

Chapter 3 Affected Environment, Environmental Consequences, and Cumulative Effects

3.1 Introduction

This chapter describes the environment that may be affected (affected environment) by adoption and implementation of a habitat conservation plan (HCP) for the Pacific Coast population of western snowy plover (snowy plover) on the Oregon coast. This chapter also describes the environmental consequences, including the cumulative effects, for each of the alternatives evaluated in this draft Environmental Impact Statement (DEIS).

Each section in this chapter includes a description of the approach and methodology used to characterize the affected environment and assess the environmental impacts for a given resource area; a detailed description of the resources within the study area, as it is defined below; a summary of the potential effects of the alternatives, including the proposed action, relative to the No-Action Alternative; and a description of the mitigation measures, as appropriate.

The following provides a brief summary of the covered lands and the study area, the activities evaluated, and the alternative management strategies identified for detailed analysis in this DEIS.

3.1.1 Covered Lands

As described in chapter 1, “Purpose and Need,” the area covered by the project alternatives addressed in this DEIS (the covered lands), includes the sandy portions

of the Ocean Shore along the Oregon coast that extend between the mouth of the Columbia River South Jetty on the north and the California/Oregon border on the south (approximately 230 miles of beach) (figure 1-1). The sandy Ocean Shore includes the area from extreme low tide to the actual or statutory vegetation line; whichever is most landward (figure 1-2). The Ocean Shore does not include estuaries or river mouths, which are under the management of the Oregon Department of State Lands.

In addition, portions of following key State parks, State natural areas, and State recreation areas are included in the covered lands (figures 1-3 through 1-11). The parenthetical reference after each listing reflects the name of the associated snowy plover management area (SPMA) that is evaluated in this DEIS:

- Fort Stevens State Park (Columbia River South Jetty),
- Gearhart Ocean State Recreation Area (Necanicum Spit),
- Nehalem Bay State Park (Nehalem Spit),
- Cape Lookout State Park (Netarts Spit),
- Robert Straub State Park (Nestucca Spit),
- Bullards Beach State Park (Bullards Beach),
- Bandon State Natural Area (Bandon),
- Cape Blanco State Park (Sixes River Mouth), and
- Pistol River State Natural Area (Pistol River).

3.1.2 Study Area

Throughout the DEIS, the study area may vary by resource topic. In some cases, the study area is the same as the covered lands. However, for some resources, the study area extends beyond the geographic boundaries of the covered lands to address potential impacts to lands and resources affected by proposed project actions, or lands that could have an affect on management of the covered lands. When a resource topic requires evaluation of a study area that is different from the covered lands detailed above, a description of that study area is provided within the relevant section of this chapter.

3.1.3 Duration and Covered Activities

Analysis of the resources covered in this DEIS is based on management of the covered lands for a duration of 25 years (2008 to 2033). Three categories of covered activities have been proposed by the Oregon Parks and Recreation Department (OPRD) in the HCP and are evaluated in this DEIS: public use and recreation

management; natural resources management, including snowy plover management and other habitat restoration activities; and beach management.

3.1.4 Alternatives Evaluated

As described in chapter 2 “Alternatives,” three alternative management strategies have been identified for detailed analysis in this DEIS.

Alternative 1 – Current Management (No-Action)

Alternative 1 – Current Management (No-Action) would continue management strategies currently in place on the covered lands. As described in chapter 1, “Purpose and Need,” OPRD is responsible for various management activities along most of the Oregon Ocean Shore, including recreation management, general beach management, and management of natural resources. Since populations of snowy plover nest, roost, forage, and raise chicks on the sandy beaches of Oregon coast, OPRD must ensure that these management activities do not result in take of snowy plover. In addition, OPRD must balance snowy plover management activities with their mandate to maintain the public’s access to the Ocean Shore.

Each year, at the request of Federal and State agencies and Curry County, OPRD restricts use of a portion of the Ocean Shore at six areas occupied by nesting populations of snowy plover during the breeding season (March 15 to September 15). These seasonal use restrictions have been imposed since 1994, with such restrictions affecting anywhere from 0.5 miles (1994) to 19.8 miles (1998) of beach. Seasonal use restrictions limit recreational use and access to these specific areas, and vary unpredictably in scale and location.

Under Alternative 1, OPRD would continue to manage the Habitat Restoration Area at the Bandon State Natural Area for nesting populations of snowy plover, and would consider applications to restrict recreational use at other areas (Recreation Management Area (RMA), at the request of the landowner. Additional information on how these restrictions would be implemented on both OPRD owned or leased lands, and lands owned by other landowners, is described in section 2.3.1, “Alternative 1 – Current Management (No Action).” The No-Action Alternative is the baseline against which the effects of all other alternatives are compared in this chapter.

Alternative 2 – Proposed HCP

Alternative 2 – Proposed HCP, represents OPRD’s preferred alternative, and is supported by the draft *Western Snowy Plover Habitat Conservation Plan* (Oregon Parks and Recreation Department 2007). The draft HCP was developed by OPRD, in collaboration with the Fish and Wildlife Service (FWS) and Oregon Department of Fish and Wildlife (ODFW), to address potential effects on snowy plover within the covered lands, and to meet the regulatory requirements of the Federal and State

Endangered Species Acts (ESA). The draft HCP was also developed in consideration of input provided by the public during a series of public meetings held in the spring and winter of 2002 and the fall of 2004, and input received between 2002 and 2004 from the Steering Committee convened to assist in formulation of the draft HCP.

Similar to Alternative 1, under Alternative 2, OPRD would manage recreational use, natural resources, and other general beach responsibilities on the covered lands to minimize potential effects on snowy plover. Up to six SPMAs would be managed for nesting populations of snowy plover by OPRD, including SPMAs at Bandon, Columbia River South Jetty, Necanicum Spit, Nehalem Spit, Netarts Spit and Pistol River. OPRD would also implement recreational use restrictions at up to 11 RMAs that are owned by other landowners and are either currently occupied by snowy plovers, or that could be targeted for snowy plover management in the future. Additional information on how management activities and restrictions would be implemented on both OPRD owned or leased lands, and lands owned by other landowners, is described in section 2.3.2, “Alternative 2 – Proposed HCP.”

Alternative 3 – Management of Additional OPRD Sites

Alternative 3 – Management of Additional OPRD Sites is evaluated in this DEIS as an alternative to the proposed HCP. Specifically, Alternative 3 is included to provide the FWS with an additional option (outside of the No-Action Alternative) for comparison of the proposed action with the environmental risks of an alternate course of action. Although this alternative was considered during the development of the HCP, it was subsequently eliminated by OPRD due to recreational use and other management conflicts. Since then, the FWS has determined that Alternative 3 would be a reasonable alternative, as defined under the National Environmental Policy Act (NEPA), and should be evaluated in this DEIS.

Under Alternative 3, OPRD would manage recreational use, natural resources, and other general beach responsibilities on the covered lands to minimize potential effects on snowy plover. Up to nine SPMAs (three more than Alternative 2) would be managed for nesting populations of snowy plover by OPRD, including SPMAs at Bandon, Necanicum Spit, Columbia River South Jetty, Nestucca Spit, Pistol River, Nehalem Spit, Netarts Spit, Bullards Beach, and Sixes River Mouth. In addition, OPRD would implement recreational use restrictions at up to 12 RMAs that are owned by other landowners, and are either currently occupied by snowy plovers, or targeted for snowy plover management in the future. Additional information on management activities and restrictions that would be implemented on both OPRD owned or leased lands, and lands owned by other landowners, is described in section 2.3.3, “Alternative 3 – Management of Additional OPRD Sites.”

3.2 Land Use

This section describes land use in the study area, as well as potential effects on land use resulting from implementation of the project alternatives. For this section, the study area includes the covered lands described in section 3.1.1, “Covered Lands,” and lands immediately adjacent to the inland boundary of the covered lands.

3.2.1 Approach and Methodology

The description of land use plans, policies, and existing land uses presented in this section is based on summary information from relevant Federal, State, and local land use plans, as well as information gathered from conversations with OPRD staff and direct observation from a July 2006 field visit. The potential effects on land use were assessed based on a review of the management strategies for each of the project alternatives, including the draft *Western Snowy Plover Habitat Conservation Plan* (Oregon Parks and Recreation Department 2007) and an assessment of whether those activities would be consistent with the applicable land use plans and policies.

3.2.2 Regulatory Context

Federal Land Use Planning

Lewis and Clark National Historic Park Comprehensive Management Plan

The Lewis and Clark National Historic Park Comprehensive Plan for Management and Use (National Park Service 1982), more commonly called the Comprehensive Management Plan, guides land use management within the park and along the trail. The Lewis and Clark National Historic Trail extends for over 3,700 from Illinois to the Oregon coast. Within the Pacific Northwest, the park consists of 12 park sites located on a 60-kilometer (40-mile) stretch of the Pacific Coast from Long Beach, Washington to Cannon Beach, Oregon. The National Park Service (NPS) works in coordination with Oregon and Washington State Park departments to promote visitor use, to provide cooperative management to preserve the remnants of the historic route, and to promote a comprehensive interpretation of its history. At the close of the Lewis and Clark Bicentennial in 2006, NPS plans to update the Comprehensive Management Plan for the park.

Oregon Coast National Wildlife Refuge Complex Comprehensive Conservation Planning

The Oregon Coast National Wildlife Refuge Complex has initiated a planning process called Comprehensive Conservation Planning to review and plan for long term management of wildlife, habitat, and public use activities on Cape Meares,

Oregon Islands, and Three Arch Rocks National Wildlife Refuges (Fish and Wildlife Service 2006a, 2007a). The FWS is coordinating with Tribes, interested agencies, elected officials, the public, and other organizations regarding their interests, concerns, and viewpoints about refuge management issues. This information will be used to develop the Comprehensive Conservation Plan for the refuges.

Northwest Forest Plan

The Northwest Forest Plan (NWFP) is an overall plan for the Pacific Northwest that focuses on producing timber products while simultaneously protecting and managing wildlife species (Fish and Wildlife Service Regional Ecosystem Office 1994). The NWFP covers 24.5 million acres in Oregon, Washington, and northern California that are managed as national forests, Bureau of Land Management (BLM) Districts, national parks, and national wildlife refuges.

The principles of the NWFP ecosystem management strategy are reflected in that document as five key elements: implementation of an aquatic conservation strategy; adaptive management; compatibility with adjacent land-ownership objectives; consideration of potential effects on local economies; and protection of existing large blocks of late-successional reserve and old-growth forests to provide terrestrial and aquatic habitat for fish and wildlife species (Fish and Wildlife Regional Ecosystem Office 1994).

Within the study area, lands managed by the U.S. Forest Service (USFS) under the Siuslaw National Forest Management Plan, and by the BLM under the Western Oregon Resource Management Plan and the Coos Bay District Resource Management Plan, are subject to the NWFP, as described below.

Western Oregon Resource Management Plan

In 1980, Congress created the 100-acre Yaquina Head Outstanding Natural Area. The Yaquina Head Outstanding Natural Area is located at the north end of Newport, Oregon, and provides visitors with one of the most accessible wildlife and ocean viewing locations on the Pacific Coast.

In cooperation with the State of Oregon, USFWS, and the U.S. Coast Guard, BLM manages the area to protect its unique scenic, scientific, educational, and recreational values under the Western Oregon Resource Management Plan (RMP) (currently under revision), tiered to the NWFP. The area also includes Oregon's tallest and second oldest continually active lighthouse (Bureau of Land Management 2006).

Coos Bay District Resource Management Plan

The Coos Bay District RMP (Bureau of Land Management 1995) describes management of approximately 329,700 acres of land in Oregon administered by the U.S. Department of the Interior, BLM Coos Bay District. The goals of this RMP include maintaining late successional and old growth species habitat and ecosystems

on Federal lands, and maintaining biological diversity associated with native species and ecosystems. The North Coos Bay Spit, Umpqua Resource Area, and Myrtlewood Resource Area, located within the study area, are managed under the RMP, which is tiered to, and in conformance with the NWFP.

Siuslaw National Forest Management Plan

The Siuslaw National Forest Management Plan (U.S. Forest Service 1990) guides forest management within the Siuslaw National Forest. The Forest Plan was amended in April of 1994 to meet the requirements of the NWFP. The Suislaw National Forest encompasses over 630,000 acres in the Oregon Coast Range. It is bordered on the east by the Willamette Valley, on the west by the Pacific Ocean, and is located along the coast between the cities of Newport and Reedsport.

Within the national forest, Cascade Head is maintained as an experimental forest and scenic research area. Research partners include The Nature Conservancy, State and private universities in Oregon and Washington, ODFW, Oregon Department of Agriculture (ODA), National Aeronautic and Space Administration, Environmental Protection Agency (EPA), and National Marine Fisheries Service (NMFS).

The Oregon Dunes National Recreation Area is the largest expanse of coastal sand dunes in North America, extending approximately 60 kilometers (40 miles) along the Oregon coast, from Florence to Coos Bay. The area is managed by the U.S. Department of Agriculture (USDA) and USFS under the NWFP as a part of the Siuslaw National Forest.

State Land Use Planning

Oregon Statewide Planning Goals

Land use planning in the State of Oregon is governed by 19 Statewide Planning Goals, which are achieved through local comprehensive planning. State law requires that each city and county adopt a comprehensive plan consistent with the Statewide Planning Goals, including the zoning and land use ordinances necessary to implement the plan effectively. Comprehensive plans are reviewed by the Oregon Department of Land Conservation and Development (DLCD) and, once approved, become the controlling document for land use in the area covered by that plan. The Statewide Planning Goals require that local governments consider specific resources when developing their comprehensive plans, including:

- Forest Lands (Goal 4), which provides guidance on the protection of forest lands to maintain the forest land base, protect the state's forest economy, and ensure that forest practices are consistent with the sound management of soil, air, water, fish, and wildlife resources and the provision of recreation and agriculture;

- Open Spaces, Scenic and Historic Areas, and Natural Resources (Goal 5), which provides guidance on the protection and use of natural areas, including riparian corridors, wetlands, and wildlife habitat;
- Air, Water and Land Resources Quality (Goal 6), which provides guidance on maintaining and improving the quality of the state's air, water, and land resources; and
- Economic Development (Goal 9), which provides guidance to promote adequate opportunities for a variety of economic activities vital to the health, welfare, and prosperity of the state's citizens.

Oregon Coastal Management Program

In an effort to encourage states to better manage coastal areas, Congress enacted the Coastal Zone Management Act (CZMA) in 1972. The CZMA provides grants to states that develop and implement federally approved coastal zone management plans. It allows states with approved plans the right to review Federal actions to ensure they are consistent with those plans, and it authorizes the National Estuarine Research Reserve System. Within Oregon, the CZMA is executed via the Oregon Coastal Management Program (OCMP).

The DLCD also administers the OCMP. The mission of the OCMP is to work in partnership with coastal local governments, State and Federal agencies, and other stakeholders to ensure that Oregon's coastal and ocean resources are managed, conserved, and developed consistent with statewide planning goals.

In addition to addressing the goals and policies of the CZMA, the OCMP addresses Oregon's Statewide Planning Goals (see above); the provisions of other key Oregon laws, including the Beach Bill (discussed below) and the Oregon Removal-Fill Law; and the plans and policies of coastal local land use planning jurisdictions.

Ocean Shore Management Plan

In 1967, the Oregon Legislature passed the Beach Bill, establishing a recreational easement across the dry sand portion of the ocean shore, and placing recreation management of the ocean shore with OPRD. The Ocean Shore Management Plan (OSMP) is a comprehensive planning tool to guide future decision making by OPRD (Oregon Parks and Recreation Department 2005). The OSMP defines the goals and objectives for managing the ocean shores, defines a vision for the future of Oregon's ocean shores, and makes recommendations for achieving that vision.

3.2.3 Affected Environment

Land Ownership and Use

Within the study area, the State of Oregon owns most of the wet sand area of the beach (extreme low tide line to the ordinary high tide line). The dry sand portion (ordinary high tide line to the statutory or actual vegetation line) is generally owned by the adjacent upland landowners. Landowners within the study area include Federal, State, and local governments and various private individuals.

Although other landowners own portions of the beach, OPRD has an easement over the entire Ocean Shore that supersedes this ownership. As discussed in chapter 1, “Purpose and Need,” OPRD’s jurisdiction includes the area from extreme low tide to the actual or statutory vegetation line, whichever is most landward. This area does not include estuaries or river mouths. As mandated by the Beach Bill of 1967, this area is maintained and managed by OPRD for recreational use by the general public.

The primary recreational uses commonly observed on the shore include walking/exercising, dog exercising, relaxing, and scenic enjoyment. These and other recreational activities are described in greater detail in section 3.3, “Recreation.” The ocean shore is open to driving except in locations noted in subsection 3.3.3, “Affected Environment” under the heading *Recreational Use Restrictions*.

The majority of the Oregon coast is relatively remote and undeveloped. However, there are many coastal communities located along the coast that attract tourists. There are several coastal towns with hotels, parks, and other recreational facilities adjacent to the shore that attract visitors. Development in these areas is guided by local comprehensive plans and zoning, and is limited to designated areas.

Other uses along the ocean shore include additional management activities performed by OPRD for beach maintenance and natural resource management. These activities are described in detail in chapter 2, “Alternatives.”

The Oregon Department of State Lands (DSL) has jurisdiction over nearly 640,000 acres of grazing and agricultural land; 131,000 acres of forestland; and 800,000 acres of offshore land, estuarine tidelands, and submerged and submersible lands of the State’s extensive navigable waterway system. Within the project area for this DEIS, this includes the Columbia River South Jetty at Fort Stevens State Park and the many streams and estuaries that extend to the ocean. Land use within DSL’s jurisdiction is subject to Oregon Administrative Rule (OAR). Chapter 141, Division 88 (OAR 141-088-0000) regarding Public Recreational Use of State-Owned Property indicates that there are currently no restrictions regulating recreation at the Columbia River South Jetty.

3.2.4 Environmental Consequences

Consequences Common to All Alternatives

Consistency with Federal, State, and Local Land Use Plans and Policies

As mentioned previously, OPRD's jurisdiction and authority to manage the Ocean Shore supersedes the underlying land ownership. Under all of the project alternatives, OPRD would retain the right to implement activities associated with recreation, beach, and natural resource management on the Ocean Shore. Similar to existing conditions, OPRD would be required to obtain a local grading permit for any modifications to the ocean shore, and would do so prior to implementing any dune modifications.

In addition, local land use comprehensive plans and zoning were considered in the design and selection of the areas that are currently managed or would be managed for snowy plover under all of the project alternatives. Therefore, implementation of snowy plover management activities would be consistent with Oregon's land use planning goals and policies. Furthermore, activities associated with the project alternatives are focused on changes in the way that the land is managed, not changes in the land use itself. The management activities proposed under each of the project alternatives would also be consistent with the other Federal, State, and local land use management plans described above.

3.3 Recreation

This section describes recreation activities and uses in the study area, as well as potential effects on these activities and uses resulting from implementation of the project alternatives. For this section, the study area is the same as the covered lands described in section 3.1.1, “Covered Lands.”

3.3.1 Approach and Methodology

The description of recreational resources presented in this section is based on discussions with OPRD staff and data collected for the *Oregon Shore Recreational Use Study* (recreational use study) (Shelby and Tokarczyk 2002). Survey and observation data for the recreational use study were gathered on-site at key points along the entire coast between June 29 and September 3, 2001 (the higher-use summer months). Additional information was collected in the form of a follow-up mailed questionnaire. Observations were also made during a field visit to the coast in July 2006.

The potential effects on recreation resources in the study area were assessed based on a review of the management strategies for each of the project alternatives, including the draft *Western Snowy Plover Habitat Conservation Plan* (Oregon Parks and Recreation Department 2007), and a programmatic assessment of how those strategies could affect recreation opportunities and use.

The *Draft Economic Analysis of Critical Habitat Designation for the Western Snowy Plover* (Critical Habitat Report) (Industrial Economics, Inc. 2005) was also considered in the analysis of potential effects for this DEIS. The analysis of potential recreational effects in the Critical Habitat Report is programmatic in nature and considers a much larger study area (35 units along the West Coast) compared with the DEIS (which includes up to 9 SPMAs and 12 RMAs (RMA) within Oregon only, depending on the project alternative). In addition, the Critical Habitat Report assumed that recreation effects occurring as a result of snowy plover management activities would fall into one of two categories: a recreationist would forego a trip to the beach entirely or the recreationist’s enjoyment during that trip would be substantially diminished.

Because the project alternatives would affect a smaller area, it was determined that a more site-specific approach to the analysis would be needed and is presented under section 3.3.4, “Environmental Consequences,” below. The socioeconomic analysis for the Critical Habitat Report is discussion in section 3.4, “Socioeconomics and Environmental Justice.”

3.3.2 Regulatory Context

Ocean Shore Management Plan

In 1967, the Oregon Legislature passed the Beach Bill, establishing a recreational easement across the dry sand portion of the Ocean Shore, placing recreation management of the Ocean Shore with OPRD. The OSMP (Oregon Parks and Recreation Department 2005) is a comprehensive planning tool to guide future decision making by OPRD. The OSMP defines the goals and objectives for managing the Ocean Shores, defines a vision for the future of Oregon's Ocean Shores, and makes recommendations for achieving that vision.

The following specific recommendations to protect and enhance recreational resources on the Oregon coast are outlined in the OSMP.

- Provide additional recreation amenities including campgrounds and hike-in camps at select locations.
- Continue to allow camping on the beach where it is currently allowed except where otherwise noted by the HCP.
- Continue to allow street legal driving on the beach where it is now officially allowed, with the following exceptions:
 - Restrict use in SPMAs, as outlined in the HCP.
 - Restrict use on the beach from the Garrison Lake outlet area to the mouth of Elk River.
 - Restrict use north of Myers Creek and at China Creek.
 - Allow use in otherwise restricted areas if authorized by OPRD through permitting process.
- Continue off highway vehicle riding in areas that are now officially open, and enforce existing restrictions. Improve enforcement in restricted areas, including improved signage.
- Continue existing horseback riding, dory fishing, surf sports, and other general beach activities such as picnicking and relaxing, except where restricted by the HCP.
- Work with the National Coast Trail Association and the Oregon Trails Council to connect portions of the Coast Trail, and make some sections available to horseback riding and mountain biking.
- Enforce the current restrictions on fireworks where safety and fire danger threats have become serious. Improve interagency cooperation on enforcement during the peak firework season.

- Restrict driftwood fires in areas of high fire danger, in cooperation with local and State firefighting agencies.
- Keep dog and leash rules as they are, except for those additional restrictions proposed as part of the HCP.
- Coordinate with other agencies to improve use of the Pacific Ocean for jet skis, surfing, and dory launching.
- Add additional enforcement staff and contract for law enforcement where needed.
- Conduct annual courses on Ocean Shore regulations for all pertinent agencies.
- Acquire lands for recreational use from willing landowners.
- Complete an interpretive plan for the Ocean Shore.

3.3.3 Affected Environment

The following provides a description of the coastal communities within the study area, a description of the types of visitors that use the Oregon coast for recreation, and an overview of the types of recreational uses typical on the covered lands. Three coastal regions, the North Coast region, Central Coast region, and South Coast region are used to present the description of the affected environment in this section. These regions are further divided into the six coastal segments, and listed below, to allow for more specific attention when considering recreational use.

- North Coast Region
 - Columbia River to Nehalem River (Segment 1)
 - Nehalem River to Cascade Head (Segment 2)
- Central Coast Region
 - Roads End to Yaquina River (Segment 3)
 - South Beach to Umpqua River (Segment 4)
- South Coast Region
 - Umpqua River to Blacklock Point (Segment 5)
 - Sixes River Mouth to Crissie Field Beaches (Segment 6)

Recreational uses of beach areas within these six coastal segments are also summarized in this section.

Coastal Communities

The Oregon coast is a nationally known recreation destination. According to the Oregon Shore Recreational Use Study, beachgoers reported participating in more

than 40 different recreation activities during trips to the Oregon coast (Shelby and Tokarczyk 2002). Coast wide, the most popular beach recreational activities included walking (37 percent), relaxing at a stationary location (21 percent), and scenic enjoyment (12 percent).

The North Coast region of the Oregon coast (figure 3.3-1) (Columbia River to Cascade Head), including Clatsop and Tillamook Counties, is the most popular coastal region visited by Oregon residents, mostly due to the day-trip proximity to the Portland Metropolitan Area. Approximately 32 kilometers (20 miles) of beachfront in the North Coast have urban settings, including portions of several developed urban coastal communities (Seaside, Cannon Beach, Tolovanna, Manzanita, Rockaway and Pacific City); some smaller and less developed communities (Oceanside, Netarts, Gearhart, Neskowin and Tierra del Mar); and a couple of rural residential communities (Cape Mears and Arch Cape). Indian Beach at Ecola State Park and Short Sands Beach at Oswald West State Park are the most heavily used State Park beaches, while Seaside and Cannon Beach are the most heavily used city beaches. Few beachside areas in the North Coast remain undeveloped.

The Central Coast region (Cascade Head to Umpqua River), including Lincoln, Lane, and Douglas counties, is further away from the Portland Metropolitan Area than those in the North Coast. There are several major urban areas along the Interstate 5 (I-5) corridor (Salem, Corvallis, Albany, Eugene, Springfield, Roseburg) that are located within a reasonable distance for day-trips to the coast (161 kilometers [100 miles] or less). The largest urban coastal settings are located in Lincoln County, and include Newport and Lincoln City with smaller communities in Lane and Douglas Counties. Recreational areas in the Central Coast include South Beach, Beachside, and Washburne State Parks, and the Oregon Dunes National Recreation Area, which provides access for off highway vehicle riders. In addition, the USFS provides two large campgrounds and beach accesses at Sutton Creek and Tillicum Beach, and beach access at Baker Beach.

The South Coast region (Umpqua River to California Border), including Coos and Curry Counties, is relatively more remote. This region is located farther from Portland and other larger urban areas, and tends to be frequented more often by local residents and visitors from California (Oregon Parks and Recreation Department 2004). Levels of use on the South Coast are much lower than the Central and North Coasts. Popular recreational areas within the South Coast include Harris Beach in Brookings, Bastendorf Beach in Charleston, and the beaches adjacent to the City of Bandon. About 24 kilometers (15 miles) of the Dunes National Recreation Area extend into the South Coast region.

Different types of organized events are held along the coast in all three coastal regions. Some events, especially those held annually, have created visitor traditions and attract many visitors to the beach each year.

Figure 3.3-1. Origin of Visitors from Oregon by Coastal Region

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Some events, such as Fourth of July festivities, are commonly held in many of the coastal communities. Other events, such as a lighted boat parade in Newport each December, are only held in individual communities. Clatsop and Lincoln Counties host the greatest number of annual coastal events.

Visitor Profile

Almost 9 of 10 people surveyed visited either the Oregon coast in general or the beach itself as a destination, rather than to attend a specific event. Nearly 2 out of 3 coastal visitors came from Oregon (60.8 percent), followed by residents of Washington State (18.1 percent), residents from other states excluding California (13.6 percent), residents of California (4.6 percent), and residents of other countries (2.9 percent). More international visitors came from Canada (Shelby and Tokarczyk 2002).

Within Oregon, the majority of visitors to the beaches are residents of Oregon's major urban centers located along I-5 (figure 3.3-1). Residents from these areas mainly travel to the North and Central Coasts. Nearly 66 percent of all visits to the North Coast originated from the Portland-Vancouver Metropolitan Area. About 33 percent of the visitors to the Central Coast traveled from the Eugene-Springfield area and 15 percent of Central Coast visitors traveled from the Portland Metropolitan Area. In the South Region, local residents represent a much higher proportion of the area's beach users. According to the recreational use survey, day trips were more common to the North and Central Coasts than to the South Coast. The majority of same-day visitors traveled between 80 and 161 kilometers (50 and 100 miles) to reach the coast, which was the same for all three regions (Shelby and Tokarczyk 2002).

Based on survey results, more than 70 percent of all visitors to the Oregon coast spent at least one night there (Shelby and Tokarczyk 2002). Overnight visitors tended to travel either shorter distances (less than 16 kilometers [10 miles]) or distances greater than 80 kilometers (50 miles) in all three coastal regions. All three regions had almost the same proportion of visitors who traveled between 161 and 322 kilometers (100 and 200 miles). In terms of visitor age, the highest percentage of visitors to the Oregon coast was in the 35 to 44 years age group, followed by 45 to 54 years. These two age groups make up more than half (58 percent) of the total visitors to the coast.

Recreational Activities and Uses of Beach Areas

The recreation use study collected considerable information concerning recreation activities on beaches along the Oregon coast.

For the six beach segments shown in figure 3.3-2, the primary recreational activities included walking (ranging from 35 percent to 39 percent of visitors), followed by

relaxing at a stationary location (ranging from 16 percent to 27 percent), and scenic enjoyment (ranging from 9 percent to 14 percent). Other popular activities included exercising dogs, surfing, jogging, kite flying, camping, wind surfing, and beach combing (Shelby and Tokarczyk 2002).

Table 3.3-1 identifies recreational activities and levels of use that occur in each of the six Oregon coast segments by beach area. As noted in chapter 2, “Alternatives,” under each of the project alternatives, OPRD would focus efforts to protect snowy plovers on specific beach areas by implementing snowy plover management actions at up to six SPMA or by issuing recreational use restriction permits at up to 11 RMAs. Beach areas that would contain either an SPMA or a RMA under one or more of the project alternatives are noted in bold and marked with an asterisk in table 3.3-1. The name of each SPMA or RMA is noted in parentheses after the name of the beach area. Of the beaches that contain targeted areas, the most heavily used beaches (i.e., those averaging more than 100 visitors per weekend day) occur in the following areas:

- Columbia River to Necanicum River (Columbia River South Jetty SPMA and Necanicum Spit SPMA),
- Neahkanie Mountain to Nehalem River (Nehalem Spit SPMA),
- Netarts River to Cape Lookout (Netarts Spit SPMA), and
- Cape Kiwanda to Nestucca River (Nestucca Spit SPMA).

No RMAs were included in the list because average weekend day beach use was found to be less than 100 visitors.

Figure 3.3-2. Beach Segments

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Table 3.3-1. Recreation Use and Activities at Beaches along the Oregon Coast

Beach Segment	Beach Area	Avg. # People Weekend Day	Avg. # People Weekday	Reporting crowding (%)	% Walking, Other Exercise (%)	Near Shore Activities ¹ (%)	Camping (%)	Kite Flying (%)	Dog Exercising (%)	Relaxing, Scenic Enjoyment (%)	Other Listed Activities
North Coast Region											
Beach Segment 1 – Columbia River to Nehalem River											
1	Columbia River to Necanicum River* (Columbia River South Jetty SPMA and Necanicum Spit SPMA)	277	150	32	14	1	<1	2	5	67	Beachcombing, fishing from beach, clamming, horseback riding, jet skiing
1	Necanicum River to Tillamook Head	466	226	51	14	1	<1	3	3	75	Beachcombing, fishing from beach, sports, clamming, fireworks
1	Indian and Ecola Beaches	214	73	63	18	14	0	1	3	59	Kayaking, sports, fishing from beach
1	Chapman Point to Humbug Point	726	427	48	29	1	<1	2	4	60	Beachcombing, horseback riding, fishing from the beach, artistic pursuits, hang gliding
1	Humbug Point to Hug Point	117	37	31	13	2	0	<1	4	79	Kayaking
1	Hug Point to Arch Cape	101	124	41	15	2	<1	1	3	79	Rock climbing, fishing from beach
1	Arch Cape to Cape Falcon	7	9	0	0	0	0	0	0	63	Fishing from beach
1	Short Sands Beach	232	92	73	9	27	<1	<1	2	59	Kayaking, driftwood fires, birding
1	Neahkanie Mountain To Nehalem River* (Nehalem Spit SPMA)	128	141	37	22	3	0	3	8	60	Horseback riding, kayaking, hang gliding, fishing from beach

Beach Segment	Beach Area	Avg. # People Weekend Day	Avg. # People Weekday	Reporting crowding (%)	% Walking, Other Exercise (%)	Near Shore Activities ¹ (%)	Camping (%)	Kite Flying (%)	Dog Exercising (%)	Relaxing, Scenic Enjoyment (%)	Other Listed Activities
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Beach Segment 2 – Nehalem River to Cascade Head

2	Nehalem River to Tillamook Bay	337	216	23	24	1	<1	3	3	63	Sports, beachcombing, fishing from beach, driftwood fires, driftwood collection
2	Bayocean Spit* <i>(Bay Ocean Spit RMA)</i>	84	30	21	36	1	<1	1	3	44	Fishing from beach, beachcombing, sports, driftwood collection, birding
2	Maxwell Point to Netarts River	181	65	36	36	3	<1	1	5	52	
2	Netarts River to Cape Lookout* <i>(Netarts Spit SPMA)</i>	119	72	40	31	1	0	2	3	38	Fishing from beach, sports, tide pooling, beachcombing, land sailing
2	Cape Lookout to North Sand Lake Spit <i>(North Sand Lake Spit RMA)*</i>	33	19	37	8	0	0	0	<1	12	Vehicle
2	Sand Lake to Cape Kiwanda* <i>(South Sand Lake Spit RMA)</i>	77	62	21	29	2	2	2	3	44	Vehicle, driftwood fires, sports, tide pooling, jet skiing
2	Cape Kiwanda to Nestucca River* <i>(Nestucca Spit SPMA)</i>	295	170	56	25	6	<1	1	2	59	Tide pooling, vehicle, kayaking, sports, horseback riding
2	Nestucca River to Cascade Head	85	76	15	37	2	1	1	4	52	Horseback riding, driftwood fires, fishing from beach, kayaking, sports

Central Coast Region

Beach Segment 3 – Roads End to Yaquina River

3	Roads End to Siletz River	1089	527	33	26	1	0	4	2	57	Tide pooling, sport, crabbing from beach, beachcombing, driftwood fires
3	Siletz River to Boiler Bay	279	148	23	27	1	0	5	4	54	Beachcombing, sports, tide pooling, fishing from beach, driftwood fires
3	Otter Rock to Schooner Point	187	159	34	29	4	0	5	3	53	Beachcombing, sports, tide pooling, special events, driftwood collection

Beach Segment	Beach Area	Avg. # People Weekend Day	Avg. # People Weekday	Reporting crowding (%)	% Walking, Other Exercise (%)	Near Shore Activities ¹ (%)	Camping (%)	Kite Flying (%)	Dog Exercising (%)	Relaxing, Scenic Enjoyment (%)	Other Listed Activities
3	Yaquina Head to Yaquina River	442	184	31	34	2	0	5	2	51	Tide pooling, sports, beachcombing, crabbing from beach, land sailing

Beach Segment 4 – South Beach to Umpqua River

4	South Beach	73	53	13	43	2	5	3	5	28	Beachcombing, special events, sports, driftwood fires, photography
4	Collins Creek to Alsea River	60	50	10	40	1	1	6	4	38	Sports, beachcombing, hang gliding, tide pooling, driftwood collection
4	Alsea River to Starr Creek	220	132	16	29	1	2	4	4	54	Sports, special events, beachcombing, driftwood collection, reading
4	Rocky Knoll to Heceta Head	55	36	25	39	0	2	6	7	39	Beachcombing, beach cleanup, tide pooling, remote control vehicles, Dory fishing landing
4	Lily Lake Area to Sutton Creek* (Sutton/Baker Beach RMA)	16	8	33	0	0	0	0	0	25	Horseback riding
4	Sutton Creek to Siuslaw River	259	56	41	37	0	0	4	6	47	Beachcombing, sports, photography, horseback riding, fireworks
4	Siuslaw River to Siltcoos River*	163	79	27	21	2	1	1	3	33	Vehicle, sports, beachcombing, horseback riding, family activities
4	Siltcoos River to Tahkenitch Creek* (Siltcoos/Dunes Overlook/Tahkenitch RMA)	25	8	9	52	0	1	5	2	29	Beachcombing, photography, vehicle, wildlife viewing
4	Tahkenitch Creek to Threemile Creek* (Tahkenitch South RMA)	34	7	9	25	1	11	1	3	18	Fishing from beach, vehicle, sports, birding, beachcombing
4	Threemile Creek to Umpqua River* (North Umpqua River)	8	7	30	22	0	15	0	5	20	Fishing from beach, clamming

Beach Segment	Beach Area	Avg. # People Weekend Day	Avg. # People Weekday	Reporting crowding (%)	% Walking, Other Exercise (%)	Near Shore Activities ¹ (%)	Camping (%)	Kite Flying (%)	Dog Exercising (%)	Relaxing, Scenic Enjoyment (%)	Other Listed Activities
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South Coast Region

Beach Segment 5 – Umpqua River to Blacklock Point

5	Umpqua River to Tenmile Creek* (<i>Tenmile RMA</i>)	64	39	16	36	3	3	2	10	41	Sports, driftwood fires, driftwood collections, fishing from beach, vehicle
5	Tenmile Creek to Coos Bay* (<i>Coos Bay North Spit RMA</i>)	60	38	23	16	0	0	0	4	21	Vehicle, fishing from beach, horseback riding
5	Bastendorf Beach	98	38	16	27	2	<1	2	13	51	Sports, beachcombing, driftwood collection, fishing from beach, kayaking
5	Sacchi Beach	4	4	0	This beach was not included in the Beach Survey, but is reportedly used mostly for passive activities and some local surfing. The beach has such poor access that only locals who know how to get there use the beach.						
5	Agate Beach to Five Mile Point	6	5	7	50	0	0	0	15	13	Beachcombing, driftwood fires, driftwood collection, vehicle, fishing from beach
5	Five Mile Point to Coquille River* (<i>Bullards Beach SPMA</i>)	57	54	12	43	0	3	1	10	31	Beachcombing, vehicle, fishing from beach, horseback riding, driftwood collection
5	Coquille River (Face Rock) to New River* (<i>Bandon SPMA</i>)	90	71	12	47	1	0	3	7	27	Beachcombing, horseback riding, fishing from the beach, family activities, clamming
5	New River to Blacklock Point* (<i>New River RMA</i>)	34	5	0	71	9	0	0	4	13	Horseback riding

Beach Segment 6 – Sixes River Mouth to Crissie Field Beaches

6	Sixes River Mouth* (<i>Sixes River Mouth SPMA</i>)	22	7	8	61	10	0	0	6	6	Crabbing from beach
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Beach Segment	Beach Area	Avg. # People Weekend Day	Avg. # People Weekday	Reporting crowding (%)	% Walking, Other Exercise (%)	Near Shore Activities ¹ (%)	Camping (%)	Kite Flying (%)	Dog Exercising (%)	Relaxing, Scenic Enjoyment (%)	Other Listed Activities
6	Cape Blanco to Elk River	3	4	16	61	0	0	0	3	29	Horseback riding, crabbing from beach
6	Elk River to Port Orford Head* <i>(Elk River RMA)</i>	19	14	21	75	0	0	0	0	0	Beachcombing, fishing from beach
6	Battle Rock to Humbug Mountain	12	12	15	39	7	0	2	1	42	Vehicle, beachcombing, sports, clamming, crabbing from beach
6	Devil's Backbone to Nesika Beach* <i>(Euchre Creek RMA)</i>	4	6	21	72	0	0	10	0	10	Sports
6	Otter Point to Rogue River	5	5	12	100	0	0	0	0	0	N/A
6	Rogue River to Cape Sebastian	21	15	16	46	1	0	5	0	38	Fishing from beach, driftwood collection, beachcombing
6	Cape Sebastian to Pistol River	15	9	30	21	57	0	1	1	13	Horseback riding, paragliding
6	Pistol River to Crook Point* <i>(Pistol River SPMA)</i>	3	3	14	71	0	0	0	0	29	Horseback riding, paragliding
6	Whaleshead Beach	19	8	23	53	0	0	2	1	37	Photography, rock climbing, fishing from beach
6	Harris Beach	54	52	42	25	1	0	3	1	62	Sports, fishing from beach, artistic pursuits, kayaking, birding
6	Harbor Beach	36	26	25	31	1	0	4	1	58	Fishing from beach, beachcombing, sport, photography
6	Winchuck and Crissie Fields Beaches	16	5	15	3	0	16	0	6	28	Horseback riding, fishing from beach, clamming, photography, beachcombing

Source: Shelby and Tokarczyk 2002

*Beach areas that are proposed SPMA or RMA are indicated by an asterisk and shown in bold with the name of the SPMA or RMA in parentheses.

¹Near Shore Activities include surfing, boogie boarding, and wind surfing.

²Relaxing and Scenic Enjoyment also include sand play and swimming, wading, chasing/jumping waves, and getting feet wet.

% = percent

RMA = Recreation Management Area

SPMA = Snowy Plover Management Area

Table 3.3-2 provides estimates of annual use in 2002 for the beach areas associated with SPMA's or RMA's. Visitation was estimated based on the annualized weekday and weekend day beach use volumes shown in table 3.3-1. Because this information was collected for the entire beach area, not just the proposed targeted areas, the visitation estimates are likely greater than the actual use for a specific area.

However, the estimates are intended to provide context for the relative magnitude of use in these areas. It should be noted that SPMA's and RMA's considered under all of the project alternatives were selected, in part, because the associated beach areas had relatively lower levels of attendance during the peak summer months compared to adjacent or nearby beach areas.

Table 3.3-2. Beach Use Estimates 2002

Areas Targeted for Snowy Plover Management by OPRD or Other Landowners	Beach Area	Attendance
Columbia River South Jetty Necanicum Spit	Columbia River to Necanicum River	67,808*
Nehalem Spit	Neahkanie Mountain To Nehalem River	49,972
Bay Ocean Spit	Bay Ocean Spit	16,536
Netarts Spit	Netarts River to Cape Lookout	31,096
North Sand Lake Spit	Cape Lookout to Sand Lake Spit North	8,372
South Sand Lake Spit	Sand Lake to Cape Kiwanda	24,128
Nestucca Spit	Cape Kiwanda to Nestucca River	74,880
Sutton/Baker Beach	Lily Lake Area to Sutton Creek	3,744
Siltcoos/Dunes Overlook/Tahkenitch	Siltcoos River to Tahkenitch Creek	4,680
Tahkenitch South	Tahkenitch Creek to Threemile Creek	5,356
North Umpqua River	Threemile Creek to Umpqua River	2,652
Tenmile	Umpqua River to Tenmile Creek	16,796
Coos Bay North Spit	Tenmile Creek to Coos Bay	16,120
Bullards Beach	Five Mile Point to Coquille River	19,968
Bandon/New River	Coquille River (Face Rock) to Blacklock	32,656
Sixes River Mouth	Sixes River Mouth	4,108
Elk River	Elk River to Port Orford Head	5,616
Euchre Creek	Devil's Backbone to Nesika Beach	1,976
Pistol River	Cape Sebastian to Pistol River	1,092

Source: Shelby and Tokarczyk 2002

* Note: Attendance was calculated for the entire Beach Area, which in this case, includes both the Columbia River South Jetty and Necanicum Spit SPMA's. For this reason, the attendance estimated for each SPMA is the same.

OPRD = Oregon Parks and Recreation Department

SPMA = Snowy Plover Management Area

Current Recreational Use

The majority of popular recreational activities identified in the Ocean Shore Recreational Use Study are allowed to occur unrestricted along the Oregon coast. The following provides a description of permissible recreational uses on the covered lands, and existing recreational use restrictions as applicable. The recreational use restrictions for each of these activities under existing conditions are summarized in table 3.3-3.

- **Dog Exercising** – Recreationists often exercise their dogs both on and off-leash on the Ocean Shore. Dogs are required to be on leash within all Oregon State Parks. In addition, dogs are required to be on a leash or under voice or signal command in the communities of Seaside, Rockaway, and Cannon Beach. Dog access to the beach at Siltcoos Estuary is currently prohibited during the snowy plover nesting season, and dogs must be leashed during the nesting season at several other locations along the beach (i.e., Baker/Sutton Beach, Dunes Overlook/Tahkenitch, Coos Bay North Spit, the Bandon portion of the Bandon/New River site, and Tenmile).
- **Driving** – Driving includes driving all-terrain vehicles/off-highway vehicles (ATV/OHV) and ordinary motor vehicle access on the beach. ATV/OHV riding is allowed on the beach at three locations on the coast, the Sand Lake Recreation Area and on two sections of the Dunes National Recreational Area. All other beach segments are off limits to ATV/OHV use without a drive-on beach permit.

The Ocean Shore is generally open to motor vehicle access other than ATV/OHV use, unless otherwise posted. Existing limitations to driving for sites both currently occupied and unoccupied by snowy plovers regardless of landownership are summarized in table 3.3-3. Beaches closed to driving may only be accessed with a motor vehicle permit issued by OPRD, or in the event of an emergency. Approval of drive-on beach permits and motor vehicle permits is conditioned on demonstration that such activities would avoid effects on snowy plover.

- **Kite-Flying** – Visitors to the beach often like to fly kites on both the dry and wet sand portions of the Ocean Shore. There are currently no restrictions on kite-flying.
- **Non-Motorized Vehicle Use** – Non-motorized vehicle use, which typically occurs on the wet sand portions of the beach, includes bicycling, land sailing (riding a cart with a sail attached to it), kite-buggy (riding a sit-down buggy that is steered with the feet and powered by a kite), and kite-mountain boarding (riding an all-terrain skateboard which is powered by a kite). There are currently no restrictions on non-motorized vehicle use.

- **Other Dry Sand Activities** – The public uses the dry sand portion of the Ocean Shore for a variety of recreational activities, including camping, walking, jogging, hiking, picnicking, horseback riding, beach fires, beachcombing, and driftwood collection and removal. Use of the dry sand portion of the beach is limited during the nesting season at sites currently occupied by snowy plovers, including Baker/Sutton Beach, Siltcoos Estuary, Coos Bay North Spit, the Bandon portion of the Bandon/New River site, and Tenmile. The following provides a description of the specific restrictions that apply to camping, beach fires, and horseback riding. Other dry sand activities are generally not restricted unless otherwise subject to permit requirements or as specified by restrictions for snowy plover management under the project alternatives.
 - **Camping** – Beach camping is currently allowed on the beach and dune areas next to the beaches along the Oregon coast unless otherwise specified by the State rule that disallows that use. Beach camping is prohibited on beaches adjacent to State parks and within the city limits of Seaside, Cannon Beach, Manzanita, Rockaway Beach, Lincoln City, Newport, Bandon, and Gold Beach, North Manzanita city limits to the base of Neahkanie Mountain, and from the Necanicum River to the Columbia River (Oregon Parks and Recreation Department 2007).
 - **Beach Fires** – Small recreational fires are generally allowed on the Ocean Shore as long as they are located in open, dry, sandy areas, downwind of and below beachgrass and driftwood lines and beyond 8 meters (25 feet) of a seawall constructed of wood or other combustible material. Beach fires are restricted at Bandon State Natural Area during the snowy plover season. OPRD also has the authority to restrict or prohibit such fires during high fire hazard conditions.
 - **Horseback Riding** – Horseback riding is allowed on all Oregon beaches, with the exception of those beaches located within the city limits of Rockaway, where equestrian use on the beach is prohibited by State rule. Horse concessions are operated at Nehalem Bay State Park, Pistol River State Park, and Baker/Sutton Beach.

