique and significant habitat currently undescribed in NVCS)	Windswept, gently to moderately sloping areas on exposed headlands dominated by dune rush and red fescue	All	*Erigeron glaucus, Trifolium wormskioldii, Bromus pacificus, Plantago maritima, Lupinus littoralis*
Red fescue *(Festucca rubra)* Beach	Open South Coast Headland erosion forblands and	Exposed, windswept marine terrace headland composed of sandstone, forbs, and isolated low dunes, including an	All	Savannah sparrow, sagebrush lizard, burrowing bees

Focal Species	Habitat Type	Habitat Structure	Life History Requirement	Other Benefiting Species
strawberry *(Frageria chiloensis)* Dune rush *(Juncus breweri)* Seashore lupine *(Lupinus littoralis)*	dunes. Not well described, and not included in NVCS. Found at only two sites in Oregon.	unusual mix of plant communities and four primary dune types: 1) *Juncus breweri – Fragaria chiloensis* dominated dunes with significant amounts of *Erigeron glaucus, Lupinus littoralis,* and *Festuca rubra*; 2) *Festuca rubra* dominated dunes with *Fragaria chiloensis, Hypochaeris radicata, Erigeron glaucus,* and *Achillea millefolium*; 3) *Fragaria chiloensis* dominated dunes with *Lupinus littoralis*; and 4) *Lupinus littoralis* dominated dunes with some *Festuca rubra.*		
American peregrine falcon	Steep, rocky cliffs	Very steep, windswept, largely-unvegetated cliffs.		Turkey vulture, common raven, Acmon blue butterfly, *Eriogonum latifolium, Erigeron glaucus, Dudleya farinosa*
Coastal Sagewort *(Artemisia pycnocephala)* [G4, S1]; Thompson's broad-leaved lupine *(Lupinus latifolius)* [G5T3, S3]	Steep, coastal, erosion bluffs	Steep, windswept, cliffs and talus/rocky slopes with significant plant cover situated above the ocean	All	Clouded salamander, ring-necked snake, Acmon blue butterfly, *Bromus vulgaris, Festuca rubra, Juncus breweri, Fragaria chiloensis, Erigeron glaucus, Trifolium wormskioldii, Equisetum arvense, Plantago pacifica, Eriogonum latifolium, Dudleya farinosa, Achillea millefolium* and *Antennaria* sp.
Coastal cutthroat trout (Southern Oregon/ California Coasts ESU) [G4T?Q, S?] Coastal cutthroat	Headland Riparian Shrublands/ Stream Mouth Coastal Riparian	Stream channel and mouth with associated riparian corridor including a diverse channelside mix of native shrubs with moist openings dominated by Carex obnupta and patches of dwarf sitka spruce, red alder, Hooker willow, grasses and forbs associated	All	Song sparrow, common yellowthroat, yellow warbler, Wilson's warbler, orante-crowned warbler, Swainson's thrush

Focal Species	Habitat Type	Habitat Structure	Life History Requirement	Other Benefiting Species
trout (Oregon coast ESU) [G4T3Q, S3]		with the stream mouth		
Red crossbill	*Picea sitchensis* / *Gaultheria shallon* coastal forest (G3,S1)	Relatively young (<50 y.o.) stands of sitka spruce and salal invading former grassland habitats	Breeding Foraging Roosting	Band-tailed pigeon, brown creeper, red-breasted nuthatch, golden-crowned kinglet, hermit warbler, pine siskin, evening grosbeak, purple finch
Hermit warbler	*Picea sitchensis* regenerating forest	Young spruce forest with dense, closed canopy and exceedingly depauperate understory represented by fern species, salal, *Maianthemum dilatatum* and huckleberry	Breeding Foraging Roosting	Golden-crowned kinglet, chestnut-backed chickadee, brown creeper, red-breasted nuthatch.

Table J-6. Resources of Concern – Three Arch Rocks NWR

Focal Species	Habitat Type	Habitat Structure	Life History Requirement	Other Benefiting Species
Common murre	Offshore Rocks >30 feet above mean high tide (Described as "Offshore rocks, not awash at high tide, with soil and vegetation" in ONHP 2003)	Level or gently-sloping bare rock surfaces; rock ledges	Breeding	Brandt's cormorant, double-crested cormorant, western/glaucous-winged gull,
Brandt's cormorant		Level or gently-sloping bare rock surfaces; wide ledges; soil-covered slopes with short vegetation		Double-crested Cormorant
Pelagic cormorant		Ledges on very steep or vertical rock surfaces		Peregrine falcon, common murre
Pigeon guillemot		Rock cavities and crevices		Cassin's Auklet
Tufted puffin Cassin's auklet		Relatively steep, seaward-facing slopes with deep soils and relatively sparse vegetation		Rhinoceros Auklet, Cassin's Auklet, Purdy's stonecrop (Sedum spathulofolium)
Leach's Storm-Petrel		Deep, sandy soils dominated by grasses, rushes, or other low and/or sparse vegetation; crevices		Fork-tailed Storm-Petrel, Oregon Vole, Acmon Blue Butterfly, Coast microseris (Microseris bigelovii), Purdy's stonecrop (Sedum spathulofolium), San Francisco bluegrass (Poa unilateralis)