Table 3.3-3. Recreational Use Restrictions under Existing Conditions and Each of the Project Alternatives

Recreational Use	Existing Conditions	Alternative 1 – Current Management (No Action)	Alternative 2 – Proposed HCP	Alternative 3 – Management of Additional OPRD sites
Dog Exercising	<ul style="list-style-type: none"> ▪ Dogs are required to be on leash on beaches adjacent to State Parks and on leash or under voice command within the communities of Seaside, Rockaway, and Cannon Beach. ▪ Dogs are also required to be on leash and restricted to the wet sand in areas currently occupied by nesting snowy plovers during the nesting season. This includes Sutton/Baker Beach, Tenmile, Coos Bay North Spit, Bandon, and New River. Dogs are prohibited from the Siltcoos Estuary portion of the Siltcoos/Dunes Overlook/Tahkenitch area during the nesting season. ▪ Within areas not owned or leased by OPRD, these restrictions are implemented at the request of the landowner. 	<p>General recreational use restrictions not associated with snowy plover management areas or superseded by the measures described below would continue as described under existing conditions (e.g., dogs on leash adjacent to State Parks).</p>	<p>General recreational use restrictions not associated with snowy plover management areas or superseded by the measures described below would continue as described under existing conditions (e.g., dog restrictions in the communities of Seaside).</p>	<p>General recreational use restrictions not associated with snowy plover management areas or superseded by the measures described below would continue as described under existing conditions (e.g., dog restrictions in the communities of Seaside).</p>
		<p><u>Unoccupied Areas Actively Managed for Snowy Plovers</u></p> <ul style="list-style-type: none"> ▪ OPRD would not actively manage any unoccupied areas to attract snowy plovers under Alternative 1. ▪ OPRD would not issue recreational use restrictions at locations that are not occupied by nesting snowy plovers. 	<p><u>Unoccupied Areas Actively Managed for Snowy Plovers</u></p> <ul style="list-style-type: none"> ▪ Dogs would be required to be on leash during the nesting season at sites being actively managed for nesting snowy plovers. Within SPMA's, the extent of these restrictions would be determined by the FWS-approved site management plan, but limited to the management boundary. Within RMA's, the extent of these restrictions would apply to the area within the management boundary. ▪ These restrictions would apply to the five currently unoccupied SPMA's and the six currently unoccupied RMA's prior to the sites becoming occupied. ▪ Restrictions could include symbolic fencing, signage, and enforcement to be implemented by OPRD. ▪ At the six RMA's, restrictions would be put in place at the request of the landowner. OPRD would work with the landowner to provide signs, supervision, and avenues for the landowner's enforcement authority. 	<p><u>Unoccupied Areas Actively Managed for Snowy Plovers</u></p> <ul style="list-style-type: none"> ▪ Dogs would be required to be on leash during the nesting season at sites being actively managed for nesting snowy plovers. Within SPMA's, the extent of these restrictions would be determined by the FWS-approved site management plan, but limited to the management boundary. Within RMA's, the extent of the restrictions would apply to the area within the management boundary. ▪ These restrictions would apply to the seven currently unoccupied SPMA's and the seven currently unoccupied RMA's prior to the sites becoming occupied. ▪ Restrictions could include symbolic fencing, signage, and enforcement to be implemented by OPRD. ▪ At the seven RMA's, restrictions would be put in place at the request of the landowner. OPRD would work with the landowner to provide signs, supervision, and avenues for the landowner's enforcement authority.
		<p><u>Areas Occupied by Snowy Plovers</u></p> <ul style="list-style-type: none"> ▪ Dogs would be required to be on leash and restricted to the wet sand during the nesting season in areas occupied by nesting snowy plovers. ▪ These restrictions could be applied anywhere along the Oregon coast where nesting snowy plovers appeared. Within areas not owned or leased by OPRD, these restrictions would be implemented at the request of the landowner. The nature of the restrictions and the extent of the restricted area would be developed in consultation with the FWS and the landowner. ▪ In addition to any new nesting sites, it is anticipated that these restrictions would continue to be implemented at locations currently occupied by nesting populations of snowy plover, including Sutton/Baker Beach, Tenmile, Coos Bay North Spit, Bandon, and New River. Dogs would continue to be prohibited entirely from the Siltcoos portion of the Siltcoos Estuary/Dunes Overlook/Tahkenitch area during the nesting season. 	<p><u>Areas Occupied by Snowy Plovers</u></p> <ul style="list-style-type: none"> ▪ Dogs would be prohibited from areas occupied by snowy plovers during the nesting season. ▪ These restrictions would apply at up to six SPMA's and up to 11 RMA's during the nesting season once a site became occupied. ▪ The restrictions would automatically be implemented by OPRD once a site became occupied. At SPMA's, the extent of the restricted area would be determined by FWS and the landowner, but limited to the management boundary. At the 11 RMA's, the extent of the restrictions would apply to the area within the management boundary. OPRD would work with the landowner to provide signs, supervision, and avenues for the landowner's enforcement authority. ▪ At areas not identified as an SPMA or RMA, dog exercising would be prohibited within a 50-meter radius buffer on the dry sand portion of the nesting site should the location become occupied by snowy plovers. 	<p><u>Areas Occupied by Snowy Plovers</u></p> <ul style="list-style-type: none"> ▪ Dogs would be prohibited from areas occupied by snowy plovers during the nesting season. ▪ These restrictions would apply at up to nine SPMA's and up to 12 RMA's during the nesting season once a site became occupied. ▪ The restrictions would automatically be implemented by OPRD once a site became occupied. At SPMA's, the extent of the restricted area would be determined by FWS and the landowner, but limited to the management boundary. At the 12 RMA's, the extent of the restrictions would apply to the area within the management OPRD would work with the landowner to provide signs, supervision, and avenues for the landowner's enforcement authority. ▪ At areas not identified as an SPMA or RMA, dog exercising would be prohibited within a 50-meter radius buffer on the dry sand portion of the nesting site should the location become occupied by snowy plovers.

Recreational Use	Existing Conditions	Alternative 1 – Current Management (No Action)	Alternative 2 – Proposed HCP	Alternative 3 – Management of Additional OPRD sites
Driving	<ul style="list-style-type: none"> ▪ Driving is prohibited seasonally and year-round at several locations along the coast by State Rule. ▪ These restrictions include, but are not limited to, year-round prohibitions at Necanicum, Nehalem, Bay Ocean Spit, Netarts, North Sand Lake Spit, Sutton/Baker Beach, the Siltcoos Estuary portion of Siltcoos Estuary/Dunes Overlook/Tahkenitch, Tenmile, Bandon, New River, Sixes River Mouth, Euchre Creek, and Pistol River. Driving is also currently prohibited during the nesting season at Sand Lake Spit South and Coos Bay North Spit and is unrestricted on the remainder of the Oregon coast, including Nestucca, Tahkenitch South, North Umpqua River, Bullards Beach, Elk River, and the river shore at Columbia River South Jetty. 	<p>General recreational use restrictions not associated with snowy plover management areas or superseded by the measures described below would continue as described under existing conditions.</p> <p><u>Unoccupied Areas Actively Managed for Snowy Plovers</u></p> <ul style="list-style-type: none"> ▪ OPRD would not actively manage any unoccupied areas to attract snowy plovers under Alternative 1. ▪ OPRD would not issue recreational use restrictions at locations not occupied by nesting snowy plovers. <p><u>Areas Occupied by Snowy Plovers</u></p> <ul style="list-style-type: none"> ▪ If driving restrictions were not already in place, driving would be prohibited during the nesting season at locations once they became occupied by nesting snowy plovers. ▪ These restrictions could be applied anywhere along the Oregon coast where nesting snowy plovers appeared. Within areas not owned or leased by OPRD, these restrictions would be implemented at the request of the landowner. The nature of the restrictions and the extent of the restricted area would be developed in consultation with the FWS and the landowner. ▪ Driving restrictions specified by State Rule would also continue to be implemented. This includes year-round restrictions at Sutton/Baker Beach, the Siltcoos Estuary portion of Siltcoos Estuary/Dunes Overlook/Tahkenitch, Tenmile, Bandon, and New River. Driving is also prohibited during the nesting season at Coos Bay North Spit. 	<p>General recreational use restrictions not associated with snowy plover management areas or superseded by the measures described below would continue as described under existing conditions.</p> <p><u>Unoccupied Areas Actively Managed for Snowy Plovers</u></p> <ul style="list-style-type: none"> ▪ If driving restrictions were not already in place, driving would be prohibited during the nesting season at sites being actively managed for nesting snowy plovers. Within SPMA's, the extent of these restrictions would be determined by the FWS-approved site management plan, but limited to the management boundary. Within RMAs, the extent of these restrictions would apply to the area within the management boundary. ▪ These restrictions would apply to the five currently unoccupied SPMA's and the six currently unoccupied RMA's prior to the sites becoming occupied. ▪ Restrictions could include symbolic fencing, signage, and enforcement to be implemented by OPRD. ▪ At the six RMA's, restrictions would be put in place at the request of the landowner. OPRD would work with the landowner to provide signs, supervision, and avenues for the landowner's enforcement authority. <p><u>Areas Occupied by Snowy Plovers</u></p> <ul style="list-style-type: none"> ▪ If driving restrictions were not already in place, driving would be prohibited during the nesting season at sites once they became occupied by nesting snowy plovers. ▪ These restrictions would apply to up to six SPMA's and up to 11 RMA's during the nesting season once a site became occupied. ▪ The restrictions would automatically be implemented by OPRD once a site became occupied. At SPMA's, the extent of the restricted area would be determined by FWS and the landowner, but limited to the management boundary. At the 11 RMA's, the extent of the restrictions would apply to the area within the management boundary. OPRD would work with the landowner to provide signs, supervision, and avenues for the landowner's enforcement authority. ▪ At areas not identified as an SPMA or RMA, driving would be prohibited within a 50-meter radius buffer on the dry sand portion of the nesting site should the location become occupied by snowy plovers. 	<p>General recreational use restrictions not associated with snowy plover management areas or superseded by the measures described below would continue as described under existing conditions.</p> <p><u>Unoccupied Areas Actively Managed for Snowy Plovers</u></p> <ul style="list-style-type: none"> ▪ If driving restrictions were not already in place, driving would be prohibited during the nesting season at sites being actively managed for nesting snowy plovers. Within SPMA's, the extent of these restrictions would be determined by the FWS-approved site management plan, but limited to the management boundary. Within RMAs, the extent of these restrictions would apply to the area within the management boundary. ▪ These restrictions would apply to the eight currently unoccupied SPMA's and the seven currently unoccupied RMA's prior to the sites becoming occupied. ▪ Restrictions could include symbolic fencing, signage, and enforcement to be implemented by OPRD. ▪ At the seven RMA's, restrictions would be put in place at the request of the landowner. OPRD would work with the landowner to provide signs, supervision, and avenues for the landowner's enforcement authority. <p><u>Areas Occupied by Snowy Plovers</u></p> <ul style="list-style-type: none"> ▪ If driving restrictions were not already in place, driving would be prohibited during the nesting season at sites once they became occupied by nesting snowy plovers. ▪ These restrictions would apply to up to nine SPMA's and up to 12 RMA's during the nesting season once a site became occupied. ▪ The restrictions would automatically be implemented by OPRD once a site became occupied. At SPMA's, the extent of the restricted area would be determined by FWS and the landowner, but limited to the management boundary. At the 12 RMA's, the extent of the restrictions would apply to the area within the management boundary. OPRD would work with the landowner to provide signs, supervision, and avenues for the landowner's enforcement authority. ▪ At areas not identified as an SPMA or RMA, driving would be prohibited within a 50-meter radius buffer on the dry sand portion of the nesting site should the location become occupied by snowy plovers.

Recreational Use	Existing Conditions	Alternative 1 – Current Management (No Action)	Alternative 2 – Proposed HCP	Alternative 3 – Management of Additional OPRD sites
Non-Motorized Vehicles	Use of non-motorized vehicles is unrestricted.	<p>General recreational use restrictions not associated with snowy plover management areas or superseded by the measures described below would continue as described under existing conditions.</p>	<p>General recreational use restrictions not associated with snowy plover management areas or superseded by the measures described below would continue as described under existing conditions.</p>	<p>General recreational use restrictions not associated with snowy plover management areas or superseded by the measures described below would continue as described under existing conditions.</p>
		<p><u>Unoccupied Areas Actively Managed for Snowy Plovers</u></p>	<p><u>Unoccupied Areas Actively Managed for Snowy Plovers</u></p>	<p><u>Unoccupied Areas Actively Managed for Snowy Plovers</u></p>
		<ul style="list-style-type: none"> ▪ OPRD would not actively manage any unoccupied areas to attract snowy plovers under Alternative 1. ▪ OPRD would not issue recreational use restrictions at locations not occupied by nesting snowy plovers. 	<ul style="list-style-type: none"> ▪ Use of non-motorized vehicles would be prohibited during the nesting season at sites being actively managed for nesting snowy plovers. Within SPMA's, the extent of these restrictions would be determined by the FWS-approved site management plan, but limited to the management boundary. Within RMA's, the extent of these restrictions would apply to the area within the management boundary. ▪ These restrictions would apply to the five currently unoccupied SPMA's and the six currently unoccupied RMA's prior to the sites becoming occupied. ▪ Restrictions could include symbolic fencing, signage, and enforcement to be implemented by OPRD. ▪ At the six RMA's, restrictions would be put in place at the request of the landowner. OPRD would work with the landowner to provide signs, supervision, and avenues for the landowner's enforcement authority. 	<ul style="list-style-type: none"> ▪ Use of non-motorized vehicles would be prohibited during the nesting season at sites being actively managed for nesting snowy plovers. Within SPMA's, the extent of these restrictions would be determined by the FWS-approved site management plan, but limited to the management boundary. Within RMA's, the extent of these restrictions would apply to the area within the management boundary. ▪ These restrictions would apply to the five currently unoccupied SPMA's and the six currently unoccupied RMA's prior to the sites becoming occupied. ▪ Restrictions could include symbolic fencing, signage, and enforcement to be implemented by OPRD. ▪ At the six RMA's, restrictions would be put in place at the request of the landowner. OPRD would work with the landowner to provide signs, supervision, and avenues for the landowner's enforcement authority.
		<p><u>Areas Occupied by Snowy Plovers</u></p>	<p><u>Areas Occupied by Snowy Plovers</u></p>	<p><u>Areas Occupied by Snowy Plovers</u></p>
		<ul style="list-style-type: none"> ▪ Use of non-motorized vehicles would be prohibited during the nesting season once a site became occupied by nesting snowy plovers. ▪ These restrictions could be applied anywhere along the Oregon coast where nesting snowy plovers appeared. Within areas not owned or leased by OPRD, these restrictions would be implemented at the request of the landowner. The nature of the restrictions and the extent of the restricted area would be developed in consultation with the FWS and the landowner. ▪ In addition to any new nesting sites, it is anticipated that these restrictions would be implemented at locations currently occupied by nesting snowy plovers, including Sutton/Baker Beach, the Siltcoos portion of the Siltcoos Estuary/Dunes Overlook/Tahkenitch, Tenmile, Coos Bay North Spit, Bandon, and New River. 	<ul style="list-style-type: none"> ▪ Use of non-motorized vehicles would be prohibited from areas occupied by snowy plovers during the nesting season. ▪ These restrictions would apply at up to the six SPMA's and up to 11 RMA's during the nesting season once a site became occupied. ▪ The restrictions would automatically be implemented by OPRD once a site became occupied. At SPMA's, the extent of the restricted area would be determined by FWS and the landowner, but limited to the management boundary. At the 11 RMA's, the extent of the restrictions would apply to the area within the management boundary. OPRD would work with the landowner to provide signs, supervision, and avenues for the landowner's enforcement authority. ▪ At areas not identified as an SPMA or RMA, non-motorized vehicle use would be prohibited within a 50-meter radius buffer on the dry sand portion of the nesting site should the location become occupied by snowy plovers. 	<ul style="list-style-type: none"> ▪ Use of non-motorized vehicles would be prohibited from areas occupied by snowy plovers during the nesting season. ▪ These restrictions would apply at up to nine SPMA's and up to 12 RMA's during the nesting season once a site became occupied. ▪ The restrictions would automatically be implemented by OPRD once a site became occupied. At SPMA's, the extent of the restricted area would be determined by FWS and the landowner, but limited to the management boundary. At the 12 RMA's, the extent of the restrictions would apply to the area within the management boundary. OPRD would work with the landowner to provide signs, supervision, and avenues for the landowner's enforcement authority. ▪ At areas not identified as an SPMA or RMA, non-motorized vehicle use would be prohibited within a 50-meter radius buffer on the dry sand portion of the nesting site should the location become occupied by snowy plovers.
Kite flying	Kite flying is unrestricted.	<p>General recreational use restrictions not associated with snowy plover management areas or superseded by the measures described below would continue as described under existing conditions (e.g., dogs on leash adjacent to State Parks).</p>	<p>General recreational use restrictions not associated with snowy plover management areas or superseded by the measures described below would continue as described under existing conditions.</p>	<p>General recreational use restrictions not associated with snowy plover management areas or superseded by the measures described below would continue as described under existing.</p>
		<p><u>Unoccupied Areas Actively Managed for Snowy Plovers</u></p>	<p><u>Unoccupied Areas Actively Managed for Snowy Plovers</u></p>	<p><u>Unoccupied Areas Actively Managed for Snowy Plovers</u></p>
		<ul style="list-style-type: none"> ▪ OPRD would not actively manage any unoccupied areas for active snowy plover management under Alternative 1. ▪ OPRD would not issue recreational use restrictions at locations not occupied by nesting snowy plovers. 	<ul style="list-style-type: none"> ▪ Kite flying would be allowed at sites targeted for active management of snowy plovers. 	<ul style="list-style-type: none"> ▪ Kite flying would be allowed at sites targeted for active management of snowy plovers.

Recreational Use	Existing Conditions	Alternative 1 – Current Management (No Action)	Alternative 2 – Proposed HCP	Alternative 3 – Management of Additional OPRD sites
		<p><u>Areas Occupied by Snowy Plovers</u></p> <ul style="list-style-type: none"> There would be no restrictions on kite flying at sites occupied by nesting snowy plovers under Alternative 1. 	<p><u>Areas Occupied by Snowy Plovers</u></p> <ul style="list-style-type: none"> Kite flying would be prohibited from areas occupied by snowy plovers during the nesting season. These restrictions would apply at up to six SPMA's and up to 11 RMA's during the nesting season once a site became occupied. The restrictions would automatically be implemented by OPRD once a site became occupied. At SPMA's, the extent of the restricted area would be determined by FWS and the landowner, but limited to the management boundary. At the 11 RMA's, the extent of the restrictions would apply to the area within the management boundary. OPRD would work with the landowner to provide signs, supervision, and avenues for the landowner's enforcement authority. At areas not identified as an SPMA or RMA, kite flying would be prohibited within a 50-meter radius buffer on the dry sand portion of the nesting site should the location become occupied by snowy plovers. 	<p><u>Areas Occupied by Snowy Plovers</u></p> <ul style="list-style-type: none"> Kite flying would be prohibited from areas occupied by snowy plovers during the nesting season. These restrictions would apply at up to nine SPMA's and up to 12 RMA's during the nesting season once a site became occupied. The restrictions would automatically be implemented by OPRD once a site became occupied. At the SPMA's, the extent of the restricted area would be determined by FWS and the landowner, but limited to the management boundary. At the 12 RMA's, the extent of the restrictions would apply to the area within the management boundary. OPRD would work with the landowner to provide signs, supervision, and avenues for the landowner's enforcement authority. At areas not identified as an SPMA or RMA, kite flying would be prohibited within a 50-meter radius buffer on the dry sand portion of the nesting site should the location become occupied by snowy plovers.
Other Dry Sand Activities	<ul style="list-style-type: none"> Recreation use of certain areas of the dry sand surrounding nesting locations is restricted as indicated by signage and roping. These restrictions apply to Sutton/Baker Beach, the Siltcoos Estuary portion of Siltcoos Estuary/Dunes Overlook/Tahkenitch, Tenmile, Coos Bay North Spit, Bandon, and New River. 	General recreational use restrictions not associated with snowy plover management areas or superseded by the measures described below would continue as described under existing conditions (e.g., dogs on leash adjacent to State Parks).	General recreational use restrictions not associated with snowy plover management areas or superseded by the measures described below would continue as described under existing conditions.	General recreational use restrictions not associated with snowy plover management areas or superseded by the measures described below would continue as described under existing conditions.
		<p><u>Unoccupied Areas Actively Managed for Snowy Plovers</u></p> <ul style="list-style-type: none"> OPRD would not actively manage any unoccupied areas to attract snowy plovers under Alternative 1. OPRD would not issue recreational use restrictions at locations not occupied by nesting snowy plovers. 	<p><u>Unoccupied Areas Actively Managed for Snowy Plovers</u></p> <ul style="list-style-type: none"> Use of the dry sand would not be prohibited at sites targeted for active management of snowy plovers. 	<p><u>Unoccupied Areas Actively Managed for Snowy Plovers</u></p> <ul style="list-style-type: none"> Use of the dry sand would not be prohibited at sites targeted for active management of snowy plovers.
		<p><u>Areas Occupied by Snowy Plovers</u></p> <ul style="list-style-type: none"> Use of certain areas of the dry sand surrounding an occupied nesting site would be prohibited during the nesting season. These restrictions could be applied anywhere along the Oregon coast where nesting snowy plovers appeared. Within areas not owned or leased by OPRD, these restrictions would be implemented at the request of the landowner. The nature of the restrictions and the extent of the restricted area would be developed in consultation with the FWS and the landowner. In addition to new nesting sites, it is anticipated that these restrictions would continue to be implemented at Sutton/Baker Beach, the Siltcoos Estuary portion of Siltcoos Estuary/Dunes Overlook Tahkenitch, Tenmile, Coos Bay North Spit, Bandon, and New River. 	<p><u>Areas Occupied by Snowy Plovers</u></p> <ul style="list-style-type: none"> Use of certain areas of the dry sand surrounding an occupied nesting site would be prohibited during the nesting season. These restrictions would apply at up to six SPMA's and up to 11 RMA's during the nesting season once a site became occupied. The restrictions would automatically be implemented by OPRD once a site became occupied. At the SPMA's, the extent of the restricted area would be determined by FWS and the landowner, but limited to the management boundary. At the 11 RMA's, the extent of the restrictions would apply to the area within the management boundary. OPRD would work with the landowner to provide signs, supervision, and avenues for the landowner's enforcement authority. At areas not identified as an SPMA or RMA, use of certain areas of the dry sand would be prohibited within a 50-meter radius buffer of the site location should the location become occupied by snowy plovers. 	<p><u>Areas Occupied by Snowy Plovers</u></p> <ul style="list-style-type: none"> Use of certain areas of the dry sand surrounding an occupied nesting site would be prohibited during the nesting season. These restrictions would apply at up to nine SPMA's and up to 12 RMA's during the nesting season once a site became occupied. The restrictions would automatically be implemented by OPRD once a site became occupied. At the SPMA's, the extent of the restricted area would be determined by FWS and the landowner, but limited to the management boundary. At the 12 RMA's, the extent of the restrictions would apply to the area within the management boundary. OPRD would work with the landowner to provide signs, supervision, and avenues for the landowner's enforcement authority. At areas not identified as an SPMA or RMA, use of certain areas of the dry sand would be prohibited within a 50-meter radius buffer of the nesting site should the location become occupied by snowy plovers.

Source: Schutt pers. comm., Oregon Parks and Recreation Department 2007.
FWS = Fish and Wildlife Service
OPRD = Oregon Parks and Recreation Department
RMA = Recreation Management Area
SPMA = Snowy Plover Management Area

3.3.4 Environmental Consequences

Under all of the project alternatives, recreational use restrictions for the protection of snowy plovers have the potential to affect recreational opportunities in the study area. The location and extent of these restrictions would differ depending on the project alternative and whether the site was being actively managed to attract snowy plovers or it was currently occupied by nesting snowy plovers. Although the extent of the restrictions at SPMA's would be developed in consultation with the FWS and ODFW and documented in the site management plan, to be conservative for the purposes of this analysis, it is assumed that the restricted area would include the full extent of the SPMA boundary.

Potential recreational use restrictions on the covered lands could include restrictions on dog exercising, driving, non-motorized vehicle use, kite flying, or other dry sand activities. These restrictions would differ between all the alternatives, as summarized in table 3.3-3 and discussed in detail below. These restrictions would apply primarily to the dry sand portion of the beach, with the exception of implementing restrictions on certain portions of the wet sand. Activities that would not normally occur on the wet sand, such as beach camping, picnicking, beach fires, etc. would be allowed to continue in compliance with existing conditions outside of the restricted dry sand areas, but would effectively not occur on the wet sand.

Some of the natural resource management activities, such as habitat maintenance, predator management, snowy plover monitoring, and public outreach and education, are not expected to result in effects on recreation. This is because these activities are compatible with recreational use, would occur infrequently, and would occur at relatively isolated locations.

Alternative 1 – No Action (Current Management)

Potential Effects on Recreational Use Opportunities at Unoccupied Areas Actively Managed for Snowy Plovers

Under Alternative 1, OPRD would not actively manage any unoccupied locations to attract nesting populations of snowy plovers. In addition, OPRD would not issue recreational use restrictions at sites not occupied by nesting snowy plovers. The general recreational use restrictions described above under Affected Environment and summarized in table 3.3-3 under existing conditions, would continue to be implemented.

Potential Effects on Recreational Use Opportunities at Sites Occupied by Snowy Plover

Under Alternative 1, once a location is occupied by nesting snowy plovers, the recreational use restrictions listed in table 3.3-3 would be implemented during the snowy plover nesting season. On lands not owned or leased by OPRD, restrictions

would only be implemented at the request of the landowner. The extent of the restricted area and the degree of the restrictions would be determined in consultation with the FWS. For the purposes of this analysis, it is assumed that the restrictions would include prohibitions on driving and non-motorized vehicle use; requirements that dogs be on leash and restricted to the wet sand portion of the beach; and prohibitions on recreational use at portions of the dry sand area surrounding a nest site as indicated by roping and signage.

These restrictions could be implemented anywhere along the Oregon coast that nesting snowy plovers were observed. These restrictions would be implemented automatically on lands owned or leased by OPRD and at the request of the landowner on all other lands. For the purposes of this analysis, it is anticipated that in addition to any new nesting location, snowy plover protections would continue to be implemented at the six currently occupied locations, including Sutton/Baker Beach, the Siltcoos Estuary portion of Siltcoos Estuary/Dunes Overlook/Tahkenitch Estuary, Coos Bay North Spit, Tenmile Estuary, Bandon, and New River.

Some recreational use restrictions are currently in place either because certain beach areas already have nesting populations of snowy plovers or because of existing recreational restrictions unrelated to snowy plover protections. The current recreational use restrictions are listed in table 3.3-3 under existing conditions. With respect to the six currently occupied sites, dogs are already required to be on leash and are prohibited entirely from the Siltcoos Estuary during the snowy plover nesting season. Driving is also already prohibited at all of these locations either year-round or during the nesting season and the use of certain portions of the dry sand at each of these areas is also prohibited during the nesting season as indicated by roping and signage. For each of these recreational activities, there would be no difference in recreational use restrictions at the six occupied sites under Alternative 1 when compared with existing conditions.

In addition to the existing recreational use restrictions, OPRD is planning to prohibit non-motorized vehicle use at currently occupied sites under Alternative 1. Prohibition of non-motorized vehicle use would be more restrictive under Alternative 1 since there are currently no restrictions in place for this activity. As noted in table 3.3-4, there are substitute locations at all six of the currently occupied sites where non-motorized vehicle use could take place unrestricted.

In spite of the fact that the effect of these restrictions would be minimal at the six currently occupied sites, there is a potential for these restrictions to be implemented at any other location along the Oregon coast where a nesting snowy plover may appear. Although some of these locations may already have restrictions on certain recreational activities (e.g., dogs must be on leash on beaches adjacent to State Parks and driving is prohibited at certain locations by State Rule), other beach areas may not have any restrictions. Therefore, there is a potential for implementation of

Alternative 1 to affect recreational activities at other locations where nesting plovers may appear.

Table 3.3-4. Alternate Locations for Activities Restricted Under Alternative 1 at Sites Occupied by Snowy Plovers

Location	Non-Motorized Vehicle Use
Sutton/Baker Beach	Non-motorized vehicle use would be allowed to continue to the north from the Heceta Head Lighthouse access point and to the south from existing access points north of Florence.
Siltcoos/Dunes Overlook/Tahkenitch	Non-motorized vehicle use would be allowed to continue on the beach immediately to the north from the existing Siltcoos access point and in the area to the south from the Three Mile Creek access point.
Tenmile	Non-motorized vehicle use would be allowed to continue to the north from the Dunes National Recreation Area access point and to the south from the Sider Tree access point.
Coos Bay North Spit	Non-motorized vehicle use would be allowed to continue to the north from the Horsefall access point.
Bandon	Non-motorized vehicle use would be allowed to continue on the beach immediately north from existing China Creek access point and south from the Lower Four Mile Road access, if the New River RMA is not occupied by nesting snowy plovers.
New River	Non-motorized vehicle use would be allowed to continue on the beach immediately north from existing China Creek access point and at Floras Lake.

RMA = Recreation Management Area

Alternative 2 – Proposed HCP

Potential Effects on Recreational Use Opportunities at Unoccupied Areas Actively Managed for Snowy Plovers

Under Alternative 2, if an SPMA becomes actively managed to attract nesting populations of snowy plovers (after completion of a FWS-approved site management plan), OPRD would implement the recreational use restrictions described in table 3.3-3 during the nesting season. At RMAs (locations not owned or leased by OPRD), these restrictions would be implemented at the request of the landowner and would apply to the area within the management boundary. The restrictions that would be implemented include requiring dogs to be on leash, restricting non-motorized vehicle use, and prohibiting driving during the nesting season.

These restrictions would only be implemented at the five currently unoccupied SPMAs and the six currently unoccupied RMAs over the term of the 25-year ITP, as described in section 2.3.2, “Alternative 2 – Proposed HCP.” The SPMAs targeted by OPRD under Alternative 2 would be located at Columbia River South Jetty (figure 1-3), Necanicum Spit (figure 1-4), Nehalem Spit (figure 1-5), Netarts Spit (figure 1-6),

and Pistol River (figure 1-11). The RMAs would be located at Bay Ocean Spit, South Sand Lake Spit, Tahkenitch South, Umpqua River North Jetty, Elk River Spit, and Euchre Creek. The location of the RMAs are shown in Appendix A of this DEIS.

Because OPRD would not target any areas for active snowy plover management or issue recreational use restrictions at sites not occupied by snowy plovers under Alternative 1, implementation of Alternative 2 would result in more prohibitive recreation use restrictions. The key differences between the two alternatives would occur at locations where dogs, driving, and non-motorized vehicle use are not already restricted. Dogs are already required to be on leash at all five currently unoccupied SPMA's and driving is already prohibited during the snowy plover nesting season at four of the five currently unoccupied SPMA's, with the exception of Columbia River South Jetty. Dogs are not currently required to be on leash at any of the six currently unoccupied RMAs, and driving is unrestricted at Tahkenitch South, North Umpqua River, and Elk River. Table 3.3-5 lists the alternate beach areas where dog exercising and driving could occur unrestricted for these locations. Non-motorized vehicle use would be more prohibitive than Alternative 1 for all locations. This is because no restrictions are proposed for non-motorized vehicle use under Alternative 1 at unoccupied sites.

Table 3.3-5. Alternate Locations for Activities Restricted Under Alternative 2 at Unoccupied Sites Targeted for Snowy Plover Management

Location	Dog Exercising	Driving	Non-Motorized Vehicle Use
SPMA's			
Columbia River South Jetty	There would be no difference compared with Alternative 1. Dogs are required to be on leash in areas adjacent to State lands.	Driving could occur unrestricted on the Ocean Shore to the south of the Peter Iredale access point.	Non-motorized vehicle use would be allowed to continue to the south of the northernmost State Park access point on the Ocean Shore and to the east of the SPMA on the river shore.
Necanicum Spit	There would be no difference compared with Alternative 1. Dogs are required to be on leash in areas adjacent to State Parks.	There would be no difference compared with Alternative 1. Driving is already prohibited at this location by State Rule.	Non-motorized vehicle use could occur on the Ocean Shore to the north of the proposed SPMA from the Gearhart Beach Access Ramp (10th Street).
Nehalem Spit	There would be no difference compared with Alternative 1. Dogs are required to be on leash in areas adjacent to State Parks.	There would be no difference compared with Alternative 1. Driving is already prohibited at this location by State Rule.	Non-motorized vehicle use could occur on the Ocean Shore to the north from the existing access points within the State Park, and to the south of the SPMA across from the Nehalem River. Land-sailing would be allowed to continue to the south, on the other side of the Nehalem River.

Location	Dog Exercising	Driving	Non-Motorized Vehicle Use
Netarts Spit	There would be no difference compared with Alternative 1. Dogs are required to be on leash in areas adjacent to State Parks.	There would be no difference compared with Alternative 1. Driving is already prohibited at this location by State Rule.	Non-motorized vehicle use could occur on the Ocean Shore to the south of the SPMA, accessible from the existing State Park access. The area to the north would continue to be accessible from the Happy Camp access point.
Pistol River	There would be no difference compared with Alternative 1. Dogs are required to be on leash in areas adjacent to State Parks.	There would be no difference compared with Alternative 1. Driving is already prohibited at this location by State Rule.	Non-motorized vehicle use could occur on the Ocean Shore immediately adjacent to the north of the SPMA.
RMA s			
Bay Ocean Spit	Dogs could be exercised off-leash in the area adjacent to the existing access points to the south of the RMA along the full length of the beach.	There would be no difference compared with Alternative 1. Driving is already prohibited at this location by State Rule.	Non-motorized vehicle use could occur on the Ocean Shore would be allowed to continue in the area adjacent to the existing access points to the south of the RMA along the full length of the beach.
South Sand Lake Spit	Dogs could be exercised off-leash to the south from the Tierra Del Mar access points.	There would be no difference compared with Alternative 1. Driving is already prohibited seasonally at this location by State Rule.	Non-motorized vehicle use could occur on the Ocean Shore to south from the Tierra Del Mar access points.
Tahkenitch South	Dogs could be exercised off-leash to the south from the Three Mile Creek access point.	Driving would be allowed to occur unrestricted to the south from the Three Mile Creek access point.	Non-motorized vehicle use would be allowed to occur unrestricted in the area to the south from the Three Mile Creek access point.
North Umpqua River	Dogs could be exercised off-leash on the beach immediately north of the RMA reached from the existing access point at Three Mile Creek.	Driving could occur unrestricted north of the RMA reached from the existing access point at Three Mile Creek.	Non-motorized vehicle use would be allowed to continue to the north of the RMA, which is closer in proximity to the existing access point at Three Mile Creek and on the beach south of the Umpqua River.
Elk River	Dogs could be exercised off-leash on the beach immediately adjacent to the north from the existing Cape Blanco State Park access and to the south from the Paradise Point access point.	Driving could occur unrestricted north of the RMA from the Cape Blanco State Park Access and could occur to the south from the Paradise Point access.	Non-motorized vehicle use would be allowed to continue to the north immediately adjacent to the north from the Cape Blanco State Park access and to the south from the Paradise Point access point.
Euchre River	Dogs could be exercised off-leash on the beach immediately to the south of the potentially restricted area from the existing Ophir Wayside access point.	There would be no difference compared with Alternative 1. Driving is already prohibited at this location by State Rule.	Non-motorized vehicle use could occur on the Ocean Shore to the south at the Ophir access point.

RMA = Recreation Management Area

SPMA = Snowy Plover Management Area

Although these restrictions would limit some recreational opportunities in these areas relative to Alternative 1, the potential effects would likely be minimal. The locations of the SPMA and RMA were specifically selected to minimize potential effects on recreation based on recreational use survey data (Shelby and Tokarczyk 2002). Compared to other more frequently used areas of the beach, the areas selected for snowy plover management are considered low-density use areas where the heaviest concentration of use occurs outside of the proposed management boundary. As indicated in table 3.3-5, there would be multiple locations in proximity to these areas where recreational activities would be allowed to continue unrestricted. As a result, the potential effects on recreational opportunities at these areas are expected to be minimal under Alternative 2, but greater than Alternative 1 at unoccupied sites.

Potential Effects on Recreational Use Opportunities at Areas Occupied by Snowy Plovers

Under Alternative 2, if a site becomes occupied by nesting populations of snowy plovers, OPRD would automatically implement the restrictions summarized in table 3.3-3. These restrictions would be applied at up to six SPMA and up to 11 RMA during the nesting season over the course of the 25-year ITP as described in section 2.3.2, “Alternative 2 – Proposed HCP.” The SPMA and RMA where restrictions would take place would include all of the unoccupied areas noted above, as well as the Bandon SPMA (figure 1-9) and the RMA located at Sutton/Baker Beach, Siltcoos Estuary/Dunes Overlook/Tahkenitch, Tenmile, Coos Bay North Spit, and New River (Appendix A).

The extent of the restricted area would be limited to the area within the management boundary. At the 11 RMA, OPRD would work with the landowner to provide signs, supervision, and avenues for the landowner’s enforcement authority. In areas not identified as an SPMA or RMA, the restrictions would be implemented within a set 50-meter radius buffer on the dry sand portion of the nesting location.

Under Alternative 2, at occupied sites, dog exercising, driving, non-motorized vehicle use, and kite flying would be prohibited during the nesting season. In addition, use of a portion of the dry sand area surrounding a nesting site would also be prohibited.

The dog exercising restrictions proposed under Alternative 2 would be more prohibitive than Alternative 1 for all six of the SPMA and 10 of the 11 RMA. This is because under Alternative 1, dogs are already prohibited at Siltcoos Estuary RMA, but are only required to be on leash at the other currently occupied areas during the nesting season. Under Alternative 2, dogs would be prohibited entirely during the nesting season at all occupied sites. Similarly, kite flying restrictions under Alternative 2 would be more prohibitive than Alternative 1 for all locations. This is because no kite flying restrictions are proposed under Alternative 1 at occupied sites.

Restrictions on driving, non-motorized vehicle use, and use of the dry sand area surrounding a nesting site would be similar under Alternative 2 compared to Alternative 1 because these activities would be prohibited during the nesting season under both alternatives. However, there are subtle differences between the two alternatives. Under Alternative 1, the nature and extent of these restrictions would be determined on a case-by-case basis with the FWS and could be applied to any location along the Oregon coast. Under Alternative 2, the full extent of these restrictions would be implemented automatically at the six SPMAs and 11 RMAs only. Table 3.3-6 summarizes the alternate locations where the potentially affected recreational activities could occur unrestricted.

Although the proposed restrictions have the potential to further limit recreational opportunities relative to Alternative 1, the potential effects on recreational use under Alternative 2 would likely be minimal because of the availability of substitute locations where these activities could be unrestricted (table 3.3-6). In addition, the locations of the targeted areas were selected because they supported lower recreational use relative to the surrounding beach areas. For these reasons, the potential effects on recreational opportunities at these six SPMAs and 11 RMAs are expected to be minimal, but slightly greater than Alternative 1.

At locations outside of the SPMAs or RMAs, the potential recreational restrictions would be limited to lands owned or leased by OPRD and to an area within a 50-meter radius buffer on the dry sand portion of the nesting location. These restrictions would include prohibiting use of the dry sand within the buffer area, as determined by the FWS. Under Alternative 1, the nature and extent of the restrictions would be determined in consultation with the FWS on a case-by-case basis and could have the potential to be more restrictive and affect a larger area. Therefore, implementation of Alternative 2 is anticipated to have less of an effect than Alternative 1 on recreational opportunities for areas outside the SPMAs and RMAs.

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Table 3.3-6. Alternate Locations for Activities Restricted under Alternative 2 at Occupied Actively Managed SPMA and RMAs

Location	Dog Exercising	Kite Flying	Driving and Non-Motorized Vehicle Use	Other Dry Sand Activities
SPMAs				
Columbia River South Jetty	Dog exercising could occur on the Ocean Shore to the south of the SPMA from the northern most Fort Stevens State Park access point and to the east of the SPMA along the river shore. Dogs would continue to be required to be on leash in areas adjacent to State lands.	Unrestricted kite flying would be allowed on the Ocean Shore south from the northernmost State Park access point and to the east of the SPMA Ocean Shore along the river shore.	The restrictions proposed under Alternative 2 would be the same as those proposed under Alternative 1 with the exception that the nature of the restrictions and the size of restricted area could potentially be greater under Alternative 2 at this location. Driving would be allowed to continue year-round on the Ocean Shore south of the Peter Iredale Fort Stevens State Park access. Non-motorized vehicle use would be allowed to continue to the south of the northernmost State Park access point on the Ocean Shore and to the east of the SPMA on the river shore.	The restrictions proposed under Alternative 2 would be the same as those proposed under Alternative 1 with the exception that the nature of the restrictions and the size of restricted area could potentially be greater under Alternative 2 at this location. To the extent possible, dry sand activities would be allowed to continue on the wet sand portion of the Ocean Shore. Access to the wet sand would remain open. Unrestricted use of the dry sand would be allowed on the Ocean Shore from the northernmost State Park access point.
Necanicum Spit	Dog exercising could occur in the area to the north of the proposed SPMA from the Gearhart Beach Access Ramp (10th Street). Dogs would continue to be required to be on leash in areas adjacent to State lands.	Kite flying would be allowed to continue on the Ocean Shore to the north of the proposed SPMA from the Gearhart Beach Access Ramp (10th Street).	Driving is already prohibited year-round by State Rule at this location. Non-motorized vehicle use could occur on the Ocean Shore to the north of the proposed SPMA from the Gearhart Beach Access Ramp (10th Street).	The restrictions proposed under Alternative 2 would be the same as those proposed under Alternative 1 with the exception that the nature of the restrictions and the size of restricted area could potentially be greater under Alternative 2 at this location. To the extent possible, dry sand activities would be allowed to continue on the wet sand portion of the Ocean Shore. Access to the wet sand would remain open. Unrestricted use of the dry sand would be allowed to continue north of the Gearhart Beach Access Ramp (10th Street), approximately 1.6 kilometers (1 mile) north of the potentially restricted area.
Nehalem Spit	Dog exercising could occur in the area to the north from the existing access points within the State Park and to the south of the SPMA across the Nehalem River. Dogs would continue to be required to be on leash in areas adjacent to State lands.	Unrestricted kite flying would be allowed to the north from the existing access points within the State Park, and to the south of the SPMA across the Nehalem River.	Driving is already prohibited year-round by State Rule at this location. Non-motorized vehicle use could occur on the Ocean Shore to the north from the existing access points within the State Park, and to the south of the SPMA across the Nehalem River. Land-sailing would be allowed to continue to the south, on the other side of the Nehalem River.	The restrictions proposed under Alternative 2 would be the same as those proposed under Alternative 1 with the exception that the nature of the restrictions and the size of restricted area could potentially be greater under Alternative 2 at this location. To the extent possible, dry sand activities would be allowed to continue on the wet sand portion of the Ocean Shore. Access to the wet sand would remain open. Unrestricted use of the dry sand would be allowed to continue to the north from the existing access points within the State Park and to the south across the Nehalem River.
Netarts Spit	Dog exercising could occur on the beach to the south of the SPMA, which is accessible from the existing State Park access. The area to the north would continue to be accessible from the Happy Camp access point. Dogs would continue to be required to be on leash in areas adjacent to State lands.	Unrestricted kite flying would be allowed on the beach to the south of the SPMA, accessible from the existing State Park access. The area to the north would continue to be accessible from the Happy Camp access point.	Driving is already prohibited year-round by State Rule at this location. Non-motorized vehicle use could occur on the Ocean Shore to the south of the SPMA, accessible from the existing State Park access. The area to the north would continue to be accessible from the Happy Camp access point.	The restrictions proposed under Alternative 2 would be the same as those proposed under Alternative 1 with the exception that the nature of the restrictions and the size of restricted area could potentially be greater under Alternative 2 at this location. To the extent possible, dry sand activities would be allowed to continue on the wet sand portion of the Ocean Shore. Access to the wet sand would remain open. Unrestricted use of the dry sand would be allowed to continue south of the potentially restricted area, which is accessible from the existing State Park access. The area to the north would continue to be accessible from the Happy Camp access point.

Location	Dog Exercising	Kite Flying	Driving and Non-Motorized Vehicle Use	Other Dry Sand Activities
Bandon*	Dog exercising would be allowed to the north on the beach immediately adjacent to the SPMA from the exiting China Creek beach access and south from Lower Fourmile Road as long as the New River RMA is not occupied. Dogs would continue to be required to be on leash in areas adjacent to State lands.	Unrestricted kite flying would be allowed immediately to the north of the SPMA from the existing China Creek Access and south from the Lower Four Mile Road access, as long as the New River portion of this site was not occupied by nesting snowy plovers.	Driving is already prohibited year-round by State Rule at this location. Non-motorized vehicle use could occur on the Ocean Shore immediately to the north of the SPMA from the existing China Creek Access and south from the Lower Four Mile Road access, as long as New River is not occupied by nesting snowy plovers.	This location is already actively managed for snowy plovers, which includes restricting use of the dry sand. There is no difference between Alternatives 1 and 2 at this location.
Pistol River	Dog exercising would be allowed on the beach immediately adjacent to the SPMA to the north. Dogs would continue to be required to be on leash in areas adjacent to State lands.	Unrestricted kite flying would be allowed on the beach immediately adjacent to the north of the SPMA.	Driving is already prohibited year-round by State Rule at this location. Non-motorized vehicle use could occur on the Ocean Shore immediately adjacent to the north of the SPMA.	The restrictions proposed under Alternative 2 would be the same as those proposed under Alternative 1 with the exception that the nature of the restrictions and the size of restricted area could potentially be greater under Alternative 2 at this location. To the extent possible, dry sand activities would be allowed to continue on the wet sand portion of the Ocean Shore. Access to the wet sand would remain open. Unrestricted use of the dry sand would be allowed to continue from the existing access points on the beach immediately adjacent to the north.
RMA's				
Bay Ocean Spit	Dog exercising could occur in the area adjacent to the existing access points to the south of the RMA along the full length of the beach.	Unrestricted kite flying would be allowed in the area adjacent to the existing access points to the south of the RMA along the full length of the beach.	Driving is already prohibited year-round by State Rule at this location. Non-motorized vehicle use could occur on the Ocean Shore would be allowed to continue in the area adjacent to the existing access points to the south of the RMA along the full length of the beach.	The restrictions proposed under Alternative 2 would be the same as those proposed under Alternative 1 with the exception that the nature of the restrictions and the size of restricted area could potentially be greater under Alternative 2 at this location. To the extent possible, dry sand activities would be allowed to continue on the wet sand portion of the Ocean Shore. Access to the wet sand would remain open. Unrestricted use of the dry sand would be allowed to continue in the area adjacent to the existing access points to the south of the RMA along the full length of the beach.
South Sand Lake Spit	Dog exercising could occur to the south from the Tierra Del Mar access points.	Unrestricted kite flying would be allowed to the south from the Tierra Del Mar access points.	Driving is already prohibited during the nesting season by State Rule at this location. Non-motorized vehicle use could occur on the Ocean Shore to the south from the Tierra Del Mar access points.	The restrictions proposed under Alternative 2 would be the same as those proposed under Alternative 1 with the exception that the nature of the restrictions and the size of restricted area could potentially be greater under Alternative 2 at this location. To the extent possible, dry sand activities would be allowed to continue on the wet sand portion of the Ocean Shore. Access to the wet sand would remain open. Unrestricted use of the dry sand would be allowed to continue to the south from the Tierra Del Mar access points.
Sutton/Baker Beach*	Dog exercising could occur from the Heceta Head Lighthouse access point to the north and to the south from the existing access points north of Florence.	Unrestricted kite flying would be allowed from the Heceta Head Lighthouse access point to the north and to the south from the existing access points north of Florence.	Driving is already prohibited year-round by State Rule at this location. Non-motorized vehicle use could occur on the Ocean Shore to the north from the Heceta Head Lighthouse access point and to the south from the existing access points north of Florence.	This location is already actively managed for snowy plovers, which includes restricting use of the dry sand. There is no difference between Alternatives 1 and 2 at this location.

Location	Dog Exercising	Kite Flying	Driving and Non-Motorized Vehicle Use	Other Dry Sand Activities
Siltcoos/Dunes Overlook/Tahkenitch*	Dog exercising is currently restricted at the Siltcoos portion of this site during the nesting season under existing conditions. Dog exercising would be allowed immediately to the north from the existing Siltcoos access point and in the area to the south from the Three Mile Creek access point.	Unrestricted kite flying would be allowed immediately to the north from the existing Siltcoos access point.	Driving is already prohibited year-round by State Rule at this location. Non-motorized vehicle use could occur on the Ocean Shore immediately to the north from the existing Siltcoos access point.	This location is already actively managed for snowy plovers, which includes restricting use of the dry sand. There is no difference between Alternatives 1 and 2 at this location.
Tahkenitch South	Dog exercising could occur immediately to the north from the existing Siltcoos access point and in the area to the south from the Three Mile Creek access point.	Unrestricted kite flying would be allowed immediately to the north from the existing Siltcoos access point and in the area to the south from the Three Mile Creek access point.	The restrictions proposed under Alternative 2 would be the same as those proposed under Alternative 1 with the exception that the nature of the restrictions and the size of restricted area could potentially be greater under Alternative 2 at this location. Driving and non-motorized vehicle use would be allowed to occur unrestricted in the area to the south from the Three Mile Creek access point.	The restrictions proposed under Alternative 2 would be the same as those proposed under Alternative 1 with the exception that the nature of the restrictions and the size of restricted area could potentially be greater under Alternative 2 at this location. To the extent possible, dry sand activities would be allowed to continue on the wet sand portion of the Ocean Shore. Access to the wet sand would remain open. Unrestricted use of the dry sand would be allowed to continue in the area to the south from the Three Mile Creek access point.
North Umpqua River	Dog exercising could occur in the area just north of the RMA, which is closer in proximity to the existing access point at Three Mile Creek and on the beach south of the Umpqua River.	Unrestricted kite flying would be allowed in the area just north of the RMA, which is closer in proximity to the existing access point at Three Mile Creek and on the beach south of the Umpqua River.	The restrictions proposed under Alternative 2 would be the same as those proposed under Alternative 1 with the exception that the nature of the restrictions and the size of restricted area could potentially be greater under Alternative 2 at this location. Driving and non-motorized vehicle use would be allowed to continue to the north of the RMA, which is closer in proximity to the existing access point at Three Mile Creek and on the beach south of the Umpqua River.	The restrictions proposed under Alternative 2 would be the same as those proposed under Alternative 1 with the exception that the nature of the restrictions and the size of restricted area could potentially be greater under Alternative 2 at this location. To the extent possible, dry sand activities would be allowed to continue on the wet sand portion of the Ocean Shore. Access to the wet sand would remain open. Unrestricted use of the dry sand would be allowed to continue to the north of the RMA, which is closer in proximity to the existing access point at Three Mile Creek and on the beach south of the Umpqua River.
Tenmile*	Dog exercising could occur to the north from the Dunes National Recreation Area access point and to the south from the Sider Tree access point.	Unrestricted kite flying would be allowed to the north from the Dunes National Recreation Area access point and to the south from the Sider Tree access point.	Driving is already prohibited year-round by State Rule at this location. Non-motorized vehicle use could occur on the Ocean Shore to the north from the Dunes National Recreation Area access point and to the south from the Sider Tree access point.	The restrictions proposed under Alternative 2 would be the same as those proposed under Alternative 1 with the exception that the nature of the restrictions and the size of restricted area could potentially be greater under Alternative 2 at this location. To the extent possible, dry sand activities would be allowed to continue on the wet sand portion of the Ocean Shore. Access to the wet sand would remain open. Unrestricted use of the dry sand would be allowed to continue to the north from the Dunes National Recreation Area access point and to the south from the Sider Tree access point.
Coos Bay North Spit*	Dog exercising could occur immediately to the north from the existing access point near the New Carissa site.	Unrestricted kite flying would be allowed immediately to the north from the existing access point near the New Carissa site.	Driving is already prohibited during the nesting season by State Rule at this location. Non-motorized vehicle use could occur on the Ocean Shore immediately to the north from the Horsefall access point.	This location is already actively managed for snowy plovers, which includes restricting use of the dry sand. There is no difference between Alternatives 1 and 2 at this location.
New River*	Dog exercising could occur on the beach immediately north from the existing China Creek access point and at Floras Lake.	Unrestricted kite flying would be allowed on the beach immediately north from the existing China Creek access point and at Floras Lake.	Driving is already prohibited year-round by State Rule at this location. Non-motorized vehicle use could occur on the Ocean Shore immediately north from the existing China Creek access point and at Floras Lake.	The restrictions proposed under Alternative 2 would be the same as those proposed under Alternative 1 with the exception that the nature of the restrictions and the size of restricted area could potentially be greater under Alternative 2 at this location. To the extent possible, dry sand activities would be allowed to

Location	Dog Exercising	Kite Flying	Driving and Non-Motorized Vehicle Use	Other Dry Sand Activities
Elk River	Dog exercising could occur on the beach immediately adjacent to the north from the Cape Blanco State Park access and to the south from the Paradise Point access point.	Unrestricted kite flying would be allowed on the beach immediately adjacent to the north from the Cape Blanco State Park access and to the south from the Paradise Point access point.	<p>The restrictions proposed under Alternative 2 would be the same as those proposed under Alternative 1 with the exception that the nature of the restrictions and the size of restricted area could potentially be greater under Alternative 2 at this location.</p> <p>Driving and non-motorized vehicle use would be allowed to continue to the north immediately adjacent to the north from the existing Cape Blanco State Park access and to the south from the Paradise Point access point.</p>	<p>continue on the wet sand portion of the Ocean Shore. Access to the wet sand would remain open.</p> <p>Unrestricted use of the dry sand would be allowed to continue immediately north from the existing China Creek access point and at Floras Lake.</p> <p>The restrictions proposed under Alternative 2 would be the same as those proposed under Alternative 1 with the exception that the nature of the restrictions and the size of restricted area could potentially be greater under Alternative 2 at this location.</p> <p>To the extent possible, dry sand activities would be allowed to continue on the wet sand portion of the Ocean Shore. Access to the wet sand would remain open.</p> <p>Unrestricted use of the dry sand would be allowed to continue to the north immediately adjacent to the north from the Cape Blanco State Park access and to the south from the Paradise Point access point.</p>
Euchre Creek	Dog exercising could occur on the beach immediately to the south at the Ophir Wayside access.	Unrestricted kite flying would be allowed on the beach immediately to the south at the Ophir Wayside access.	<p>Driving is already prohibited year-round by State Rule at this location.</p> <p>Non-motorized vehicle use could occur on the Ocean Shore to the south at the Ophir Wayside access.</p>	<p>The restrictions proposed under Alternative 2 would be the same as those proposed under Alternative 1 with the exception that the nature of the restrictions and the size of restricted area could potentially be greater under Alternative 2 at this location.</p> <p>To the extent possible, dry sand activities would be allowed to continue on the wet sand portion of the Ocean Shore. Access to the wet sand would remain open.</p> <p>Unrestricted use of the dry sand would be allowed to continue to the south at the Ophir Wayside access.</p>

Note: Only those activities for which there would be a difference compared with Alternative 1 are discussed.

* SPMA and RMA that are currently occupied by nesting populations of snowy plover are indicated with an asterisk.

SPMA = Snowy Plover Management Area

RMA = Recreation Management Area

Alternative 3 – Management of Additional OPRD Sites

Potential Effects on Recreational Use Opportunities at Unoccupied Areas Actively Managed for Snowy Plover

Similar to Alternative 2, if a targeted area becomes actively managed to attract nesting populations of snowy plovers under Alternative 3, OPRD would require dogs to be on leash, restrict non-motorized vehicle use, and prohibit driving during the nesting season. At SPMAs, the extent of the restrictions would be determined in coordination with the FWS. At RMAs (locations not owned or leased by OPRD), these restrictions would be implemented at the request of the landowner and would apply to the area within the management boundary.

These restrictions would apply to the same areas proposed under Alternative 2, but would also include three additional SPMAs and one additional RMA over the term of the 25-year ITP, as described in section 2.3.3, “Alternative 3 – Management of Additional OPRD Sites.” The SPMAs targeted by OPRD under Alternative 3 would be located at Columbia River South Jetty, Necanicum Spit, Nehalem Spit, Netarts Spit, Nestucca Spit (figure 1-7), Bullards Beach (figure 1-8), Sixes River Mouth (figure 1-9), and Pistol River. The RMAs would be located at Bay Ocean Spit, North Sand Land Spit, South Sand Lake Spit, Tahkenitch South, Umpqua River North Jetty, Elk River Spit, and Euchre Creek. The locations of the RMAs are shown in Appendix A of this DEIS.

Because OPRD would not target any areas for active snowy plover management or issues recreational use restrictions at sites not occupied by snowy plovers under Alternative 1, implementation of Alternative 3 would be more prohibitive with respect to the active management and recreational use restrictions at unoccupied sites. The key differences between the two alternatives would occur at locations where dogs, driving, and non-motorized vehicle use are not already restricted.

Dogs are already required to be on leash at the eight currently unoccupied SPMAs. Dogs are not currently required to be on leash at any of the seven currently unoccupied RMAs. Driving is already prohibited at four of the six SPMAs, not including Columbia River South Jetty or Nestucca Spit. Driving is unrestricted at Nestucca Spit, Tahkenitch South, North Umpqua River, and Elk River. Non-motorized vehicle use is unrestricted at all the RMAs. Table 3.3-7 lists the alternate beach areas where dog exercising and driving could occur unrestricted for the six SPMAs and seven RMAs.

Table 3.3-7. Alternate Locations for Activities Restricted Under Alternative 3 at Unoccupied Sites Targeted for Snowy Plover Management

Location	Dog Exercising	Driving	Non-Motorized Vehicle Use
SPMAs			
Columbia River South Jetty	There would be no difference compared with Alternative 1. Dogs are required to be on leash in areas adjacent to State lands.	Driving could occur unrestricted on the Ocean Shore to the south of the Peter Iredale access point. Driving could occur unrestricted to the east of the potentially restricted area along the river shore.	Non-motorized vehicle use would be allowed to continue to the south of the northernmost State Park access point on the Ocean Shore and to the east of the SPMA on the river shore.
Necanicum Spit	There would be no difference compared with Alternative 1. Dogs are required to be on leash in areas adjacent to State Parks.	There would be no difference compared with Alternative 1. Driving is already prohibited at this location by State Rule.	Non-motorized vehicle use could occur on the Ocean Shore to the north of the proposed SPMA from the Gearhart Beach Access Ramp (10th Street).
Nehalem Spit	There would be no difference compared with Alternative 1. Dogs are required to be on leash in areas adjacent to State Parks.	There would be no difference compared with Alternative 1. Driving is already prohibited at this location by State Rule.	Non-motorized vehicle use could occur on the Ocean Shore to the north from the existing access points within the State Park, and to the south of the SPMA across from the Nehalem River. Land-sailing would be allowed to continue to the south, on the other side of the Nehalem River.
Netarts Spit	There would be no difference compared with Alternative 1. Dogs are required to be on leash in areas adjacent to State Parks.	There would be no difference compared with Alternative 1. Driving is already prohibited at this location by State Rule.	Non-motorized vehicle use could occur on the Ocean Shore to the south of the SPMA, accessible from the existing State Park access. The area to the north would continue to be accessible from the Happy Camp access point.
Nestucca Spit	There would be no difference compared with Alternative 1. Dogs are already required to be on leash in areas adjacent to State Parks.	Driving could occur on the Ocean Shore to the north of the SPMA from the Bob Straub State Park access point and north of Cape Kiwanda.	Non-motorized vehicle use would be allowed in the area to the north of the SPMA from the Bob Straub State Park access point.
Bullards Beach	There would be no difference compared with Alternative 1. Dogs are already required to be on leash in areas adjacent to State Parks.	Driving could occur on the Ocean Shore to the north of the SPMA from the Whisky Creek access point.	Non-motorized vehicle use would be allowed in the area immediately to the north of the SPMA from the Whisky Creek access point. Driving is already prohibited year-round in the area to the south of the SPMA.

Location	Dog Exercising	Driving	Non-Motorized Vehicle Use
Sixes River Mouth	There would be no difference compared with Alternative 1. Dogs are already required to be on leash in areas adjacent to State Parks.	There would be no difference compared with Alternative 1. Driving is already prohibited at this location by State Rule.	Non-motorized vehicle use would be allowed to continue in the area south of the SPMA from the Sixes River access at Cape Blanco State Park.
Pistol River	There would be no difference compared with Alternative 1. Dogs are already required to be on leash in areas adjacent to State Parks.	There would be no difference compared with Alternative 1. Driving is already prohibited at this location by State Rule.	Non-motorized vehicle use could occur on the Ocean Shore immediately adjacent to the north of the SPMA.
RMA's			
Bay Ocean Spit	Dogs could be exercised off-leash in the area adjacent to the existing access points to the south of the RMA along the full length of the beach.	There would be no difference compared with Alternative 1. Driving is already prohibited at this location by State Rule.	Non-motorized vehicle use could occur on the Ocean Shore would be allowed to continue in the area adjacent to the existing access points to the south of the RMA along the full length of the beach.
North Sand Lake Spit	Dogs could be exercised off-leash in the area to the north of the RMA from the North Sand Lake Federal access point.	Driving could occur on the Ocean Shore from the North Sand Lake Federal access point.	Non-motorized vehicle use could occur in the area immediately to the north of the RMA from the North Sand Lake Federal access point.
South Sand Lake Spit	Dogs could be exercised off-leash to the south from the Tierra Del Mar access points.	There would be no difference compared with Alternative 1. Driving is already prohibited seasonally at this location by State Rule.	Non-motorized vehicle use could occur on the Ocean Shore to the south from the Tierra Del Mar access points.
Tahkenitch South	Dogs could be exercised off-leash to the south from the Three Mile Creek access point.	Driving would be allowed to occur unrestricted to the south from the Three Mile Creek access point.	Non-motorized vehicle use would be allowed to occur unrestricted in the area to the south from the Three Mile Creek access point.
North Umpqua River	Dogs could be exercised off-leash on the beach immediately north of the RMA reached from the existing access point at Three Mile Creek.	Driving could occur unrestricted north of the RMA reached from the existing access point at Three Mile Creek.	Non-motorized vehicle use would be allowed to continue to the north of the RMA, which is closer in proximity to the existing access point at Three Mile Creek and on the beach south of the Umpqua River.
Elk River	Dogs could be exercised off-leash on the beach immediately adjacent to the north from the Cape Blanco State Park access and to the south from the Paradise Point access point.	Driving could occur unrestricted north of the RMA from the Cape Blanco State Park Access and could occur to the south from the Paradise Point access.	Non-motorized vehicle use would be allowed to continue to the north immediately adjacent to the north from the Cape Blanco State Park access and to the south from the Paradise Point access point.

Location	Dog Exercising	Driving	Non-Motorized Vehicle Use
Euchre River	Dogs could be exercised off-leash on the beach immediately to the south of at the Ophir access point.	There would be no difference compared with Alternative 1. Driving is already prohibited at this location by State Rule.	Non-motorized vehicle use could occur on the Ocean Shore to the south at the Ophir Wayside access.

RMA = Recreation Management Area

SPMA = Snowy Plover Management Area

As indicated in table 3.3-7, there would be multiple locations in proximity to all of the SPMA's and RMA's where recreational activities would be allowed to continue unrestricted. For all the recreational activities, there is a location immediately adjacent to the restricted area where the activity could occur unrestricted. Although these restrictions would limit some recreational opportunities in these areas relative to Alternative 1, the potential effects would likely be minimal because alternate locations are available in close proximity to the restricted areas.

In addition, the locations of the SPMA's and RMA's were specifically selected to minimize potential effects on recreation based on recreational use survey data (Shelby and Tokarczyk 2002). As indicated in table 3.3-1, recreational use at Bullards Beach and Sixes River Mouth are currently low (57 people per day and 27 people per day, respectively, on a summer weekend), indicating that changes in allowed recreational uses would likely have a minimal effect on recreationists. Compared to other more frequently used beaches, these areas are considered low-density use areas where the heaviest concentration of use occurs outside of the proposed management boundary. Although the level of recreational use at Nestucca Spit is relatively high (295 people/day), the portion of the beach identified as the SPMA would generally be located at a distance from known concentrations of recreationists.

Because of the availability of alternate beach locations in the immediate area where the majority of activities could occur unrestricted, the potential effects on recreational opportunities under Alternative 3 are expected to be minimal. However, because there are no restrictions proposed for unoccupied sites under Alternative 1, the potential effects of Alternative 3 are expected to be greater than Alternative 1 at unoccupied sites.

Potential Effects on Recreational Use Opportunities at Sites Occupied by Snowy Plover

Similar to Alternative 2, if a site became occupied by nesting populations of snowy plovers, OPRD would automatically implement the restrictions summarized in table 3.3-3 under Alternative 3. These restrictions would be applied at up to nine SPMA's and up to 12 RMA's during the nesting season over the course of the 25-year ITP as described in section 2.3.2 *Alternative 2 – Proposed HCP*.

The potential effects of Alternative 3 on recreational opportunities would be similar to those of Alternative 2, with the exception that three additional SPMA and one additional RMA would also be targeted for snowy plover management. The SPMA and RMA where restrictions would take place under Alternative 3 would include all of the unoccupied areas noted above, as well as the Bandon SPMA and the RMAs located at Sutton/Baker Beach, Siltcoos Estuary/Dunes Overlook/Tahkenitch, Tenmile, Coos Bay North Spit, and New River (Appendix A).

The extent of the restricted area would be limited to the area within the management boundary. At the 12 RMAs, OPRD would work with the landowner to provide signs, supervision, and avenues for the landowner's enforcement authority. In areas not identified as an SPMA or RMA, the restrictions would be implemented within a set 50-meter radius buffer on the dry sand portion of the nesting location.

Under Alternative 3 at occupied sites, dog exercising, driving, non-motorized vehicle use, and kite flying would be prohibited during the nesting season. In addition, use of a portion of the dry sand area surrounding a nesting site would also be prohibited.

The dog exercising restrictions proposed under Alternative 3 would be more prohibitive than Alternative 1 for all nine of the SPMA and 11 of the 12 RMAs. This is because under Alternative 1, dogs are already prohibited at Siltcoos Estuary Restoration Management Area, but are otherwise only required to be on leash at the other currently occupied areas during the nesting season. Under Alternative 3, dogs would be prohibited entirely during the nesting season at all occupied sites. Similarly, kite flying restrictions under Alternative 3 would be more prohibitive than Alternative 1 for all locations. This is because no kite flying restrictions are proposed under Alternative 1.

Restrictions on driving, non-motorized vehicle use, and use of the dry sand area surrounding a nesting site would be similar compared to Alternative 1 because these activities could be prohibited during the nesting season under both alternatives. However, there are subtle differences between the two alternatives. Under Alternative 1, the nature and extent of these restrictions would be determined on a case-by-case basis with the FWS and could be applied to any location along the Oregon coast. Under Alternative 3, the full extent of these restrictions would be implemented automatically at the nine SPMA and 12 RMAs only. Table 3.3-8 summarizes the alternate locations where the potentially affected recreational activities could occur unrestricted.

Although the proposed restrictions have the potential to further limit recreational opportunities relative to Alternative 1, the potential effects on recreational use under Alternative 3 would likely be minimal because of the availability of substitute locations where these activities could occur unrestricted (table 3.3-8). In addition, the locations of the targeted areas were selected for areas with relatively lower recreational use relative to the surrounding beach areas. For these reasons, the

potential effects on recreational opportunities at these nine SPMA's and 12 RMA's are expected to be minimal, but slightly greater than Alternative 1.

At locations outside of the SPMA's or RMA's, the potential recreational restrictions would be limited to lands owned or leased by OPRD and to an area within a set 50-meter radius buffer on the dry sand portion of the nesting location. These restrictions would include prohibiting use of the dry sand within the buffer area, as determined by the FWS. Under Alternative 1, the nature and extent of the restrictions would be determined in consultation with the FWS on a case-by-case basis and would have the potential to affect a larger area and be more restrictive. Therefore, implementation of Alternative 3 is anticipated to have less of an effect than Alternative 1 on recreational opportunities for areas outside the SPMA's and RMA's.

Table 3.3-8. Alternate Locations for Activities Restricted under Alternative 3 at Occupied Actively Managed SPMA and RMAs

Location	Dog Exercising	Kite Flying	Driving and Non-Motorized Vehicle Use	Other Dry Sand Activities
SPMAs				
Columbia River South Jetty	Dog exercising could occur on the Ocean Shore to the south of the SPMA from the northernmost Fort Stevens State Park access point. Dogs would continue to be required to be on leash in areas adjacent to State lands. Dogs would be allowed to exercise off leash to the east of the SPMA along the river shore.	Unrestricted kite flying would be allowed on the Ocean Shore south from the northernmost State Park access point and to the east of the SPMA along the river shore.	The restrictions proposed under Alternative 3 would be the same as those proposed under Alternative 1 with the exception that the nature of the restrictions and the size of restricted area could potentially be greater under Alternative 3 at this location. Driving would be allowed to continue year-round on the ocean south of the Peter Iredale Fort Stevens State Park access. Non-motorized vehicle use would be allowed to continue to the south of the northernmost State Park access point on the Ocean Shore and to the east of the SPMA on the river shore.	The restrictions proposed under Alternative 3 would be the same as those proposed under Alternative 1 with the exception that the nature of the restrictions and the size of restricted area could potentially be greater under Alternative 3 at this location. To the extent possible, dry sand activities would be allowed to continue on the wet sand portion of the Ocean Shore. Access to the wet sand would remain open. Unrestricted use of the dry sand would be allowed on the Ocean Shore south from the northernmost State Park access point.
Necanicum Spit	Dog exercising could occur in the area to the north of the proposed SPMA from the Gearhart Beach Access Ramp (10th Street). Dogs would continue to be required to be on leash in areas adjacent to State lands.	Unrestricted kite flying would be allowed to continue on the Ocean Shore to the north of the proposed SPMA from the Gearhart Beach Access Ramp (10th Street).	Driving is already prohibited year-round by State Rule at this location. Non-motorized vehicle use could occur on the Ocean Shore to the north of the proposed SPMA from the Gearhart Beach Access Ramp (10th Street).	The restrictions proposed under Alternative 3 would be the same as those proposed under Alternative 1 with the exception that the nature of the restrictions and the size of restricted area could potentially be greater under Alternative 3 at this location. To the extent possible, dry sand activities would be allowed to continue on the wet sand portion of the Ocean Shore. Access to the wet sand would remain open. Unrestricted use of the dry sand would be allowed to continue north of the Gearhart Beach Access Ramp (10th Street), approximately 1.6 kilometers (1 mile) north of the potentially restricted area.
Nehalem Spit	Dog exercising could occur in the area to the north from the existing access points within the State Park and to the south of the SPMA across the Nehalem River. Dogs would continue to be required to be on leash in areas adjacent to State lands.	Unrestricted kite flying would be allowed to the north from the existing access points within the State Park, and to the south of the SPMA across the Nehalem River.	Driving is already prohibited year-round by State Rule at this location. Non-motorized vehicle use could occur on the Ocean Shore to the north from the existing access points within the State Park, and to the south of the SPMA across the Nehalem River. Land sailing would also be allowed to continue unrestricted to the south just on the other side of the Nehalem River.	The restrictions proposed under Alternative 3 would be the same as those proposed under Alternative 1 with the exception that the nature of the restrictions and the size of restricted area could potentially be greater under Alternative 3 at this location. To the extent possible, dry sand activities would be allowed to continue on the wet sand portion of the Ocean Shore. Access to the wet sand would remain open. Unrestricted use of the dry sand would be allowed to continue to the north from the existing access points within the State Park.
Netarts Spit	Dog exercising could occur on the beach to the south of the SPMA, which is accessible from the existing State Park access. The area to the north would continue to be accessible from the Happy Camp access point. Dogs would continue to be required to be on leash in areas adjacent to State lands.	Unrestricted kite flying would be allowed on the beach to the south of the SPMA, accessible from the existing State Park access. The area to the north would continue to be accessible from the Happy Camp access point.	Driving is already prohibited year-round by State Rule at this location. Non-motorized vehicle use could occur on the Ocean Shore to the south of the SPMA, accessible from the existing State Park access. The area to the north would continue to be accessible from the Happy Camp access point.	The restrictions proposed under Alternative 3 would be the same as those proposed under Alternative 1 with the exception that the nature of the restrictions and the size of restricted area could potentially be greater under Alternative 3 at this location. To the extent possible, dry sand activities would be allowed to continue on the wet sand portion of the Ocean Shore. Access to the wet sand would remain open. Unrestricted use of the dry sand would be allowed to continue south of the potentially restricted area, which is accessible from the existing State Park access. The area to the north would continue to be accessible from the Happy Camp access point.

Location	Dog Exercising	Kite Flying	Driving and Non-Motorized Vehicle Use	Other Dry Sand Activities
Nestucca Spit	Dog exercising would be allowed on the beach in the area immediately north of the SPMA from the Bob Straub State Park access point. Dogs would continue to be required to be on leash in areas adjacent to State lands.	Unrestricted kite flying would be allowed immediately north of the SPMA from the Bob Straub State Park access point.	The restrictions proposed under Alternative 3 would be the same as those proposed under Alternative 1 with the exception that the nature of the restrictions and the size of restricted area could potentially be greater under Alternative 3 at this location. Driving and non-motorized vehicle use would be allowed in the area to the north of the SPMA from the Bob Straub State Park access point and north of Cape Kiwanda. Driving is already prohibited year-round in the area to the south of the SPMA.	The restrictions proposed under Alternative 3 would be the same as those proposed under Alternative 1 with the exception that the nature of the restrictions and the size of restricted area could potentially be greater under Alternative 3 at this location. To the extent possible, dry sand activities would be allowed to continue on the wet sand portion of the Ocean Shore. Access to the wet sand would remain open. Dry sand activities would be allowed to continue in the area immediately to the north of the SPMA from the Bob Straub State Park access point.
Bullards Beach	Dog exercising would be allowed on the beach in the area immediately to the north of the SPMA from the Cut Creek access point and to the south from the Bullards Beach access point. Dogs would continue to be required to be on leash in areas adjacent to State lands.	Unrestricted kite flying would be allowed immediately to the north of the SPMA from the Cut Creek access point and to the south from the Bullards Beach access point.	The restrictions proposed under Alternative 3 would be the same as those proposed under Alternative 1 with the exception that the nature of the restrictions and the size of restricted area could potentially be greater under Alternative 3 at this location. Driving and non-motorized vehicle use would be allowed in the area immediately to the north of the SPMA from the Cut Creek access point. Driving is already prohibited year-round in the area to the south of the SPMA.	The restrictions proposed under Alternative 3 would be the same as those proposed under Alternative 1 with the exception that the nature of the restrictions and the size of restricted area could potentially be greater under Alternative 3 at this location. To the extent possible, dry sand activities would be allowed to continue on the wet sand portion of the Ocean Shore. Access to the wet sand would remain open. Dry sand activities would be allowed to continue in the area immediately to the north of the SPMA from the Cut Creek access point and immediately to the south from the Bullards Beach State Park access point.
Sixes River Mouth	Dog exercising would be allowed in the area immediately adjacent to the south from the Sixes River access point. Dogs would continue to be required to be on leash in areas adjacent to State lands.	Unrestricted kite flying would be allowed immediately adjacent to the south from the Sixes River access point.	Driving is already prohibited year-round by State Rule at this location. Non-motorized vehicle use would be allowed to continue in the area south of the SPMA from the Sixes River access at Cape Blanco State Park.	The restrictions proposed under Alternative 3 would be the same as those proposed under Alternative 1 with the exception that the nature of the restrictions and the size of restricted area could potentially be greater under Alternative 3 at this location. To the extent possible, dry sand activities would be allowed to continue on the wet sand portion of the Ocean Shore. Access to the wet sand would remain open. Dry sand activities would be allowed to continue in the area immediately south of the SPMA from the Sixes River access at Cape Blanco State Park.
Bandon*	Dog exercising would be allowed to the north on the beach immediately adjacent to the SPMA from the exiting China Creek beach access and south from Lower Fourmile Road as long as the New River RMA is not occupied. Dogs would continue to be required to be on leash in areas adjacent to State lands.	Unrestricted kite flying would be allowed immediately to the north of the SPMA from the existing China Creek Access and south from the Lower Four Mile Road access, as long as the New River portion of this site was not occupied by nesting snowy plovers.	Driving is already prohibited year-round by State Rule at this location. Non-motorized vehicle use could occur on the Ocean Shore immediately to the north of the SPMA from the existing China Creek Access and south from the Lower Four Mile Road access, as long as New River is not occupied by nesting snowy plovers.	This location is already actively managed for snowy plovers, which includes restricting use of the dry sand. There is no difference between Alternatives 1 and 2 at this location.

Location	Dog Exercising	Kite Flying	Driving and Non-Motorized Vehicle Use	Other Dry Sand Activities
Pistol River	Dog exercising would be allowed on the beach immediately adjacent to the SPMA to the north. Dogs would continue to be required to be on leash in areas adjacent to State lands.	Unrestricted kite flying would be allowed on the beach immediately adjacent to the north of the SPMA.	Driving is already prohibited year-round by State Rule at this location. Non-motorized vehicle use could occur on the Ocean Shore immediately adjacent to the north of the SPMA.	The restrictions proposed under Alternative 3 would be the same as those proposed under Alternative 1 with the exception that the nature of the restrictions and the size of restricted area could potentially be greater under Alternative 3 at this location. To the extent possible, dry sand activities would be allowed to continue on the wet sand portion of the Ocean Shore. Access to the wet sand would remain open. Unrestricted use of the dry sand would be allowed to continue from the existing access points on the beach immediately adjacent to the north.
RMA's				
Bay Ocean Spit	Dog exercising could occur in the area adjacent to the existing access points to the south of the RMA along the full length of the beach.	Unrestricted kite flying would be allowed in the area adjacent to the existing access points to the south of the RMA along the full length of the beach.	Driving is already prohibited year-round by State Rule at this location. Non-motorized vehicle use could occur on the Ocean Shore would be allowed to continue in the area adjacent to the existing access points to the south of the RMA along the full length of the beach.	The restrictions proposed under Alternative 3 would be the same as those proposed under Alternative 1 with the exception that the nature of the restrictions and the size of restricted area could potentially be greater under Alternative 3 at this location. To the extent possible, dry sand activities would be allowed to continue on the wet sand portion of the Ocean Shore. Access to the wet sand would remain open. Unrestricted use of the dry sand would be allowed to continue in the area adjacent to the existing access points to the south of the RMA along the full length of the beach.
North Sand Lake Spit	Dog exercising could occur in the area immediately to the north of the RMA from the North Sand Lake Federal access point.	Unrestricted kite flying would be allowed in the area immediately to the north of the RMA from the North Sand Lake Federal access point.	The restrictions proposed under Alternative 3 would be the same as those proposed under Alternative 1 with the exception that the nature of the restrictions and the size of restricted area could potentially be greater under Alternative 3 at this location. Driving would be allowed to the south from the North Sand Lake Federal access point. Non-motorized vehicle use could occur in the area immediately to the north of the RMA from the North Sand Lake Federal access point.	The restrictions proposed under Alternative 3 would be the same as those proposed under Alternative 1 with the exception that the nature of the restrictions and the size of restricted area could potentially be greater under Alternative 3 at this location. To the extent possible, dry sand activities would be allowed to continue on the wet sand portion of the Ocean Shore. Access to the wet sand would remain open. Unrestricted use of the dry sand would be allowed to continue in the area immediately to the north from the North Sand Lake Federal access point.
South Sand Lake Spit	Dog exercising could occur to the south from the Tierra Del Mar access points.	Unrestricted kite flying would be allowed to south from the Tierra Del Mar access points.	Driving is already prohibited during the nesting season by State Rule at this location. Non-motorized vehicle use could occur on the Ocean Shore to the south from the Tierra Del Mar access points.	The restrictions proposed under Alternative 3 would be the same as those proposed under Alternative 1 with the exception that the nature of the restrictions and the size of restricted area could potentially be greater under Alternative 3 at this location. To the extent possible, dry sand activities would be allowed to continue on the wet sand portion of the Ocean Shore. Access to the wet sand would remain open. Unrestricted use of the dry sand would be allowed to continue to the south from the Tierra Del Mar access points.

Location	Dog Exercising	Kite Flying	Driving and Non-Motorized Vehicle Use	Other Dry Sand Activities
Sutton/Baker Beach*	Dog exercising could occur from the Heceta Head Lighthouse access point to the north and to the south from the existing access points north of Florence.	Unrestricted kite flying would be allowed from the Heceta Head Lighthouse access point to the north and to the south from the existing access points north of Florence.	Driving is already prohibited year-round by State Rule at this location. Non-motorized vehicle use could occur on the Ocean Shore to the north from the Heceta Head Lighthouse access point and to the south from the existing access points north of Florence.	This location is already actively managed for snowy plovers, which includes restricting use of the dry sand. There is no difference between Alternatives 1 and 2 at this location.
Siltcoos/Dunes Overlook/Tahkenitch*	Dog exercising is currently restricted at the Siltcoos portion of this site during the nesting season under existing conditions. Dog exercising would be allowed immediately to the north from the existing Siltcoos access point and in the area to the south from the Three Mile Creek access point.	Unrestricted kite flying would be allowed immediately to the north from the existing Siltcoos access point.	Driving is already prohibited year-round by State Rule at this location. Non-motorized vehicle use could occur on the Ocean Shore immediately to the north from the existing Siltcoos access point.	This location is already actively managed for snowy plovers, which includes restricting use of the dry sand. There is no difference between Alternatives 1 and 2 at this location.
Tahkenitch South	Dog exercising could occur immediately to the north from the existing Siltcoos access point and in the area to the south from the Three Mile Creek access point.	Unrestricted kite flying would be allowed immediately to the north from the existing Siltcoos access point and in the area to the south from the Three Mile Creek access point.	The restrictions proposed under Alternative 3 would be the same as those proposed under Alternative 1 with the exception that the nature of the restrictions and the size of restricted area could potentially be greater under Alternative 3 at this location. Driving and non-motorized vehicle use would be allowed to occur unrestricted in the area to the south from the Three Mile Creek access point.	The restrictions proposed under Alternative 3 would be the same as those proposed under Alternative 1 with the exception that the nature of the restrictions and the size of restricted area could potentially be greater under Alternative 3 at this location. To the extent possible, dry sand activities would be allowed to continue on the wet sand portion of the Ocean Shore. Access to the wet sand would remain open. Unrestricted use of the dry sand would be allowed to continue in the area to the south from the Three Mile Creek access point.
North Umpqua River	Dog exercising could occur in the area just north of the RMA, which is closer in proximity to the existing access point at Three Mile Creek and on the beach south of the Umpqua River.	Unrestricted kite flying would be allowed in the area just north of the RMA, which is closer in proximity to the existing access point at Three Mile Creek and on the beach south of the Umpqua River.	The restrictions proposed under Alternative 3 would be the same as those proposed under Alternative 1 with the exception that the nature of the restrictions and the size of restricted area could potentially be greater under Alternative 3 at this location. Driving and non-motorized vehicle use would be allowed to continue to the north of the RMA, which is closer in proximity to the existing access point at Three Mile Creek and on the beach south of the Umpqua River.	The restrictions proposed under Alternative 3 would be the same as those proposed under Alternative 1 with the exception that the nature of the restrictions and the size of restricted area could potentially be greater under Alternative 3 at this location. To the extent possible, dry sand activities would be allowed to continue on the wet sand portion of the Ocean Shore. Access to the wet sand would remain open. Unrestricted use of the dry sand would be allowed to continue to the north of the RMA, which is closer in proximity to the existing access point at Three Mile Creek and on the beach south of the Umpqua River.
Tenmile*	Dog exercising could occur to the north from the Dunes National Recreation Area access point and to the south from the Sider Tree access point.	Unrestricted kite flying would be allowed to the north from the Dunes National Recreation Area access point and to the south from the Sider Tree access point.	Driving is already prohibited year-round by State Rule at this location. Non-motorized vehicle use could occur on the Ocean Shore to the north from the Dunes National Recreation Area access point and to the south from the Sider Tree access point.	The restrictions proposed under Alternative 3 would be the same as those proposed under Alternative 1 with the exception that the nature of the restrictions and the size of restricted area could potentially be greater under Alternative 3 at this location. To the extent possible, dry sand activities would be allowed to continue on the wet sand portion of the Ocean Shore. Access to the wet sand would remain open. Unrestricted use of the dry sand would be allowed to continue to the north from the Dunes National Recreation Area access point and to the south from the Sider Tree access point.
Coos Bay North Spit*	Dog exercising could occur immediately to the north from the existing access point near the New Carissa site.	Unrestricted kite flying would be allowed immediately to the north from the existing access point near the New Carissa site.	Driving is already prohibited during the nesting season by State Rule at this location. Non-motorized vehicle use could occur on the Ocean Shore immediately to the north from the Horsefall access point.	This location is already actively managed for snowy plovers, which includes restricting use of the dry sand. There is no difference between Alternatives 1 and 2 at this location.

Location	Dog Exercising	Kite Flying	Driving and Non-Motorized Vehicle Use	Other Dry Sand Activities
New River*	Dog exercising could occur on the beach immediately north from the existing China Creek access point and south at Floras Lake.	Unrestricted kite flying would be allowed on the beach immediately north from the existing China Creek access point and south at Floras Lake.	<p>Driving is already prohibited year-round by State Rule at this location.</p> <p>Non-motorized vehicle use could occur on the Ocean Shore immediately north from the existing China Creek access point and south from Floras Lake.</p>	<p>The restrictions proposed under Alternative 3 would be the same as those proposed under Alternative 1 with the exception that the nature of the restrictions and the size of restricted area could potentially be greater under Alternative 3 at this location.</p> <p>To the extent possible, dry sand activities would be allowed to continue on the wet sand portion of the Ocean Shore. Access to the wet sand would remain open.</p> <p>Unrestricted use of the dry sand would be allowed to continue immediately north from the existing China Creek access point and south at Floras Lake.</p>
Elk River	Dog exercising could occur on the beach immediately adjacent to the north from the Cape Blanco State Park access and to the south from the Paradise Point access point.	Unrestricted kite flying would be allowed on the beach immediately adjacent to the north from the Cape Blanco State Park access and to the south from the Paradise Point access point.	<p>The restrictions proposed under Alternative 3 would be the same as those proposed under Alternative 1 with the exception that the nature of the restrictions and the size of restricted area could potentially be greater under Alternative 3 at this location.</p> <p>Driving and non-motorized vehicle use would be allowed to continue to the north immediately adjacent to the north from the Cape Blanco State Park access and to the south from the Paradise Point access point.</p>	<p>The restrictions proposed under Alternative 3 would be the same as those proposed under Alternative 1 with the exception that the nature of the restrictions and the size of restricted area could potentially be greater under Alternative 3 at this location.</p> <p>To the extent possible, dry sand activities would be allowed to continue on the wet sand portion of the Ocean Shore. Access to the wet sand would remain open.</p> <p>Unrestricted use of the dry sand would be allowed to continue to the north immediately adjacent to the north from the Cape Blanco State Park access and to the south from the Paradise Point access point.</p>
Euchre Creek	Dog exercising could occur on the beach immediately to the south at the Ophir Wayside access point.	Unrestricted kite flying would be allowed on the beach immediately to the south at the Ophir Wayside access point.	<p>Driving is already prohibited year-round by State Rule at this location.</p> <p>Non-motorized vehicle use could occur on the Ocean Shore to the south from at the Ophir Wayside access point.</p>	<p>The restrictions proposed under Alternative 3 would be the same as those proposed under Alternative 1 with the exception that the nature of the restrictions and the size of restricted area could potentially be greater under Alternative 3 at this location.</p> <p>To the extent possible, dry sand activities would be allowed to continue on the wet sand portion of the Ocean Shore. Access to the wet sand would remain open.</p> <p>Unrestricted use of the dry sand would be allowed to continue to the south from the Ophir Wayside access point.</p>

Note: Only those activities for which there would be a difference compared with Alternative 1 are discussed.

*SPMAs and RMAs that are currently occupied by nesting populations of snowy plover are indicated with an asterisk.

RMA = Recreation Management Area

SPMA = Snowy Plover Management Area

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3.4 Socioeconomics and Environmental Justice

This section describes socioeconomic resources and environmental justice considerations in the study area, as well as potential socioeconomic and environmental justice effects resulting from implementation of the project alternatives. For this analysis, the study area extends beyond the ocean shore to the adjacent coastal communities. This includes the limits of Clatsop, Tillamook, Lincoln, Coos, and Curry Counties and selected coastal communities within Lane County (Florence, Mapleton and Westlake) and Douglas County (Reedsport, Scottsburg and Gardiner) (figure 3.4-1).

3.4.1 Approach and Methodology

The description of the socioeconomic environment presented in this section is based on information from the U.S. Census Bureau 2000 Census.

The potential effects on socioeconomic resources in the study area were assessed based on a review of the management strategies for each of the project alternatives, including the draft *Western Snowy Plover Habitat Conservation Plan* (Oregon Parks and Recreation Department 2007). More specifically, this analysis considers potential effects on tourism and visitor spending in coastal communities that could occur as a result of the possible displacement of recreational activities related to the project alternatives. The potential effects on recreational activities and uses are discussed in more detail in section 3.3, “Recreation.” The environmental justice analysis considers whether the recreation and related socioeconomic effects of the project alternatives would disproportionately affect low income or minority individuals.

The *Draft Economic Analysis of Critical Habitat Designation for the Western Snowy Plover* (Critical Habitat Report) (Industrial Economics, Inc. 2005) was also considered in the analysis of potential effects for this DEIS. The analysis of potential recreational effects in the Critical Habitat Report is programmatic in nature and considers a much larger study area (35 units along the West Coast) compared with the DEIS (which includes up to nine SPMAAs and 12 RMAAs within Oregon only, depending on the project alternative). In addition, the Critical Habitat Report assumed that recreation effects occurring as a result of snowy plover management activities would fall into one of two categories: a recreationist would forego a trip to the beach entirely or the recreationist’s enjoyment during that trip would be substantially diminished.

Because the project alternative would affect a smaller area, it was determined that a more site-specific approach to the analysis would be needed, and is presented in section 3.3, “Recreation.”

In spite of the more programmatic focus of the Critical Habitat Report, the conclusions of the potential socioeconomic impacts are relevant to this analysis and are discussed below under section 3.4.3, “Environmental Consequences.”

3.4.2 Regulatory Setting

Environmental Justice

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations, requires that a Federal agency analyze the effects of a proposed action to ensure that it does not disproportionately affect low income or minority populations. Incorporation of environmental justice principles throughout the planning and decision-making processes implements the principles of NEPA, Title VI of the Civil Rights Act, and the Uniform Relocation Act.

3.4.3 Affected Environment

As indicated in section 3.3, “Recreation,” about 61 percent of the visitors to the Oregon coast lives in Oregon, with the majority of those visitors being residents of Oregon’s major urban centers along I-5. This section describes key demographic characteristics of study area residents and coastal visitors, and economic conditions and trends pertaining to coastal recreation activities.

Demographics

Population Distribution

As indicated from data in table 3.4-1, about 6 percent of Oregon’s 3.4 million population is located within the study area (U.S. Census Bureau 2000). Of these 208,850 coastal residents, about 40 percent live in communities with populations greater than 4,000 (Astoria, Warrenton, Seaside, Tillamook, Lincoln City, Newport, Florence, Reedsport, North Bend, Coos Bay, and Brookings). The remainder of the coastal population lives in relatively small communities spread along the coast. Coastal populations are projected to grow over the next several decades, with average annual growth rates approaching the State average of 1.3 percent per year. However, this growth is projected to be slower for the next 25 years (2008 to 2033) than it was in the previous 30 years (1970 to 2000). Only Clatsop and Coos Counties are projected to have higher growth rates than in the past 30 years.

Age Composition

Counties with higher proportions of residents from smaller coastal communities such as Florence (Lane County), Reedsport (Douglas County), and Brookings (Curry County) tend to have a relatively higher proportion of residents who are 65 years of age or older.

Figure 3.4-1 Study Area for Socioeconomics Analysis

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These same counties are expected to experience the highest population growth within this age group during the 25-year management period. In general, the population of younger residents is more concentrated in the counties with the more urbanized coastal communities such as Seaside, Coos Bay, and the Newport-Lincoln City area. Nearly one out of four residents of Clatsop, Tillamook, Lincoln or Coos County is under 20 years old.

Low Income Characteristics

To define poverty, the U.S. Census Bureau follows the Office of Management and Budget's Directive 14 (May 1978). If the total income for a family or unrelated individual falls below the relevant poverty threshold (based on family size and composition), then the family or unrelated individual is classified as being "below the poverty level." The official poverty definition counts income before taxes and does not include capital gains and non-cash benefits (such as public housing, Medicaid, and food stamps). Poverty is not defined for people in military barracks, institutional group quarters, or for unrelated individuals under age 15 (such as foster children). The poverty threshold is not adjusted for regional, State, or local variation in the cost of living; however, poverty thresholds are updated annually for inflation, based on the Consumer Price Index.

The term "low-income" is used to describe persons whose median household income is at, or below the Department of Health and Human Services poverty guidelines for the applicable household size. These poverty guidelines are a simplified version of the Census Bureau's poverty thresholds. Neither the Census Bureau nor the Department of Health and Human Services prepares tabulations of the number of people below the Department of Health and Human Services poverty guidelines. The best method for approximating the poverty levels for a particular area is to use the number of persons below the Census Bureau poverty thresholds in that area, as reported in the 2000 Census.

Income information for the study area is presented in table 3.4-1. With the exception of Tillamook County, all of the counties in the study area have a higher percentage of *individuals* below the poverty line than the statewide average. All of the counties also have a higher percentage of *households* below the poverty line. The median household incomes and number of people in the labor force were also lower than the statewide average

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Table 3.4-1. Low Income and Minority Characteristics of the Coastal Counties

Socioeconomic Characteristics	State of Oregon	Clatsop	Tillamook	Lincoln	Lane ¹	Douglas ¹	Coos	Curry
Average Household Size	2.51	2.35	2.33	2.27	2.26	2.26	2.34	2.19
In Labor Force (16 years or older)	1,742,638	18,119	11,499	21,079	5043	2459	27,700	8,683
In Labor Force (16 years or older)	65.2%	63.6%	58.7%	58.3%	35.6%	38.4%	54.3%	49.3%
Median Household Income in 1999	40,916	36,301	34,269	32,769	29,347	26,630	31,542	30,117
Per Capita Income in 1999 (\$)	20,940	19,515	19,052	20,187	18,468	13,634	17,547	18,138
Families Below the Poverty Level	70,032	869	553	1,216	396	225	1,948	601
Families Below the Poverty Level	7.9%	9.1%	8.1%	9.8%	11%	15.5%	11.1%	9.7%
Individuals Below the Poverty Level	388,740	4,625	2,718	6,084	1914	1020	9,257	2,554
Individuals Below the Poverty Level	11.6%	13.2%	11.4%	13.9%	13.5%	15.9%	15.0%	12.2%
Race Characteristics								
Black or African American	55,662 (1.6%)	185 (0.5%)	54 (0.2%)	132 (0.3%)	27 (0.19%)	2 (0.0003%)	194 (0.3%)	32 (0.2%)
American Indian and Alaskan Native	45,211 (1.3%)	367 (1.0%)	289 (1.2%)	1,397 (3.1%)	162 (1.1%)	83 (1.3%)	1,515 (2.4%)	452 (2.1%)
Asian	101,350 (3.0%)	430 (1.2%)	157 (0.6%)	413 (0.9%)	75 (0.5%)	28 (0.43%)	568 (0.9%)	147 (0.7%)
Native Hawaiian and Other Pacific Islander	7,976 (0.2%)	60 (0.2%)	50 (0.2%)	70 (0.2%)	20 (0.1%)	2 (0.0003%)	107 (0.2%)	24 (0.1%)
Total Population	3,421,399	35,630	24,262	44,479	14163	6397	62,779	21,137
Hispanic or Latino (of any race)	275,314 (8.0%)	1,597 (4.5%)	1,244 (5.1%)	2,119 (4.8%)	324 (2.3%)	253 (3.9%)	2,133 (3.4%)	761(3.6%)

Source: U.S. Census Bureau, 2000 Census

¹For Lane County, only coastal zip codes were included (97439, 97453, and 97493). For Douglas County, only coastal zip codes were included (97467, 97473, and 97441)

Minority Characteristics

For purposes of this analysis, “minority” is defined as people who have identified themselves as African American, Hispanic, Asian American, American Indian or Alaskan Native. The U.S. Census defines Hispanic origin as an ethnicity and not a race. Consequently, a person of Hispanic origin may be of any race, and because of this, the U.S. Census reports these characteristics separately.

Table 3.4-1 lists the minority characteristics of the population within the study area, which were quantified by examining racial data at the county level. Overall, minorities tend to make up a smaller percentage of the population along the Oregon coast than the statewide average.

Demographic Characteristics of Recreation Visitors

Based on survey results from the Oregon Shore Recreation Use Study, an estimated 96 percent of visitors to the Oregon coast reported being Caucasian, with about 1 percent each reporting to be Hispanic, Native American, or Asian. The median household income for respondents to the mail-back survey was between \$50,000 and \$70,000.

Economic Conditions and Trends

Economic Structure and Contribution of the Travel Industry

Based on annual payroll expenditures for 2004, the primary industries along the Oregon Coast include manufacturing; retail trade; health care and social services; accommodation and food services; and construction (table 3.4-2). Other notable industries include professional, scientific, and technical services; wholesale trade; and administration, support, and waste management remediation services.

Industries directly affected by recreation and tourism include accommodation and food services; retail trade; and arts, entertainment, and recreation. For each of the counties within the study area, retail trade is among the top three largest industries, with accommodation and food services ranking in the top 10 largest industries for all counties except Coos County. Arts, entertainment, and recreation tend to be lower on the list of industries for all counties, except Lincoln County for which it was ranked the fifth largest industry. Overall, these industries make up approximately 9 percent of the total payroll for all industries within the study area.

Table 3.4-2 also lists information about the number of employees and the number of establishments by industry within the study area. Based on the information presented, recreation and tourism related industries employed approximately 15 percent of the workforce and consisted of approximately 750 individual establishments (or 14 percent of the total for the study area).