Focal Species	Habitat Type	Habitat Structure	Life History Requirement	Other Benefiting Species
Western Gull		Relatively level, bare rock and vegetated surfaces; grassy slopes; intertidal areas	Breeding, Foraging, Loafing, Roosting (Year-Round)	San Francisco bluegrass (Poa unilateralis)
Black Oyster-catcher		Lower elevation bare rock surfaces; intertidal areas		Harlequin Duck, Black Turnstone, Surfbird, Ruddy Turnstone, Rock Sandpiper, Sanderling, Wandering Tattler, Spotted Sandpiper, Glaucous-winged Gull, Herring Gull, California Gull, Heermann's Gull, Ring-billed Gull
Peregrine Falcon		Vertical rock faces; vegetated and unvegetated ledges; upper elevation bare rock surfaces		Cliff Swallow
Bald Eagle		Open, sparsely-vegetated upper elevations areas and grassy slopes	Foraging, Loafing (Year-Round)	
California Brown Pelican		Bare rock surfaces; sparsely-vegetated and grassy slopes	Loafing, Roosting (Summer, Fall)	
Aleutian Cackling Goose		Grassy slopes; areas of short vegetation	Foraging, Roosting (Spring and Fall Migration; Winter)	Western Canada goose, Dusky Canada goose
Steller Sea Lion	Offshore rocks above mean high tide (Described as "Offshore rocks, not awash, unvegetated" in ONHP 2003)	Flat or gently-sloping rocky surfaces	Breeding, Haulout (Year-Round)	

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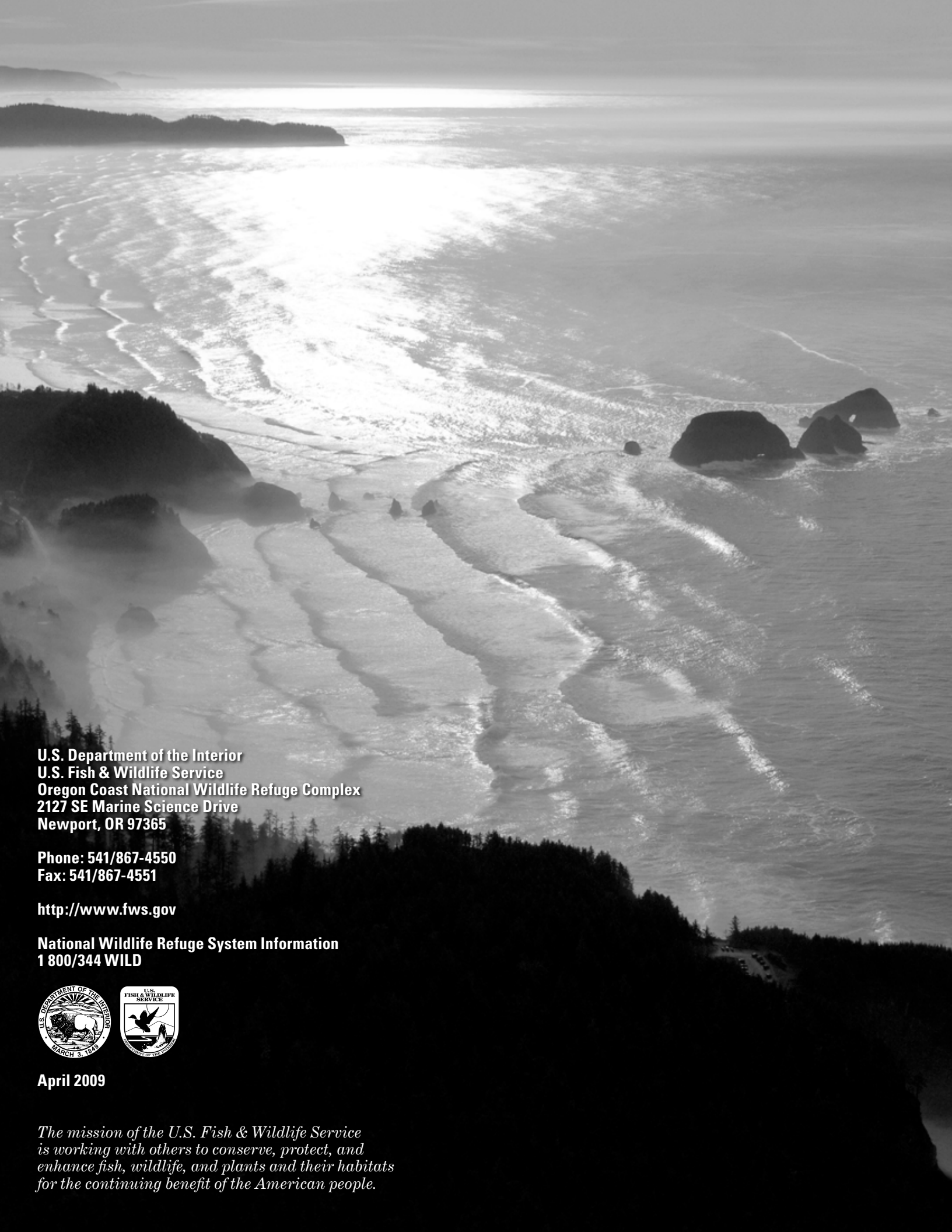

U.S. Department of the Interior
U.S. Fish & Wildlife Service
Oregon Coast National Wildlife Refuge Complex
2127 SE Marine Science Drive
Newport, OR 97365

Phone: 541/867-4550
Fax: 541/867-4551

http://www.fws.gov

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