Table 3.4-2. Industry Information by County in 2004

Industry	Total			Clatsop County			Tillamook County			Coos County			Curry County			Lincoln County			Lane County			Douglas County		
	Annual Payroll (\$1000)	Employees	Establishments	Annual Payroll (\$1000)	Employees	Establishments	Annual Payroll (\$1000)	Employees	Establishments	Annual Payroll (\$1000)	Employees	Establishments	Annual Payroll (\$1000)	Employees	Establishments	Annual Payroll (\$1000)	Employees	Establishments	Annual Payroll (\$1000)	Employees	Establishments	Annual Payroll (\$1000)	Employees	Establishments
Accommodation and Food Services	342,110	26,542	35,890	40,691	2,922	230	12,454	983	121	21,786	2,115	181	11,984	982	118	50,652	3,498	248	146,715	11,934	832	57,828	4,108	271
Administration, Support, Waste Management, Remediation Services	240,171	11,957	43,611	3,830	209	48	3,608	193	24	39,332	2,361	60	4,326	181	24	10,587	604	58	153,482	7,135	432	25,006	1,274	97
Arts, Entertainment, and Recreation	81,877	4,468	20,743	4,330	210	27	1,025	66	13	19,468	814	25	1,381	80	14	26,810	1,055	38	24,093	1,824	150	4,770	419	23
Construction	400,604	11,383	38,406	23,491	780	175	10,425	347	101	26,068	849	174	15,212	466	126	17,972	618	157	256,037	6,890	1,111	51,399	1,433	345
Educational services	36,181	2,263-2,381	4,826	-	20-99	15	3,248	155	8	1,399	95	10	-	0-19	2	1,762	77	14	23,960	1,478	129	5,812	438	27
Finance and Insurance	270,452	6,795	23,145	9,477	287	45	3,926	115	24	18,325	532	93	7,232	239	39	10,426	350	59	198,256	4,526	578	22,810	746	125
Forestry, Fishing, Hunting, and Agriculture Support	163,911	4,151	47,556	7,070	463	52	11,447	351	28	35,695	1,034	107	3,733	142	29	7,126	239	78	61,445	1,780	171	37,395	142	29
Health Care and Social Assistance	1,029,796	30,668	126,708	51,083	1,734	124	24,661	819	56	100,395	3,305	218	15,283	745	82	51,110	1,512	109	600,457	17,088	927	186,807	5,465	316
Information	133,200	3,763	16,412	5,042	164	20	1,860	73	11	14,277	486	26	2,598	96	13	5,929	179	27	90,610	2,385	170	12,884	380	39
Management	73,836	1,572-2,268	67	1,998	64	4	-	-	-	-	20-99	5	-	100-249	1	-	20-99	5	71,838	1,268	48	-	100-249	8
Manufacturing	1,010,975	30,949	99,670	25,294	800	49	46,617	1,326	22	52,154	1,410	74	26,175	675	26	47,479	937	55	776,862	19,594	605	36,394	6,207	139
Mining	14,807	381-499	3,208	-	20-99	2	-	-	-	3,175	66	6	-	0-19	3	1,819	54	4	6,530	166	12	3,283	75	8
Other Services (except Public Administration)	166,543	9,009	20,792	9,379	629	115	5,309	344	69	13,997	774	162	2,732	173	53	9,537	604	136	106,356	5,400	906	19,233	1,085	229
Professional, Scientific, and Technical Services	345,646	9,212	19,146	6,523	282	92	4,843	161	33	12,870	451	111	2,532	105	45	11,091	359	89	272,200	6,890	1,001	35,587	964	187
Real Estate	87,464	4,243	12,015	3,646	218	58	2,071	106	35	9,059	377	65	2,623	141	55	4,533	246	78	55,149	2,633	552	10,383	522	135
Retail Trade	649,602	35,562	97,932	50,532	2,473	288	20,020	963	119	75,341	3,314	293	24,851	1,302	117	55,182	2,876	332	422,659	19,482	1,371	01,017	5,152	458
Transportation and Warehousing	180,977	5,685	38,630	10,469	240	45	6,168	200	24	31,940	871	78	1,622	51	11	6,079	228	54	88,383	2,804	264	36,316	1,291	115
Unclassified Establishments	690	84-221	279	-	0-19	2	-	0-19	1	146	23	15	122	12	12	95	5	8	327	24	28	-	20-99	70
Utilities	21,932	453-769	32	2,553	54	8	-	0-19	2	-	20-99	3	-	20-99	3	-	20-99	4	8,397	153	11	10,982	186	11
Wholesale Trade	298,901	7,870	23,241	7,702	227	37	4,870	185	18	17,721	474	43	1,936	104	12	7,341	224	38	227,366	5,474	491	31,965	1,182	66
TOTAL	5,549,675	207,010-208,395	672,312	275,003	11,877	1,436	162,596	6,392	709	499,737	19,435	1,749	133,653	5,685	785	330,705	13,757	1,591	3,591,122	118,928	9,789	908,139	32,427	2,823

Source: Dean Runyan Associates, Inc 2006.

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Travel and Tourism Related Economic Trends

The travel and tourism related industries along the Oregon coast represent an important source of income at the local and State levels. Table 3.4-3 presents travel-related spending, earnings, and the number of travel-related jobs between 1991 and 2005. Only the direct contribution from travelers is presented. Secondary effects (often referred to as indirect and induced effects), related to the additional spending of businesses and employees are not included in the estimates. During 2005, travel spending in the study area totaled nearly \$1.4 billion. These travel-related expenditures generated earnings (including wage and salary disbursement, other earned income, and proprietor income) of \$389 million and supported over 20,000 jobs (including full-and part-time employees and proprietors).

Also shown in table 3.4-3 are the total tax receipts from travel-related industries, which totaled more than \$40 million in 2005. The local tax receipts noted on the table include those levied on applicable travel-related purchases (e.g., room taxes, auto rental taxes). State tax receipts include motor fuel taxes, and business and personal income taxes attributable to travel expenditures. Property taxes are not included.

Travel- and tourism-related economic activity within the study area has experienced steady growth since 1991, with travel-related expenditures growing an average of 5.1 percent per year. This is consistent with growth in travel spending statewide (Dean Runyan Associates, Inc. 2006). Travel related expenditures are anticipated to continue growing in the future as the number of visitors to the coastal communities continues to grow.

Table 3.4-3. Travel-Related Economic Data for the Study Area (1991 – 2005)

Year	Spending (\$Million)	Earnings (\$Million)	Employment (Jobs)	Tax Receipts (\$Million)		
				Local	State	Total
1991	691	197.6	16,130	5.8	13.0	18.8
1992	734	209.9	16,090	6.6	13.7	20.3
1993	776	222.1	16,460	7.3	14.5	21.8
1994	818	234.4	16,660	7.8	15.3	23.2
1995	871	249.8	17,290	8.4	16.3	24.7
1996	926	261.4	17,590	9.0	16.9	26.0
1997	977	275.3	17,640	9.5	17.7	27.1
1998	1,014	287.4	17,740	9.8	18.3	28.2
1999	1,074	303.6	18,540	10.4	19.3	29.6

Year	Spending	Earnings	Employment	Tax Receipts (\$Million)		
	(\$Million)	(\$Million)	(Jobs)	Local	State	Total
2000	1,169	327.6	19,240	11.0	21.0	32.0
2001	1,243	348.3	20,450	11.7	22.0	33.8
2002	1,271	356.9	20,440	12.5	22.3	34.7
2003	1,277	359.8	20,310	12.5	22.6	35.1
2004	1,331	374.2	20,480	13.5	25.6	39.0
2005	1,378	389.1	20,690	13.9	26.6	40.6
Annual Percentage Change						
2004-2005	3.5	4.0	1.0	3.6	4.1	3.9
1991-2005	5.1	5.0	1.8	6.4	5.3	5.6

Source: Dean Runyan Associates 2006

Table 3.4-4 shows the percentage contribution of travel-related expenditures to the overall expenditures in 2004 for each county within the study area. Travel-related expenditures were greater than 10 percent for Clatsop, Tillamook, Lincoln, and Curry Counties, and less than 5 percent for Lane, Douglas, and Coos Counties. All had much smaller contributions at less than 5 percent of total expenditures for all other industries.

Table 3.4-4. Percentage of Travel-Related Expenditures by County for 2004

County	Travel-Related Expenditures	Total Expenditure	Percentage
Clatsop	102.3	701.5	14.6
Tillamook	43.3	384.3	11.3
Lincoln	109.5	757.7	14.5
Lane	125.4	6,488.1	1.9
Douglas	58.4	1,672.2	3.5
Coos	43.7	948.5	4.6
Curry	31.8	272.8	11.7

Source: Dean Runyan Associates 2006

Note: Lane County includes the cities of Eugene, Springfield, as well as other non-coastal communities. Douglas County includes the city of Roseburg as well as other non-coastal communities.

Note: Estimates do not include spending made by local residents.

Local Community Conditions

While information at the county-level provides context for this analysis, the potential socioeconomic and environmental justice effects associated with the project would be

more substantial at the local level. This is because implementation of the project alternatives could potentially result in beach visitors going to another beach area to avoid recreational use restrictions. If beach visitors did choose to recreate at a different beach, visitor spending at local businesses near potentially restricted areas could be affected.

As discussed in section 3.3, “Recreation,” the beaches where recreational use restrictions are most likely include the SPMAs and RMAs listed in chapter 2, “Alternatives.” Table 3.4-5 lists the community profiles for those communities that are closest to these targeted areas that could potentially be affected by the project alternatives.

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Table 3.4-5. Local Community Information by County

Local Community	Nearest Areas Targeted for Snowy Plover Management Regardless of Ownership	Distance to Nearest SPMA or RMA kilometer (miles)	Population (Census 2000)	Primary Recreational Activities and Amenities	Principal Industries	Approximate Drive Time/Distance from Nearest Major City
Clatsop County						
Astoria	Columbia River South Jetty	16.1 (10)	9,813	Astoria Column, Columbia River Maritime Museum, Lewis and Clark Historical Site, Victorian Homes, Galleries, Beaches, Fort Clatsop, Fort Stevens, Scandinavian Midsummer Festival, Astoria Regatta, Astoria-Warrenton Crab and Seafood Festival, Tillamook State Forest, Clatsop State Forest, Columbia River Parks and Riverwalk.	Fishing, Lumber, Agriculture, Food and Kindred Products	Portland, 1½ hours 152 kilometers (95 miles)
Warrenton	Columbia River South Jetty	9.7 (6)	4,096	Clatsop State Forest, Fort Clatsop National Memorial, Fort Stevens State Park, Youngs Bay, Warrenton Trails System, Beaches, Buoy 10 Fishery, Warrenton/Hammond Mooring Basins.	Fishing, Lumber, Agriculture, Food and Kindred Products	Portland, 1½ hours 152 kilometers (95 miles)
Gearhart	Necanicum Spit	0.8 (0.5)	995	Tillamook State Forest, Clatsop State Forest, Clatsop National Memorial, Fort Stevens Historical Area, 2 Public Golf Courses.	Fishing, Lumber, Agriculture, Food and Kindred Products	Portland, 1½ hours 129.6 kilometers (81 miles)
Seaside	Necanicum Spit	4.0 (2.5)	5,900	Pacific Ocean coast, Seaside historical Museum, Oceanfront Promenade, Aerial Tours, Town Center Carousel, Tillamook Head.	Fishing, Lumber, Agriculture, Food and Kindred Products	Portland, 1½ hours 126.4 kilometers (79 miles)
Cannon Beach	Necanicum Spit	9.7 (6)	1,588	Ecola State Park, Haystack Rock, Sand Castle Day, Stormy Weather Festival, Kite Festival, Haystack Holiday Festival, Art Galleries, Shopping, Whale Watching.	Fishing, Lumber, Agriculture, Food and Kindred Products	Portland, 1½ hours 129.6 kilometers (81 miles)

Local Community	Nearest Areas Targeted for Snowy Plover Management Regardless of Ownership	Distance to Nearest SPMA or RMA kilometer (miles)	Population (Census 2000)	Primary Recreational Activities and Amenities	Principal Industries	Approximate Drive Time/Distance from Nearest Major City
Tillamook County						
Manzanita	Nehalem Spit	2.4 (1.5)	564	Camping, Boating, Picnicking, Hiking up Neahkanie Mt., Nehalem Bay State Park, Oswald West State Park, and Manzanita Golf Course.	Agriculture, Lumber, Recreation and Tourism, Food Processing	Portland, 1½ hours 136 kilometers (85 miles)
Nehalem	Nehalem Spit	6.4 (4)	203	Fishing, Hunting, Crabbing, Charter Fishing, Kayaking, Swimming, Golf, Camping, State Parks, Horseback Riding, Crafts Fair (July), Art's Festival (August), Christmas Bizarre, Boat Rentals, 2 miles to Ocean Beaches, Nature Trail, Bicycling.	Agriculture, Lumber, Recreation and Tourism, and Food Processing	Portland, 1½ hours 160 kilometers (100 miles)
Wheeler	Nehalem Spit	9.7 (6)	391	Boat Launch, Waterfront Park, Mountain Park, Fishing, Boating, Clamming, Hiking, Beachcombing, Scenic Coastline, Art Galleries, Crab Festival and Salmon Festival.	Agriculture, Lumber, Recreation and Tourism, Food Processing	Portland, 1½ hours 155.2 kilometers (97 miles)
Rockaway Beach	Nehalem Spit	19.3 (12)	1,267	City Parks, Ocean Beach, Golf.	Agriculture, Lumber, Recreation and Tourism, and Food Processing	Portland, 1½ hours 139.2 kilometers (87 miles)
Garibaldi	Nehalem Spit	20.9 (13)	899	Fishing, Hunting, Crabbing, Clamming, Charter Boats, County Park, Bicycling, ¼ mile to Ocean Beaches.	Agriculture, Lumber, Recreation and Tourism, and Food Processing	Portland, 1½ hours 145.6 kilometers (91 miles)
Bay City	Nehalem Spit	22.5 (14)	1,149	Art Gallery, Crabbing, Fishing.	Agriculture, Lumber, Recreation and Tourism, Food Processing	Portland, 1½ hours 128 kilometers (80 miles)

Local Community	Nearest Areas Targeted for Snowy Plover Management Regardless of Ownership	Distance to Nearest SPMA or RMA kilometer (miles)	Population (Census 2000)	Primary Recreational Activities and Amenities	Principal Industries	Approximate Drive Time/Distance from Nearest Major City
Tillamook	Nehalem Spit Netarts Spit	25.7 (16) 19.3 (12)	4,352	Fishing, Boating, Clamming, Hiking, Beachcombing, Tillamook Creamery, Scenic Coastline, Tillamook County Fair, June Dairy Festival and Rodeo, Bays and Rivers.	Agriculture, Lumber, Recreation and Tourism, and Food Processing	Portland, 1½ hours 118.4 kilometers (74 miles)
Pacific City	Nestucca Spit Sand Lake Spit	4.8 (3) 9.7 (6)	900	Fishing, Boating, Clamming, Hiking, Beachcombing, Scenic Coastline, Storm Watching, Whale Watching, Pacific City Birding and Blues Festival, Dory Days Parade.	Fishing and Tourism	Portland, 2½ hours 166.4 kilometers (104 miles)
Lane County						
Florence	Sutton/Baker Beach	1.6 (1)	7,263	Oregon Dunes National Recreation Area, Neptune State Park, Devils Elbow State Park, Washburne Memorial State Park, Honeyman State Park.	Retail, Manufacturing, Health Services	Eugene, 1½ hours 96 kilometers (60 miles)
Douglas County						
Reedsport	Tahkenitch South North Umpqua River	12.9 (8) 9.7 (6)	4,378	Salmon Harbor, Wildflower Show, Loon Lake, Ten Mile Lakes, Winchester Bay, Umpqua River, Siltcoos, Dean Creek Elk Viewing Area, Tahkenitch, Pacific beaches, numerous art galleries, Umpqua Discovery Center, Oregon Dunes Recreation Area, water skiing, hunting, fishing, art viewing, bird watching, crabbing, beach combing, biking/hiking trails.	Fishing, Manufacturing, Recreation and Tourism	Coos Bay, 30 minutes 43.2 kilometers (27 miles)

Local Community	Nearest Areas Targeted for Snowy Plover Management Regardless of Ownership	Distance to Nearest SPMA or RMA kilometer (miles)	Population (Census 2000)	Primary Recreational Activities and Amenities	Principal Industries	Approximate Drive Time/Distance from Nearest Major City
Coos County						
Lakeside	Tenmile Coos Bay North Spit	11.3 (7) 22.5 (14)	1,371	The Mill Casino, Simpson Park Nature Walk. Eel Lake; Dean Creek Elk Viewing Area, Tenmile Lake, Oregon Dunes National Recreation Area, Pacific Ocean Campgrounds, Dune Musers Mail Run, Mayday Blast Off, Bass Tournaments, Drag Boat Racing, Boat Rentals, Charleston, Bastendorff Beach County Park.	Wood Products, Fishing, Recreation and Tourism, Agriculture	Portland, 4 hours 315.2 kilometers (197 miles)
North Bend	Coos Bay North Spit	8.0 (5)	9,544	Ocean and freshwater fishing, boating, surfing, Scuba diving, wind surfing, kayaking, camping, ATV dune riding, water skiing, horseback riding, hunting, clamming, hiking, mountain biking, whale watching, canoeing, beachcombing, golf, Oregon Dunes National Recreation Area, South Slough National Estuarine Reserve, Tenmile Lake County Park, Bastendorff Beach County Park and several other county parks, Little Theater on the Bay, July Jubilee Celebration, and The Mill Casino.	Wood Products, Fishing, Recreation and Tourism, Agriculture	Portland, 4 hours 339.2 kilometers (212 miles)
Coos Bay	Coos Bay North Spit	11.3 (7)	15,374	Oregon Dunes National Recreation Area, South Slough National Estuarine Shore Acres Botanical Gardens, The Mill Casino, On Broadway Thespians, Little Theater on the Bay, Coos Art Museum, Marshfield Sun Printing Museum, Coos County Historical Society Museum, Charleston Seafood Festival, Blackberry Arts Festival, Bay Area Fun Festival, Bass Tournaments, Drag Boat Races, Myrtlewood Factories and Tours, Charleston (a small fishing village), Empire Lakes, bird watching, fishing (ocean, bay and freshwater), boating, surfing, wind surfing, kayaking, camping, ATV dune riding, water skiing, horseback riding, hunting, clamming, crabbing, hiking, mountain bike riding.	Wood Products, Fishing, Recreation and Tourism, Agriculture	Portland, 4 hours 339.2 kilometers (212 miles)

Local Community	Nearest Areas Targeted for Snowy Plover Management Regardless of Ownership	Distance to Nearest SPMA or RMA kilometer (miles)	Population (Census 2000)	Primary Recreational Activities and Amenities	Principal Industries	Approximate Drive Time/Distance from Nearest Major City
Bandon	Bandon/New River Bullards Beach	12.9 (8) 8.0 (5)	2,833	Coquille Point, Face Rock Viewpoint State Park, Bandon Marsh, Bullards Beach State Park, Bandon State Park, West Coast Game Park, Cranberry Tours, Bandon Cheese Factory, Lighthouse at Bullards Beach, Old Towne Bandon, Bandon Dunes Golf Course, Wildlife Watching, Shrader Old Growth Trail, Ride the Rogue River and Storm Watching.	Wood Products, Fishing, Tourism, and Agriculture	Coos Bay, 20 minutes 28.8 kilometers (18 miles)
Curry County						
Port Orford	Bandon/New River Sixes River Mouth Elk River Euchre Creek	19.3 (12) 9.7 (6) 6.4 (4) 19.3 (12)	1,153	Battle Rock Park, W. Coast Game Park Safari, Cape Blanco, Shrader Old Growth Trail, Jet Boats on the Rogue River, Beaches, Surfing, Fishing, Camping.	Fishing, Recreation and Tourism, and Lumber	Coos Bay, 1 hour 70.4 kilometers (44 miles)
Gold Beach	Pistol River	16.1 (10)	1,897	Freshwater and Ocean Fishing, Jet Boat Tours, Rafting, Recreational Boating, Ocean Viewpoints, Windsurfing, Clamming, Tide pools, Beachcombing, Whale Watching, Hiking, Trail riding, Golf, Prehistoric Gardens, Museums, Camping, Backcountry Lodges, Shrader Old Growth Trail, Battle Rock park, W. Coast Game Park Safari.	Fishing, Recreation and Tourism, and Lumber	Coos Bay, 1½ hours 124.8 kilometers (78 miles)
Brookings	Pistol River	29.0 (18)	5,447	Samuel Boardman State Park, Kalmiopsis Wilderness Area, Chetco River, Myrtlewood Forests, Botanical Viewing, Tide pools, Historical Sites, Hiking, Fishing and River Tours, Shrader Old Growth Trail Ride, Rogue River, Special Forest Products Floral Display, Azalea Festival, American Music Festival.	Fishing, Recreation and Tourism, and Lumber	Coos Bay, 2 hours 160 kilometers (100 miles)

Source: U.S. Census Bureau 2000; Dean Runyan Associates 2007.

ATV = all terrain vehicle; RMA = Recreation Management Area; SPMA = snowy plover management area

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3.4.4 Environmental Consequences

Consequences Common to All Alternatives

Potential Effects on Tourism and Local Economies

Under each of the project alternatives, OPRD would restrict certain recreational activities along the Ocean Shore for the protection of snowy plovers. As discussed in section 3.3, “Recreation,” these restrictions would have the potential to disrupt recreation by prohibiting or limiting certain activities during the snowy plover nesting season. If visitors to the beach were displaced to locales far enough away from the existing beach areas because of the proposed recreational use restrictions, potential effects on the economy of local communities could occur. This would be because visitors would no longer be spending money at nearby businesses. As mentioned above, travel and tourism related industries are an important component of the economy at the local and State levels.

Although there is a potential for some visitors to relocate their recreational activities to out-of-the-area locations in response to the proposed restrictions, the likelihood of this occurring is expected to be minimal. As discussed in section 3.3, “Recreation,” the issuance of recreational use restrictions under each of the project alternatives would have only a minimal potential to disrupt recreational activity. This is because easily accessible, alternative beach areas are available for each potentially restricted activity under all of the project alternatives (see tables 3.3-4 through 3.3-8 in section 3.3, “Recreation”).

In the majority of cases, the alternative beach would be the same and could be accessed from the same existing access point. In all cases, the alternative beach would be located within the immediate vicinity of the potentially restricted beach area and would be served by the same community. Because these alternative beach areas are geographically located within the same proximity to the communities closest to each management area, it is anticipated that the majority of beach visitors would still frequent the same local businesses under each of the project alternatives. Therefore, the local and regional socioeconomic effects directly attributable to any of the project alternatives would be minimal.

This conclusion is further supported by the Critical Habitat Report (Industrial Economics, Inc. 2005), to the extent that conservation-related measures (such as symbolic fencing or enclosures) were not anticipated to result in the loss of local employment for those beaches with proposed critical habitat designations. It is, however, important to note that the Critical Habitat Report also estimated some losses in expenditures. This outcome is different from what is presented in this DEIS because of a key difference in the assumptions for the Critical Habitat Report. Unlike the analysis presented in this DEIS, the Critical Habitat Report did not

consider that alternate locations are available within the same beach area where recreational activities could occur unrestricted. Therefore, estimates of potential losses in expenditures, although minimal, were likely overestimated in the Critical Habitat Report.

Potential Disproportionate Effects on Environmental Justice Populations

As discussed above, implementation of the project alternatives have the potential to affect visitors who recreate at beaches where snowy plover management actions or beach use restrictions would occur. However, because low income and minority populations do not appear to be disproportionately represented among visitors to the Oregon coast, displacement effects would not be expected to excessively affect these groups. In addition, as discussed above and in section 3.3, "Recreation," displacement effects are expected to be minor for all visitors to the Oregon coast. Therefore, no adverse environmental justice effects are expected.

3.5 Air Quality

This section describes air quality in the study area, as well as potential effects on air quality resulting from implementation of the project alternatives. For this section, the study area is the same as the covered lands described in section 3.1.1, “Covered Lands.”

3.5.1 Approach and Methodology

The description of air quality presented in this section is based on a review of the available literature and a summary of Federal, State, and local policies and regulations related to air quality. The potential effects on air quality in the study area were assessed based on a review of the management strategies for each of the project alternatives, including the draft *Western Snowy Plover Habitat Conservation Plan* (Oregon Parks and Recreation Department 2007), and a programmatic assessment of how those strategies could impact air quality.

The primary source of pollutants associated with the project alternatives would be exhaust emissions from the equipment used for habitat maintenance as well as from vehicle trips associated with the other OPRD management activities. The specific equipment that would be used for these activities is unknown; consequently, emissions from these activities are assessed qualitatively.

3.5.2 Regulatory Context

Criteria Pollutants

The Federal and State governments have established ambient air quality standards for the following six criteria pollutants: ozone, carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), particulate matter (particulate matter smaller than 10 microns or less in diameter [PM₁₀] and particulate matter smaller than 2.5 microns or less in diameter [PM_{2.5}]), and lead. Ozone and NO₂ are generally considered “regional” pollutants because these pollutants or their precursors affect air quality on a regional scale. Pollutants such as CO, SO₂ and lead are considered local pollutants that tend to accumulate in the air locally. Particulate matter is considered a localized pollutant as well as a regional pollutant. Within the study area, CO, PM₁₀, and ozone are considered pollutants of concern. Brief descriptions of these pollutants are provided below, while a complete summary of State and Federal ambient air quality standards (Oregon State Ambient Air Quality Standards (SAAQS) and the National Ambient Air Quality Standards [NAAQS], respectively) for all regulated pollutants is provided in table 3.5-1.

Table 3.5-1. Ambient Air Quality Standards Applicable in Oregon

Pollutant	Averaging Time	NAAQS Violation Determination	Federal Standard Exceedance Level	State Standard Exceedance Level
CO	1-hour	Not to be exceeded more than once/year.	35 ppm	35 ppm
	8-hour	Not to be exceeded more than once/year.	9 ppm	9 ppm
Lead	Calendar Quarter	Quarterly arithmetic mean	1.5 µg/m ³	1.5 µg/m ³
NO ₂	Annual	Annual arithmetic mean	0.05 ppm	0.05 ppm
Ozone	8-hour	3-year average of the annual 4th highest daily maximum 8-hour average concentration.	0.08 ppm	0.08 ppm
PM _{2.5}	Annual Average	3-year average of the annual arithmetic mean.	15 µg/m ³	15 µg/m ³
	24 hour	98th percentile of the 24-hour values determined for each year. 3-year average of the 98th percentile values.	65 µg/m ³	65 µg/m ³
PM ₁₀	Annual Average	3-year average of the annual arithmetic mean.	50 µg/m ³	50 µg/m ³
	24 hour	The expected number of days per calendar year with 24-hour average concentrations above 150 µg/m ³ is equal to or less than 1 over a 3-year period.	150 µg/m ³	150 µg/m ³
SO ₂	Annual Arithmetic Mean	Not to be exceeded more than once per calendar year.	0.03 ppm	0.02 ppm
	24 hour	Not to be exceeded more than once per calendar year.	0.14 ppm	0.10 ppm
	3 hour	Not to be exceeded more than once per calendar year.	N/A	0.5 ppm

Source: Oregon Department of Environmental Quality 2006.

µg/m³ = micrograms of pollutant per cubic meter of air.

CO = Carbon monoxide

NAAQS = National Ambient Air Quality Standard

NO₂ = Nitrogen Dioxide

PM_{2.5} = particulate matter smaller than 2.5 microns or less in diameter

PM₁₀ = particulate matter smaller than 10 microns or less in diameter

ppm = parts per million.

SO₂ = Sulfur Dioxide

Toxic air contaminants are also included in this discussion, although no State or Federal ambient air quality standards exist for these pollutants.

Ozone

Ozone is a respiratory irritant that increases susceptibility to respiratory infections. It is also an oxidant that can cause substantial damage to vegetation and other materials. It is a severe eye, nose, and throat irritant and attacks synthetic rubber, textiles, plants, and other materials. Ozone can cause extensive damage to plants by leaf discoloration and cell damage.

Ozone is not emitted directly into the air, but is formed by a photochemical reaction in the atmosphere. Ozone precursors—reactive organic gases and oxides of nitrogen (NO_x)—react in the atmosphere in the presence of sunlight to form ozone. Because photochemical reaction rates depend on the intensity of ultraviolet light and air temperature, ozone is primarily a summer air pollution problem. The ozone precursors, reactive organic gases and NO_x, are mainly emitted by mobile sources and by stationary combustion equipment.

Carbon Monoxide

CO is essentially inert to plants and materials, but can affect human health. It is a public health concern because it combines readily with hemoglobin to reduce the amount of oxygen transported in the bloodstream. CO can cause health problems such as fatigue, headache, confusion, dizziness, and even death.

Motor vehicles are the dominant source of CO emissions in most areas. High CO levels develop primarily during winter when periods of light winds combine with the formation of ground-level temperature inversions (typically from the evening through early morning). These conditions result in reduced dispersion of vehicle emissions. Motor vehicles also exhibit increased CO emission rates at low air temperatures.

Inhalable Particulates

Inhalable particulates can damage human health and retard plant growth. Health concerns associated with suspended particulate matter focus on those particles small enough to reach the lungs when inhaled. Particulates also reduce visibility and corrode materials. Particulate emissions are generated by a wide variety of sources, including agricultural activities, industrial emissions, dust suspended by vehicle traffic and construction equipment, and secondary aerosols formed by reactions in the atmosphere.

Air Toxics

Toxic air contaminants are pollutants which may cause an increase in mortality or serious illness, or which may pose a present or potential hazard to human health. Health effects include cancer, birth defects, neurological damage, damage to the body's natural defense system, and diseases which can lead to death. Although

ambient air quality standards exist for criteria pollutants, no standards exist for toxic air contaminants. The EPA has designated air toxics as air pollutants that are known or suspected of causing cancer or other serious health effects.

Federal Regulations

Federal Clean Air Act

The Federal Clean Air Act (CAA) of 1963 as amended establishes the framework for modern air pollution control. The CAA directs the EPA to establish ambient air standards for ozone, CO, lead, NO₂, particulate matter, and sulfur dioxide. The standards are divided into primary and secondary standards. Primary standards are designed to protect human health, including the health of "sensitive" populations such as people with asthma, children, and the elderly within an adequate margin of safety. Secondary standards are designed to protect public welfare, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings. Federal standards are listed in table 3.5-1.

State Implementation Plans

Areas that do not meet the Federal ambient air quality standards shown in table 3.5-1 are called *nonattainment areas*. For these nonattainment areas, the CAA requires States to develop and adopt State Implementation Plans (SIPs), which are air quality plans showing how air quality standards will be attained. The SIP, which is reviewed and approved by the EPA, must demonstrate how the Federal standards will be achieved. Failing to submit a plan or secure approval could lead to denial of Federal funding and permits for such improvements as highway construction and sewage treatment plants.

Federal Conformity Requirements

The primary legislation that governs Federal air quality regulations is the Clean Air Act Amendments of 1990 (CAAA). The CAAA delegates primary responsibility for clean air to the EPA. The EPA develops rules and regulations to preserve and improve air quality, as well as delegating specific responsibilities to State and local agencies.

The CAAA of 1990 requires that all federally funded projects come from a plan or program that conforms to the appropriate SIP. Federal actions are subject to either the Transportation Conformity Rule (40 CFR 51[T]), which applies to Federal highway or transit projects, or the General Conformity Rule (40 CFR 51[W]), which applies to all other Federal actions.

General Conformity Requirements

The purpose of the General Conformity Rule is to ensure that Federal actions conform to applicable SIPs so that they do not interfere with strategies employed to

attain NAAQS. The rule applies to Federal actions in areas designated as nonattainment areas for any of the six criteria pollutants and in some areas designated as maintenance areas. The rule applies to all Federal actions except:

- programs specifically included in a transportation plan or program that is found to conform under the Federal transportation conformity rule;
- projects with associated emissions below specified *de minimis* (too small to be concerned about) threshold levels; and
- certain other projects that are exempt, or presumed to conform.

A general conformity determination would be required if a proposed Federal action's total direct and indirect emissions failed to meet any of the following two conditions:

- emissions for each affected pollutant for which the region is classified as a maintenance or nonattainment area for the national standards are below the *de minimis* levels indicated in tables 3.5-2 and 3.5-3; and
- emissions for each affected pollutant for which the region is classified as a maintenance or nonattainment area for the national standards are regionally insignificant (total emissions are less than 10 percent of the area's total emissions inventory for that pollutant).

If a general conformity determination is required, it must be demonstrated that total direct and indirect emissions for each affected pollutant for which the region is classified as an area of maintenance or nonattainment for the national standards would conform to the applicable SIP.

Attainment Classifications

If monitored pollutant concentrations meet State or Federal standards over a designated period of time, the area is classified as being in attainment for that pollutant. If monitored pollutant concentrations violate the standards, the area is considered a nonattainment area for that pollutant. If data are insufficient to determine whether a pollutant is violating the standard, the area is designated unclassified.

Table 3.5-2. Federal de minimis Threshold Levels for Criteria Pollutants in Nonattainment Areas

Pollutant	Emission Rate (Tons per Year)
Ozone (VOC or NO _x)	
Serious nonattainment areas	50
Severe nonattainment areas	25
Extreme nonattainment areas	10
Other ozone nonattainment areas outside an ozone transport region	100

Pollutant	Emission Rate (Tons per Year)
Marginal and moderate nonattainment areas inside an ozone transport region	
VOC	50
NO _x	100
CO: All nonattainment areas	100
SO ₂ or NO ₂ : All nonattainment areas	100
PM10	
Moderate nonattainment areas	100
Serious nonattainment areas	70
Pb: All nonattainment areas	25

Source: 40 CFR 51.853. Note: *de minimis* threshold levels for conformity applicability analysis.

CO = carbon monoxide

NO_x = oxides of nitrogen

NO₂ = nitrogen dioxide

PM10 = particulate matter smaller than 10 microns in diameter

SO₂ = sulfur dioxide

VOC = volatile organic compound

Table 3.5-3. Federal de minimis Threshold Levels for Criteria Pollutants in Maintenance Areas

Pollutant	Emission Rate (Tons per Year)
Ozone (NO_x), SO₂ or NO₂	
All maintenance areas	100
Ozone (VOCs)	
Maintenance areas inside an ozone transport region	50
Maintenance areas outside an ozone transport region	100
CO: All maintenance areas	100
PM10: All maintenance areas	100
Pb: All maintenance areas	25

Source: 40 CFR 51.853.

Note: *de minimis* threshold levels for conformity applicability analysis.

CO = carbon monoxide

NO_x = oxides of nitrogen

NO₂ = nitrogen dioxide

Pb = lead

PM10 = particulate matter smaller than 10 microns in diameter

SO₂ = sulfur dioxide

VOC = volatile organic compound

Regional Haze Plan

The CAA contains requirements for states to protect and improve visibility in national parks and wilderness areas. In 1977, Congress designated certain national parks and wilderness areas as “Class I areas,” where visibility was identified as an important value. There are 12 Class I areas, including Crater Lake National Park and 11 wilderness areas within Oregon. The Kalmiopsis Wilderness Area in southern Oregon is the nearest Class I area, located approximately 64 kilometers (40 miles) east of the Pistol River State Park.

In response to EPA’s first visibility rules, the Oregon Department of Environmental Quality (DEQ) adopted the Oregon Visibility Protection Plan (OVPP) in 1986. The OVPP focuses on protecting Oregon’s Class I areas from smoke due to nearby forest and agricultural burning, and industrial air pollution from new and expanding facilities. In 1990, the CAA was amended to place additional emphasis on the regional haze problem. The amendments established the Grand Canyon Visibility Transport Commission (GCVTC), which conducted a 4-year comprehensive study of regional haze in the Grand Canyon and 15 other areas on the Colorado Plateau in the Southwest. In 1996 the GCVTC developed recommendations that included specific regional haze strategies for industrial and mobile sources, fire, road dust, and pollution prevention, which were forwarded to EPA.

In July 1999, the EPA adopted the Regional Haze Rule (40 CFR 51), which contains two rule sections: Section 308 and Section 309. Section 308 applies to the majority of states in the country, and requires adopting a plan to improve regional haze out to the year 2064. Section 309 applies to the nine western states that were part of the GCVTC study. These states have the option of adopting a 308 plan or a Section 309 plan; the latter based on the GCVTC recommendations from 1996.

On December 5, 2003, DEQ adopted the first regional haze plan for Oregon. This plan follows Section 309, which requires a second plan to be submitted by the end of 2007. Oregon’s Section 309 Regional Haze Plan contains strategies that apply to sources such as industrial facilities, motor vehicles, and fire (forestry and agricultural burning). Pollution prevention is also a key strategy. The plan involves a 2-step process for reducing regional haze. The first step involves applying these strategies to improve haze in the 16 Class I areas of the Colorado Plateau. The second step involves developing a similar plan by 2007 that focuses on Oregon’s 12 Class I areas. This provides 5 years to evaluate the strategies to determine the overall effectiveness and how well they would work in improving haze in Oregon. During this time DEQ will also be reviewing monitoring data to identify the degree of regional haze in Class I areas across Oregon.

State Regulations

The DEQ's Air Quality Division manages air quality in Oregon. The role of the DEQ Air Quality Division is to ensure that Oregon meets and maintains public health and visibility standards and goals. Using a variety of activities, including public health advisories, inspections, ambient air monitoring, education, and incentives, the DEQ Air Quality Division promotes clean air and the control of greenhouse gases and air toxics.

The DEQ Air Quality Division works with local governments, communities, and businesses to find solutions that will prevent or reduce air pollution and solve current air quality problems. Oregon Revised Statutes Chapter 468a contains Oregon's laws pertaining to air quality, and are legally enforceable, while Division 200 through 268 are rules enacted by the DEQ to control air quality within the State.

3.5.3 Affected Environment

Regional Climate and Meteorology

The Oregon coastal zone stretches along Oregon's Pacific Ocean border, and is characterized by mild temperatures throughout the year, with wet winters and relatively dry summers. The terrain of the coastal zone is widely varied, and includes a coastal plain (which can extend from less than 1.6 kilometers [1 mile] to 0.5 kilometer [a few tens of miles in width]); numerous coastal valleys; and the Coast Range, whose peaks range from 610 to 1,676 meters (2,000 to 5,500 feet) above sea level and extend down the full length of the State. The Coast Range is dissected and drained by many rivers, including the Coquille, Umpqua, and Yaquina Rivers. Moist air masses moving off the Pacific Ocean onto land result in the region's heavy precipitation, especially during winter months. This abundant moisture supports valley crops of grass seed, flower bulbs, nuts, and fruit, as well as lush pastures for dairy and animal production.

The warmest months typically occur during July, August, and September with the average summer temperature being only approximately 15 degrees above the coldest month, January. The mild temperatures result in the coastal region having the lowest heating and cooling degree days (base 65° Fahrenheit [°F]) (18.3° Celsius [°C]) than any other Oregon region. Extremely high or low temperatures are rare, with temperatures of 90° F (32.2° C) or above occurring less than once per year, on average, and freezing temperatures occurring infrequently. Killing frosts occur even less frequently, as most of the area averages more than 300 days between the last occurrence (spring) and the first occurrence (fall) of 28° F (-2.2° C) temperatures.

Normal annual precipitation is between 165 to 229 centimeters (65 to 90 inches) along the lower elevations of the immediate coast. However, spots high on the west

slopes of the Coast Range may get up to 200 inches annually. Strong flood events can result from several days of abundant rainfall.

However, flood control dams have greatly reduced the incidence of damaging floods in some locations. The highest monthly precipitation values for the coastal zone occur in the winter months (November, December, and January), which is typical of western Oregon. Typically, snowfall in the coastal zone is minimal, with only one to three inches occurring in most instances. However, some of the higher elevations receive considerable amounts of snowfall. Mary's Peak, the highest peak in the Coast Range at 1,249 meters (4,097 feet), can have snow pack that lasts into May.

Strong winds, often in advance of winter storms, occasionally strike the Oregon coast. Wind speeds can exceed hurricane force, and cause extensive damage to structures or vegetation in rare cases. Damage typically occurs at exposed coastal locations, but may extend into inland valleys. However, such events are typically short-lived, lasting less than one day.

Skies are typically cloudy during winter and partly cloudy during summer. Summer cloud cover is due mostly to fog and low clouds. Total solar radiation is lower here than in any other part of the State due to the persistent cloudiness (Oregon Climate Service 2006).

Sensitive Receptors

For the purposes of air quality analysis, sensitive land uses are defined as locations where people reside or where the presence of pollutant emissions could adversely affect the use of the land. Sensitive land uses in the study area include residences and beaches that support recreational use.

Attainment Status

Currently, there are no areas within Oregon that are classified by the EPA as being nonattainment areas for the NAAQS. However, there are areas within Oregon that have been designated by the EPA as being maintenance areas for certain pollutants (table 3.5-4) or are in the process of being redesignated as such (table 3.5-5). These areas are predominantly located in the vicinity of populated areas (i.e., cities and towns).

Table 3.5-4. Oregon Communities with Air Quality Maintenance Strategies (Re-designated as Attainment Areas)

City	Pollutant	Re-designation Date
Eugene/Springfield	CO	1994
Grants Pass	CO	1999
Portland	CO	1996
Klamath Falls	CO	2001
Medford/Ashland	CO	2001
Klamath Falls	PM10	2002
Grants Pass	PM10	2003

Oregon Department of Environmental Quality 2006.
CO = carbon monoxide
PM10 = particulate matter with a diameter less than 10 microns

Table 3.5-5. Remaining Non-Attainment Communities with Air Quality Maintenance Strategy Development in Progress

City	Pollutant	Redesignation Status
Salem-Keizer	CO	NAAQS met, plan in development
Eugene/Springfield	PM10	NAAQS met, plan in development
La Grande	PM10	NAAQS met, plan in EPA review
Lakeview	PM10	NAAQS met, plan in EPA review
Medford	PM10	NAAQS met, plan in EPA review
Oakridge	PM10	NAAQS met, plan in development

Oregon Department of Environmental Quality 2006.
CO = carbon monoxide
PM10 = particulate matter with a diameter less than 10 microns

Global Climate Change

Since 1997, Federal agencies executing projects under NEPA have been charged with determining how those projects contribute to greenhouse emissions and ultimately changes in the global climate. The following draft guidance was given to Federal agencies on October 8, 1997:

“Global climate change is a serious environmental concern which, given the current state of scientific knowledge, must be viewed under NEPA as a reasonably foreseeable impact of continued emission and changes in sinks of greenhouse gases (Executive Office of the President 1997).”

The issue of how emissions from human activities may affect the global climate has been the subject of extensive international research in the past several decades.

There is now a broad consensus among atmospheric scientists that emissions caused by humans have already caused measurable increases in global temperature and are expected to result in significantly greater increases in temperature in the future. However, there is still considerable uncertainty about the exact magnitude of future global impacts and the best approach to mitigate the impacts.

The United Nations' Intergovernmental Panel on Climate Change (IPCC) published its most recent sets of 5-year progress reports summarizing worldwide research on global climate change in 2001 and 2007 (Intergovernmental Panel on Climate Change 2007). These reports indicated that some level of global climate change is likely to occur and that there is a significant possibility of adverse environmental effects. Several alternative mitigation measures were evaluated by the worldwide scientific community to reduce global emissions, including the first round of worldwide reductions in greenhouse gases (GHGs), as prescribed by the Kyoto Protocol. For more information about the potential environmental effects of global climate change, refer to section 3.7, Wildlife.

3.5.4 Environmental Consequences

Consequences Common to All Alternatives

Potential Increase in the Emission of Pollutants

Some of the covered activities that would be conducted under each of the project alternatives, such as habitat restoration, would involve activities that could increase the emission of air pollutants. This includes operating equipment for installing enclosures fences, ropes, and signage, as well as for habitat restoration. Emissions would also result from an increase in vehicle trips associated with snowy plover management activities (e.g., equipment deliveries and employee commute trips). These activities would continue under all of the project alternatives, although the extent of habitat restoration could be greater under Alternatives 2 and 3, relative to Alternative 1, due to habitat restoration activities being proposed at additional SPMAAs (chapter 2, "Alternatives").

It is anticipated that these emissions would be minimal under each of the project alternatives because the type of equipment and number of vehicle trips that would be required would be minimal and the use would occur temporarily. In addition, because the study area is classified as a Federal attainment area for the ozone, CO, and PM10 standards, the project is not subject to general conformity requirements. It is also possible that localized emissions from recreational vehicles would be lower in areas where driving would be restricted seasonally.

Potential Effects on Global Climate Change Caused by Emissions from Construction Equipment for Beach Restoration Projects

Temporary emissions from construction equipment used to restore beach habitat for the proposed project would have a negligible effect on global climate change in Oregon. Global climate change is a worldwide problem caused by combined GHG emissions throughout the planet. Global circulation patterns ensure that local emissions from any given spot on earth will be well mixed globally. In effect all emissions (no matter how local) will become part of the worldwide emission inventory for GHGs. Thus, climate change in coastal Oregon would be affected as much by a ton of emissions from power plants in China, for example, as by that same ton of emissions from construction equipment restoring beach habitat in Oregon.

To provide perspective on whether construction emissions for beach habitat restoration could affect global climate change, it is necessary to consider worldwide GHG emissions. GHG emission rates are quantified in units of million metric tons of carbon dioxide (CO₂) equivalent per year (MMTCO₂E/year). The current worldwide annual emissions of combined GHGs are roughly 45,000 MMTCO₂E/year, and those emissions are expected to increase over the next 20 years. If the diesel-powered construction equipment used for the beach restoration projects used a conservatively high 10,000 gallons of fuel in a year, that equipment would emit 110 tons of CO₂, which is only 0.0001 MMTCO₂E/year of greenhouse gases. That project-related emission rate would be only a tiny fraction of the worldwide total. That fraction is so small it is certain the project-related emissions would have a negligible influence on climate either in Oregon or anywhere on the planet. For a discussion of global climate change and the snowy plover, refer to section 3.7, "Wildlife."

3.6 Noise

This section describes noise considerations in the study area, as well as potential noise effects from implementation of the project alternatives. For this section, the study area is the same as the covered lands described in section 3.1.1 *Covered Lands*.

3.6.1 Approach and Methodology

The description of noise-related issues presented in this section is based on a review of the available literature and a summary of Federal, State, and local policies and regulations related to noise. The potential effects of noise in the study area were assessed based on a review of the management strategies for each of the project alternatives, including the draft *Western Snowy Plover Habitat Conservation Plan* (Oregon Parks and Recreation Department 2007), and a programmatic assessment of how those strategies could impact the surrounding environment.

The primary source of noise associated with the project alternatives would be from the equipment used for habitat maintenance, and from vehicle trips associated with the other OPRD management activities. The specific equipment that would be used for these activities is unknown; consequently, noise levels near these activities have been assessed based on published data from representative construction operations.

Noise Effect Criteria

There are no Federal, State, or local regulations limiting allowable noise levels generated by the construction operations likely to be used for the project alternatives. For purposes of evaluating noise effects in this DEIS, a potential noise effect was considered substantial if daytime construction would cause a noise increase at a home or established campsites or picnic areas exceeding 10 A-Weighted Decibel (dBA), compared to daytime background.

3.6.2 Regulatory Setting

Noise Terminology

Sound is mechanical energy transmitted by pressure waves moving through the air. Noise can be defined as unwanted sound. Sound is characterized by various parameters that include the rate of oscillation of sound waves (frequency or pitch), and the pressure level or energy content (amplitude or sound volume). In particular, the sound pressure level is the most common descriptor used to characterize the loudness of an ambient sound level. The decibel (dB) scale is used to quantify sound intensity. Because sound pressure can vary enormously within the range of human hearing, a logarithmic loudness scale is used to express sound intensity numbers in a

convenient and manageable manner. The human ear is not equally sensitive to all frequencies in the entire spectrum, so community noise measurements are typically weighted more heavily for frequencies to which humans are sensitive in a process called “A-weighting,” written “dBA.”

The ability to perceive a new noise source intruding onto background conditions depends on the nature of the intruding sound and the background sound. For situations where the nature of the new sound is similar to the background sound (e.g., new traffic noise added to background traffic noise) a noise of 3 dB is just noticeable, a change of 5 dB is clearly noticeable, and a change of 10 dB is perceived as doubling or halving sound level. For situations where the nature of the new intruding sound is different from background (e.g., construction noise in an otherwise quiet setting), the new sound (including sporadic “clanks” from construction equipment) can be perceived even if it only raises the overall noise level by less than 1 dBA.

Different types of measurements are used to characterize the time-varying nature of sound. These measurements include the equivalent sound level (L_{eq}) and, the maximum sound levels (L_{max}). Below are brief definitions of these measurements and other terminology used in this analysis.

- **Sound.** Acoustical energy generated by a vibrating object, which, when transmitted by pressure waves through a medium such as air, is capable of being detected by a receiver or receptor, such as a human or animal ear, or a microphone.
- **Noise.** Sound that is loud, unpleasant, unexpected, or otherwise undesirable.
- **dB.** A dimensionless measure of the ratio between two quantities (levels) of sound. Decibels are quantified on a logarithmic scale, which indicates the squared ratio of sound pressure amplitude to a reference (or baseline) sound pressure amplitude. The standard reference pressure used for comparison is 20 micro-pascals.
- **dBA.** An overall frequency-weighted sound level measured in decibels, which approximates the frequency response of the human ear.
- **L_{max}** The maximum sound level measured during the measurement period. For commonly used sound level monitors, the L_{max} is generally equivalent to the loudest 1 second during the measurement period.
- **L_{eq} .** The equivalent steady state sound level that in a stated period of time would contain the same acoustical energy.

Federal Regulations

There are no Federal regulations applicable to noise that could be generated by the proposed project alternatives. Region 10 of the EPA published guidance for evaluating long-term noise increases at residential areas caused by noise from

industrial or transportation projects. That guidance suggests a long-term noise increase of 5 to 10 dBA above background noise should be considered to have a noticeable effect (Environmental Protection Agency 1980) ..

State Regulations

Oregon Revised Statutes Chapter 467, which is legally enforceable, contains Oregon's laws pertaining to noise. Division 35 contains noise control regulations enacted by DEQ. Temporary construction noise and noise from motor vehicles traveling on public roads are specifically exempted from the noise limits specified by the State regulation enacted by Division 35.

Local Policies and Regulations

Several Oregon cities and counties, such as Lincoln and Clatsop Counties and the City of Newport have enacted local noise ordinances. Project elements located in jurisdictions where noise ordinances have been enacted may be subject to these ordinances if they are not located on State-owned property.

3.6.3 Affected Environment

Ambient Noise Environment

Within the study area, the predominant sources of noise are wind and waves at the ocean, recreational activity on the beaches, traffic on adjacent roadways, and general aviation aircraft overflights. Background noise levels typically found at a beach environment are 40 to 45 dBA during calm wind conditions, and 50 to 55 dBA during windy, wavy conditions (U.S. Forest Service 1980).

Noise-Sensitive Land Uses

Noise-sensitive land uses are usually residences, campgrounds, quiet picnic areas, and other similar uses where noise can adversely affect use of the land. Noise-sensitive land uses in the study area include residences and beaches where recreation typically occurs. Temporary construction activities (e.g., temporary bulldozing for dune restoration) could occasionally be required near some noise-sensitive receivers.

3.6.4 Environmental Consequences

Consequences Common to All Alternatives

Some of the covered activities that would be conducted under each of the project alternatives, such as habitat restoration, could increase localized noise levels in the study area. This includes operating equipment for installing enclosures, fences, ropes, and signage, as well as for habitat restoration (temporary bulldozing for dune modification). These activities would continue under all of the project alternatives,

although the extent of habitat restoration could be greater under Alternatives 2 and 3, relative to Alternative 1, due to habitat restoration activities being proposed at additional snowy plover management areas (see chapter 2, “Alternatives.”)

It is anticipated that the use of noise generating equipment would be infrequent and would occur for only a short duration at any given site. In addition, noise from the loudest activities (temporary bulldozing for dune restoration) is not anticipated to be audible at great distances due to ocean noise in the immediate vicinity. For example, a typical bulldozer used for dune restoration generates a noise emission of 81 dBA (L_{eq}) at a 15-meter (50-foot) reference distance (Thalheimer 2000). That noise emission would dissipate with increasing distance from the bulldozer. As described previously, noise from temporary bulldozer operation is considered noteworthy if it increases noise levels by more than 10 dBA above background levels. The bulldozer noise would dissipate to within 10 dBA of background noise levels at the distances listed in table 3.6-1, depending on the background conditions, ground type, and local topography. Calculations for noise levels are shown in Appendix B of this DEIS.

Table 3.6-1. Distance Beyond which Bulldozer Noise Dissipates to Inconsequential Levels

Background Condition	Distance to End of Noticeable Effect
Quiet conditions (45 dBA background)	152 to 274 meters (500 to 900 feet)
Windy, wavy conditions (55 dBA background)	61 to 91 meters (200 to 300 feet)

Source: Jones & Stokes (see Appendix B of this DEIS for supporting calculations).

Note: Noticeable effect is defined as more than 10 dBA above background
dBA=10 A-Weighted Decibel

In addition, bulldozing would seldom be required close to homes, campsites, or picnic areas. Therefore, the potential noise effects are anticipated to be minimal.

3.7 Wildlife and Their Habitat

This section describes wildlife species listed under the Federal ESA or the Oregon ESA that have the potential to occur in ocean shore habitats in the study area. A general discussion of coastal wildlife communities and species movement within the study area is also provided. Although the study area for this section is the same as the covered lands described in section 3.1.1, “Covered Lands,” the analysis focuses on wildlife and their habitat in the specific portions of the key State parks, State natural areas, and State recreation areas described in section 1.2.3, “Context,” and illustrated in figures 1-3 through 1-11.

3.7.1 Approach and Methodology

Wildlife species with the potential to occur in ocean shore habitats on the Oregon coast were determined by reviewing species lists from the FWS, ODFW, and Oregon Natural Heritage Information Center (ORNHIC). Wildlife occurrence information was cross-referenced with the extent of suitable habitat on the covered lands to determine which wildlife species could occur in the study area. If a species is known to occur along the Oregon coast, and there is suitable habitat to support the species within the study area, it was assumed that the species was present and could be potentially affected by the proposed project alternatives.

Potential effects on wildlife were analyzed by reviewing the proposed management strategies associated with each of the project alternatives and comparing those impacts with information in current field guides, biological field survey reports, annotated lists of local birds, and general information collected during a site visit in July 2006. Relevant scientific literature and reports were also reviewed for information on potential impacts on individual species or species groups associated with the proposed restoration and management activities.

3.7.2 Regulatory Context

Federal Endangered Species Act

As described in chapter 1, “Purpose and Need,” wildlife species listed as threatened or endangered are protected under the Federal ESA. Section 7 of the ESA requires that Federal agencies ensure that the actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of listed species, or result in the destruction or adverse modification of habitat critical for these species.

Federally listed wildlife species and critical habitat that may occur in the study area are described in section 3.7.3, “Affected Environment.”

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act prohibits the taking of both bald and golden eagles or any parts, nests, or eggs. This act prohibits killing, collection, and disturbance of these species. Project activities that cause direct mortality of these species or removal or alteration of a nest site would likely violate the provisions of this Act.

Bald eagles have the potential to occur in the study area, as described in section 3.7.3, “Affected Environment,” and would be protected under the Bald and Golden Eagle Protection Act.

Migratory Bird Treaty Act and Executive Order 13186

The Migratory Bird Treaty Act (MBTA) prohibits the take of any migratory bird, or any part, nest, or egg of any such bird. Take under the MBTA is defined as “the action of or attempt to pursue, hunt, shoot, capture, collect, or kill” (50 CFR 10.12) and includes intentional take (i.e., take that is the purpose of the activity in question) and unintentional take (i.e., take that results from, but is not the purpose of, the activity in question). The MBTA applies to all persons and organizations in the United States, including Federal and State agencies.

The MBTA is administered by FWS, with regulation of listed migratory birds delegated to the agency staff handling Section 7 of the ESA, and regulation of unlisted migratory birds delegated to FWS’s Migratory Bird Division.

Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds, provides guidance for FWS programs relative to the management and conservation of migratory birds. The Executive Order directs each Federal agency taking actions that could adversely affect migratory bird populations to work with FWS to develop a memorandum of understanding (MOU) that will promote the conservation of migratory bird populations. Protocols developed under the MOU should include the following agency responsibilities:

- avoid and minimize, to the extent practicable, adverse impacts on migratory bird resources when conducting agency actions;
- restore and enhance habitat of migratory birds, as practicable; and
- prevent or abate the pollution or detrimental alteration of the environment for the benefit of migratory birds, as practicable.

The Executive Order is designed to assist Federal agencies in their efforts to comply with the MBTA and does not constitute any legal authorization to take migratory birds.

Several species of migratory birds may use lands in the study area, as described in section 3.7.3, “Affected Environment,” and would be protected by under the MBTA and Executive Order 13186.

Oregon State Endangered Species Act

Similar to the Federal ESA, the Oregon ESA offers protection to species listed as threatened or endangered in the State. However, the Oregon ESA is much more limited in scope and applies only to State agencies taking actions on State owned or leased lands. Protections afforded wildlife species listed under Oregon’s ESA are administered by the ODFW.

State listed wildlife species that may occur on the covered lands are described in section 3.7.3, “Affected Environment.” Since the covered lands are owned by the State, OPRD would be required to consult with ODFW for impacts on State listed wildlife species.

3.7.3 Affected Environment

Wildlife communities within the study area are typical of the ocean shore along the Oregon coast. Wildlife species using highly volatile dune environments, such as the ocean shore, are typically adapted to conditions like strong winds, blowing sand, and salt spray. The intertidal (low-tide to extreme high-tide) area, otherwise referred to as the wet-sand, along the ocean shore supports a diverse array of invertebrates, particularly along the wrack line (the area where seaweed and woody debris wash up and accumulate on the beach). This nutrient rich portion of the ocean shore supports many nesting migratory bird species, both on the sandy beach and in the adjacent uplands.

Table 3.7-1 provides a list of seven special status species that could occur in the vicinity of the study area. These species are addressed in this DEIS because they 1) are closely associated with beach or ocean shore environments; 2) are known to, or could potentially, occur in the study area, or 3) are considered sensitive to the management activities proposed under the project alternatives.

Table 3.7-1. Threatened or Endangered Wildlife Species along the Oregon Coast

Species Name	Federal Status	State Status
Oregon silverspot butterfly (<i>Speyeria zerene hippolyta</i>)	Threatened	Threatened
Bald eagle (<i>Haliaeetus leucocephalus</i>)	Delisted	Threatened
Brown pelican (<i>Pelecanus occidentalis</i>)	Endangered	Endangered
Marbled murrelet (<i>Brachyramphus marmoratus marmoratus</i>)	Threatened	Threatened
Northern spotted owl (<i>Strix occidentalis</i>)	Threatened	Threatened

Species Name	Federal Status	State Status
Western snowy plover (<i>Charadrius alexandrinus nivosus</i> [coastal population])	Threatened	Threatened
Steller sea lion (<i>Eumetopias jubatus</i>)	Threatened	Sensitive/ Vulnerable

Source: Fish and Wildlife Service 2006b.

Endangered = species that is in danger of extinction throughout all or a significant portion of its range

Threatened = species that is likely to become endangered in the foreseeable future

Sensitive/Vulnerable = species for which listing as threatened or endangered is not believed to be imminent and can be avoided through continued or expanded use of adequate protective measures and monitoring.

Oregon Silverspot Butterfly

Species Ecology

The Oregon silverspot butterfly occurs in coastal environments along the coast of Oregon. Historically the species likely occurred from northern California to the coast of Washington. In 1982, the only sites considered viable for the species were found in Oregon at the mouths of Big and Rock Creeks in Lane County (about 500 acres), and at Mt. Hebo in Tillamook County (about 1,200 acres) (NatureServe 2006a). The Clatsop Plains in Clatsop County are also currently considered viable habitat for the butterfly (Fish and Wildlife Service 2001a).

This species occupies early successional, coastal grassland habitat that contains the caterpillar host plant, early blue violet (*Viola adunca*), and adult nectar sources. Soil and climatic conditions, salt-spray or mist, and disturbance regimes historically contributed to maintaining low, open grasslands within the species' range by suppressing encroaching trees and shrubs (Fish and Wildlife Service 2001a).

Threats to Species

Invasion by non-native (invasive) species, natural succession due to stabilization of historically ephemeral habitats, and land development have resulted in modification and loss of the species' habitat. Historic and ongoing land management practices preclude the type of disturbance necessary to maintain existing habitats and create new habitats for species expansion (Fish and Wildlife Service 2001a). Other threats include off-road vehicle use, grazing, erosion, road kill, and pesticides. The most recent pressures on the species include lack of genetic diversity due to a reduction in the total number of viable populations (NatureServe 2006a).

Management and Status in Western Oregon

The Oregon silverspot butterfly is listed as threatened under the Federal ESA and Oregon ESA. Critical habitat for the species was designated in Lane County in 1980. The FWS prepared a recovery plan for the species in 1982, which was revised in 2001 (Fish and Wildlife Service 2001a).

A county-wide Safe Harbor Agreement between The Nature Conservancy and FWS is proposed in Lane County and is expected to be completed before the fall of 2007 (Fish and Wildlife Service 2006c).

Current OPRD Management Prescriptions

There are currently no OPRD management prescriptions in place for Oregon silverspot butterfly.

Bald Eagle

Species Ecology

Bald eagles are closely associated with freshwater, estuarine, and marine ecosystems that provide abundant prey and suitable habitat for nesting and communal roosting (Buehler 2000). Breeding territories are typically located within one mile of permanent water in predominantly coniferous; uneven aged stands with old growth structural components (Fish and Wildlife Service 1986; Buehler 2000). Bald eagles winter along ice-free lakes, streams, and rivers where food and perch sites are abundant and the level of human disturbance is low (Fish and Wildlife Service 1986; Buehler 2000). Communal night roosts are used by bald eagles primarily during the winter months. In the Pacific Northwest, communal roosts occur generally in multi-layered mature or old growth conifer stands that provide protection from weather and human disturbance (Buehler 2000).

The bald eagle can be found along the entire Oregon coast, from the Columbia River to the California border. Although many birds nest along the Oregon coast, it is unlikely that nest trees large enough to support breeding pairs would be located in close proximity to the covered lands. Nests are often reused year after year, and with additions made annually, the nests can become very large. Bald eagle nests have been found within or in proximity to a number of coastal parks, including Fort Stevens State Park. The bald eagle, which breeds in all seven coastal counties, nests from February through mid-August (Oregon Parks and Recreation Department 2005). Winter foraging areas are usually located near open water on rivers, lakes, reservoirs, and bays where fish and waterfowl are abundant, or in areas with little or no water (i.e., rangelands, barren land, suburban areas, etc.) where other prey species (e.g., rabbit, rodents, scavenged deer, and other carrion) are abundant. Waterfowl are the most common avian prey, but shorebirds and land birds are also eaten. On the Oregon coast, varieties of mammals are also taken as prey, although mammals are less important than fish and birds.

Threats to Species

Population declines are attributed to reproductive failure associated with eggshell thinning resulting from widespread use of organochloride compounds, habitat loss, shooting, secondary lead poisoning, exposure to lethal poisons from vertebrate control programs, and other environmental contaminants (Fish and Wildlife Service

1986). Other threats include disturbances associated with urban and recreational development and associated human activities (i.e., hiking, camping, boating, and off-highway vehicle use). Use of fireworks is another activity that can affect nesting bald eagles (Oregon Parks and Recreation Department 2005).

Management and Status in Western Oregon

The bald eagle was listed as threatened under the Federal ESA in 1978, and as a threatened species under the Oregon ESA in 1987. The FWS appointed a recovery team in 1979, and a Pacific Bald Eagle Recovery Plan for seven western states was completed in 1986 (Fish and Wildlife Service 1986). No critical habitat has been designated for bald eagle in Oregon or other western states.

In 1998, the Oregon Fish and Wildlife Commission proposed to remove the bald eagle from the State list because most bald eagle recovery goals had been met or exceeded. The FWS announced its intent to begin the Federal process for delisting the bald eagle in 1999. Both proposals were put on hold shortly after they were announced due to concerns about protection of the species after delisting. The ODFW recently re-initiated the process for reviewing the State status of bald eagle in Oregon. In June 2007, FWS removed the bald eagle from the Federal list after determining that threats to the species have been eliminated or reduced to the point that the species has recovered (Federal Register, Volume 72, Number 130, Pages 37346 to 37371). The National Bald Eagle Management Guidelines were finalized in May 2007 (Fish and Wildlife Service 2007b).

Current OPRD Management Prescriptions

There are currently no OPRD management prescriptions in place for the bald eagle. In accordance with State and Federal law, OPRD avoids disturbance to nesting sites during the nesting season (January to August) and roosts during the wintering season (November to March). Use of fireworks on the covered lands is also illegal without a permit from OPRD. Although permits are generally issued to local communities for July 4th celebrations, no permits are issued for firework activities within 1,000 feet of a known bald eagle nest.

Brown Pelican

Species Ecology

The brown pelican can be found along the entire Oregon coast, from the Columbia River to the California border. Brown pelicans feed mostly in shallow estuarine water on fish, and make extensive use of sand spits, offshore sand bars, and islets for nocturnal roosting and daytime loafing (NatureServe 2006b). They breed in California, and then disperse along the Pacific coast as far north as Vancouver Island during the non-breeding season (Shields 2002). The brown pelican is a common

spring, summer, and fall visitor along the Oregon coast, and has been known to winter in the Charleston and Coos Bay area.

Brown pelicans are often seen frequenting the rocky shoreline of the Oregon coast, but rarely occur on the ocean shore. Large numbers of pelicans have congregated on East Sand Island at the mouth of the Columbia River in the past several years. Breeding behavior (i.e., courtship displays, nest-building and attempted copulations) was observed as recently as 2006 on East Sand Island, although there was no evidence of egg laying (Reinalda et. al. 2007).

Threats to Species

Population declines are attributed to reproductive failure due to environmental contamination and lack of food, although threats to essential habitats, human disturbance, and the need for continued population monitoring are molding current recovery and management efforts (NatureServe 2006b). Human disturbance during critical times in the breeding cycle can also affect the reproductive success of brown pelican.

Management and Status in Western Oregon

The brown pelican is listed as endangered under both the Federal ESA and the Oregon ESA. Critical habitat has not been designated for the brown pelican.

Current OPRD Management Prescriptions

There are currently no OPRD management prescriptions in place for the brown pelican.

Marbled Murrelet

Species ecology

The marbled murrelet is a small seabird that inhabits coastal areas from Alaska to south-central California. They spend most of their lives in the marine environment where they feed primarily on small fish and invertebrates in near-shore marine waters (Fish and Wildlife Service 1997; Nelson 1997). The species typically nests within remaining older forest stands that are close enough to the coast for murrelets to fly back and forth. In the Pacific Northwest, murrelets nest in low elevation old growth and mature coniferous forests that contain multilayered canopies (Hamer and Nelson 1995; Nelson 1997). Nests are typically in the largest diameter trees available in a stand. Trees commonly used for nesting include Douglas-fir (*Pseudotsuga menziesii.*), western hemlock (*Tsuga heterophylla*), and Sitka spruce (*Picea sitchensis*). Individual tree attributes that provide conditions suitable for nesting include large branches (average 13 inches in diameter, range of 4 to 32 inches), forked branches, deformities, witches' brooms, or other structures that provide a platform for nesting (Fish and Wildlife Service 1996).

Documented nests in Oregon and Washington have been in trees greater than 32 inches diameter at breast height (Fish and Wildlife Service 1997; Hamer and Nelson 1995). The farthest known inland occurrence of marbled murrelets in Oregon is 61 km (38 miles) (Fish and Wildlife Service 1997). At sea, marbled murrelets can be found during breeding season at Boiler Bay, Yaquina Head, and Cape Perpetua (Oregon Parks and Recreation Department 2005). The breeding season for the marbled murrelet is late March through late September.

Threats to the Species

The *Recovery Plan for the Threatened Marbled Murrelet* (Fish and Wildlife Service 1997) lists threats to the species' survival and recovery in both marine and terrestrial habitats. Terrestrial threats include the loss of nesting habitat, poor reproductive success, and predation of nests and adults. At-sea threats include mortality from fishing nets, oil spills, marine pollutants, and changes in prey abundance and distribution.

McShane et al. (2004) conducted a 5-year review of the status of marbled murrelet and found the threat posed to the species by past and ongoing habitat loss and oil spills had not changed since listing. Threats from the rate of habitat loss mortality and from gill net fisheries had decreased. The review identified disease as one possible new threat.

Management and Status in Western Oregon

The marbled murrelet is listed as threatened under the Federal ESA and the Oregon ESA. Critical habitat for the marbled murrelet was designated in 1996 (Fish and Wildlife Service 1996), and the Recovery Plan for the Threatened Marbled Murrelet was released in 1997 (Fish and Wildlife Service 1997). The FWS published a revised proposed designation of critical habitat on September 12, 2006.

Current OPRD Management Prescriptions

There are currently no OPRD management prescriptions in place for marbled murrelets.

Northern Spotted Owl

Species Ecology

The northern spotted owl is a forest-dwelling owl that prefers mature/old growth mixed coniferous forest habitats (Fish and Wildlife Service 2007c). Spotted owls will occupy second growth (managed) forest if key components of old-growth forest are present. However, population density and reproductive success are usually lower than for owls inhabiting old growth forests (Fish and Wildlife Service 2007c). Major roosting and nesting areas are generally dispersed throughout a spotted owl territory, and their pattern of use varies seasonally (Fish and Wildlife Service 2007c). Spotted

owls prey on a variety of small animals, including mammals, birds, and insects. Diets vary considerably between regions and habitat types; however, small mammals are the principal prey throughout their range (Fish and Wildlife Service 2007c). Since the study area encompasses the ocean shore, it is devoid of all mature coniferous and mixed coniferous forest that represent potential nesting habitat for the spotted owl.

Threats to Species

The FWS initiated a five-year review of the northern spotted owl in January 2003. For the review, FWS contracted with Sustainable Ecosystems Institute to produce a report on the status of the northern spotted owl, summarizing and evaluating new information available since its listing, and any new understanding of information that existed at the time of listing (Fish and Wildlife Service 2004). The conclusions of the Sustainable Ecosystems Institute Panel, as documented in a report titled Scientific Evaluation of the Status of the Northern Spotted Owl (Status Report) (Courtney et. al. 2004), provided the primary biological basis for the conclusions of the five-year review.

In summary, the Status Report found that primary threats to northern spotted owls include loss of habitat from timber harvest and potentially, from catastrophic wildfires, and impacts from competition and potential interbreeding with barred owls (*Strix varia*). Other factors considered in the listing of the species may still affect the species, including disease or predation, inadequate regulatory mechanisms for protection of spotted owls, and isolation of small populations (Courtney et. al 2004).

In April 2007, the Fish and Wildlife Service released the *Draft Recovery Plan for the Northern Spotted Owl* (Fish and Wildlife Service 2007c), which identifies competition from barred owl as the primary threat to northern spotted owls.

Management and Status in Western Oregon

The northern spotted owl is listed as threatened under the Federal ESA and the Oregon ESA. The FWS designated critical habitat for the northern spotted owl in 1992. All State lands were deleted from the final designation of critical habitat. A draft recovery plan for northern spotted owl was completed in 1992 (Fish and Wildlife Service 1992), but not finalized due to the development of the Northwest Forest Plan. The draft recovery plan was revised and released for public review in April 2007 (Fish and Wildlife Service 2007c). Since the proposed alternatives would only be implemented on the Ocean Shore, and are not likely to affect forested areas typical of northern spotted owl, this species is not evaluated further in this DEIS.

Current OPRD Management Prescriptions

There are currently no OPRD management prescriptions in place for northern spotted owl.

Western Snowy Plover

Species Ecology

The western snowy plover is a small shorebird that nests on the sandy beach. The Pacific Coast population of western snowy plover in Oregon (snowy plover) is at the northern end of the subspecies' range and consists of approximately 140 birds spread between 7-8 breeding sites (Oregon Parks and Recreation Department 2007). Current Oregon breeding sites are Baker/ Sutton Beaches; the north and south spits of the mouth of the Siltcoos River; beachgrass removal sites at Dunes Overlook; north and south spits of Tahkenitch Creek; north and south spits of Tenmile Creek; Coos Bay North Spit; Bandon State Natural Area (SNA); and the New River spit.

Surveys conducted in earlier years indicated that before 1978, the snowy plover population in Oregon was larger and more widely distributed than it is currently. Along the Oregon coast, snowy plover nesting habitat is characterized by wide, open sandy beaches, river mouths, or dredge spoils, often with scattered driftwood or vegetation. Driftwood, wrack, and native dune plants often harbor snowy plover food sources, and provide cover for chicks hiding from predators (Page et al. 1995; Fish and Wildlife Service 2001b). Driftwood and plants can also provide protection from the wind and cover from predators. In 2006, a total of 147 snowy plover nests were located, and an estimated 177 to 179 adult snowy plovers were located at breeding sites. Of these, eggs hatched from 69 nests, resulting in 109 fledged snowy plovers (Lauten et al. 2006).

Threats to the Species

The primary threats to snowy plovers include loss of habitat for nesting and foraging, predation, climate, and reproductive failures. Sources for habitat loss include the introduction of European beachgrass, which stabilizes sand dunes and results in diminished sandy beach area available for habitat. Development of adjacent properties may also result in loss of habitat, through installation of riprap facings to sustain embankments and seawalls, which affect beach erosional processes (Fish and Wildlife Service 2001b).

Reproductive failure is the indirect result of European beachgrass, which provides cover for predatory species, including fox, skunk, raccoon, and feral cats. Human recreational activity on the beach may also result in an increase in reproductive failure. Birds will flush from their nests if approached too closely by humans or their pets, and particularly when approached by dogs (Lafferty 2001). Collection and removal of driftwood may result in the loss of protective cover for snowy plover and their chicks, although excessive amounts of driftwood can provide places for predators to hide. Natural occurrences, such as windstorms, may also bury eggs (Fish and Wildlife Service 2001b).

Management and Status in Western Oregon

The Pacific Coast population of snowy plover is listed as threatened under the Federal ESA and the Oregon ESA. Critical habitat was designated for the coastal population of snowy plover in 2005 (Fish and Wildlife Service 2005b), and a recovery plan was prepared for the Pacific Coast Population in 2001 (Fish and Wildlife Service 2001b).

Current OPRD Management Prescriptions

Section 2.3.1, “Alternative 1 – Current Management (No-Action),” describes OPRD’s current management prescriptions for snowy plover. In summary, OPRD currently manages the Habitat Restoration Area (HRA) at Bandon SNA for nesting populations of snowy plover. Management activities typically occur during the nesting season (March 15 to September 15), and include recreation use restrictions; habitat maintenance; predator management; monitoring; and public outreach and education.

If a snowy plover nest is discovered on OPRD owned or leased lands outside of the HRA at Bandon SNA, OPRD works with the FWS to determine what protections should be put in place. Generally, OPRD places an enclosure and 50-meter (164 foot) radius buffer around the identified nest, although the size of the enclosure varies with the local geography and physical constraints (i.e., high tide line, drifting sand, level of recreational use). OPRD also considers permit applications on a case-by-case basis to temporarily limit recreational use on portions of their Ocean Shore at lands owned or managed by other landowners for nesting populations of plover (RMAs). Since 1994, OPRD has considered and approved permit applications submitted by Federal landowners and Coos County to restrict recreation use on the dry sand portions of the Ocean Shore at Baker/Sutton Beach, Siltcoos Estuary/Dunes Overlook/Tahkenitch Estuary, Tenmile Estuary, Coos Bay North Spit, and Bandon/New River. The actual recreational use restrictions that are currently implemented at these sites are described in section 3.3, “Recreation.”

Steller Sea Lion

Species Ecology

The Steller sea lion is found in the Pacific Ocean from Japan to southern California. Steller sea lions tend to remain offshore or haul out in unpopulated areas, and are not often seen in bays or rivers. The main haul-out areas in Oregon are Rogue Reef, Three Arch Rocks, and Shell Island (Oregon Parks and Recreation Department 2005). During the May to July breeding season, Steller sea lions congregate at offshore island rookeries, where mating takes place and pups are born. Stellers are opportunistic predators, feeding primarily on a wide variety of fishes and cephalopods. Steller sea lions have been known to prey on harbor seal, fur seal, and ringed seal to supplement their diet (National Marine Mammal Laboratory 2006).

Threats to the Species

There is concern that a population decline, similar to that observed in Alaska, could occur in Oregon. The cause of the decline in the Alaskan population is not fully understood, but possibly includes epidemic diseases, predation, reproductive rate decline, entanglement in fishing nets, and loss of their primary prey, the walleye pollock (*Theragra chalcogramma*) to the North Pacific trawl fishing industry. The latter is considered the most probable cause. Stellar sea lions can also be disturbed by human presence in some places, if there is easy access (Oregon Parks and Recreation Department 2005).

Management and Status in Western Oregon

The Steller sea lion is listed as threatened under the Federal ESA and Oregon ESA. Critical habitat was designated in 1993 (National Marine Fisheries Service 1993), and a revised draft recovery plan was proposed in May 2006 (National Marine Fisheries Service 2006).

Current OPRD Management Prescriptions

Steller sea lion haul out areas in the study area are under the jurisdiction of the FWS (Refuge system), and ODFW and NMFS have management responsibility for the species. Currently, OPRD works with ODFW and NMFS on recreation or permitting issues that may result in adverse effects to the species (Oregon Parks and Recreation Department 2005).

Other Coastal Species

Waters adjacent to the covered lands support a wealth of biological diversity, including many special-status species. There is the possibility that many species of seabirds, like the State and federally endangered short-tailed albatross (*Diomedea albatrus*), could occur in near shore waters at some point during the permit term. Several species of waterfowl and gulls use near-shore habitats and the wet sand portion of the beach for foraging and daytime loafing. Shorebirds, including but not limited to sanderling (*Calidris alba*), surfbird (*Aphriza virgata*), western sandpiper (*Calidris mauri*), least sandpiper (*Calidris minutilla*), and willets (*Catoptrophorus semipalmatus*), also forage on the wet sand portion of the beach.

Many species of mammals that are commensal (live in close relationship) with humans are present in beach environments. These include raccoon, (*Procyon lotor*), opossum (*Didelphis virginiana*), striped skunk (*Mephitis mephitis*), red fox (*Vulpes vulpes regalis*), black rat (*Rattus rattus*), and Norway rat (*Rattus norvegicus*). Other species of mammals that may use beach habitats but would be encountered less frequently include coyote (*Canis latrans*), mink (*Mustela vison*), long-tailed weasel (*Mustela frenata*), and deer mice (*Peromyscus maniculatus*).

Marine species such as sea turtles and whales also use near shore waters for foraging and migration. There are no known concentrations of nesting sea turtles along the Oregon coast.

Global Climate Change and Rising Sea Levels

Since 1997, Federal agencies executing projects under NEPA have been charged with determining how those projects contribute to GHG emissions and ultimately changes in the global climate. The following draft guidance was given to Federal agencies on October 8, 1997:

“Global climate change is a serious environmental concern which, given the current state of scientific knowledge, must be viewed under NEPA as a reasonably foreseeable impact of continued emission and changes in sinks of greenhouse gases (Executive Office of the President 1997).”

Since that guidance was issued, a growing body of research has documented changes in the biotic and abiotic environment that are the result of an increase in global temperature and the continued concentration of “green-house gases” in the Earth’s atmosphere. During the last 50 years, winter and spring temperatures have been warmer, spring snow levels in lower- and mid-elevation mountains have dropped, snow pack has been melting one to four weeks earlier, and flowers have been blooming one to two weeks earlier (California Climate Change Center 2006a).

In coastal areas, one of the primary concerns is the potential for sea levels to rise and for the frequency and intensity of coastal storm events to increase. Climate change simulations completed by the California Climate Change Center (2006b) project a substantial rate of global sea level rise over the next century due to thermal expansion as the oceans warms, and as runoff from melting land based snow and ice accelerates.

In general, sea level rise projected from these models increases with increases in temperature. Relative to sea levels in 2000, by the 2070-2099 period, sea level rise projections range from 11-54 centimeters (cm) (4.3-21 inches) for the lower GHG emissions scenario (B1), from 14-61 cm (5.5-24 inches) for the middle-upper emissions scenario (A2), and from 17-72 cm (6.7-28 inches) for the highest emissions scenario (A1) (California Climate Change Center 2006b). For a detailed account of these three scenarios see California Climate Change Center 2006c and 2006d.

3.7.4 Environmental Consequences

The following discusses potential effects on wildlife in the study area resulting from management actions associated with each of the project alternatives.

Consequences Common to All Alternatives

Potential Effects of Beach Fires on Ground Nesting Shorebirds

Under all of the project alternatives, small recreational fires would be allowed on the beach in open, dry, sand areas, downwind of and below beachgrass and driftwood lines; and beyond 25 feet (7.6 meters) of a seawall construction of wood or other combustible material. Beach fires that are within the line-of-site of nesting or foraging shorebirds, including snowy plover, could disorient birds at night and could cause them to abandon their nests. Smoke from these fires could also impact adults that are incubating nests and are relatively stationary. This impact would occur on a very site-specific basis, likely impacting only one nest, as beach fires are typically small and would not produce enough smoke to affect an entire nesting area. Further, there could be large numbers of people associated with beach fires, which can put undue stress on nesting birds if fires are located near the nests. Garbage or refuse left on the beach after the fire is extinguished and the public has gone could attract predators (e.g., crows, ravens, raccoons) which may, in turn, impact nesting and foraging populations of shorebirds.

The potential effects of beach fires on ground nesting shorebirds would be similar under all alternatives and would increase over the next 25-years as recreational use continues to increase. Potential effects on ground nesting shorebirds from beach fires would be minimal because most dense beach recreation activity occurs away from known snowy plover nesting areas. Little is known about where other species of birds nest along the Oregon coast, but it is assumed that other ground nesting shorebird species would also tend to nest away from concentrations of recreation activity. Ongoing patrols by beach rangers would help to ensure that incidental effects of beach fires, including residual garbage or refuse left on the beach, are minimized.

Section 3.3, "Recreation," describes recreational use restrictions that would be implemented at areas where nesting populations of snowy plover are known to be present. As described in that section, under all of the project alternatives, beach fires (considered "dry sand activities") would not be allowed at any occupied snowy plover nesting area during the nesting season (March 15 to September 15). These prescriptions would also likely provide some protection for other species of ground nesting shorebirds.

Potential Effects of Driftwood Collection and Removal on Snowy Plover

Under all of the project alternatives, OPRD would continue to allow the collection of driftwood by beach visitors for personal use at State Park beaches. On non-State Park beaches, removal of driftwood for firewood or ornamental purposes would be allowed if it was for personal use, and if the amount collected could be loaded by hand.

Driftwood is an important component of suitable nesting habitat for the snowy plover, as discussed above. Removal of driftwood from occupied snowy plover nesting areas would reduce the suitability of the habitat, if driftwood is in short supply. Similarly, driftwood removal from targeted, unoccupied snowy plover nesting areas would reduce the likelihood that individuals would attempt to nest in those areas. Collection of driftwood near snowy plover nesting areas, and the proximity of beach visitors to such nests, could also impact nest success.

The potential effects of driftwood collection and removal on nesting populations of snowy plover would be similar under all alternatives due to the rules governing its removal, and would likely increase over the next 25-years due to increases in recreational use on the Ocean Shore. However, due to the distance from access points and personal use limitations, the amount of driftwood removed from these sites would likely remain very low and have minimal effects on snowy plovers.

To minimize potential effects on snowy plovers, driftwood collection and removal would not be allowed between the ocean and any snowy plover nesting area actively managed by OPRD (i.e., areas roped off and signed on occupied or actively managed unoccupied areas), and within 100 feet (30.5 meters) in any direction of one of these areas, during the snowy plover nesting season (March 15 to September 15). The specifics of the restriction would be outlined in the site management plan prepared for each SPMA.

Potential Effects of Recreational Activities on Foraging, Migrating, and Wintering Shorebirds

Recreational activities on the beach include, but are not limited to, dog exercising, driving, non-motorized vehicle use (e.g., bicycling, kite-boarding), kite flying, walking, and horse back riding (see section 3.3, "Recreation"). Many of these activities take place on the wet sand portion of the beach and have the potential to impact shorebirds, including snowy plover, and gulls foraging along the wrack line and in other intertidal areas.

Recreation activities can have similar effects on foraging shorebirds during the nesting, migrating, or wintering periods. The Oregon coast is particularly important to shorebirds during the winter months or as stop over sites during migration between breeding and wintering locations. Migrating shorebirds spend most of their time foraging during the migration period and winter months. Recreation activities may temporarily displace foraging or wintering shorebirds, altering the normal behavior patterns of individuals within their normal range of activities. It is also possible for these activities to flush foraging adult shorebirds from optimal habitat into less-than-suitable habitat, and possibly into harms way. Recreational use adjacent to snowy plover nesting areas could also affect chicks as they leave protected management areas to forage on the adjacent wet sand. Similarly, recreation activities could affect

other young shorebirds (i.e., sanderlings) as they forage on the wet sand during the breeding season.

The potential effects of recreation activities on foraging, migrating, and wintering shorebirds would increase under all of the alternatives over the next 25-years as recreational use on the Oregon coast increases. It is likely that the effects of recreational use on these populations would be similar between alternatives; however, conservation efforts under a given alternative that could result in increased populations of shorebirds could increase the likelihood for recreational activities to conflict with ongoing bird use. Effects would be limited to birds being temporarily displaced. Heightened public awareness of the beach as sensitive nesting habitat for shorebirds, as part of the ongoing public outreach and education program, would serve to educate the public about other bird species using habitat along the Oregon coast.

Potential Effects of Beach Management and Management in Emergency Situations on Sensitive Wildlife Populations

As described in chapter 2, “Alternatives,” OPRD personnel are responsible for managing the beaches in the study area to ensure that beaches are safe for public use; for assisting law enforcement personnel with pending investigations; and for assisting with boat strandings and other salvage operations. In addition, during emergency situations (e.g., during a tsunami, flood, shipwreck, etc), OPRD can declare an emergency and allow otherwise unauthorized activities to occur on a case-by-case basis to address the emergency. All of these activities have the potential to impact wildlife species that utilize the ocean shore, depending upon the location that these management activities occur, and the nature of the activity that is undertaken.

The beach management activities and emergency actions noted above are typically carried out without much advance notice, limiting the opportunity for coordination with agency biologists to determine an approach for avoidance of impacts on sensitive wildlife species. These activities can be particularly damaging in biologically sensitive areas, such as shorebird nesting concentrations (i.e., snowy plover nest areas), pinned haul-outs, or waterbird (i.e., brown pelicans) loafing/foraging areas.

The potential effects of implementing emergency or public safety management activities would be similar under all alternatives, and could increase over the next 25-years as the population of Oregon and use of the Oregon coast increases. To minimize potential effects to sensitive wildlife species, OPRD would, as time permits, attempt to contact FWS and ODFW for input on how best to respond to emergency situations or implement beach management activities near established snowy plover nesting areas, known pinned haul-outs, or other biologically sensitive areas. OPRD would also meet with FWS and OPRD after the emergency response effort or beach management activity has been completed, as necessary, to

determine if any habitat rehabilitation or other mitigation measures are necessary to compensate for effects to wildlife species

Potential Effects of Predator Management on Nesting or Foraging Raptor Species and Roosting Brown Pelicans

As described in chapter 2 “Alternatives,” under all project alternatives, OPRD would continue to provide funding to manage the snowy plover predator base along the Oregon coast through a contract administered by the USDA. Predator management is typically implemented between February and August and has historically included both lethal and non-lethal methods.

Several sound making harassment techniques that are used for predator management could have an effect on nesting raptors by forcing them from their nests or deterring them from foraging in optimal habitat. Similarly, such devices can force roosting brown pelicans from optimal loafing or roosting areas.

The potential effects of predator management on these species would be similar under all alternatives, but slightly greater under Alternatives 2 and 3, relative to Alternative 1, due to the increased extent of predator management activities. OPRD would work with the USDA and FWS to ensure that potential effects on nesting or foraging populations of raptor species, or colonies of brown pelicans, from predator management activities are minimized.

Potential Effect of Predator Management Activities on Local and Regional Corvid Populations and Other Mammal Populations

Corvids (e.g., ravens, crows, jays) and some carnivore populations (e.g., red fox, raccoon, and striped skunk) flourish in areas with high human use, such as the beach. This is the result of opportunistic feeding in unmaintained trash facilities, and unwanted trash being left behind after beach visitors have gone. These species also prey on shorebird nests and chicks.

Under all of the project alternatives, OPRD would continue non-lethal and lethal predator control measures to reduce corvid foraging proficiency, and local population numbers near nesting populations of shorebirds, including snowy plover. Ongoing predator control at areas currently occupied by nesting populations of snowy plover relies first on deterrence measures to discourage predators from concentrating in areas used by nesting shorebirds. Lethal measures of control are only used when non-lethal techniques fail or when “problem” animals are identified. Similar techniques would be used at other occupied or targeted SPMA's under the project alternatives.

Although these measures may temporarily reduce local populations of these species, they would not likely be detrimental to regional populations. None of the species targeted for predator management are at risk, nor are they trending toward being at risk. Continued coordination between the FWS, ORNHIC, ODFW, USDA, OPRD,

and other Federal landowners on predator management activities would ensure that regional populations do not decline as the result of predator management.

The potential effects of predator management on these species would be similar under all alternatives, but slightly greater under Alternatives 2 and 3, relative to Alternative 1, due to the increased extent of predator management activities.

Potential Effects of Monitoring Activities on Nesting or Foraging Snowy Plovers

Monitoring activities are critical to understanding the population dynamics of snowy plover on the Oregon coast and for documenting how the population is responding to conservation efforts. Under all of the project alternatives, OPRD would provide funding to monitor snowy plover numbers (via breeding survey), evaluate habitat, and conduct compliance monitoring related to snowy plover nesting areas along the Oregon coast.

Monitoring may bring biologists in contact with nesting snowy plovers on a regular basis. These interactions may affect individual birds, and could result in a change in their behavior in response to human presence.

To minimize these potential effects, all monitors would be trained in accordance with the FWS standard protocol for monitoring populations of snowy plover. Monitoring would be completed in coordination with the ORNHIC, FWS, and OPRD to ensure that snowy plover populations would not be adversely affected.

As a result, it is likely that monitoring activities under all of the project alternatives would have an overall benefit for snowy plover populations over the next 25-years. Although the potential effects of these activities would be the same under all alternatives, monitoring efforts under Alternatives 2 and 3 would be greater than Alternative 1, due to additional areas targeted for management.

Potential Effects of Global Climate Change on Nesting Shorebirds

As described in section 3.7.3, “Affected Environment, Global Climate Change and Rising Sea Levels”, it is projected that sea levels will rise along the Oregon coast over the next 25 years. Under a mean sea level rise scenario, the sea level could rise 2 to 4 inches along the west coast of North America by 2032 (California Climate Change Center 2006b), which could result in a loss of beach habitat available for nesting shorebirds, including snowy plovers.

While sea level rise along the Oregon coast will likely reduce that quantity of dry sand shorebird nesting habitat over the term of the permit, none of the alternatives analyzed in this EIS would contribute substantial GHG to the environment (refer to section 3.5, “Air Quality”). As a result, none of the project alternatives would increase the rate of global climate change or further contribute to the resulting effect of rising sea levels.

Alternative 1 – Current Management (No Action)

Potential Effects of Recreational Activities on Nesting Snowy Plover

As described above, recreational activities on the beach include, but are not limited to dog exercising, driving, kite flying, and other dry sand activities, such as walking and horse back riding. Recreational use on dry sand portions of the beach may disturb nesting populations of snowy plover, including adults, eggs, and chicks.

Under Alternative 1, the potential effects of recreational activities on nesting populations of snowy plover would likely increase over the next 25-years as recreational use on the Ocean Shore increases. To minimize these effects, OPRD would implement recreational use restrictions at existing snowy plover nesting areas located within the HRA at Bandon SNA during the nesting season. At the HRA, dogs would be required to be on leash and would be confined to the wet sand, and driving and non-motorized vehicle use would be prohibited. Outside of the HRA, but within Bandon SNA, exclosures and limited fencing would be installed around nests. Recreational use restrictions would also be implemented at isolated nests outside of the Bandon SNA on OPRD owned or leased lands if nests are found in the future. Table 3.3-3 in section 3.3, “Recreation,” summarizes recreational use restrictions that would be implemented at occupied snowy plover nesting areas under Alternative 1.

OPRD would also consider applications for “Recreational Use Restriction Permits” on a case-by-case basis for temporarily limiting recreational use at RMAs, as requested by the landowner. The actual recreational use restrictions in these areas would be the same as those for occupied snowy plover nesting areas managed by OPRD, as described above.

Mitigation Measure WLD-1 outlines measures to ensure that the signage and fencing associated with the recreational use restrictions is effective and enforceable.

Mitigation Measure WLD-1. Improve Visibility of Signage Used to Designate Shorebird Foraging Areas

Barriers and signs would be erected on the dry sand portions of the beach adjacent to snowy plover nesting areas (SPMAs owned by OPRD) to limit access and provide information on the natural resource protected within the restricted area. Both the frequency and size of the signs (as compared to what has been used historically) would be increased so that the public can more easily identify the restricted area. Specifically, during the breeding season, a sign would be erected at each end of the restricted area, and midway between extreme high-tide and average high-tide. These signs would be approximately 6 feet (2 meters) tall and would be readable at 200 feet (61 meters) by a person with 20/20 vision. Signs would be readable from both directions along the wet sand, and from the water, to alert beach users from all directions of the importance of the area. The signs should be equipped with anti-

perch tines to deter raptors or other potential predators from using them as hunting perches.

Potential Effects of Predator Management Activities on Nesting Shorebirds

Under Alternative 1, OPRD would continue to provide funding (in collaboration with other agencies) to manage the snowy plover predator base along the Oregon coast. Some of the anticipated predator management activities would not likely have an effect on nesting shorebirds (e.g., non-lethal trapping and relocation). Other predator management activities may have some impact on nesting shorebirds if carried out in proximity to known nest locations. Predator deterrence activities, such as shooting mammals or predatory birds, would likely frighten adult shorebirds off of nests or chicks out of optimal habitat and into harms way.

Potential short term adverse effects of predator management on populations of shorebirds would be considered on a case-by-case basis by OPRD, USDA, and the FWS. It is likely, however, that, shorebird populations would benefit from predator management activities; increases in snowy plover nest success due to predator control activities in the Bandon/New River area have been documented in the past (Lauten et. al. 2006). As a result, predator management under Alternative 1 would likely provide an overall benefit to shorebirds and snowy plover populations over the next 25 years.

Potential Effects of Habitat Maintenance on Nesting or Overwintering Shorebird Populations

Under Alternative 1, OPRD would continue to maintain optimal habitat for nesting snowy plover at the HRA in the Bandon SNA by maintaining approximately 50 acres of habitat that has been restored at the site to date. Maintenance work would be completed between October and December. Since maintenance work would be completed outside of the snowy plover nesting season, there would be no effect on nesting snowy plovers. Further, effects of maintenance activities on wintering shorebirds, including snowy plover, would likely be minimal due to the ability of adult birds to move to other suitable locations when maintenance activities area occurring.

In the long term, maintenance activities at the HRA at Bandon SNA would ensure that nesting habitat suitable for snowy plover is maintained at a level comparable to existing conditions.

Alternative 2 – Proposed Habitat Conservation Plan

Potential Effects of Recreational Activities on Nesting Snowy Plover

As described for Alternative 1, recreational use on dry sand portions of the beach may disturb nesting populations of snowy plover, including adults, eggs, and chicks. Under Alternative 2, the potential effects of these recreational activities on nesting

populations of snowy plover would be similar to those described for Alternative 1; however recreational use restrictions to minimize these effects would be more extensive and protective under Alternative 2, as described below.

Specifically, under Alternative 2, OPRD would implement recreational use restrictions at the Bandon SPMA and at up to five additional SPMAs targeted for management over the term of the 25-year permit. The five additional SPMAs subject to recreational use restrictions would be located at Columbia River South Jetty; Necanicum Spit; Nehalem Spit; Netarts Spit; and Pistol River (figures 2-1 through 2-3; section 2.3.2, “Alternative 2 – Proposed HCP”).

As summarized in table 3.3-3 in section 3.3, “Recreation,” recreational use restrictions at SPMAs would be more restrictive than Alternative 1. At occupied SPMAs, dog exercising, kite flying, driving, and non-motor vehicle use would be prohibited during the nesting season. At unoccupied, targeted SPMAs, dogs would be required to be on leash during the nesting season and driving would be prohibited.

OPRD would also install a next exclosures and 50-meter radius buffer around nesting sites found outside of an occupied or targeted SPMA or RMA on OPRD owned or leased lands. In addition, if snowy plover nest in that area three years in a row, and there is nesting success at least two of those three years, OPRD would work with FWS to consider managing that area as a SPMA.

Under Alternative 2, OPRD would also commit to automatically implementing recreational use restriction at up to 11 RMAs once those areas become occupied by snowy plover. These RMAs would be located at New River; Sutton/Baker Beach; Siltcoos/Dunes/Tahkenitch; Tenmile; Coos Bay North Spit; Bayocean Spit; South Sand Lake Spit; Tahkenitch South; Umpqua River North Jetty; Elk River; and Euchre Creek (figures 2-1 through 2-3). If unoccupied, restrictions would be implemented if an area is actively managed, as requested by the landowner and after consultation and collaboration with FWS. The actual restrictions at these RMAs would be the same as those for OPRD occupied and/or targeted SPMAs.

Implementation of Mitigation Measure WLD-1 would ensure that the signage and fencing associated with the recreational use restrictions is effective and enforceable.

Finally, OPRD would commit to funding three full time beach ranger positions under Alternative 2 to encourage compliance with beach restrictions.

Potential Effects of Predator Management Activities on Nesting Shorebirds

Similar to Alternative 1, under Alternative 2, OPRD would provide funding to manage the snowy plover predator base along the Oregon coast. The level of funding would be similar to Alternative 1, but would increase as additional SPMAs are targeted for management over the term of the 25-year permit.

Predator management funded by ORPD would be implemented by the USDA between February and August and would include both lethal and non-lethal methods, as described for Alternative 1. If for some reason the USDA discontinued predator management activities over the term of the permit, OPRD would assume responsibility for implementing these activities at all actively managed SPMA.

If it is determined that local populations of predator species have increased near or in a SPMA, OPRD and FWS would collaborate to determine if the site management plan for that SPMA contains adequate predator control measures and, if not, if additional control measures are warranted.

Nest enclosures are also used at snowy plover nesting sites to prevent predators from destroying nests and eggs. Under Alternative 2, through monitoring efforts, OPRD, in collaboration with FWS and ODFW would evaluate the relative success of these nest enclosures to determine if changes in the management or application (e.g., elimination of the enclosure, timing changes for application of the enclosure, design changes) should be considered.

Potential Effects of Habitat Maintenance on Nesting or Overwintering Shorebird Populations

Under Alternative 2, OPRD would continue to maintain the 50-acres of restored habitat at the Bandon SPMA. Similar to Alternative 1, maintenance work would be completed between October and December and would not effect nesting populations of snowy plover, or other wintering populations of adult shorebirds capable of relocating to other suitable habitat during maintenance work.

In addition to habitat maintenance activities at the Bandon SPMA, under Alternative 2, OPRD would restore up to 40 acres of habitat at the Columbia River South Jetty SPMA, Necanicum Spit SPMA, and Nehalem Spit SPMA (Schutt pers. comm.). Given that none of these areas currently support snowy plover, initial habitat restoration activities are not likely to have an effect on nesting populations. To minimize potential effects to other populations of nesting shorebirds, initial habitat restoration activities would be completed between October and December, and would be preceded by a shorebird nest survey to ensure that there are no active nests within the restoration area. If shorebirds, including snowy plover, nest at these SPMA in the future, habitat maintenance activities would also be carried out between October and December.

Over the term of the 25-year permit, maintenance and habitat restoration activities at the sites described above would increase the amount and the quality of habitat available for snowy plover and other shorebirds, as compared to Alternative 1.

Alternatives 3 – Management of Additional OPRD Sites

Potential Effects of Recreational Activities on Nesting Snowy Plover

Under Alternative 3, the potential effects of recreational activities on nesting populations of snowy plover would be similar to those described for Alternative 1. However, similar to Alternative 2, recreational use restrictions to minimize these effects would be more extensive and protective under Alternative 3, as described below.

Under Alternative 3, OPRD would implement recreational use restrictions at the Bandon SPMA and at up to eight additional SPMA's targeted for management over the term of the 25-year permit. The eight additional SPMA's would be located at Necanicum Spit; Columbia River South Jetty; Nestucca Spit; Pistol River; Nehalem Spit; Netarts Spit; Bullards Beach; and Sixes River (figures 2-1 through 2-3; section 2.3.3, "Alternative 3 – Management of Additional OPRD Sites").

Recreational use restrictions under Alternative 3 at occupied and unoccupied SPMA's are summarized in table 3.3-3 and would include prohibitions on dog exercising, kite flying, driving, and non-motor vehicle use during the nesting season at occupied SPMA, and restrictions on dogs (required to be on leash) and driving (prohibited) at unoccupied SPMA's during the nesting season.

Under Alternative 3, OPRD would also commit to automatically implementing recreational use restriction at up to 12 RMA's once those areas become occupied by snowy plover. These RMA's would be located at New River; Sutton/Baker Beach; Siltcoos/Dunes/Tahkenitch; Tenmile; Coos Bay North Spit; Bayocean Spit; South Sand Lake Spit; Tahkenitch South; Umpqua River North Jetty; Elk River; Euchre Creek; and North Sand Lake Spit (figures 2-1 through 2-3). If unoccupied, restrictions would be implemented if an area is actively managed, if requested by the landowner and after consultation and collaboration with FWS. The actual restrictions at these RMA's would be the same as those for OPRD occupied and/or targeted SPMA's.

Implementation of Mitigation Measure WLD-1 would ensure that the signage and fencing associated with the recreational use restrictions is effective and enforceable.

Finally, OPRD would commit to funding three full time beach ranger positions under Alternative 3 to encourage compliance with beach restrictions.

Potential Effects of Predator Management Activities on Nesting Shorebirds

Similar to Alternative 1, under Alternative 3, OPRD would provide funding to manage the snowy plover predator base along the Oregon coast. The level of funding would be similar to Alternative 1, but would increase as additional SPMA's are targeted for management over the term of the 25-year ITP.

Predator management funded by ORPD would be implemented by the USDA between February and August and would include both lethal and non-lethal methods, as described for Alternative 1. OPRD and FWS would also work together to determine if site management plans for SPMA contain adequate predator control measures, and if next exclosures are preventing predators from destroying nest and eggs.

Potential Effects of Habitat Maintenance on Nesting or Overwintering Shorebird Populations

Under Alternative 3, OPRD would maintain the 50 acres of restored habitat at the Bandon SPMA. Similar to Alternative 1, maintenance work would be completed between October and December and would not effect nesting populations of snowy plover, or other wintering populations of adult shorebirds capable of relocating to other suitable habitat during maintenance work.

In addition to habitat maintenance activities at the Bandon SPMA, under Alternative 3, OPRD would restore up to 40 acres of habitat at the following six targeted SPMAs: Necanicum Spit, Columbia River South Jetty, Nestucca Spit, Nehalem Spit, Bullards Beach, and Sixes River Mouth (Schutt pers. comm.). Given that none of these sites currently support snowy plover, initial habitat restoration activities would not have an effect on nesting populations. To minimize potential effects to other populations of nesting shorebirds, initial habitat restoration activities would be completed between October and December, and would be preceded by a shorebird nest survey to ensure that there are no active nests within the restoration area. If shorebirds, including snowy plover, nest at these SPMA in the future, habitat maintenance activities would also be carried out between October and December, outside of the nesting season.

Over the term of the 25-year permit, maintenance and habitat restoration activities at the sites described above would increase the amount and the quality of habitat available for snowy plover and other shorebirds, as compared to Alternative 1.

3.8 Aquatic Species and Their Habitat

This section describes aquatic (fish and marine invertebrate) species that have the potential to occur in waterways and along the beaches in the study area. For this section, the study area includes streams that traverse the covered lands, as well as estuary mouths and nearshore waters of the Pacific Ocean, including the area from extreme low tide to ordinary high tide adjacent to Oregon coastal beaches.

3.8.1 Approach and Methodology

Fish species with the potential to occur in waters within or adjacent to the study area were determined by reviewing species lists available through the FWS, ODFW, and NMFS websites. Relevant peer-reviewed journal articles, books, theses/dissertations, technical reports, and governmental reports, reviews, and Federal register notices on fish and invertebrates were also reviewed for information on species' uses of the study area, as cited in the text of this section. Much of the information on the affected environment was also derived from the *Draft Ocean Shores Management Plan, Beach-by-Beach Inventory and Analysis* (Oregon Parks and Recreation Department 2004).

Potential effects on fish and marine invertebrates were analyzed by reviewing the proposed management strategies associated with each of the project alternatives and using professional judgment to compare those impacts to information presented in the reference sources noted above.

3.8.2 Regulatory Context

Federal Endangered Species Act

As described in chapter 1, "Purpose and Need," fish species listed as threatened or endangered are protected under the Federal ESA. Section 7(a)(2) of the ESA requires that Federal agencies ensure that the actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of listed species, or result in the destruction or adverse modification of habitat critical for the species.

Federally listed fish species that may occur in the study area are described in section 3.8.3, "Affected Environment." The following provides a summary of critical habitat designations in the study area.

Critical Habitat

Critical habitat is designated in the study area for Columbia River salmonids and for Southern Oregon/Northern California coho salmon (coho). In estuarine and nearshore marine areas, Columbia River salmonid critical habitat includes areas

contiguous with the shoreline from the line of extreme high water out to a depth no greater than 30 meters (98.4 feet) relative to mean lower low water. These areas support migration, smoltification, and rearing for listed salmonids. The essential features of the estuarine and marine designated critical habitat for Columbia River salmonids in the study area include:

- water quality, water quantity, and salinity conditions that support juvenile and adult physiological transitions between fresh and salt water, support invertebrate and forage fish food sources, and support growth to maturation;
- natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels; and
- areas free of obstruction including free of excessive predation (National Marine Fisheries Service 2005).

Critical habitat for Southern Oregon/Northern California coho on the Oregon coast consists of all river reaches and estuaries accessible to listed coho between Cape Blanco, Oregon, and Punta Gorda, California, and consists of the water, substrate, and riparian areas of estuaries (National Marine Fisheries Service 1999).

Magnuson-Stevens Act (Essential Fish Habitat)

Habitat for salmon, and certain species of groundfish and coastal open-ocean (pelagic) fish, is protected under the Magnuson-Stevenson Act. The Magnuson-Stevens Act governs the conservation and management of essential fish habitat (EFH), or “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.”

EFH has been designated for 83 species of Pacific Coast groundfish, 4 species of salmon, and 5 species of coastal pelagic fish and squid that are managed by the Pacific Fishery Management Council. EFH for groundfish (rockfish, flatfish, skates, and sharks) and pelagic fish (sardines, anchovy, mackerel and squid) is located along all areas of the Oregon coast from nearshore marine and estuarine waters, to 200 miles offshore at the U.S. Economic Exclusion Zone boundary. EFH in estuarine and marine habitats for salmon include all coastal areas from Point Conception northward (National Marine Fisheries Service 2006a).

Coastal Zone Management Act

The Federal CZMA encourages states to voluntarily preserve and protect resources along the nation’s coast. With an approved coastal zone management plan, a State is authorized to ensure that development within their designated coastal zone is consistent with that plan. In addition, under the “Federal consistency” provisions of the CZMA, a State is also afforded the opportunity to review Federal actions, inside

or outside of the coastal zone, which may affect coastal resources to ensure that those actions are consistent with the approved plan.

The Oregon Coastal Management Program is administered by the DLCD, in collaboration with local coastal jurisdictions and other State agencies, including OPRD and DSL. In addition to addressing the goals and policies of the CZMA, the OCMP incorporates provisions specific to the Oregon’s Statewide Planning Goals, Beach Bill; and Oregon’s Removal-Fill Law, as described in section 3.2, “Land Use.”

Oregon Endangered Species Act

Similar to the Federal ESA, the Oregon ESA offers protection to species listed as threatened or endangered in the State. However, the Oregon ESA is much more limited in scope and applies only to State agencies taking actions on State owned or leased lands. Protections afforded fish species listed under Oregon’s ESA are administered by the ODFW.

State listed fish species that may occur in the study area are described in section 3.8.3, “Affected Environment.” Since the covered lands are owned by the State, OPRD would be required to consult with ODFW for impacts on State listed fish species.

3.8.3 Affected Environment

Special-Status Fish Species

Table 3.8-1 provides a list of special-status fish species that occur within the study area. It is followed by a general description of the life and habitat requirements for Chinook salmon, chum salmon, coho salmon, sockeye salmon (sockeye), steelhead trout (steelhead), and bull trout.

Table 3.8-1. Special-Status Fish Species in the Study Area

Species	Scientific Name	Federal Status	State Status	Critical Habitat
Columbia River Spring-run Chinook ESU	<i>Oncorhynchus tshawytscha</i>	Endangered	Threatened	Designated
Lower Columbia River Chinook ESU	<i>O. tshawytscha</i>	Threatened	Threatened	Designated
Upper Willamette River Chinook ESU	<i>O. tshawytscha</i>	Threatened	Threatened	Designated
Snake River Fall-run Chinook ESU	<i>O. tshawytscha</i>	Threatened	Threatened	Designated
Columbia River chum ESU	<i>O. keta</i>	Threatened	Threatened	Designated

Species	Scientific Name	Federal Status	State Status	Critical Habitat
Lower Columbia River coho ESU	<i>O. kisutch</i>	Threatened	Endangered	Under Review
Snake River Sockeye ESU	<i>O. nerka</i>	Endangered	Not listed	Designated
Lower Columbia River steelhead DPS	<i>O. mykiss</i>	Threatened	Not listed	Designated
Upper Columbia River steelhead DPS	<i>O. mykiss</i>	Threatened	Not listed	Designated
Snake River Basin steelhead DPS	<i>O. mykiss</i>	Threatened	Not listed	Designated
Middle Columbia River steelhead DPS	<i>O. mykiss</i>	Threatened	Not listed	Designated
Upper Willamette River steelhead DPS	<i>O. mykiss</i>	Threatened	Not listed	Designated
Columbia River Basin bull trout DPS	<i>Salvelinus confluentus</i>	Threatened	Not listed	Designated
Southern Oregon/Northern California coho ESU	<i>O. kisutch</i>	Threatened	Endangered	Designated

Source: National Marine Fisheries Service 2006a; Fish and Wildlife Service 2006b
 Endangered = species that is in danger of extinction throughout all or a significant portion of its range
 Threatened = species that is likely to become endangered in the foreseeable future
 ESU = Evolutionary Significant Unit
 DPS = Distinct Population Segment

Chinook Salmon (*Oncorhynchus tshawytscha*)

Weighing up to 120 pounds, Chinook salmon (Chinook) are the largest of the salmon species (salmonids). They range from larger rivers in San Francisco Bay north to Alaska, and eastward to Russia and Japan (Beauchamp et al. 1983). Chinook are anadromous fish, meaning they migrate from marine waters to their birth or natal freshwater rivers to mate and spawn. They are also semelparous, meaning they spawn only once. Timing of freshwater entries differs by population, and migration “runs” may occur in the spring, summer, fall, or winter. It is believed that freshwater entry and spawning timing are related to local temperature and water flow regimes (National Marine Fisheries Service 2006b).

Differing life histories are also exhibited by population stocks being either stream-type or ocean-type fish. Commonly found in headwater streams of large river systems, stream-type Chinook have a longer freshwater residency, and perform extensive offshore migrations in the central North Pacific before returning to their natal streams in the spring or summer months. Stream-type juveniles are much more dependent on freshwater stream ecosystems because of their extended residence in these areas. A stream-type life history may be adapted to areas that are more consistently productive and less susceptible to dramatic changes in water flow. At the

time of saltwater entry, stream-type (yearling) smolts are much larger, averaging 73 to 134 millimeters (mm) (3.0-5.25 inches) depending on the river system, than their ocean-type (subyearling) counterparts, and therefore, are able to move offshore relatively quickly (National Marine Fisheries Service 2006b).

Other Chinook are considered ocean-type and are commonly found in coastal streams in North America. Ocean-type Chinook typically migrate to sea within the first three months of life, but may spend up to a year in freshwater prior to emigration to the sea. They also spend their ocean life in coastal waters, returning to their natal streams or rivers in spring, winter, fall, summer, and late-fall (summer and fall runs predominate). Ocean-type Chinook are likely to use estuaries and coastal areas more extensively than other Pacific salmonids for juvenile rearing, and tend to migrate along the coast. Populations of Chinook salmon south of the Columbia River drainage appear to consist predominantly of ocean-type fish (National Marine Fisheries Service 2006b).

Coho Salmon (*O. kisutch*)

Another anadromous Pacific salmon species, coho was historically distributed throughout the North Pacific Ocean from central California to Alaska, and across the Pacific Ocean to Russia and Japan (National Marine Fisheries Service 2006c). Historically, coho probably inhabited most coastal streams in Washington, Oregon, and central and northern California.

Coho spend approximately the first half of their life cycle rearing and feeding in freshwater streams. The remainder of the life cycle is spent foraging in estuarine and marine waters of the Pacific Ocean (National Marine Fisheries Service 2006c).

Chum Salmon (*O. keta*)

Weighing up to 21 kilograms (46 pounds), chum are the second largest Pacific salmon. Chum spawn in the lowermost reaches of rivers and streams, typically within 100 kilometers (km) (62 miles) of the ocean. They migrate almost immediately after hatching to estuarine and ocean waters, in contrast to other Pacific salmonids, which migrate to sea after months or even years in fresh water. This means that survival and growth for juvenile chum salmon depend less on freshwater conditions than on favorable estuarine and marine conditions (National Marine Fisheries Service 2006d).

This species has the widest natural geographic and spawning distribution of any Pacific salmonid, primarily because its range extends farther along the shores of the Arctic Ocean than that of the other salmonids. Spawning populations are known from Korea and Japan and into the far north of Russia. Historically, in North America, chum salmon were distributed throughout the coastal regions of western Canada and the United States, as far south as Monterey, California. Presently, major spawning

populations are found only as far south as Tillamook Bay on the northern Oregon coast (National Marine Fisheries Service 2006d).

Sockeye Salmon (*O. nerka*)

On the Pacific Coast, sockeye inhabit riverine, marine, and lake environments from the Klamath River and its tributaries north to Alaska. As they generally require lakes for part of their life cycle, their distribution in river systems depends on the presence of usable lakes in the system (National Marine Fisheries Service 2006e).

Sockeye exhibit a wide variety of life history patterns that reflect varying dependency on the freshwater environment. With the exception of certain river-type and sea-type populations, the vast majority of sockeye spawn in or near lakes, where the juveniles rear for 1 to 3 years prior to migrating to sea. For this reason, the major distribution and abundance of large sockeye stocks are closely related to the location of rivers that have accessible lakes in their watersheds for juvenile rearing (National Marine Fisheries Service 2006e).

Most sockeye stay at sea for 2 years, returning to spawn in their fourth year, but some may be 5 or 6 years old when they spawn.

Steelhead Trout (*O. mykiss*)

In the United States, steelhead are found along the entire Pacific Coast. Individuals develop differently depending on their environment. While all steelhead hatch in gravel-bottomed, fast-flowing, well-oxygenated rivers and streams, some remain in fresh water their entire lives. These resident forms are known as rainbow trout (National Marine Fisheries Service 2006f).

Steelhead can be divided into two basic reproductive types, stream-maturing or ocean-maturing, based on the state of sexual maturity at the time of river entry and duration of spawning migration. The stream-maturing type (summer-run steelhead) enters freshwater in a sexually immature condition between May and October and requires several months to mature and spawn. The ocean-maturing type (winter-run steelhead) enter freshwater between November and April as sexually mature individuals, and spawn shortly thereafter. Coastal streams are dominated by winter-run steelhead, whereas inland, steelhead of the Columbia River basin are almost exclusively summer-run steelhead (National Marine Fisheries Service 2006f).

Bull Trout (*Salvelinus confluentus*)

Bull trout are members of the char subgroup of salmonids, and exhibit resident and migratory life history strategies through much of their current range (Fish and Wildlife Service 2003). Anadromous bull trout also occur, although only in the Puget Sound region. Historically, bull trout occurred in the Columbia River Basin, western Montana, northern Nevada, the Klamath Basin in Oregon, the McCloud River in California, and parts of Washington, Canada and Alaska (Fish and Wildlife

Service 2003). Today bull trout are found primarily in upper tributary streams and several lake and reservoir systems. They have been eliminated from, or their numbers reduced, in the mainstems of most large rivers. Bull trout are known to migrate from tributary rivers and streams of the Columbia River Basin to the Columbia River estuary to forage (U.S. Army Corps of Engineers 2001). Juvenile bull trout rear in their natal stream system from 1 to 4 years before migrating into other rivers, lakes, and saltwater (Rieman and McIntyre 1993).

Fish Habitat

The description of the affected environment for fisheries resources in the study area follows the regions and beach boundaries outlined in the *Draft Ocean Shores Management Plan, Beach by Beach Inventory and Analysis* (Oregon Parks and Recreation Department 2004), where appropriate. In that document, beaches were listed from north to south, grouped by region, and numbered. The presentation in this section is based on that format with north coast region beaches labeled with an “N” followed by a number between 1 and 18 (e.g., N1); central coast region beaches labeled with a “C” followed by a number between 1 and 14 (e.g., C1); and south coast region beaches labeled with a “S” followed by a number between 1 and 23 (e.g., S1). Figures 2-1 to 2-3 in chapter 2, “Alternatives,” illustrate the location of these boundaries in the study area for each geographic region.

North Coast Region Beaches (N1 to N18)

The extent of north coast region beaches is illustrated on figure 2-1 in chapter 2, “Alternatives.”

N1: Columbia River to Necanicum River

The Columbia River estuary provides rearing and/or migrating habitat for hatchery salmon and for the following evolutionarily significant units (ESUs) and distinct population segments (DPSs) of salmon and trout¹: Deschutes River Summer/fall-run Chinook, Lower Columbia River Chinook, Upper Columbia River Spring-run Chinook, Snake River Fall-run Chinook, Snake River Spring/summer-run Chinook, Upper Willamette River Chinook, Columbia River chum, Lower Columbia River coho, Snake River sockeye, Lower Columbia River steelhead, Upper Columbia River steelhead, Snake River Basin steelhead, Middle Columbia River steelhead, Upper Willamette River steelhead, and Columbia Basin bull trout.¹ Anadromous coastal cutthroat trout (*O. clarki clarki*) also occur in the estuary.

¹The NMFS defines a salmon DPS as an ESU of a biological species. A salmon ESU is a salmon stock that is substantially reproductively isolated from other conspecific population units and represents an important component in the evolutionary legacy of the species (FR 61 4722)

Coho, stream-type Chinook (summer and spring-run Chinook, excluding Upper Willamette River Chinook), steelhead, and anadromous cutthroat trout move rapidly through the estuary on their way seaward (Northwest Power and Conservation Council 2004). Bull trout have not been observed in the mainstem Columbia River lower than river mile 50, and utilization of this area for bull trout is unknown. However, chum may spend several weeks in the estuary, and ocean-type Chinook sub-yearlings utilize the estuary and lower mainstem for up to several months as they forage and grow to a size to enhance their ocean survival (Northwest Power and Conservation Council 2004). Ocean-type Chinook, such as Lower Columbia River, Snake River Fall, and Upper Willamette River Chinook, are known to use shallow water areas, beaches, and flats in the estuary, and can be found in lower mainstem nearshore areas year-round (Friesen 2005). Stream-type juvenile Chinook may also use these shallow habitats, but for a shorter period of time (National Marine Fisheries Service 2002).

Within Fort Stevens State Park, the Columbia River South Jetty is a popular place for salmon fishing (Oregon Department of Fish and Wildlife 2006), and coastal areas provide recreational fishing opportunities for redbtail surfperch (*Amphistichus rhodoterus*) and silver surfperch (*Hyperprosopon ellipticum*). Other fish and invertebrates that use the intertidal soft-bottom areas of the Columbia River estuary and nearshore areas of beach N1 include Pacific tomcod (*Microgadus prximus*), northern anchovy (*Engraulis mordax*), English sole (*Parophrys vetulus*), larval smelt (*Osmeridae*), staghorn sculpin (*Leptocottus armatus*), shiner surfperch (*Cymatogaster aggregate*), larval flatfish (*Pleuronectidae*), starry flounder (*Platichthys stellatus*), whitebait smelt (*Allosmerus elongates*), longfin smelt (*Spirinchus thaleichthys*), and small and juvenile Dungeness crab (*Cancer magister*). Waters and substrates necessary to some of these fish for spawning, breeding, feeding, or growing to maturity are protected under the Magnuson-Stevenson Act.

A large Caspian tern (*Sterna caspia*) colony exists on East Sand Island, located at the mouth of the Columbia River north of Fort Stevens State Park. Caspian terns prey on salmon smolts and other juvenile, and small forage fish. The East Sand Island colony is of concern because of the impact of predation on the recovery of federally listed salmonids, which migrate and rear in the Columbia River, as discussed above.

Beach section N1 includes Necanicum Spit and the Gearhart Ocean State Recreation Area. The Gearhart Ocean State Recreation Area contains the north shoreline of the Necanicum River estuary outlet and the ocean beach. The lower river channel and river mouth are relatively unrestricted, and are allowed to meander under natural conditions. The estuary contains anadromous fish such as Oregon coast Chinook, coho, and steelhead, Pacific Coast chum, sea-run cutthroat trout, white sturgeon (*Acipenser transmontanus*), and Pacific lamprey (*Lampetra tridentate*) (Kavanagh et al. 2006). There are also Pacific Coast estuarine fish such as starry flounder, longfin smelt, a variety of sculpin, among others.

N2 through N12: Necanicum River to Tillamook Bay

South of the Necanicum River estuary, the beach is wide, flat, and lightly vegetated with European beachgrass (*Ammophila arenaria*) and other native and non-native vegetation. Razor clams (*Siliqua patula*) populate intertidal areas, and sculpin, flatfish, coastal cutthroat trout, and a variety of other species use intertidal and nearshore areas of the beach.

Tillamook Head and Cape Falcon beaches present a variety of beach characteristics such as small sand coves surrounded by rocky cliffs, expansive flat sandy beaches, short stream outlets, rocky shores and points, cobble/rock beaches, and beaches containing aspects of development such as rip-rap, stairs, and beach stabilization structures. Anglers fish from the beach for redbait surfperch and other nearshore fishes. This area contains a number of small anadromous fish streams that provide habitat for Oregon coast coho, steelhead, and coastal cutthroat trout.

Nehalem Bay State Park is located south of Cape Falcon, and is composed of the southern portion of a sand spit that separates Nehalem Bay and Nehalem River from the Pacific Ocean. The bay outlet is restricted by two jetties on either side which channelize and restrict movement of the channel and mouth. Nehalem Bay and the Nehalem River contain Pacific Coast chum; Oregon coast coho, Chinook, and steelhead; and coastal cutthroat trout. The bay also contains Dungeness crab, softshell clams, and redrock crab (*Cancer productus*).

Beaches from Nehalem Bay to Cape Meares (excluded) are characterized by moderately flat sandy beaches, and include coastal areas around the outlet of Tillamook Bay. Five major rivers (Miami, Kilchis, Wilson, Trask, and Tillamook) that drain into Tillamook Bay provide habitat for anadromous fish such as Oregon coast coho, steelhead and Chinook; white sturgeon; and Pacific lamprey. The southernmost major chum salmon population also occurs in Tillamook Bay and associated watersheds. Tillamook Bay provides important wintering habitat for resident and migratory piscivorous birds, such as brown pelicans, great blue herons (*Ardea Herodias*), and surf scoters (*Melanitta perspicillata*).

N13 through N18: Cape Meares to Cascade Head

Sandy and cobble low profile beaches and some rocky intertidal areas characterize Tillamook County beaches from Cape Meares to Cascade Head. Wave erosion problems exist in many areas. Estuaries such as Netarts Bay, Sand Lake and Nestucca Bay provide migration and rearing habitat for anadromous fish such as Oregon coast coho, steelhead, and Chinook, hatchery and wild chum salmon, eulachon (*Thaleichthys pacificus*) and other smelt. Shellfish are prevalent in Nestucca Bay and Netarts Bay.

Central Coast Region Beaches (C1 to C16)

The extent of the central coast region beaches is illustrated in figure 2-2 in chapter 2, “Alternatives.” Beaches of Oregon’s central coast begin at the confluence of the Salmon River in Lincoln County, and end at Umpqua River in Douglas County. These beaches have a variety of characteristics such as sandy flat beaches, rocky intertidal areas, drift-wooded shores, sand spits, and estuary outlets that provide migrating and foraging habitat for anadromous fish. The existing conditions of central coast beaches are similar to those of northern coast beaches discussed above. The region does not contain any notable climatic, oceanographic, geographic, or biologic differences from those described for northern coast beaches.

South Coast Region Beaches (S1 to S23)

The extent of the south coast region beaches is illustrated in figure 2-3 in chapter 2, “Alternatives.” Beaches of Oregon’s south coast begin on the southern shores of the Umpqua River outlet to the Pacific Ocean in Douglas County and end at the Oregon/California border. The south coast region supports populations of Southern Oregon/Northern California coho salmon, which are federally listed as threatened.

S1 to S9: Umpqua River (excluded) to Sixes River Mouth

Wide sandy beaches with adjacent grassy sand dunes, and a number of small lagoons and large estuary outlets characterize beaches from the Umpqua River (excluded), to the mouth of the Sixes River. Salmon rivers and streams include the Umpqua River, Coquille River, and Ten Mile, Two Mile, and Four Mile creeks. Surf fishing occurs along the shorelines and jetty fishing occurs at Coos Head Jetty.

Cape Arago is the only rocky shoreline area between Heceta Head and Cape Blanco and is a marine protected area. The wide variety of habitat types at Cape Arago has created a very diverse intertidal community. A high diversity and abundance of algal species occur in North Cove, behind the protection of Simpson Reef, and subtidal kelp beds are extensive. Simpson Reef is the only site in Oregon where major beds of giant kelp (*Macrocystis integrifolia*) are found.

The Bandon SNA beaches consist of sandy beaches and adjacent sand dunes between Bradley Lake and Laurel Lake. Two Mile Creek and Four Mile Creek discharge at the beach and provide habitat for Oregon coast coho. Four Mile Creek also contains Oregon coast Chinook and coho.

South of Bandon SNA, Bethel Creek, Croft Lake outlet, Floras Creek, New River, and Sixes River contain anadromous fish such as Oregon coast steelhead, coho, and Chinook; coastal cutthroat trout; and Pacific lamprey that migrate through the estuary outlet. The beach at Sixes River Mouth includes estuarine habitats that support crab, juvenile salmonids, trout, and marine and estuarine fish. Herring (*Clupea harengus*), surf smelt (*Hypomesus pretiosus*), and shiner perch (*Cymatogaster aggregate*) also spawn in the estuary (Oregon Department of Fish and Wildlife 1973).

S10 to S23: Cape Blanco to the Oregon/California border

Beaches from Cape Blanco to the Oregon/California border are characterized by coarse sloping sands, rocky shores, and flat sandy beaches.

Cape Blanco forms the westernmost point in Oregon and is also the boundary for the southern range of the Oregon coast salmon ESUs. South of Cape Blanco, Euchre Creek marks the northernmost distribution of the Southern Oregon and Northern California Coastal ESU of Chinook. The Elk River (at beach S11) marks the northernmost range of Southern Oregon/Northern California coho, listed as threatened under the Federal ESA.

There is heavy vehicle traffic in October and November between Cape Blanco and the mouth of the Elk River as fishermen drive to the Elk River and estuary area to fish for salmon during the return migration. Surf fishing occurs here mainly in the spring (Oregon Parks and Recreation Department 2004). Blanco and Orford reefs, which are part of the Oregon Island's National Wildlife Refuge, are located offshore and provide rich and diverse subtidal and kelp habitats for many of the fish species in this area.

South of Cape Blanco and the Elk River, Hubbard Creek and Brush Creek discharge into the Pacific Ocean on the beach and provide habitat for steelhead and cutthroat trout. Migrating Oregon/Northern California coho are found at the outlets of Euchre Creek and Gregg's Creek. Butter clams (*Saxidomus giganteus*) are harvested at Rocky Point, and surf fishing occurs along the coastal beaches to the Rogue River jetties.

The Rogue River contains Southern Oregon/Northern California coho, Oregon coast steelhead, Southern Oregon and Northern California Coastal Chinook, and green sturgeon (*Acipenser medirostris*). South of the Rogue River, Hunter Creek estuary seasonally contains Chinook, coho, and steelhead although reduced estuarine habitat and passage barriers in the upper system limit salmonid production (Massingill 2001). The Pistol River estuary discharges into the Pacific and is located adjacent to the Pistol River State Park. The Pistol River estuary contains Southern Oregon and Northern California Coastal Chinook, Southern Oregon/Northern California coho, and Oregon coast steelhead. The outlet of the river is extremely dynamic and changes seasonally as well as year to year (Oregon Parks and Recreation Department 2004). The Pistol River State Park contains sandy beaches, grassy dunes, and sea stacks.

The beaches south of Pistol River State Park are composed of sandy beaches interspersed with rocky inter-tidal areas that provide habitat for clams and other marine invertebrates. These beaches contain numerous small stream outlets, and support populations of Southern Oregon/Northern California coho and Oregon coast steelhead. Chetco and Winchuck Rivers also contain Southern Oregon and Northern California Coastal Chinook. Surf fishing also occurs along these beaches.

3.8.4 Environmental Consequences

Consequences Common to All Alternatives

Potential Effects on Marine Invertebrates from Motor Vehicle Use

As described in section 3.3, “Recreation,” currently and under all project alternatives, the Ocean Shore would generally remain open to motor vehicle access, unless otherwise posted or prohibited due to snowy plover management activities. All-terrain vehicle/off-highway vehicle riding would also continue to be allowed on the beach at three locations on the coast: Sand Lake Recreation Areas and on two sections of the Dunes National Recreation Area.

Beach driving has the potential to kill marine invertebrates on and in the sand and those that live in the wrack line (area where vegetation accumulates at high tide) (Steinback et. al. 2004). Sand may also be compacted, thereby destroying burrows or hiding places and forcing moisture out of the sand. However, the potential long-term effects of these impacts are not known, nor are the indirect effects to fish prey and intertidal fish habitat.

The potential effects on marine invertebrates from motor vehicle use would be similar under all alternatives, and would increase over the next 25-years due to increases in recreational use on the Oregon coast.

Potential Effects on Fishery Resources from Public Recreational Use

It has long been recognized that human recreation activities can have adverse effects on anadromous fisheries (Clark and Gibbons 1991). Although the primary influence of recreation on salmonids is fishing, there are also indirect effects related to hiking, boating, tide pooling, walking, water sports, camp fires (including the burning or removal of large woody debris), off-road vehicle use, concentrated use areas such as parks and campgrounds, and horseback riding (Clark and Gibbons 1991; Spence et al. 1996).

Recreational use in the study area could affect both fish habitats and fish populations. Changes in management, population center size and location, and access could result in either detrimental or beneficial effects on fish populations and fish habitat (Clark and Gibbons 1991). For example, driving on the beach can introduce contaminants into adjacent waterbodies, including oil, gasoline, or other automobile fluids. Intense beach use by humans could impact riparian vegetation, streambank stability, and/or stream and lagoon outlet dimensions. Increased beach use could also increase fishing pressure on coastal, estuarine and anadromous species, and log removal by recreational boaters or campers could decrease the quality of lower estuary and marine habitats (Maser and Sedell 1994, cited in Spence et al. 1996).

The potential effects of recreational use in the study area would be similar under all alternatives, and would likely increase over the next 25-years. As described in section 3.3, “Recreation,” some recreational uses would be restricted near areas managed for nesting populations of snowy plover, which could reduce potential effects to aquatic resources in those areas. Under all alternatives, however, the potential effects of recreational use on aquatic resources are expected to be minimal.

Alternative 1 – No Action (Current Management)

Potential Benefits to Fishery Resources from Law Enforcement Activities

Under Alternative 1, OPRD staff would continue to patrol the beach and implement recreational use restrictions in accordance with existing management practices. Those enforcement activities would include monitoring the study area and checking for valid permits (including fishing permits), which could reduce poaching and provide protections for aquatic resources by decreasing opportunities for natural resource abuse.

Potential Effects of Invasive Species Removal

Under Alternative 1, OPRD would continue to manage dunes in the study area to remove targeted invasive species, including European beachgrass (*Ammophila arenaria*), and provide habitat for native vegetation. In addition, OPRD would maintain the 50 acres of snowy plover habitat restored in 1998 at the HRA on the Bandon SNA. These maintenance activities would likely include removal of invasive plant species as they encroach into the HRA.

Removal of European beachgrass has the potential to alter the dimension and environmental zones of dunes, shorelines, and sand spits (Wiedemann et al. 1969, cited in Fish and Wildlife Service 2001b). Non-native beachgrass can cause sand spits at the mouths of rivers and small creeks to become more stable than those without vegetation, affecting fish and fish habitat (Fish and Wildlife Service 2001b).

Dunes, however, are located landward of beaches outside of the direct influence of tides and rivers outlets. As a result, management of dunes to remove invasive species is unlikely to affect fish or fish habitat. Similarly, maintenance activities at the HRA on Bandon SNA would likely be minimal and not of a nature to affect the estuary or waters adjacent to the HRA. As a result, potential effects of invasive species removal on fish and fish habitat under Alternative 1 are likely to be minimal.

Alternative 2 – Proposed HCP

Potential Benefits to Fishery Resources from Law Enforcement Activities

Similar to Alternative 1, under Alternative 2, OPRD staff would patrol the beach and implement recreational use restrictions in accordance with existing management

practices, which could reduce poaching and provide protections for aquatic habitat by decreasing opportunities for natural resource abuse. In addition, three full time beach ranger positions would be funded to encourage compliance with beach restrictions at SPMA. These rangers would provide additional oversight protection for fishery resources over the next 25-years relative to Alternative 1.

Potential Effects of Invasive Species Removal

Similar to Alternative 1, under Alternative 2, OPRD would manage dunes in the study area to control invasive species, as needed, and would maintain the 50 acres of snowy plover habitat restored at the Bandon SPMA, which would include removal of invasive species. In addition, under Alternative 2, OPRD would restore up to 40 acres of snowy plover habitat at the Columbia River South Jetty SPMA, the Nehalem Spit SPMA, and the Necanicum Spit SPMA (Schutt pers. comm.). Although the exact nature of the restoration would be determined after site plans for each SPMA have been prepared by OPRD and approved by the FWS, it is anticipated that non-native beach grass in these areas would be removed to provide conditions more favorable for nesting snowy plovers.

Removal of European beachgrass has the potential to alter the dimension and environmental zones of dunes, shorelines, and sand spits (Wiedemann et al. 1969, cited in Fish and Wildlife Service 2001b). Non-native beachgrass can cause sand spits at the mouths of rivers and small creeks to become more stable than those without vegetation, affecting fish and fish habitat (Fish and Wildlife Service 2001b).

Similar to Alternative 1, invasive species management at dunes in the study area and maintenance activities at the Bandon SPMA would have minimal effects on fish and fish habitat. Similarly, because of the large extent of the Columbia River estuary, and given the distance of vegetation from fisheries habitat, any minor changes in bank stability or form due to beach grass removal at the Columbia River South Jetty SPMA is not expected to affect nearshore fish or fisheries habitat. However, because Caspian tern colonies are established on East Sand Island just northeast of Columbia River South Jetty, and because terns prefer bare sandy beaches for nesting (Fish and Wildlife Service 2005c), removal of beach grass in this area could conceivably create nesting habitat for terns. Juvenile salmon are known to comprise 31 percent of the East Sand Beach Island Caspian tern colony's diet and terns have been implicated in reducing the potential for recovery of federally listed salmonids in the Columbia River. Coordination with FWS and NMFS during development of the site management plan for this SPMA, as required under the HCP, would minimize the potential for additional Caspian tern nesting areas to be inadvertently created as a result of habitat restoration activities at the Columbia River South Jetty SPMA.

Habitat restoration and invasive species removal at the Necanicum Spit SPMA would have little effect on fisheries resources because Necanicum Spit and estuary outlet are in a relatively natural state with and are able to meander. Clearing large areas of

non-native beach grass may affect erosional processes of the beach and outlet, however it is unlikely that restoration efforts at this SPMA would affect fisheries resources due to the size of the river outlet and shoreline area, and the distance of vegetation from fisheries habitat.

The Nehalem River estuary outlet, however, is more restricted and small in relation to the size and hydrology of the Nehalem River, and is further restricted by jetties built on either side of the river. Vegetation on the Nehalem Spit is also closer to the river channel. Removing this vegetation during restoration of the Nehalem Spit SPMA could potentially destabilize the beach sands and dampen the beach slope during flood events. Although the exact effects of these changes are unknown, removing large areas of vegetation and reducing the slope of the shoreline, in combination with winter flooding could result in eroding areas of the spit over time. Such erosion could result in a net gain of shallow nearshore habitat, slow moving backwater areas, and estuarine wetlands that benefit rearing salmonids. Coordination with FWS and NMFS during development of the site management plan for this area, as required under the HCP, would allow the regulatory agencies to determine if removal of non-native beach grasses could alter beach and shoreline erosion processes and adversely effect aquatic resources. Overall, the potential adverse effects of invasive species removal on fish and fish habitat under Alternative 2 are likely to minimal, and would be mitigated through coordinated development of site management plans. These effects would be similar to those experienced under Alternative 1, although potential effects on fish resources at the Columbia River South Jetty SPMA and Nehalem Spit SPMA could be greater under Alternative 2.

Alternative 3 – Management of Additional OPRD Sites

Potential Benefits to Fishery Resources from Law Enforcement Activities

Similar to Alternative 1, under Alternative 3, OPRD staff would patrol the study area and implement recreational use restrictions as necessary, which would likely reduce poaching and provide protections for aquatic resources by decreasing opportunities for natural resource abuse. In addition, three full time beach ranger positions would be funded to encourage compliance with beach restrictions at SPMAs. These rangers would provide additional oversight protection for aquatic resources over the next 25-years, relative to Alternative 1.

Potential Effects of Invasive Species Removal

Similar to Alternative 1, under Alternative 3, OPRD would manage dunes in the study area to control invasive species, as needed, and would maintain the 50 acres of snowy plover habitat restored at the Bandon SPMA. In addition, under Alternative 3, OPRD would restore up to 40 acres of snowy plover habitat at the following six SPMAs: Necanicum Spit, Columbia River South Jetty, Nestucca Spit, Nehalem Spit, Bullards Beach, and Sixes River Mouth (Schutt pers. comm.). Although the exact

nature of the restoration would be determined after site plans for each SPMA have been prepared by OPRD and approved by FWS, it is anticipated that non-native beach grass in these areas would be removed to provide conditions more favorable for nesting snowy plovers. The removal of European beachgrass has the potential to alter the dimension and environmental zones of dunes, shorelines, and sand spits, as noted above.

Similar to Alternative 1, invasive species management at dunes in the study area and maintenance activities at the Bandon SPMA would have minimal effects on fish and fish habitat. Invasive species management at the Columbia River South Jetty SPMA could create bare sandy beaches where Caspian tern could nest and feed on juvenile salmon rearing in the Columbia River. Removal of vegetation at the Nehalem Spit SPMA could potentially destabilize the beach sands and dampen the beach slope during flood events, which could result in a net gain of shallow nearshore habitat, slow moving backwater areas, and estuarine wetlands that benefit rearing salmonids. The potential effects of invasive species removal at these two SPMAs, however, would be more informed during coordinated development of the site management plans for these areas with FWS and NMFS, and are likely to be minimal. Potential effects on fish or fish habitat are not expected as a result of restoration activities at the other four SPMAs.

Overall, the potential effects of invasive species removal on fish and fish habitat under Alternative 3 are likely to be minimal, and would be mitigated through coordinated development of site management plans. These effects would be similar to those experienced under Alternative 1, although potential effects to fish resources at the Columbia River South Jetty SPMA and Nehalem Spit SPMA could be greater under Alternative 3.

3.9 Plant Communities

This section describes the community structure and typical species composition of vegetation in the study area, and the potential effects on those plant communities resulting from implementation of the project alternatives. For this section, the study area is the same as the covered lands described in section 3.1.1, “Covered Lands.”

3.9.1 Approach and Methodology

The descriptions of vegetation communities and typical plant species presented in this section was derived from a review of photographs taken on-site in July 2006; interpretation of aerial photographs mapped in 2003 (Oregon State University 2003); and a review of pertinent literature, including *Natural Vegetation of Oregon and Washington* (Franklin and Dyrness 1973) and *Wildlife-Habitat Relationships in Oregon and Washington* (Johnson and O’Neil 2001). Information on special-status plant species was gathered from a review of relevant plant profiles on the website for the Center for Plant Conservation (CPC); from *Flora of the Pacific Northwest* (Hitchcock and Cronquist 1973) and *Rare and Endangered Plants of Oregon* (Eastman 1990); and review of the *Ocean Shore Management Plan* (Oregon Parks and Recreation Department 2005).

Evaluation of the potential effects on vegetation in the study area was assessed based on a review of the management strategies for each of the project alternatives, and a programmatic assessment of how those strategies could impact plant diversity, invasive species, and special-status plant communities.

3.9.2 Regulatory Context

Federal Endangered Species Act

Similar to wildlife species, plant species listed as threatened or endangered are also protected under the Federal ESA. During consultation with a Federal agency, the FWS must insure that a proposed project would not result in incidental take of a federally listed plant species. For listed plant species, incidental take may only occur if the FWS determines that a proposed project would result in jeopardy to the species. Chapter 1, “Purpose and Need,” provides a more detailed discussion of the Federal ESA, and the Section 7 consultation process required by the ESA.

A description of the federally listed, special status plant species that occur in the study area is provided in section 3.9.3, “Affected Environment.”

Executive Order 13112

Executive Order 13112, Invasive Species, directs Federal agencies to prevent the introduction of invasive species; control their populations (through eradication, if necessary); monitor their distribution; and provide for restoration of native species and habitat conditions in those ecosystems that have been invaded, to the extent practical and permitted by law. The Executive Order also states that Federal agencies should not fund or carry out actions that are likely to cause or promote the introduction or spread of invasive species.

Oregon Endangered Species Act

Similar to the Federal ESA, the Oregon ESA offers protection to plant species listed as threatened or endangered in the State. However, the Oregon ESA is much more limited in scope and applies only to State agencies taking actions on State owned or leased lands. Protections afforded listed plant species under Oregon's ESA are administered by the ODA.

State listed plant species that may occur on the covered lands are described in section 3.9.3, "Affected Environment." Since the covered lands are State-owned lands, OPRD would be required to consult with ODA to ensure that the proposed project would not appreciably reduce the likelihood of the survival or recovery of any State listed plant species (ORS 564.115).

Ocean Shore Management Plan

In January 2005, OPRD completed the comprehensive OSMP. The OSMP is a long-range plan for ocean recreational beach use and management, and is designed to balance recreation needs with natural and cultural resource protection and adjoining land uses (Oregon Parks and Recreation Department 2005). Within the OSMP, OPRD identifies management strategies for invasive species and for protection of special status plant communities along the Oregon coast, as described in the following sections.

3.9.3 Affected Environment

Ecoregions and Plant Communities

The entire study area is located within the Coast Range Ecoregion of Oregon (Ecoregion 1; Thorson et al 2003). Ecoregions are geographic areas with similar features, such as climate, vegetation, geology, geomorphology, soils, and ecosystem processes. They tend to support characteristic natural ecological communities and are typically used to provide natural resource managers with a common basis to aid in managing similar resource areas.

Plant communities within the study area are typical of Oregon shore vegetation, which are strongly influenced by high winds and salt spray. Franklin and Dyrness (1973) identified three major categories of oceanfront plant communities:

- tideland (salt marsh) communities which are characterized by a dominance of plants that thrive in saline soil (halophytes), such as pickleweed (*Salicornia depressa*), saltgrass (*Distichlis spicata*) and common arrow-grass (*Triglochin maritimum*);
- sand dune/strand communities, which are characterized by sand colonizing/stabilizing species such as European beachgrass (*Ammophila arenaria*) and beach strawberry (*Fragaria chiloensis*); and
- herb- and shrub-dominated communities, which vary in species composition based on location in either northern or southern Oregon, but are primarily restricted to exposed headlands.

Vegetation in Identified Portions of State Parks, State Natural Areas, and State Recreation Areas

As noted in chapter 1, “Purpose and Need,” specific portions of key State parks, SNAs, and State recreation areas are included in the covered lands, including portions of Fort Stevens State Park, Gearhart Ocean State Recreation Area, Nehalem Bay State Park, Cape Lookout State Park, Robert Straub State Park, Bullards Beach State Park, Bandon SNA, Cape Blanco State Park, and Pistol River State Park (see figures 1-3 through 1-11).

In addition to the oceanfront plant communities identified above, vegetation within these areas includes species more representative of coast range forest communities. Forest communities are primarily characterized by:

- a woody overstory dominated by lodgepole pine (*Pinus contorta*) and Sitka spruce;
- a shrub layer dominated by salal (*Gaultheria shallon*), thimbleberry (*Rubus parviflorus*), evergreen huckleberry (*Vaccinium ovatum*) and Pacific rhododendron (*Rhododendron macrophyllum*); and
- an herbaceous layer typified by bracken fern (*Pteridium aquilinum*) and deer fern (*Blechnum spicant*). In southern Oregon, Port Orford-cedar (*Chamaecyparis lawsoniana*) is an important overstory tree species.

Mosaics of coastal freshwater wetlands dominated by slough sedge (*Carex obnupta*), willow (*Salix* spp.), bog Labrador tea (*Ledum groenlandicum*) and sweet gale (*Myrica gale*) are also quite common in these areas. Within these forested wetlands, Sitka spruce and western red cedar (*Thuja plicata*) are common dominant tree

species, with deer fern and skunk cabbage (*Lysichiton americanum*) as dominant understory species.

Table 3.9-1 summarizes typical vegetation community structure and species composition within the study area.

Table 3.9-1. Typical Vegetation within the Study Area

Habitat Type	Dominant Tree Species	Dominant Shrub Species	Dominant Herb Species
Salt Marsh	None present.	None present.	pickleweed, salt grass, common arrow-grass
Dune/strand	lodgepole pine, Sitka spruce, Port Orford-cedar	salal, evergreen huckleberry, sweet gale, rhododendron	(early colonizers) European beachgrass, sand verbena, beach strawberry
Freshwater wetlands	Sitka spruce, western red cedar	sweet gale, willow, western Labrador tea	slough sedge (and other sedge species), deer fern, skunk cabbage

Non-Native/Invasive Vegetation

European beachgrass was introduced to the Oregon coast in the late 1800s as a means of dune stabilization (Franklin and Dyrness 1973). Today, it acts as a pioneer species along most of the dunes in Oregon and is responsible for the establishment of foredunes along the majority of the coastline. This means that European beachgrass captures sand, decreasing natural sand movement and causing the dunes to increase in height. As the dunes increase in height and coastal winds diminish behind the dunes, a new microclimate develops that is no longer suitable for species that use dune habitat, such as pink sand verbena (*Abronia umbellata* ssp. *brevifolia*), as described below (Oregon Parks and Recreation Department 2005). Large dune areas also provide less space for recreational activities on the beach.

As dunes encroach inland, native coastal vegetation species have been recolonized by other exotic species, including Scotch broom (*Cytisus scoparius*) and gorse (*Ulex europaeus*). Scotch broom is a perennial shrub native to the British Isles and central and southern Europe. It tolerates a variety of soil types and depths, and can reach heights of more than 3 meters (9.84 feet). This species continues to expand its range and dominates many acres of land along the Oregon coast, where it crowds out native plant species (Oregon Parks and Recreation Department 2005).

Gorse, a relative of Scotch broom, is another perennial, non-native species that aggressively invades stabilized dunes and deflation plans, and quickly excludes native vegetation. Currently, it covers many acres of land in Douglas, Coos, and Curry Counties. Gorse is difficult to control due to its waxy cuticle, which inhibits herbicide penetration. Goats and sheep feed on the young growth, but animals are

not known to graze on adult plants. Gorse plants also produce a large number of seeds that can remain viable in the soil for over 30 years. The plant is also prone to burning and can cause safety problems (Oregon Parks and Recreation Department 2005).

The OPRD is currently formalizing an internal invasive species committee made up of field and headquarters staff. This committee will be responsible for developing a statewide invasive species management plan to address invasive species on State Park property.

Special-Status Species

Table 3.9-2 lists the special-status plant species that may occur in the study area, and their State and Federal listing status in Oregon. A data request was submitted to the ORNHIC for information on special-status plant species within a 2-mile radius of the key State parks, SNAs, and State recreation areas noted above. Due to the spatial scale of the study area, only data within these areas were selected for focused assessment. The ORNHIC printout documented three special-status plant species within the search area: pink sand verbena, saltmarsh bird's-beak (*Cordylanthus maritimus* ssp. *palustris*) and silvery phacelia (*Phacelia argentea*).

The OSMP also addresses four additional species: western lily (*Lilium occidentale*), Wolf's evening primrose (*Oenothera wolfii*), large-flowered goldfields (*Lasthenia californica* ssp. *macrantha*) and manyleaf gilia (*Gilia millefoliata*). Of these, western lily, a coastal bog species, is not likely to occur within the study area (Center for Plant Conservation 2006a). The remaining species are described below.

Table 3.9-2. Special-Status Plant Species in the Study Area

Species Name	Listing Status	
	Federal	State
Pink sand verbena (<i>Abronia umbellata</i> ssp. <i>brevifolia</i>)	Species of Concern	Endangered
Saltmarsh bird's-beak (<i>Cordylanthus maritimus</i> ssp. <i>palustris</i>)	None	Endangered
Silvery (Sand dune) phacelia (<i>Phacelia argentea</i>)	Species of Concern	Threatened
Wolf's evening primrose (<i>Oenothera wolfii</i>)	Species of Concern	Threatened
Large-flowered goldfields (<i>Lasthenia macrantha</i> ssp. <i>prisca</i>)	Species of Concern	Candidate
Manyleaf (Seaside) gilia (<i>Gilia millefoliata</i>)	Species of Concern	None

Source: Fish and Wildlife Service 2006b, Fish and Wildlife Service 2005d, Center for Plant Conservation 2006a through 2006e

Endangered = species that is in danger of extinction throughout all or a significant portion of its range

Threatened = species that is likely to become endangered in the foreseeable future

Species of Concern = species whose conservation status is of concern to the FWS. This listing status is based on their status in the State of Oregon.

Candidate = species designated for study by the ODA whose numbers are believed low or declining, or whose habitat is sufficiently threatened and declining in quantity and quality, so as to potentially qualify for listing as threatened or endangered in the foreseeable future.

Pink Sand Verbena

Pink sand verbena is listed as an endangered plant species under the Oregon ESA and is identified as a species of concern in Oregon by the Oregon FWS office. It is a prostrate perennial that occupies open sandy beaches above the high tide line (Eastman 1990), and is often found near populations of yellow sand verbena (*Abronia latifolia*) (Oregon Parks and Recreation Department 2005). This species is known to occur in only a few sites in northern California and southern Oregon, although its historic range extended north to British Columbia (Center for Plant Conservation 2006b). It is presumed to be extinct in Washington.

The primary threats to pink sand verbena are competition from European beach grass and habitat disturbance from motor vehicles (Center for Plant Conservation 2006b; Oregon Parks and Recreation Department 2005).

The USFS, Siuslaw National Forest, and the BLM, Coos Bay District, have undertaken projects to transplant and seed pink sand verbena at several beaches and dune habitats along the Oregon coast since 1997. In addition, OPRD received a grant from the FWS to seed the HRA recently restored for nesting snowy plover at Bandon SNA.

Salt Marsh Bird's-Beak

Salt marsh bird's-beak is listed as an endangered plant species under the Oregon ESA. It is an annual herb that grows above the high tide line in salt marshes, is halophytic, and can live either independently or as a parasite (hemiparasitic) (Eastman 1990). Associated species include pickleweed, salt grass and fleshy jaumea (*Jaumea carnosa*), which are likely host species for salt marsh bird's-beak (Center for Plant Conservation 2006c). It is currently known to occur in clustered populations in Coos Bay and Tillamook, Oregon, and in Humboldt Bay, California (Center for Plant Conservation 2006b). Threats to its habitat are related to draining, filling and pollution of its estuarine wetland habitat (Eastman 1990).

Silvery Phacelia

Silvery phacelia is listed as threatened under the Oregon ESA and is identified as a species of concern in Oregon by the Oregon FWS office. It is a perennial herb that grows in open sandy dunes and reproduces by seed and rhizome. Silvery phacelia is known to occur in Coos and Curry Counties, Oregon, and from four extant populations in Del Norte County, California (Center for Plant Conservation 2006d). Limited distribution in only a few specific habitat types reduces the ability for the species to rebound from adverse habitat changes (Oregon Parks and Recreation Department 2005).

The primary threat to silvery phacelia is habitat loss attributable to OHV use and encroachment by European beach grass (Center for Plant Conservation 2006d;

Oregon Parks and Recreation Department 2005). Other threats include succession to forest communities, recreation use, and development.

Wolf's Evening Primrose

Wolf's evening primrose is listed as threatened under the Oregon ESA and is identified as a species of concern in Oregon by the Oregon FWS office. Wolf's evening primrose is an erect, perennial herb that occupies sandy soils on grasslands, coastal strand, roadsides and coastal bluffs that are well drained but receive adequate moisture (Center for Plant Conservation 2006e). Populations are known to occur on 16 sites from Del Norte County, California to Curry County on the southern Oregon coast (Eastman 1990, Center for Plant Conservation 2006e). The species usually occurs to the south of headlands or at the mouths of rivers. These types of sites tend to accommodate the species' requirement of protection from northwesterly exposure (Center for Plant Conservation 2006e).

The predominant threat to Wolf's evening primrose is hybridization with the weedy, ornamental red sepal evening primrose (*Oenothera glazioviana*) (Center for Plant Conservation 2006e). Hybridization compromises the genetic integrity of Wolf's evening primrose, and appears to be a larger threat than habitat disturbance or alterations. Herbicide application and road development are two other threats to existing populations of Wolf's evening primrose.

Large-flowered Goldfields

Large-flowered goldfield is identified as a species of concern in Oregon by the Oregon FWS office, and as an Oregon candidate species by the ODA. This perennial herb grows on seaward slopes, rocky cliffs and sandy areas above the beach (Eastman 1990). Its known occurrence is from a few isolated populations in Curry County (Eastman 1990), and has been found at several sites in State Parks (Oregon Parks and Recreation Department 2005).

Manyleaf Gilia

Manyleaf gilia is identified as a species of concern in Oregon by the Oregon FWS office. This herbaceous perennial grows on semi-stabilized sand dunes within 183 meters (600 feet) of the ocean. Known distribution of this species ranges from Curry County, Oregon (Oregon Parks and Recreation Department 2005) south to Santa Barbara County, California (CalFlora 2006). Predominant threats to manyleaf gilia are similar to that of other dune species: competition from European beachgrass, vehicular disturbance, and development.

This species is not known to occur in any State park, but OPRD has noted that a species conservation management plan will be prepared should manyleaf gilia be discovered at any park site in Curry County (Oregon Parks and Recreation Department 2005).

3.9.4 Environmental Consequences

Alternative 1 – Current Management (No-Action)

Invasive Species Management

Under Alternative 1, OPRD would continue to maintain the 50-acres of snowy plover nesting habitat that were restored at the HRA on the Bandon SNA in 1998.

Maintenance activities would include removal of invasive plant species, such as Scotch broom, European beachgrass, and gorse.

Outside of the habitat maintenance at the Bandon SNA, additional dune management and invasive species control measures would be implemented in accordance with a statewide invasive species management plan that OPRD is currently preparing for State park property. For the purposes of the analysis in this DEIS, it is assumed that this plan would be in place within the next 25-years, and that the general prescriptions would result in the beneficial removal of non-indigenous invasive species.

Overall, maintenance activities at Bandon SNA, and at other locations along the Ocean Shore as outlined in the statewide invasive species management plan, would reduce the extent of invasive plant species on covered lands over the next 25-years under Alternative 1.

Potential Effects on Special-Status Plant Species

As described above, seven special-status plant species may occur in the study area. Pink sand verbena, silvery phacelia, Wolf's evening primrose, large-flowered goldfields and manyleaf gilia are typically found in dunes and sandy areas above beaches; salt marsh bird's beak is found above the high tide line in salt marshes. The primary threats to each of these species are attributed to habitat disturbance (motor vehicles, recreational use, and development) and encroachment of non-native species.

Under Alternative 1, OPRD would manage the public's use of the beach in accordance with existing management practices and to avoid potential effects on snowy plover habitat, some of which may support populations of sensitive plant species. Current recreational use restrictions on the covered lands (e.g., dogs on leash in all State Parks, ATV/OHV use allowed only at three locations on the coast without a permit) would remain in place under Alternative 1. Driving would continue to be prohibited during the nesting season or year round at a number of locations, as described in section 3.3, "Recreation." At the HRA on the Bandon SNA, dogs would be required to be on leash and confined to the wet sand, and driving and non-motorized vehicle use would be prohibited during the breeding season.

Where populations of special-status plant species are known to be present on the covered lands, OPRD generally manages those areas to avoid conflicts with recreational use, and would continue to do so under Alternative 1. In addition, efforts to control invasive species, including implementation of the statewide invasive species management plan, once it is approved, and maintenance activities at the HRA on Bandon SNA, would likely allow native dune stabilizing species, including sensitive-status species, to re-colonize the study area. As such, Alternative 1 is expected to benefit special-status plant species over the next 25 years.

Alternative 2 – Proposed HCP

Invasive Species Management

Similar to Alternative 1, OPRD would continue to maintain the 50-acres of snowy plover nesting habitat at the Bandon SPMA under Alternative 2. Maintenance activities would include removal of invasive plant species outside the snowy plover nesting season, as necessary. In addition, OPRD would restore up to 40 acres of habitat at the Columbia River South Jetty SPMA and the Nehalem Spit SPMA. Restoration would be conducted at the Necanicum Spit SPMA, if necessary and as prescribed in the site management plan.

Restoration activities at the three noted SPMA's would include removal of invasive plant species. In addition, if invasive plant species are discovered to be expanding into open sand areas associated with occupied SPMA's, outside of areas already being actively managed for restoration, OPRD would work with the FWS to determine if additional measures should be implemented to control or eradicate the species.

Although the timing of restoration activities at the SPMA's could vary over the term of the permit (see section 2.3.2, "Alternative 2- Proposed HCP, Management of Targeted Snowy Plover Nesting Sites"), for the purpose of this assessment, it is assumed that these restoration activities would occur within the term of the 25-year permit.

Outside of the SPMA's, additional dune management and invasive species control measures would be implemented in accordance with a statewide invasive species management plan that OPRD is currently preparing for State park property. As described for Alternative 1, it is assumed that this plan would be in place within the next 25-years, and that the general prescriptions would result in the beneficial removal of non-indigenous invasive species. Overall, management of invasive species resulting from implementation of a statewide invasive species management plan, maintenance activities at the Bandon SPMA, and restoration activities at three additional targeted SPMA's, would likely reduce the extent of invasive plant species on covered lands. These benefits would be similar to those described for Alternative 1, if not slightly greater due to the additional restoration efforts at the Columbia River South Jetty SPMA, Nehalem Spit SPMA, and Netarts Spit SPMA.

Potential Effects on Special-Status Plant Species

Under Alternative 2, OPRD would manage the public's use of the beach to minimize potential effects on snowy plover habitat, some of which may support populations of sensitive plant species. Current recreational use restrictions on the covered lands (e.g., dogs on leash in all State Parks, ATV/OHV use allowed only at three locations on the coast without a permit) would remain in place under Alternative 2. Driving would continue to be prohibited during the nesting season or year round at a number of locations, as described in section 3.3, "Recreation." In addition, at all occupied SPMA and RMA, dogs, kite flying, driving, and non-motorized vehicles would be prohibited during the nesting season. Dogs would also be required to be on leash, and driving would be prohibited at all actively managed, unoccupied SPMA and RMA during the nesting season. Up to six SPMA and 11 RMA would be managed under Alternative 2 (see section 2.3.2, "Alternative 2- Proposed HCP").

Where populations of special-status plant species are known to be present on the covered lands, OPRD would manage those areas to avoid conflicts with recreational use. Similar to Alternative 1, efforts to control invasive species, including implementation of the statewide invasive species management plan, once it is approved, and habitat maintenance and restoration activities at up to four SPMA, would likely allow native dune stabilizing species, to recolonize the study area (including pink sand verbena and silvery phacelia). As such, Alternative 2 is expected to provide more benefit to special-status plant species than Alternative 1.

Alternative 3 – Management of Additional OPRD Sites

Invasive Species Management

Under Alternative 3, OPRD would continue to maintain the 50-acres of snowy plover nesting habitat at the Bandon SPMA. Maintenance activities would include removal of invasive plant species outside the snowy plover nesting season, as necessary. In addition, OPRD would restore up to 40 acres of snowy plover habitat at the following six SPMA: Necanicum Spit, Columbia River South Jetty, Nestucca Spit, Nehalem Spit, Bullards Beach, and Sixes River Mouth (Schutt pers. comm.).

Restoration activities at these six SPMA would include removal of invasive plant species, as described in the site management plan. In addition, if invasive plant species are discovered to be expanding into open sand areas associated with occupied SPMA, outside of areas already being actively managed for restoration, OPRD would work with the FWS to determine if additional measures should be implemented to control or eradicate the species.

Outside of the SPMA, additional dune management and invasive species control measures would be implemented in accordance with a statewide invasive species management plan that OPRD is currently preparing for State park property. As described for Alternative 1, it is assumed that this plan would be in place within the

next 25-years, and that the general prescriptions would result in the beneficial removal of non-indigenous invasive species.

Overall, management of invasive species resulting from implementation of a statewide invasive species management plan, maintenance activities at the Bandon SPMA, and restoration activities at six additional targeted SPMAs, would likely reduce the extent of invasive plant species on covered lands. These benefits would be similar to Alternative 1, if not slightly greater due to the additional restoration efforts at the six noted SPMAs.

Potential Effects on Special-Status Plant Species

Under Alternative 3, OPRD would manage the public's use of the beach to minimize potential effects on snowy plover habitat, some of which may support populations of sensitive plant species. Recreational use restrictions currently in place on the covered lands would remain in place under Alternative 3, as described in section 3.3, "Recreation." In addition, recreational use restrictions similar to those described for Alternative 2 would be implemented at occupied and actively managed unoccupied SPMAs and RMAs. Up to nine SPMAs and 12 RMAs could be managed under Alternative 3 (section 2.3.3, "Alternative 3- Management of Additional OPRD Sites").

Where populations of special-status plant species are known to be present on the covered lands, OPRD would manage those areas to avoid conflicts with recreational use. Efforts to control invasive species, including implementation of the statewide invasive species management plan, when approved, maintenance activities at the Bandon SPMA, and restoration activities at up to six other SPMAs would likely allow native dune stabilizing species to re-colonize the study area. As such, Alternative 3 is expected to provide more benefit to special-status plant species than Alternative 1.

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3.10 Soils and Dunes

This section describes soil resources in the study area, as well as potential effects on soils and dunes resulting from implementation of the project alternatives. For this section, the study area is the same as the covered lands described in section 3.1.1, “Covered Lands.”

3.10.1 Approach and Methodology

The description of soil resources presented in this section is based on information contained in various soil survey reports published by the Natural Resources Conservation Service (NRCS) (Natural Resources Conservation Service 2006). The potential effects on soil resources in the study area was assessed based on a review of the management strategies for each of the project alternatives, including the *Western Snowy Plover Habitat Conservation Plan* (Oregon Parks and Recreation Department 2007) and a programmatic assessment of how those strategies could impact soil and water quality by influencing soil erosion and sedimentation rates.

3.10.2 Regulatory Context

Section 402 of the Clean Water Act

Section 402 of the Federal Clean Water Act (CWA) establishes a framework for regulating municipal and industrial storm water discharges under the National Pollutant Discharge Elimination System (NPDES) program. The EPA has delegated the authority for administering the NPDES storm water program in Oregon to the DEQ, where it is implemented by DEQ’s Division of Water Quality (Oregon Department of Environmental Quality 2006).

Under the NPDES Phase II Rule, any construction activity disturbing more than one acre must obtain coverage under the State’s General Permit for Storm Water Discharges Associated with Construction Activity (General Permit). General Permit applicants are required to prepare and submit an erosion and sediment control plan (ESCP) that describes the best management practices (BMPs) that will be implemented to avoid adverse effects on water quality as a result of construction activities, including earthwork.

Both OPRD, and private parties obtaining permits from OPRD, are required to prepare and implement ESCPs to control accelerated erosion and sedimentation and to comply with the requirements of the General Permit.

Local Grading and Erosion Control Ordinances

Many of the county and city governments located within the study area have enacted grading and/or erosion and sediment control ordinances that require permits for certain types of earthwork activities. Such ordinances typically require the preparation and implementation of an ESCP to control accelerated runoff, erosion, and sedimentation during project construction. Both OPRD and private parties obtaining permits from OPRD are required to prepare and implement ESCPs to control accelerated erosion and sedimentation and to comply with the requirements of the General Permit and local grading and erosion control ordinances.

3.10.3 Affected Environment

Most of the study area encompasses beaches and dune lands, which consist of loose sand materials and small amounts of gravel that have been worked and reworked by wind and water. Beach areas are typically unvegetated, while dune lands are often sparsely vegetated with beachgrass. Slope gradients typically range from 0 to 8 percent, and the hazard of erosion by wind and water ranges from slight to severe (Natural Resource Conservation Service 2006).

The portions of the covered lands within Fort Stevens State Park (figure 1-3), Nehalem Bay State Park (figure 1-5), Cape Lookout State Park (figure 1-6), Robert Straub State Park (figure 1-7), Bandon SNA (figure 1-9), and Pistol River SNA (figure 1-11) extends landward beyond the actual vegetation line, and includes interdunal areas where the soils and underling substrates also consist of loose sand. These interdunal areas are typically more densely vegetated than the seaward dune lands and beaches. Slope gradients are somewhat steeper (up to 15 percent), and hazard of erosion by wind and water ranges from slight to moderate (Natural Resource Conservation Service 2006).

3.10.4 Environmental Consequences

Consequences Common to All Alternatives

Potential Effects on Erosion and Sedimentation Rates

Some of the covered activities that would occur in the study area, such as habitat restoration, would involve ground-disturbing activities that could increase the hazard of erosion and temporarily accelerate erosion and sedimentation rates. In addition, removal of invasive plant species could allow for sand mobilization and increased sedimentation rates. Accelerated erosion and sedimentation can adversely affect soil quality and water quality in nearby receiving waters. These activities would occur under all of the project alternatives, although the extent of ground disturbance and invasive plant removal would be greater under Alternatives 2 and 3, relative to

Alternative 1, due to additional habitat restoration activities proposed at identified SPMA's.

Under all project alternatives, OPRD would be required to prepare and implement ESCPs to control accelerated erosion and sedimentation resulting from covered activities (e.g., habitat restoration and invasive species removal), and to comply with the requirements of the General Permit and local grading and erosion control ordinances, as appropriate. Implementation of an effective ESCP is typically sufficient to prevent substantial loss of topsoil, and adverse effects on surface water quality. Accordingly, none of the alternatives would have any direct adverse effects on erosion and sedimentation rates or soil and water quality in the study area.

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3.11 Cultural Resources

This section describes cultural resources in the study area, and potential effects on cultural resources resulting from implementation of the project alternatives. For this section, the study area is the same as the covered lands described in section 3.1.1 “Covered Lands.”

3.11.1 Approach and Methodology

Information on file at the Oregon State Historic Preservation Office (SHPO) was researched during a visit to their Salem office on October 5, 2006. Information presented in section 3.11.3, “Affected Environment,” is based on the records search and a review of the literature during that visit. The potential effects on cultural resources was assessed based on a review of the management strategies for each of the project alternatives, including the draft *Western Snowy Plover Habitat Conservation Plan* (Oregon Parks and Recreation Department 2007), and a programmatic assessment of how those strategies could effect cultural resources.

Evaluating Cultural Resources

The following provides criteria for evaluating potential cultural resources in the study area (including prehistoric and historic archaeological resources), and ethnographic resources. Prehistoric archaeological resources are physical properties that result from human activities that predate European contact with native peoples in America. Prehistoric archaeological sites may include villages, campsites, lithic or artifact scatters, fishing sites, roasting pits/hearths, milling features, rock art (e.g., petroglyphs/pictographs, intaglios), rock features, and burials.

Historical archaeological resources consist of the physical remains (unoccupied ruins) of structures or built objects that result from the work of Euro-Americans. These physical remains must be more than 50 years old and postdate contact between Europeans and Native Americans. Historic archaeological sites may include town sites, homesteads, agricultural or ranching features, mining-related features, and refuse concentration.

Ethnographic resources include sites, areas, and materials important to Native Americans for religious, spiritual, or traditional uses. These resources can encompass the sacred character of physical locations (e.g., mountain peaks, springs, and burial sites) or particular native plants, animals, or minerals that are gathered for use in traditional ritual activities. Included are villages, burials, rock art, rock features, and traditional hunting, gathering, and fishing sites.

Ethnographic resources that meet the definition set forth in Executive Order 13007, Indian Sacred Sites, can be considered sacred sites. Activities that might affect

accessibility to, or availability of, materials used in traditional practices are subject to Executive Order 13007. In some cases, ethnographic resources may overlap prehistoric or historic archaeological resources or they may be embedded within each other.

Architectural resources of the historic built environment can include houses, barns, stores, post offices, bridges, and community structures that are more than 50 years old. These resources are generally standing structures that are currently occupied or are being preserved from deterioration and rehabilitated to accommodate occupation and use.

3.11.2 Regulatory Context

Federal Regulations

National Historic Preservation Act of 1966

The National Historic Preservation Act (NHPA) of 1966 (16 USC 470), as amended, is the nation's central historic preservation law. The NHPA provides for the establishment of the National Register of Historic Places (NRHP) and the SHPO, and requires Federal agencies to consider the effects of their actions on historic properties.

Section 106 of NHPA requires that a Federal agency take into account the potential effects of a Federal undertaking on historic properties, and afford the Advisory Council on Historic Preservation (ACHP) an opportunity to comment on these actions. Consideration of OPRD's application for an Incidental Take Permit (ITP) would require that the FWS meet the consultation requirements of Section 106. The Section 106 process has six basic steps:

1. Initiate consultation and public involvement.
2. Identify and evaluate historic properties.
3. Assess effects of the project on historic properties.
4. Consult with the SHPO regarding adverse effects on historic properties, resulting in a Memorandum of Agreement (MOA).
5. Submit the MOA to the ACHP.
6. Proceed in accordance with the MOA.

For Federal projects, cultural resource significance is evaluated in terms of eligibility for listing in the NRHP. Districts, sites, buildings, structures, and objects of State and local importance are considered to be noteworthy in American history, architecture, archaeology, and culture when they possess integrity of location, design, setting, materials, workmanship, feeling and association, and they:

- Are associated with events that have made a contribution to the broad pattern of our history;
- Are associated with the lives of people important in our past;
- Embody the distinct characteristics of a type, period, or method of construction; represent the work of a master or possess high artistic values; or represent a noteworthy and distinguishable entity whose components may lack individual distinction; or
- Have yielded, or are likely to yield, information important in prehistory or history (36 CFR 60.4).

Ethnographic resources can be eligible for listing in the NRHP if certain criteria are met (refer to the National Register Bulletin 38 – Guidelines for Evaluating and Documenting Traditional Cultural Properties [Parker and King 1990]).

State Regulations

State of Oregon

The State of Oregon protects cultural resources, including Native American graves (ORS 97.740 – 97.760) and archaeological sites (ORS 358.905 – 358.955) on both private and public lands. Oregon laws (ORS 390.235) require the State and local agencies to obtain a permit for any ground disturbance to occur on State lands, and for disturbance to known cultural resource sites on private lands.

Ocean Shore Management Plan

As outlined in the OSMP (Oregon Parks and Recreation Department 2005), OPRD has goals specific to protect cultural resources on the Oregon coast.

- Complete the coastal portion of the OPRD archeological and historic surveys and identify priority sites that need cultural resource management plans.
- Avoid, to the best extent possible, archaeological sites of great consequence when planning and undertaking park projects, and minimize adverse effects through avoidance or mitigation if avoidance is not possible.
- Use a SHPO protocol when undertaking any ground disturbing activities that will affect or may have the potential to effect archaeological resources or in considering changing old structures and site features.
- Conserve important cultural resources on private lands through cooperative solutions with willing landowners.
- Conduct any needed consultation with affected tribes regarding potential impacts to cultural resources.

3.11.3 Affected Environment

Prehistoric Setting

The Oregon coast contains the archaeological remains of numerous ancient cultures that once lived and thrived along the ocean shores. Within the study area, there are numerous documented Native American archaeological sites. Prehistoric archeological resources found included shell middens, villages, lithic material scatter sites, burial sites, intertidal fishing structures, rock art, quarry sites, and ethnographic or ethnohistoric places (Moss 2002). These materials ranged in date from between 12,000 and 8,000 years ago to the time of first contact between Native Americans and Euro Americans during the 18th century.

Two primary chronological schemes describing the development of prehistoric peoples have been proposed for the Oregon coast as a whole. Lyman and Ross (Lyman 1991; Lyman and Ross 1988; Ross 1990) developed the first scheme, which consisted of three stages, and Minor (1995) developed a second scheme, consisting of four stages. Both of these schemes focus on adaptation to littoral or marine resources. The following information comes from the *National Register Nomination of the Native American Archaeological Sites of the Oregon Coast* submitted to the Oregon SHPO by Madonna Moss and Jon Erlandson in 1996, and describes the three schemes for characterizing the prehistory of the Oregon coast.

According to Lyman and Ross, from 8,500 years Before Christ (BC) to 5,000 BC (Pre-Littoral or Pre-Marine Stage), the adaptations of early inhabitants did not involve littoral resources. Coastal occupants originated in the interior and were heavily dependent on terrestrial resources for their subsistence needs (Lyman 1991). The period from 5,000 to 2,000 BC (Early Littoral Stage) represents the first noteworthy use of coastal resources. After 2,000 BC, coastal peoples were much more effectively adapted to the coast and lived in larger more sedentary populations than those of earlier stages (Moss and Erlandson 1996).

Alternatively, Minor (1995) identified an Early Archaic Stage (10,000-5500 BC), a Middle Archaic Stage (5500-3000 BC), a Late Archaic Stage (3000-1500 BC), and a Formative Stage (1500-200 BC) for Oregon coast prehistory. In this framework, Early Archaic coastal peoples subsisted primarily on aquatic resources, including fish, marine birds, and sea mammals. Terrestrial resources were also used, but there was little evidence of dependence on shellfish. During the Middle Archaic, substantial shell middens appear, with ample evidence of marine-oriented subsistence. The Late Archaic Stage was characterized by more intensive marine subsistence, with evidence of more sedentary sites usually termed “villages.” The Formative Stage was thought to reflect the full emergence of ethnographically known cultural patterns (Moss and Erlandson 1996).

In addition to these schemes, Moss and Erlandson (1996) divided the prehistory of the Oregon coast using a geological timescale. The *Terminal Pleistocene* period ranges from 12,000 to 10,000 BC and, at present, only a few artifacts from this period have been found in western Oregon. The subsequent *Holocene* period was divided into three roughly equivalent units (Erlandson 1988, 1994; Moss and Erlandson 1995b). The *Early Holocene* was the period from 10,000 to 6,700 BC. The *Middle Holocene* was from 6,700 to 3,300 BC, which was followed by the *Late Holocene* period after 3,300 BC. Within the *Late Holocene*, there were two further periods, the *Pre-contact* period (3,300 to ca. 200 BC) and the *Post-contact* period (circa 200 BC to present).

Moss and Erlandson (1996) demonstrated that over 87% of the radiocarbon dates from archaeological sites within the study area fell within the last 1,500 calendar years. Nonetheless, recent research also identified several *Early* and *Middle Holocene* coastal sites on State Park Lands. These included the 8,600-year-old site (35-CU-67) at Indian Sands (Curry County) (Moss and Erlandson 1995b, 1995c); the 8,300- and 5,000-year-old components at Blacklock Point (Coos County) (35-CU-75) (Minor 1993; Moss and Erlandson 1995a); a 6,100-year-old component near Cape Blanco (Curry County) (35-CU-82) (Minor and Greenspan 1991; Moss and Erlandson 1995a); and the 4,200-year-old site at Boiler Bay (Lincoln County) (35-LNC-45) (Tasa and Connolly 1995). Only the Indian Sands and Boiler Bay sites contained the remains of marine foods. The other two sites produced no faunal remains, but are currently located adjacent to productive coastal habitats. Recent investigations at these and other Oregon coast sites suggested that coastal subsistence played a role of importance in *Early* and *Middle Holocene* economies in the area, although this early use of marine resources may have been less intense than in other areas of the Pacific coast.

The relative scarcity of *Early* and *Middle Holocene* sites along the Oregon coast and of data relative to exploitation of marine resources may be due to a combination of processes including post glacial sea level rise, tectonic subsidence of the coast, severe coastal erosion, the accumulation of extensive dunes during the *Middle* and *Late Holocene* periods, the lower accessibility of rugged outer coast habitats to humans, and the relatively high productivity of terrestrial and riverine resources, especially when coastal terrestrial zones were more extensive during times of lower sea levels (Moss and Erlandson 1996). During the Pleistocene a large amount of water was in the form of glaciers, making sea levels more than 91 meters (300 feet) below modern shoreline levels, exposing wide expanses of continental shelf suitable for occupation along the Oregon coast (Leland 1999). It is likely that the evidence of cultural occupation in these areas is now inundated.

Ethnographic Setting

In the early 1800s, the Oregon coast was occupied by a diverse array of Native American tribes, including (from north to south) various bands of the Chinook, Tillamook, Alsea, Siuslaw, Umpqua, Coos, Coquille, Tututni, and Tolowa peoples. These societies are all generally regarded as part of the distinctive Northwest coast culture (Suttles 1990). There were four broad language groups used along the Oregon coast, the Athapaskan, the Oregon Penutian, the Salishan, and the Hokan families. According to Macnaughtan (1999), the Athapaskan dialect was spoken mainly in southwest Oregon, the Penutian was spoken along the central Oregon coast, Salish was spoken on the northern Oregon coast and Shasta was spoken in the southern Rogue Valley region. Trade languages were used to bridge communication gaps between the villages.

The ethnographic patterns of these societies are derivative of many economic styles- Northwest coast fishing economies, Plateau fishing/root river winter village economies, the Great Basin desert/lake economies and the California acorn economies were all well established regional resource use strategies during this period (Leland 1999). Prior to European contact, Northwest coast peoples relied predominantly on fishing, hunting, gathering, and trading for sustenance. They were adapted to a variety of environments, including sand spits, saltwater bays, tidal and intertidal estuaries, lake shorelines, river mouths and their confluences. Northwest coast peoples in general are most renowned, however, for their maritime life ways, elaborate technology, high population densities, sophisticated art and architectural traditions, and sociopolitical complexity (Moss and Erlandson 1996).

The Oregon coast and the land and waters surrounding it were part of a dynamic cultural setting characterized by abundant localities for resource acquisition. The diets of the aboriginal people relied upon salmon, shellfish, plants and land mammals. The resources utilized were in direct relation to the food sources available within their geographic locale. Evidence of subsistence activities can be found along the Oregon coastline in the form of shell middens, fishing weirs, food processing sites, villages and seasonal occupation camps.

Historical Setting

The earliest travel along the northwest coast by Europeans occurred sporadically for about 200 years from the mid-16th to the mid-18th centuries. Land-based exploration of the Oregon country began in the early nineteenth century. Lewis and Clark reached the mouth of the Columbia River in late 1805, and their expeditions opened an era of expansion in the northwest. The fur trade became the driving force behind much of the exploration of the region due to the demand for beaver pelts in the European and Chinese markets. The fur traders introduced new technological goods to entice the natives into trade. Initially the tribes viewed the goods and

supplies that foreign traders and trappers offered as a welcome addition to their already thriving economy (Confederated Tribes of the Umatilla Nation 2006).

The first wagon train into the Oregon Country was in 1843, and wagon trains of settlers traveling along the Oregon Trail successively followed (Confederated Tribes of the Umatilla Nation 2006). Violent encounters between Native Americans and settlers occurred consistently in the years between 1850 and 1856. The U.S. Army established several forts in the region in attempts to keep peace between Native Americans and settlers but eventually became involved in the conflicts.

Prior to 1850, only a handful of fur traders, missionaries, and explorers had settled and lived for any length of time along the Oregon coast. In 1850, passage of the Oregon Donation Land Act provided free land to any American willing to settle and improve the property. The prospect of free land brought many settlers to the river areas near the Oregon coast. The Homestead Act of 1862 also provided land for those willing to settle in the west.

Early settlers subsisted by gathering locally available resources, growing their own food, and maintaining the few possessions they brought with them. Settlers subsisted on vegetables from large, labor-intensive gardens; wild berries; livestock; deer; elk; and estuarine animals such as clams, crabs, and fish. Shelter was the first priority on any new land claim, and numerous small log cabins sprang up along the rivers and bottomlands. As these early families became more settled, larger houses and outbuildings were constructed. While local towns were important in trade and commerce, most residents lived in rural areas. Most of the early towns along the Oregon coast had brief periods of prosperity before disappearing.

3.11.4 Environmental Consequences

Consequences Common to All Alternatives

Inadvertent Damage to Unknown Cultural Resources

The location of the targeted SPMA's that would be managed by OPRD under the project alternatives was selected based on a number of considerations, including the intent to avoid known cultural resources. Cultural resource surveys as well as inventory maps were consulted prior to choosing the locations in order to minimize the potential effects on these resources. However, it is possible that previously unrecorded and unknown cultural resources exist within the study area.

Some of the covered activities that would be conducted by OPRD in the study area, such as habitat restoration, involve ground-disturbing activities that could potentially affect unknown cultural resources. The nature of these activities would be similar under all of the project alternatives, although the extent of ground disturbance would be greater under Alternatives 2 and 3, relative to Alternative 1, due to additional

habitat restoration activities proposed at identified SPMA. Since OPRD considered and attempted to avoid the location of documented cultural resource sites and known areas with a high potential for cultural resources in the selection of targeted SPMA, the likelihood of disturbance to cultural resources is minimal. However, implementation of the Mitigation Measure CLT-1 would ensure that these potential effects would be minimized.

Mitigation Measure CLT – 1. Stop Work and Contact Appropriate Agencies

Inadvertent discoveries of cultural resources would be handled in accordance with applicable State (ORS 358.905 to 358.955) and Federal laws. If any cultural resources are discovered, ongoing activities in the immediate area would be stopped so that a qualified archaeologist could accurately assess the context and integrity of the find. In addition, if human skeletal remains are encountered, the appropriate County Sheriff, SHPO, OPRD, and the relevant Tribal representatives would be immediately contacted.

OPRD would also continue to protect any real property of historic consequence and other important cultural resources found within the study area, in consultation with SHPO and in accordance with the *Ocean Shore Management Plan* (Oregon Parks and Recreation Department 2005).

3.12 Water Quality

This section describes the water quality of estuaries and streams in the vicinity of the study area. For this section, the study area includes streams that traverse the covered lands, and estuaries adjacent to Oregon coastal beaches.

3.12.1 Approach and Methodology

General information about water quality management basins, including the Oregon Water Quality Index (OWQI) ratings, was obtained from *Oregon's 2004 Water Quality Assessment Section 305(b) Report* (Oregon Department of Environmental Quality 2004). Generated from indicator sites routinely monitored by DEQ, the OWQI ratings provide a comparison of water quality across watersheds throughout the State and can be used to determine trends over time. Additional information on water quality impaired streams was obtained from the *Oregon 2004/2006 Integrated Report Database* (Oregon Department of Environmental Quality 2006) and Total Maximum Daily Load (TMDL) reports, where available.

Watershed assessments prepared by or for watershed councils in the study area were also reviewed for relevant water quality information. The Oregon Coast Atlas was used to classify the geomorphology of the estuaries considered in this section.

The proposed management strategies associated with each of the project alternatives were reviewed to determine if any of the alternatives evaluated in this DEIS could have a potential effect on water quality.

3.12.2 Regulatory Context

Clean Water Act, Section 303(d)

The goal of the Federal CWA is to restore and maintain the natural, chemical, physical, and biological integrity of the nation's waters. In Oregon, DEQ is responsible under the CWA for maintaining the water quality of surface waters in the State. Regulations protecting water quality are codified under Oregon Administrative Rules (OAR) 340-041, which provide numerical criteria for water temperature and a variety of chemical parameters, as well as narrative criteria designed to protect beneficial uses. Beneficial uses include salmon rearing, salmonid spawning, shellfish growing, human health contact, drinking water, recreational use, and irrigation.

Section 303(d) of the CWA requires that DEQ set water quality standards for specified beneficial uses, and prepare a list of waterbodies whose water quality does not meet these approved standards (Kasper et al. 2003). The list of quality impaired waters is referred to as the 303(d) list. For each listed stream, the impaired

parameters, the beneficial uses impacted, and the data for the basis of the listing are provided.

Section 303(d) and OAR 340-041 also provide for the establishment of TMDL limitations for specific water-quality-limited waterbodies. TMDLs specify wasteload allocations, the amount of a pollutant that a point source can contribute to a stream without violating water quality criteria, known sources that discharge into a listed waterbody, and wasteload allocations for point sources (Kasper et al. 2003). TMDL reports have been prepared for a number of estuaries and rivers located in the study area. TMDL reports that covered waterbodies in the study area are described in section 3.12.3, “Affected Environment,” below.

Coastal Zone Management Act (CZMA)

The CZMA, as amended, is administered by the National Oceanic and Atmospheric Administration (NOAA) Office of Ocean and Coastal Resource Management, and is the primary Federal law enacted to preserve and protect coastal resources. Under the CZMA, coastal states may voluntarily prepare a coastal management program compatible with the standards and goals of the CZMA for review by NOAA. Approved plans must also include a Coastal Non-point Pollution Control Program, which describes implementation of non-point source pollution (pollution from surface water runoff) control measures. A State with an approved coastal management program may review all activities, including Federal actions, in or affecting the State’s coastal zone.

The DLCD administers the OCMP (see section 3.2, “Land Use”). In addition to addressing the goals and policies of the CZMA, the OCMP addresses Oregon’s Statewide Planning Goals (see below); the provisions of other key Oregon State laws, including the Beach Bill and Oregon Removal-Fill Law; and the plans and policies of coastal local land use planning jurisdictions.

Statewide Planning Goals

Land use planning in the State of Oregon is governed by 19 Statewide Planning Goals, which are achieved through local comprehensive planning. State law requires that each city and county adopt a comprehensive plan consistent with the Statewide Planning Goals, and the zoning and land use ordinances needed to implement the plan effectively. Comprehensive plans are reviewed by the Land Conservation and Development Commission and, once approved, become the controlling document for land use in the area covered by that plan.

Many of the Statewide Planning Goals have a direct connection to water quality, including:

- Goal 5 (Natural Resources, Scenic and Historic Areas, and Open Spaces). Provides guidance on the protection and use of natural areas, including riparian corridors, wetlands, and wildlife habitat.
- Goal 6 (Air, Water, and Land Resources). Provides guidance on waste and process discharges, including thermal waste, water pollutants, and water contaminants.
- Goal 16 (Estuarine Resources). Provides guidance on the protection and use of estuaries and associated wetlands, and identifies general priorities for their overall use (preservation, development).
- Goal 17 (Coastal shorelands). Provides guidance on the protection and use of coastal shorelands and associated wetlands, and identifies general priorities for their overall use (water dependant uses).
- Goal 18 (Beaches and Dunes). Provides guidance on the protection and use of coastal beach and dune areas.

Oregon Plan for Salmon and Watersheds

The Oregon Plan for Salmon and Watersheds was established in 1997 to restore salmon runs, improve water quality, and to work to achieve healthy watersheds in the State. The Oregon Watershed Enhancement Board has the lead coordination responsibility for the Oregon Plan for Salmon and Watersheds and administers a restoration grant program, although implementation is largely dependent upon partnerships with State agencies and stakeholders in specific subbasins and watersheds. Regional teams provide focused attention to implement the Oregon Plan for Salmon and Watersheds in four regions in the State.

In addition to the State and Federal water quality programs described above, the Oregon Plan for Salmon and Watersheds builds on the Coastal Non-point Pollution Control Program.

3.12.3 Affected Environment

The description of the affected environment for water quality in the study area is organized by the four major stream basins that discharge to estuaries along the Oregon coast, as described in the *Oregon's 2004 Water Quality Assessment Section 305(b) Report* (Oregon Department of Environmental Quality 2004). These stream basins include the North Coast, Umpqua, South Coast, and Rogue basins. Within each stream basin, a detailed description of water quality in areas proposed for active management under one or more of the project alternatives (i.e., proposed SPMA) are provided. The focus on water quality conditions in these areas is provided to allow for consideration of potential impacts at areas where changes in management under the different alternatives are most likely to affect water quality.

All of the major stream basins described in this section are located in the Coast Range Ecoregion of Oregon. Ecoregions are geographic areas with similar features, such as climate, vegetation, geology, geomorphology, soils, and ecosystem processes. They tend to support characteristic natural ecological communities and are typically used to provide natural resource managers with a common basis to aid in managing similar resource areas.

In general, the streams in the Coast Range Ecoregion flow in steep, confined channels from the forested slopes of the Coast Range to low-gradient valleys and coastal floodplains before entering the Pacific Ocean. Coastal streams have been affected by logging practices, agriculture, and development. Mass wasting (the downslope movement of soil and rock) is common in the Coast Range Ecoregion due to the high annual rainfall, steep topography in the upper reaches of streams, and intense storm events.

Logging activity, roads, and stream channel changes have also increased the rates of erosion and landslides. About 28 percent of the stream miles in the Coast Range Ecoregion are considered to be in poor condition for vertebrate (e.g., fish, amphibians, mammals) communities, and 13 percent are considered to be in poor condition for macroinvertebrate (e.g., insects, crustaceans, mollusks) communities (Oregon Department of Environmental Quality 2004). Impairment from fine sediment in the Ecoregion is extensive (41 percent of stream miles), as is impairment from elevated stream temperatures (23 percent of stream miles), and degraded water quality (16 percent of stream miles) (Oregon Department of Environmental Quality 2004).

North Coast Basin

The North Coast Basin extends from the Lower Columbia /Clatskanie River subbasins west and south to the Umpqua River (Oregon Department of Environmental Quality 2004). Water quality concerns in the North Coast Basin are predominantly associated with non-point source pollution (surface water runoff), rather than point source pollution (discharge of pollution from a specific source, such as a manufacturing facility) (Kasper et al. 2003).

About 31 percent of the stream miles in North Coast Basin are considered to be in poor condition for vertebrate communities, and 20 percent are considered to be in poor condition for macroinvertebrate communities (Oregon Department of Environmental Quality 2004). These conditions are attributed primarily to impairment from fine sediment and overall poor water quality. Water temperature impairment in the North Coast Basin is relatively low, with only 9 percent of the stream miles exceeding water temperature standards (Oregon Department of Environmental Quality 2004).

Within the North Coast Basin, portions of the Columbia River, Necanicum Spit, Nehalem Spit, and Nestucca Spit estuaries are 303(d)-listed as impaired for contaminants, bacteria, temperature, and dissolved oxygen. TMDLs have been established for contaminants, bacteria, and temperature in some of these subbasins, as described below.

Columbia River South Jetty

Columbia River South Jetty, which is located on Clatsop Spit in Fort Stevens State Park, is bound on the north and east by the Columbia River and on the west by the Pacific Ocean (figure 1-3). The Columbia River estuary covers approximately 32,703 hectares (ha) (80,811 acres) and has a watershed of approximately 670,807 square kilometers (km²) (259,000 square miles) (Oregon Coast Atlas 2006). This large estuary is a river-dominated, drowned-river-mouth estuary; in these types of estuaries, large volumes of river sediment area carried to the estuary during high winter flows (Oregon Coast Atlas 2006). During summer low flows, seawater dominates the estuary.

Table 3.12-1 summarizes impaired water quality conditions in the vicinity of Columbia River South Jetty. In summary, between River Mile (RM) 0 and RM 35.2, the Columbia River is considered water quality impaired for arsenic, dichloro-diphenyl-trichloroethane (DDT) metabolite (dichloro-diphenyl-dichloroethylene [DDE]), polychlorinated biphenyls (PCBs), dioxin (2,3,7,8-Tetrachlorodibenzo-p-Dioxin [TCDD]), fecal coliform, temperature, and total dissolved gas (Oregon Department of Environmental Quality 2006). TMDLs have been approved for dioxin (2,3,7,8-TCDD) and total dissolved gas.

Table 3.12-1. Water-Quality Impaired Water Bodies in the Study Area Considered for Evaluation

Water Body (RM)	Parameter	Season	Beneficial Use	CWA 303(d) Status
North Coast Basin – Columbia River South Jetty				
Columbia River (RM 0 – RM 35.2)	Arsenic, DDT Metabolite (DDE), PCB	Year round	Anadromous fish passage, Drinking water, Resident fish and aquatic life	303(d) list
Columbia River (RM 0 – RM 35.2)	Dioxin (2,3,7,8-TCDD)	Year round	Anadromous fish passage, Drinking water, Resident fish and aquatic life	TMDL approved
Columbia River (RM 0 to RM 35.2)	Fecal coliform	Year round	Shellfish growing	303(d) list, TMDL needed
Columbia River (RM 0 to RM 35.2)	Temperature	Summer	Anadromous fish passage, Salmonid fish rearing	303(d) list
Columbia River (RM 0 to RM 306.1)	Temperature	Year round (Non-spawning)	Salmon and trout migration corridor	303(d) list, TMDL needed

Water Body (RM)	Parameter	Season	Beneficial Use	CWA 303(d) Status
Columbia River (RM 0 to RM 35.2)	Total dissolved gas	Year round	Resident fish and aquatic life	TMDL approved
North Coast Basin – Necanicum Spit				
Necanicum Estuary (RM 0 to RM 1.5)	Fecal coliform	Year round	Shellfish growing	TMDL approved
Necanicum Estuary (RM 0 to RM 5.9)	<i>E. coli</i>	Summer	Water contact recreation	TMDL approved
Necanicum Estuary (RM 0 to RM 20.6)	Temperature	September 15 – May 31 (spawning: 12.8°C)	Salmonid fish spawning	TMDL approved
Necanicum Estuary (RM 0 to RM 15)	Temperature	Summer (rearing: 17.8°C)	Anadromous fish passage, Salmonid fish rearing	TMDL approved
Pacific Ocean (Mile 26 to Mile 30 south of the Columbia River)	Fecal coliform	Year round	Shellfish growing	TMDL approved
Neacoxie Creek (RM 0 to RM 4)	<i>E. coli</i>	Fall / Winter / Spring	Water contact recreation	TMDL approved
North Coast Basin – Nehalem Spit				
Nehalem Bay (RM 0 to RM 4.2)	Fecal coliform	Year round	Shellfish growing	TMDL approved
Nehalem River (RM 0 to RM 14.7)	Fecal coliform	Year round	Shellfish growing	TMDL approved
Nehalem River (RM 0 to RM 36.2)	Dissolved oxygen	Year round (Non-spawning)	Cold-water aquatic life	303(d) list, TMDL needed
Nehalem River (RM 0 to RM 14.7)	Temperature	Summer (rearing: 17.8°C)	Anadromous fish passage, Salmonid fish rearing	TMDL approved
North Coast Basin – Nestucca Spit				
Nestucca Bay (RM 0 to RM 3.2)	Fecal coliform	Year round	Shellfish growing	TMDL approved
Nestucca River (RM 0 to RM 28.9)	Fecal coliform	Year round	Shellfish growing	TMDL approved
Nestucca River (RM 0 to RM 28.9)	<i>E. coli</i>	Summer	Water contact recreation	TMDL approved
Nestucca River (RM 0 to RM 28.9)	Temperature	Summer (rearing: 17.8°C)	Anadromous fish passage, Salmonid fish rearing	TMDL approved
Little Nestucca River (RM 0 to RM 20.5)	Fecal coliform	Year round	Shellfish growing	TMDL approved

Water Body (RM)	Parameter	Season	Beneficial Use	CWA 303(d) Status
South Coast Basin – Bandon				
Floras Creek (RM 0 to RM 12.8)	Temperature	Year round (non-spawning)	Salmon and trout migration corridor	303(d) list, TMDL needed
Floras Lake / Boulder Creek (RM 0.8 to RM 2.1)	Aquatic weeds / Algae	Undefined	Aesthetics, Fishing, Water contact recreation	303(d) List
Willow Creek (RM 0 to RM 6.9)	Temperature	Year round (Non-Spawning)	Salmon and trout migration corridor	303(d) list, TMDL needed
South Coast Basin – Sixes River Mouth				
Sixes River (RM 0 to RM 30.1)	Temperature	Year round (Non-spawning)	Salmon and trout migration corridor	303(d) list, TMDL needed
South Coast Basin – Pistol River				
Pistol River (RM 0 to RM 19.8)	Fecal coliform	Year round	Shellfish growing	303(d) list, TMDL needed
Pistol River (RM 0 to RM 19.8)	pH	Summer	Anadromous fish passage, Resident fish and aquatic life, Salmonid fish rearing, Salmonid fish spawning, Water contact recreation	303(d) list, TMDL needed
Pistol River (RM 0 to RM 19.8)	Temperature	Year round (Non-Spawning)	Salmon and trout rearing and migration	303(d) list, TMDL needed

Source: Oregon Department of Environmental Quality 2006

CWA = Clean Water Act

DDT = dichloro-diphenyl-trichloroethane

DDE = dichloro-diphenyl-dichloroethylene

PCB = polychlorinated biphenyls

TCDD = Tetrachlorodibenzo-p-Dioxin

TMDL = Total Maximum Daily Load

RM = River Mile

Necanicum Spit

Necanicum Spit is located north of the Necanicum River in Gearhart Ocean State Recreation Area (figure 1-4). The Necanicum estuary covers approximately 182 ha (451 acres) and has a watershed of approximately 225 km² (87 square miles) (Oregon Coast Atlas 2006). This estuary, designated as a Conservation estuary under the Oregon Estuary Classification system, is a bar-built estuary. As such, it receives little freshwater influence and is dominated by marine waters.

Table 3.12-1 summarizes impaired water quality conditions in the vicinity of Necanicum Spit. The OWQI of the Necanicum River for water years 1994 through 2003 was good (Oregon Department of Environmental Quality 2004). However, portions of the Pacific Ocean near Necanicum Spit, Necanicum estuary, and Neacoxie Creek are considered water quality limited for bacteria (*E. coli* and/or fecal coliform). The Necanicum estuary is also considered impaired for temperature. TMDLs for each of these parameters at all noted locations were established in 2003, and approved in 2004 (Oregon Department of Environmental Quality 2006). Although not listed, there is also concern for potential elevated levels of iron in Neacoxie Creek, and alkalinity in Neawanna Creek and the Necanicum River, all of which may have an effect on aquatic life and human health (Oregon Department of Environmental Quality 2006).

Commercial and recreational shellfish harvesting occurs at the Necanicum estuary and along the Oregon coast from Seaside to the mouth of the Columbia River. Consequently, these areas must meet marine and estuarine shellfish criteria for fecal coliform bacteria concentrations. Bacteria concentrations tend to be highest in the fall and winter during storm runoff events. Elevated bacterial concentrations in the estuary are attributed to non-point sources of bacteria from urban runoff, rural residential development, livestock, failing septic systems, and wastewater treatment facilities in the Necanicum River, Neawanna Creek, Neacoxie Creek, and other creeks entering the estuary (Kasper et. al 2003). Historically, the failing septic system at the Riverside Campground near the Necanicum River has been a key source of bacteria. In addition, the City of Seaside discharges treated wastewater into the Necanicum estuary at RM 0.2 (Kasper et. al 2003).

Nehalem Spit

Nehalem Spit is located north and west of the Nehalem River and Nehalem Bay, in Nehalem Bay State Park (figure 1-5). The Nehalem River estuary covers approximately 1,112 ha (2,749 acres) and has a watershed of approximately 2,214 km² (855 square miles) (Oregon Coast Atlas 2006). This estuary is a drowned-river mouth type of estuary, where large volumes of sediment from rivers are carried to the estuary during high winter flows, but where seawater dominates the estuary during low flow summer months.

Table 3.12-1 summarizes impaired water quality conditions in the vicinity of Nehalem Spit. The OWQI of the Nehalem River for water years 1994 through 2003 was good (Oregon Department of Environmental Quality 2004). However, Nehalem Bay and the lower Nehalem River are considered water quality limited for fecal coliform, and portions of the lower Nehalem River are considered impaired for temperature and dissolved oxygen. TMDLs have been approved for fecal coliform in Nehalem Bay and the Nehalem River, and for temperature in the Nehalem River. Elevated levels of lead and cadmium concentrations, which may have an effect on resident fish and aquatic life, are also of concern in the lower Nehalem River (Oregon Department of Environmental Quality 2006).

Existing sources of bacteria contributing to elevated levels of fecal coliform in Nehalem Bay are attributed to urban runoff, livestock, rural residential development, and wastewater treatment facilities. Point sources of bacteria include the Nehalem Bay Wastewater Agency, which discharges into Nehalem Bay at RM 2. Elevated bacteria concentrations in the bay vary seasonally and geographically, and tend to be highest during the wet season months or during storm runoff events. Violations of the bacteria standards occur during some winter months seaward of the State Park dock, but generally do not occur during summer months (Kasper et al. 2003).

Elevated stream temperatures in the Nehalem River are attributed to increased solar radiation due to riparian alterations and warm water point source discharges, including those from the Shoreline Sanitary District and the Nehalem Bay Wastewater Agency, which discharge wastewater into the Nehalem River and Nehalem Bay, respectively. Similar to Nehalem Bay, elevated levels of fecal coliform in the Nehalem River are attributed to urban runoff, livestock, rural residential development, and wastewater treatment facilities. Data indicate that fecal coliform concentrations are often higher in the North Fork Nehalem River than in the mainstem Nehalem, and that fall and winter concentrations tend to be higher than during drier months (Kasper et. al. 2003).

Netarts Spit

Netarts Spit separates the Pacific Ocean from Netarts Bay, and is located in Cape Lookout State Park (figure 1-6). The Netarts Bay estuary is a bar-built estuary that receives very little freshwater inflow and drains a 36 km² (14 square miles) watershed (Oregon Coastal Atlas 2006). Fourteen small, low elevation perennial streams flow through tidal salt marshes before draining into the shallow estuary. The largest of these tributaries, Rice, Whiskey, and Jackson creeks, are all less than three miles long.

Very little water quality data is available for this watershed. However, given that agricultural and industrial uses are largely absent in this watershed, high concentrations of organic chemicals, heavy metals, fecal coliform bacteria, and nutrient loads are unlikely. Sampling in Nehalem Bay has indicated that fecal

coliform concentrations are well within the criterion for shellfish culture (Netarts Watershed Council Undated). Turbidity in the bay is also low, and most streams clear shortly after storm events. Samples for dissolved oxygen in the bay between 1967 and 1984 ranged from 6.6 milligrams per liter (mg/l) to 11.1 mg/l, with an average of 9.3 mg/l, all of which are well within the optimal range for salmonids (Netarts Watershed Council Undated). Overall, none of the streams flowing into Nehalem Bay, or Nehalem Bay itself, are listed as impaired on the 303(d) list.

Nestucca Spit

Nestucca Spit separates the Pacific Ocean from Nestucca Bay and is located in Robert Straub State Park (figure 1-7). The Nestucca Bay estuary encompasses approximately 601 km² (232 square miles) that are largely covered by forests in the upper reaches and livestock and agriculture in the lowland areas (Oregon Department of Environmental Quality Undated). Similar to the Columbia River and Nehalem Bay estuaries, this estuary is a drowned-river mouth type of estuary. Major tributaries to the bay include the Nestucca River, which enters the bay from the north, and the Little Nestucca River, which enters from the south.

Table 3.12-1 summarizes impaired water quality conditions in the vicinity of Nestucca Spit. Portions of Nestucca Bay, the Nestucca River, and the Little Nestucca River are considered water quality limited for excessive stream temperatures and bacteria (*E. coli* and/or fecal coliform). TMDLs for the Nestucca watershed for bacteria and temperature were developed and approved in 2002 (Oregon Department of Environmental Quality 2006).

Existing sources of bacteria contributing to elevated levels of fecal coliform in this watershed are attributed to runoff from livestock operations, urban runoff, rural residential runoff, failing septic systems, and wastewater treatment plant discharges. Large concentrations of waterfowl in Nestucca Bay may also contribute to elevated levels of fecal bacteria (Oregon Department of Environmental Quality Undated). Bacteria concentrations tend to be highest in the fall and winter, during storm runoff events.

Umpqua Basin

The Umpqua Basin encompasses the entire 1567 km² (605-square mile) Umpqua River watershed from its headwaters in the Calapooya Mountains west to its estuary, where it enters the Pacific Ocean near the community of Winchester Bay. As with the other large river systems (i.e. Columbia and Rogue), the geomorphology of the Umpqua estuary is a river-dominated, drowned-river-mouth estuary (Oregon Coast Atlas 2006). Approximately 38 percent of the stream miles in this basin are considered to be in poor condition for macroinvertebrate communities, and 36 percent are considered to be in poor condition for vertebrate communities. The principal water quality parameters are elevated stream temperature (60 percent of all

stream miles) and fine sediment (36 percent of stream miles) (Oregon Department of Environmental Quality 2004).

Active management for snowy plover would not be considered in the Umpqua Basin under any of the project alternatives. As such, this section does not include any additional description of water quality conditions within this region.

South Coast Basin

The South Coast Basin includes all of the coastal watersheds entering the Pacific Ocean between the Umpqua Basin and the Oregon-California border, excluding the Rogue River watershed. Compared to the other coastal basins, the South Coast Basin has a relatively low level of impairment. About 14 percent of the stream miles in South Coast Basin are considered to be in poor condition for vertebrate communities, and 16 percent are considered to be in poor condition for macroinvertebrate communities (Oregon Department of Environmental Quality 2004). These conditions are attributed primarily to excessive fine sediment and stream temperature (Oregon Department of Environmental Quality 2004).

Within the South Coast Basin, portions of the New River, Sixes River, and Pistol River watersheds are considered impaired for algae / aquatic weeds, temperature, fecal coliform, and pH. TMDLs have not been established for any of these parameters in any of these watersheds, as described below.

Bullards Beach

Bullards Beach is located south of Cut Creek, in Bullards Beach State Park (figure 1-8). The Cut Creek watershed is a small, coastal watershed, which runs between U.S. Highway 101 and Bullards Beach. This small creek lacks a developed estuary. No water quality data is available.

Bandon

The HRA at Bandon State Natural Area is located south of the Coquille River (figure 1-9). Several small coastal watersheds are associated with this area, including the Twomile, Fourmile, and New River watersheds. The New River watershed includes several small tributary lakes (Floras Lake) and several small creeks, including Davis, Bethel, Butte, Morton, Langolis, and Floras creeks.

The lower portion of the watershed is dominated by livestock grazing, rural residential development, and other agricultural uses. Many streams and wetlands within the lower portion of the watersheds have been diked, ditched, and drained (Massingill 2001a). Flow regimes have been significantly altered to reduce the impact of winter flooding, and to increase areas available for pasture and cranberry production (Massingill 2001a).

Table 3.12-1 summarizes impaired water quality conditions in the vicinity of Bandon. Few data are available for streams in nearby watersheds, with the exception of the

Floras Lake and Floras Creek watersheds. The OWQI for Floras Creek is fair (Oregon Department of Environmental Quality 2004). Floras Creek and Willow Creek, a major tributary to Floras Creek, are considered impaired for temperature (Oregon Department of Environmental Quality 2006). TMDLs have not yet been developed for this watershed. Elevated stream temperatures are primarily attributed to lack of shade (the majority of the mainstem has less than 20 percent existing shade), and high water consumption. Stream temperatures (7-day maximum) in Floras Creek are above the 18 °C (64°F) standard for all sampling stations throughout the watershed, and out-of-stream water use is over-allocated on Floras Creek and several of its tributaries from May through October (Massingill 2001a). Data also indicated that Floras Creek exceeded State standards for total nitrate, and that it was moderately impaired for total phosphates, fecal coliform bacteria, and turbidity (Massingill 2001a).

Portions of Floras Lake / Boulder Creek are considered impaired for algae / aquatic weeds (Oregon Department of Environmental Quality 2006). Temperatures at Floras Lake are also very warm.

Sixes River Mouth

Sixes River Mouth is located north of Cape Blanco in Cape Blanco State Park (figure 1-10). The Sixes River flows from steep forested areas with narrow valleys in the upper basin to lower gradient areas dominated by grazing, rural residential development and other agricultural uses. The Sixes River estuary, the most complex of any in the South Coast Basin, covers approximately 134 ha (330 acres), and has a watershed of approximately 334 km² (129 square miles) (Oregon Coast Atlas 2006). The estuary is a blind estuary, meaning that during low flow months a sand bar closes off the mouth of the estuary. Major tributaries in the Sixes watershed include the North Fork, Middle Fork, South Fork, Dry Creek, Edson Creek, and Crystal Creek.

Both water quantity and quality are a concern in the Sixes watershed. Table 3.12-1 summarizes impaired water quality conditions in the vicinity of the Sixes River Mouth. The entire mainstem Sixes River and the South Fork Sixes are considered water quality impaired for temperature (Oregon Department of Environmental Quality 2006). TMDLs have not yet been developed for this watershed. Temperatures in the mainstem Sixes River often exceed the State standard of 18°C (64°F) during the summer. Noteworthy heat loading occurs between Elephant Rock and Dry Creek, and again between Edson Creek and U.S. Highway 101 due to lack of stream shading (South Coast Watershed Council 2001).

The DEQ maintains an ambient water quality monitoring site on the Sixes River at U.S. Highway 101. The OWQI results for the Sixes River between 1989 and 1998 were generally excellent during the summer (South Coast Watershed Council 2001). However, concentrations of total phosphates, total solids and biochemical oxygen demand were high during periods of heavy precipitation and high flows, resulting in

a poor OWQI between the fall and spring. Based on analysis of chemical water quality data collected from 1989 through 1998, the Sixes River is considered moderately impaired due to high nitrate, phosphorous and fecal coliform levels (South Coast Watershed Council 2001). Dissolved oxygen levels are low in the stream during August and September. Heavy metals, contributed by mining activities, are also a concern, especially near the Sixes River recreational mining site (South Coast Watershed Council 2001).

In addition to the parameters mentioned above, sedimentation may be a limiting factor in the Sixes River and Benson Creek (South Coast Watershed Council 2001). High turbidity in the basin is a result of both soil clay content and intensive land management. Road crossing densities and densities of roads on steep slopes are moderate to high in the Sixes watershed. The risk of peak flow enhancement (increased stream power) due to agricultural use is moderate to low for this area (South Coast Watershed Council 2001).

Water quantity has also been identified as a limiting factor to fish production in the Sixes River watershed (South Coast Watershed Council 2001). The mainstem Sixes River water right of 25 cubic feet per second is usually not met in July, August, and September. The largest users of water in the system are cranberry growers, which typically have storage rights, followed by two mining rights in the South Fork.

Pistol River

Pistol River is located south of Cape Sebastian in the Pistol River State Park (figure 1-11). The Pistol River estuary covers approximately 93 ha (230 acres) and drains a watershed of approximately 272 km² (105 square miles). Similar to the Sixes River estuary, it is a blind estuary that is completely closed off by a sandbar during the summer when river flows are low (Oregon Coast Atlas 2006). Dominant land uses in the lower watershed are grazing, rural residential development, and other agricultural uses. Private and Federal forestlands dominate land use in the upper basin.

Table 3.12-1 summarizes impaired water quality conditions in the vicinity of Pistol River. The OWQI for the Pistol River is poor, but data from water years 1994 through 2003 show an improvement in water quality (Oregon Department of Water Quality 2004). The Pistol River mainstem is considered water quality limited for fecal coliform, temperature, and pH. The lower mainstem of the Pistol River is considered moderately impaired for phosphate, and 7-day maximum temperatures typically range from the mid to high 23 to 26 °C (70°F) (Massingill 2001b). Biological oxygen demand within the Pistol River is the highest of any South Coast stream. TMDLs have not been established for any of the parameters identified above.

Sedimentation and flow in the Pistol River are also of concern. Water rights in all subwatersheds of the Pistol River basin are slightly over allocated between April and October, and sediment sources and transport associated with a high density of stream crossings may also contribute to turbidity (Massingill 2001b).

Rogue Basin

The Rogue Basin encompasses of the 13,209 km² (5,100-square mile) Rogue River watershed from its headwaters in the Siskiyou Mountains west to its estuary near the community of Gold Beach. As with the other large river systems (i.e. Columbia and Umpqua), the geomorphology of the Rogue estuary is a river-dominated, drowned-river-mouth estuary (Oregon Coast Atlas 2006). The Rogue Basin has relatively unimpaired biotic conditions compared to the other basins in the State. About 10 percent of the stream miles in Rogue Basin are considered to be in poor condition for vertebrate communities, and 23 percent are considered to be in poor condition for macroinvertebrate communities (Oregon Department of Environmental Quality 2004). These conditions are attributed primarily to poor water quality and excessive fine sediment (Oregon Department of Environmental Quality 2004).

Active management for snowy plover would not be considered in the Rogue Basin under any of the project alternatives. As such, this section does not include any additional description of water quality conditions within this region.

3.12.4 Environmental Consequences

Consequences Common to All Alternatives

Potential Effects on Water Quality from Public Recreational Use

As described in section 3.12.3, “Affected Environment,” several of the waterbodies in the study area are 303(d)-listed as water quality impaired for high bacteria levels, including fecal coliform, or contaminants. Although the most notable sources of high bacteria levels are often attributed to non-point sources of pollution, including leaking septic systems and livestock, dog and horse feces left on the beach as a result of public recreational use could contribute small amounts of bacteria to streams and estuaries in the study area. In addition, where motor vehicles are allowed, there could be leaks that contribute pollutants (oil, gasoline, brake fluid, transmission fluid) to surrounding waterbodies. The amount of these pollutants entering waterbodies in the study area under any of the project alternatives is unknown.

Potential effects on water quality from public recreational use would be similar, and likely minimal, under all alternatives. These effects would increase, however, over the next 25-years (term of the ITP) due to expected increases in recreational use in the study area (section 3.3, “Recreation”).

3.13 Cumulative Effects

3.13.1 Introduction

The National Environmental Policy Act (NEPA) defines a cumulative effect 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 actions” (40 CFR 1508.7).

This section presents an analysis of the beneficial and/or negative cumulative effects of the project alternatives on the resource areas evaluated in this DEIS. This analysis is presented in the context of other local, State, and Federal management activities in the vicinity of the covered lands.

3.13.2 Approach and Methodology

To more accurately evaluate the cumulative effects of the HCP and project alternatives, a larger cumulative effects analysis area was considered, which includes the covered lands and the full extent of each of the counties that makes up the covered lands (figure 3.13-1). The reason for expanding the area analyzed was to include areas where past, present, or reasonably foreseeable future projects could result in effects that, when considered together, could be cumulatively significant.

This DEIS uses a list approach to assess the cumulative effects of the proposed project alternatives within the cumulative effects analysis area. The list approach used for this analysis involved identifying individual land use planning efforts or projects in the cumulative effects analysis area that could contribute to the cumulative effects of the project alternatives. (*CEQ Guidance Regarding Cumulative Effects* [Council on Environmental Quality January 1997]). In determining present and reasonably foreseeable actions that have the potential to result in cumulative effects in combination with the proposed alternatives, two types of planning efforts and/or projects were considered:

- efforts and/or projects that would likely result in impacts similar in kind or in location to those of the project alternatives, and
- efforts and/or projects that would occur adjacent to the covered lands, but would be conducted or approved by Federal, State, or private landowners responsible for land management.

For this analysis, past actions are assumed to have contributed to the existing conditions, as described by resource topic in chapter 3, “Affected Environment, Environmental Consequences, and Cumulative Effects.” Therefore, past actions are considered to be part of the baseline conditions and are not listed in a project-by-project approach in this section.

3.13.3 Plans and Programs Considered in the Cumulative Effects Analysis

This section presents a summary of the land use plans that are being implemented within the cumulative effects analysis area, and those that are reasonably likely to be implemented in the future. As mentioned above, past actions are anticipated to have formulated the baseline conditions, which are described in chapter 3, “Affected Environment, Environmental Consequences, and Cumulative Effects.” Plans described in this section meet the criteria established in section 3.13-2, “Approach and Methodology.” The potential environmental effects of each of the plans that are relevant to the project alternatives and the cumulative analysis are also discussed.

Federal Land Use Plans and Programs

Lewis and Clark National Historic Park Comprehensive Management Plan and Strategic Plan

The Lewis and Clark National Historic Park is made up of 12 sites located on a 40-mile stretch of the Pacific Coast from Long Beach, Washington to Cannon Beach, Oregon. In 1982, the NPS developed the Lewis and Clark National Historic Park Comprehensive Plan for Management and Use (National Park Service 1982), more commonly called the Comprehensive Management Plan, to guide management of the Lewis and Clark National Historic Trail and associated parks and interpretive centers. Because the trail was new at that time, the Comprehensive Management Plan focused on describing the sites, segments, and motor routes recommended as part of the trail, rather than on management activities.

Since the close of the Lewis and Clark Bicentennial in 2006, the NPS has begun a legacy project to update and revise the Comprehensive Management Plan in collaboration with partner agencies and the general public. This effort marks a shift from the more descriptive focus of the 1982 Comprehensive Management Plan to efforts and activities necessary to address the major areas of trail administration such as cultural and natural resources preservation and protection, interpretation and education, and outdoor recreation.

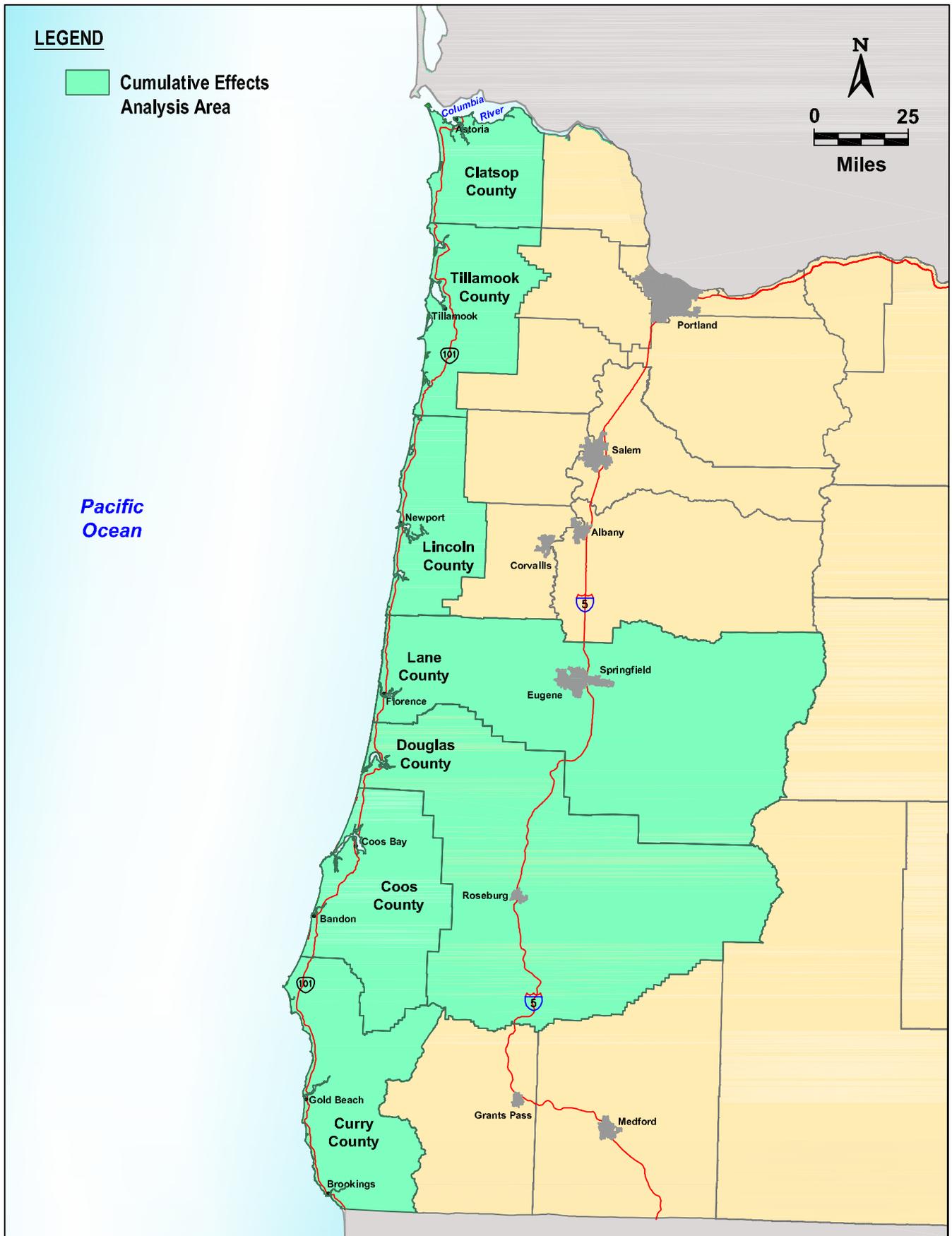


Figure 3.13-1
Cumulative Effects Analysis Area

In addition, the NPS developed a 2005–2008 Strategic Plan for the Lewis and Clark Trail (National Park Service 2005) to satisfy the requirements of Section 104 of the National Parks Omnibus Management Act of 1998. This act requires all field units within the national park system to complete strategic plans and annual performance plans consistent with the Government Performance and Results Act of 1993. The Strategic Plan focuses on specific goals to improve the interpretive nature of the trail, inventory and preserve cultural resources, and promote recreational activities associated with the trail and parks.

Within the cumulative effects analysis area, Comprehensive Management Plan activities would occur at the Fort Stevens State Park where the Columbia River South Jetty SPMA would be located.

Anticipated Environmental Effects

Implementation of the goals and strategies in the Comprehensive Management Plan and Strategic Plan is anticipated to improve recreational opportunities within the cumulative analysis area and enhance natural resource and cultural resource protections. Implementation of the project alternatives would be consistent with these plans because the project alternatives would enhance natural resource management within the covered lands, which is anticipated to result in a cumulative benefit for wildlife. Although recreational use restrictions proposed under the project alternatives would limit the types and locations of the activities that could take place on the covered lands (including at the Columbia River South Jetty SPMA), it is unlikely that any of the proposed project alternatives would contribute to an adverse cumulative effect on recreation use or opportunity because there would be numerous substitute locations where those same activities could occur unrestricted. This is particularly true since some of the primary objectives of both the Comprehensive Management Plan and Strategic Plan are designed to promote recreational activities associated with trails and parks.

A more detailed discussion of potential cumulative effects by resource area is presented in section 3.13.4, “Analysis of Cumulative Effects by Resource Topic.”

Oregon Coast National Wildlife Refuge Complex Comprehensive Conservation Planning

The Oregon Coast National Wildlife Refuge Complex has initiated a planning process called Comprehensive Conservation Planning. The purpose of the process is to review and plan for long term management of wildlife, habitat, and public use activities at six National Wildlife Refuges (Fish and Wildlife Service 2006a, 2006d, 2007a). Three of the six National Wildlife Refuges, Cape Meares, Oregon Islands, and Three Arch Rocks, are located on the Oregon coast. The other three refuges are estuarine, and include Nestucca Bay, Siletz Bay, and Bandon Marsh.

The FWS has established the policy that all national wildlife refuges must be managed according to an approved Comprehensive Conservation Plan (CCP) to meet the goals of the overall Comprehensive Conservation Planning process (Fish and Wildlife Service 2000). Of those eight goals, the following three relate directly to recreation, wildlife, fish and/or plant protection:

- Prioritize wildlife in the National Wildlife Refuge System by managing each refuge to fulfill the mission of the Refuge System; maintain and, where appropriate, restore the ecological integrity of each refuge and the Refuge System; and achieve the specific purposes for which the refuge was established.
- Encourage use of an ecosystem approach when conducting refuge planning for all refuges within the same watershed or ecosystem and consider the broader goals and objectives of the entire watershed.
- Ensure that the six priority wildlife-dependent recreational uses receive priority consideration during the preparation of the CCP.

The FWS is coordinating with Tribes, interested agencies, elected officials, the public, and other organizations regarding their interests, concerns, and viewpoints about refuge management issues, including those associated with the six refuges within the cumulative effects analysis area, and intends to use this information to develop the required CCPs.

There are no SPMA or RMA located within the National Wildlife Refuge Complex.

Anticipated Environmental Effects

The potential effects of implementing the measures in the CCP include a wide range of environmental impacts, but are anticipated to result in overall beneficial effects on wildlife and recreation. Implementation of the project alternatives would be consistent with the CCP, because the natural resource management components of the project alternatives focus on long-term management of nesting habitat for snowy plover within the covered lands. Although there are no SPMA or RMA located within the National Wildlife Refuge Complex, the complex does overlap with the covered lands. Therefore, when considered cumulatively, the CCP, along with implementation of the project alternatives, is anticipated to result in a cumulative benefit for wildlife and natural resources along the Oregon coast. Although recreational use restrictions proposed under the project alternatives would limit the types and locations of the activities that could take place on the covered lands, it is unlikely that any of the proposed project alternatives would contribute to a cumulative effect on recreation use or opportunity. This is because there would be numerous substitute locations where those same activities could occur unrestricted. As mentioned in section 3.3, "Recreation," for each SPMA and RMA, there are locations adjacent to the potentially restricted areas where recreational activities would be able to occur without prohibition. It is particularly true that there would not

likely be any cumulative effect on recreational opportunities given that the one of the goals of each CCP would be to promote public use activities.

A more detailed discussion of potential cumulative effects by resource area is presented in section 3.13.4, “Analysis of Cumulative Effects by Resource Topic.”

Northwest Forest Plan

The NWFP is an overall plan for the Pacific Northwest that focuses on producing timber products while simultaneously protecting and managing wildlife species (U.S. Forest Service and Fish and Wildlife Service 1994a). The NWFP covers 24.5 million acres in Oregon, Washington, and northern California that are managed as national forests, BLM Districts, national parks, and national wildlife refuges.

The principles of the NWFP ecosystem management strategy are reflected in that document as five key elements:

- implementation of an aquatic conservation strategy;
- adaptive management;
- compatibility with adjacent land-ownership objectives;
- consideration of potential effects on local economies; and
- protection of existing large blocks of late-successional reserve and old-growth forests to provide terrestrial and aquatic habitat for fish and wildlife species (U.S. Forest Service and Fish and Wildlife Service 1994a).

Within the cumulative effects analysis area, lands managed by the USFS under the Siuslaw National Forest Management Plan, and by the BLM under the Western Oregon Resource Management Plan and the Coos Bay District Resource Management Plan, are subject to the NWFP, as described below.

Western Oregon Resource Management Plan

In 1980, Congress created the 100-acre Yaquina Head Outstanding Natural Area located at the north end of Newport, Oregon. The Yaquina Head Outstanding Natural Area provides visitors with one of the most accessible wildlife and ocean viewing locations on the Pacific Coast, and includes Oregon's tallest and second oldest continually active lighthouse (Bureau of Land Management 2007).

In cooperation with the State of Oregon, FWS, and the U.S. Coast Guard, BLM manages the Yaquina Head Outstanding Natural Area to protect its unique scenic, scientific, educational and recreational values under the *Western Oregon Resource Management Plan* (RMP) (currently under revision), which is tiered to the NWFP. Two of the three goals outlined in the Western Oregon RMP relate directly to recreation, wildlife, fish and/or plant protection:

- Goal 1 - Maintain healthy forest ecosystems with habitat that will support populations of native species and protection of riparian areas and water.
- Goal 3 - Provide amenities that enhance communities as places to live and work.

As a component of Goal 3, the BLM policy calls for a broad spectrum of resource dependent recreation opportunities to meet the needs and demands of public land visitors. At the same time, BLM must ensure continued availability of public lands and related waters for a diversity of resource dependent outdoor recreation opportunities (Bureau of Land Management 2007).

There are no SPMA's or RMA's in the Yaquina Head Outstanding Natural Area.

Coos Bay District Resource Management Plan

The *Coos Bay District Resource Management Plan* (Bureau of Land Management 1995) describes management of approximately 329,700 acres of land in Oregon, administered by the U.S. Department of the Interior, BLM Coos Bay District. The goals of the Coos Bay District RMP include maintaining late successional and old growth species habitats and ecosystems on Federal lands, and maintaining biological diversity associated with native species and ecosystems in accordance with laws and regulations. Within the cumulative effects analysis area, the Coos Bay Spit, Umpqua Resource Area, and Myrtlewood Resource Area, are managed under the Coos Bay District RMP, which is tiered to, and in conformance with the NWFP. An updated RMP is planned for 2007.

The Coos Bay Management District extends from Reedsport to Brookings and includes four SPMA's (Bullards Beach, Bandon, Sixes River Mouth, and Pistol River) and six Recreational Management Areas (North Umpqua River, Tenmile, Coos Bay North Spit, New River, Elk River, and Euchre Creek). The Coos Bay District RMP includes general prescriptions for snowy plover management at Coos Bay North Spit and New River. In addition, site-specific management plans have been completed for Coos Bay North Spit and New River. The plans include management goals, objectives, and actions for snowy plover recovery.

Siuslaw National Forest Management Plan

The *Siuslaw National Forest Management Plan* (FMP) (U.S. Forest Service 1990) guides forest management within the Siuslaw National Forest. The FMP was amended in April of 1994 to meet the requirements of the NWFP. The Siuslaw National Forest encompasses over 630,000 acres in the Oregon Coast Range. It is bordered on the east by the Willamette Valley, on the west by the Pacific Ocean, and is located along the Oregon coast between the cities of Newport and Reedsport.

Within the National Forest, Cascade Head is maintained as an experimental forest and scenic research area. Research partners include The Nature Conservancy, State

and private universities in Oregon and Washington, ODFW, ODA, National Aeronautic and Space Administration, EPA, and NMFS.

The Oregon Dunes National Recreation Area is the largest expanse of coastal sand dunes in North America, extending approximately 40 miles along the Oregon coast, from Florence to Coos Bay. The area is managed by the USFS under the NWFP as a part of the Siuslaw National Forest.

The Siuslaw National Forest extends from Newport to Reedsport and includes the upland area adjacent to the Sutton/Baker Beach RMA.

Anticipated Environmental Effects

The potential effects of the NWFP were evaluated in the *Final Environmental Impact Statement on Management for the Northern Spotted Owl in the National Forests* (U.S. Forest Service and the Bureau of Land Management 1994b), and in supplemental environmental evaluations completed in 1994b, 2000, 2004, and 2007 (U.S. Forest Service and Bureau of Land Management 1994b, 2000, 2004, 2007). The potential effects of the Siuslaw National Forest FMP were analyzed in a final environmental impact statement completed in 1990 (U.S. Forest Service 1990) and several subsequent updates. It is anticipated that, over time, lands managed under the NWFP will maintain and improve habitats for aquatic and riparian-dependant species, and upland species dependant on old-growth habitat, on Federal forest land. In addition, certain lands, such as the Oregon Dunes National Recreation Area and Cascade Head, will continue to allow for scenic and recreational use within the cumulative effects analysis area.

When considered in combination with the effects associated with implementation of the NWFP, it is unlikely that the project alternatives would contribute to a cumulative effect on vegetation or wildlife within the cumulative effects analysis area. This is primarily because lands managed in accordance with the NWFP are typically managed for late-successional habitat and associated wildlife species (e.g., northern spotted owl), while the project alternatives evaluated in this DEIS focus on management of the Ocean Shore and beach-dependant species (e.g., snowy plover). Although recreational use restrictions proposed under the project alternatives would limit the types and locations of the activities that could take place on the covered lands, it is unlikely that any of the proposed project alternatives would contribute to a cumulative effect on recreation use or opportunity because there would be numerous substitute locations where those same activities could occur unrestricted. This is particularly true, given that the Western Oregon RMP and Siuslaw National Forest FMP require management for resource dependant recreational use at the Yaquina Head Outstanding Natural Area, Cascade Head, and at the Oregon Dunes National Recreation Area.

A more detailed discussion of potential cumulative effects by resource area is presented in section 3.13.4, “Analysis of Cumulative Effects by Resource Topic.”

State and Local Plans and Programs

Oregon Coastal Management Program

The mission of the OCMP is to work in partnership with coastal local governments, State and Federal agencies, and other stakeholders to ensure that Oregon’s coastal and ocean resources are managed, conserved, and developed consistent with the Oregon statewide planning goals. The OCMP ensures that management is coordinated with the goals and policies of the CZMA; the provisions of other key Oregon laws, including the Beach Bill and the Oregon Removal-Fill Law; and the plans and policies of local land use planning jurisdictions. The OCMP is administered by the DLCD.

To accomplish its mission, the OCMP provides substantial technical and financial assistance to local governments within the coastal zone for planning, capacity building, and special projects. In addition, the DLCD reviews State and Federal permits to support local planning and ensure protection of coastal resources.

The OCMP applies to the coastal zone, which extends from the Washington border on the north to the California border on the south; seaward to the extent of State jurisdiction as recognized by Federal law (the Territorial Sea, extending three nautical miles offshore); and inland to the crest of the coastal mountain range. The three exceptions occur where the basins of the Columbia, Umpqua, and Rogue Rivers lie predominantly inland of the crest of the Oregon Coast Range. In these cases the coastal zone boundary crosses these rivers at Bradwood, Scottsburg, and Agness, respectively. This area encompasses the covered lands and all of the proposed SPMA and RMA.

Anticipated Environmental Effects

The potential effects of the OCMP are wide reaching. Although the OCMP promotes conservation of coastal resources, it also allows for planned development, which has the potential to affect coastal wildlife, aquatic resources, vegetation, socioeconomics, recreation, air quality, and water quality.

When considered in combination with past, present, and reasonably foreseeable future actions and the proposed project alternatives, cumulative effects on recreation, wildlife, vegetation, and cultural resources could occur as a result of increased development along the coast. Overall, however, the cumulative contribution of project alternatives to these effects would likely be beneficial. This is because the project alternatives would be implemented in a manner to avoid affecting coastal resources to the extent possible and would result in habitat restoration for the snowy plover. In addition, the OCMP has specific goals to protect and enhance cultural,

natural, and recreational resources within the analysis area. Although recreational use restrictions proposed under the project alternatives would limit the types and locations of the activities that could take place on the covered lands, it is unlikely that any of the proposed project alternatives would contribute to a cumulative effect on recreation use or opportunity or local businesses. This is because there would be numerous substitute locations where those same activities could occur unrestricted. As mentioned in section 3.3, “Recreation,” for each SPMA and RMA, there are locations adjacent to the potentially restricted areas where recreational activities would be able to occur without prohibition.

A more detailed discussion of potential cumulative effects by resource area is presented below in section 3.13.4, “Analysis of Cumulative Effects by Resource Topic.”

Ocean Shore Management Plan

In 1967, the Oregon Legislature passed the Beach Bill, establishing a recreational easement across the dry sand portion of the Ocean Shore, and placing recreation management of the Ocean Shore with OPRD. The OSMP (Oregon Parks and Recreation Department 2005) is a comprehensive planning tool to guide future decision making by OPRD. The OSMP defines the goals and objectives for managing the Ocean Shores, defines a vision for the future of Oregon’s Ocean Shores, and makes recommendations for achieving that vision.

Anticipated Environmental Effects

The potential effects of the OSMP would be wide reaching and apply to the entire Oregon coast under OPRD’s jurisdiction. When considered in combination with the project alternatives, the most relevant cumulative effects include those on recreation, wildlife, vegetation, and cultural resources. Overall, these effects are anticipated to be beneficial to these resource areas. This is because the OSMP has specific goals to protect and enhance cultural, natural, and recreational resources within the cumulative effects analysis area. In addition, the project alternatives would be implemented in a manner to avoid affecting coastal resources to the extent possible and would result in habitat restoration for the snowy plover. Although recreational use restrictions proposed under the project alternatives would limit the type and location of the activities that could take place on the covered lands, it is unlikely that any of the proposed project alternatives would contribute to a cumulative effect on recreation use or opportunity. This is because there would be numerous substitute locations where those same activities could occur unrestricted. As mentioned in section 3.3, “Recreation,” for each SPMA and RMA, there are locations adjacent to the potentially restricted areas where recreational activities would be able to occur without prohibition.

A more detailed discussion of potential cumulative effects by resource area is presented in section 3.13.4, “Analysis of Cumulative Effects by Resource Topic.”

Oregon Statewide Planning Goals

Land use planning in Oregon is governed by 19 Statewide Planning Goals, which are achieved through local comprehensive planning. State law requires that each city and county adopt a comprehensive plan consistent with the Statewide Planning Goals, including the zoning and land use ordinances necessary to implement the plan effectively. Comprehensive plans are reviewed by the Land Conservation and Development Commission and, once approved, become the controlling document for land use in the area covered by that plan. The applicable comprehensive plans and land use ordinances within the cumulative effects analysis area are listed below.

- Clatsop County Comprehensive Plan (Clatsop County 2007).
- Tillamook County Comprehensive Plan and Zoning Ordinance (Tillamook County 2007).
- Lincoln County Comprehensive Plan (Lincoln County 2007).
- Lane County Comprehensive Plan Rural Areas (Lane County 2007).
- Douglas County Comprehensive Plan and Land Use Development Ordinance (Douglas County 2007).
- Coos County Comprehensive Plan and Land Use Development Ordinance (Coos County 2007).
- Curry County Comprehensive Plan (Curry County 2007).

The Statewide Planning Goals require that local governments consider specific resources when developing their comprehensive plans, including the following resources.

- **Goal 5 - Natural Resources, Scenic and Historic Areas, and Open Spaces:** Goal 5 covers more than a dozen natural and cultural resources such as wildlife habitats and wetlands, and establishes a process for each resource to be inventoried and evaluated. If a resource or site is found to be significant, a local government has three policy choices; to preserve the resource, allow proposed uses that conflict with it, or strike some sort of a balance between the resource and the uses that would conflict with it.
- **Goal 8 - Recreational Needs:** This goal calls for each community to evaluate its areas and facilities for recreation and develop plans to deal with the projected demand for them. It also sets forth detailed standards for expedited siting of destination resorts.
- **Goal 17 - Coastal Shorelands:** The purpose of Goal 17 is to conserve, protect, develop, and, where appropriate, restore the resources and benefits of all coastal shorelands. In addition, Goal 17 aims to reduce hazards to human life and property, and provides for the protection of major marshes, significant wildlife

habitat, coastal headlands, and exceptional aesthetic resources included in community inventories.

- **Goal 18 - Beaches and Dunes:** Goal 18 is designed to conserve, protect, and where appropriate develop, and/or restore the resources and benefits of coastal beach and dune areas. The goal also aims to reduce the hazard to human life and property from natural or human-induced actions associated with these areas. Coastal areas subject to this goal include beaches, active dune forms, recently stabilized dune forms, older stabilized dune forms and interdunal forms. Uses are based on the capabilities and limitations of beach and dune areas to sustain different levels of use or development, and the need to protect areas of critical environmental concern, areas having scenic, scientific, or biological importance, and significant wildlife habitat as identified through application of Goals 5 and 17.

Anticipated Environmental Effects

Although the Statewide Planning Goals and comprehensive plans require that protections be implemented to protect resources as lands are developed, development activities and associated changes in land use inherently have the potential to effect resources considered in this DEIS, including fish and wildlife habitat, vegetation, and recreational opportunities. Cumulatively, implementation of the land use plans listed above would contribute to adverse effects on these resources resulting from development activities authorized under a relevant comprehensive plan. The individual effects have been addressed by each plan as required by the Statewide Planning Goals and it is expected that such effects would be minimized and mitigated, to the extent practical and as required by the local jurisdiction.

Implementation of the project alternatives would be consistent with the purpose of the Statewide Planning Goals and is not anticipated to contribute to a cumulative effect on coastal resources. This is because implementation of each project alternative would enhance resource (i.e., wildlife, fisheries, and vegetation) protections while providing for a sustained economic development in the cumulative effects analysis area.

A more detailed discussion of potential cumulative effects by resource area is presented in section 3.13.4, “Analysis of Cumulative Effects by Resource Topic.”

3.13.4 Analysis of Cumulative Effect by Resource Topic

The following section includes an analysis of the cumulative effects by resource topic. The discussion covers only those resource areas for which the project alternatives have a potential to contribute to cumulative effects.

Recreational Use

Implementation of the recreational use restrictions proposed under the project alternatives would have the potential to affect recreation within the covered lands by limiting the types and locations of the activities that could take place. Under Alternative 1, it is possible that these restrictions could occur anywhere on the coast where nesting snowy plovers appeared. Under Alternatives 2 and 3, these restrictions would be limited to SPMA and RMA, with the potential for less prohibitive recreational use restrictions to occur on lands owned or leased by OPRD outside of these targeted areas. Therefore, compared with Alternatives 2 and 3, implementation of Alternative 1 is anticipated to have greater effects on recreation.

Although the potential for recreational effects does exist, as indicated in section 3.3, "Recreation," generally there are numerous substitute locations where these activities could occur unrestricted under each of the alternatives. Therefore, the potential for effects on recreation is considered to be greatest under Alternative 1, but minimal for all the project alternatives.

When considered cumulatively, all of the plans that are or would be implemented in the analysis area discussed above contain some element intended to protect or enhance recreational resources. Continued increases in population, with the accompanying development along the coast could affect recreational use by causing beaches to be more crowded, but Oregon's Statewide Planning Goals require local jurisdictions to assess the need for and provide facilities to satisfy recreation demand. Therefore, when considered together, the overall effect of these plans would result in beneficial effects for recreation. Although there is potential for the project alternatives to result in a slight contribution to cumulative recreational effects, overall, the net effect on recreation in the cumulative effects analysis area is anticipated to be beneficial because of the fact that the plans described above are aimed to preserve and enhance recreational use and opportunities.

Socioeconomic Effects and Environmental Justice

As described in section 3.4, Socioeconomics and Environmental Justice, there is the potential for displacement of recreational activities with minor effects on local businesses. This is because if beach visitors chose to go to a different beach to avoid recreational use restrictions, they may not spend money at the same local businesses during their visit. As indicated in the analysis, the location of substitute beach locations in proximity indicates it would be unlikely that beach visitors would need to go to a different beach location, since those areas are most often adjacent to the restricted area and reached via the same access point. In point of fact, information collected during the *Oregon Shore Recreational Use Survey* (Shelby and Tokarczyk 2002) found that the majority of beach visitors were not affected by the recreational use restrictions that are currently in place at the Bandon SPMA. Therefore, although there is a potential for the project alternatives to result in minor socioeconomic

effects, the effects would be minimal and are not anticipated to contribute to an adverse cumulative effect on socioeconomics within the cumulative effects analysis area.

Furthermore, implementation of comprehensive plans aimed at providing economic opportunities within local jurisdictions, and larger land use plans that include economic initiatives, are likely to continue to enhance the economic climate within the cumulative effects analysis area. Overall, the cumulative effects on socioeconomics within the cumulative analysis area are expected to be beneficial.

As discussed in section 3.4, “Socioeconomics and Environmental Justice,” the project alternatives would not result in a disproportionate effect on environmental justice populations. Therefore, the project alternatives would not result in an adverse cumulative environmental justice effect.

Air Quality

Implementation of the project alternatives has the potential to result in minor air quality effects, primarily from restoration activities (involving bulldozing dunes) and increased OPRD staff trips to the beach for enforcement and education and outreach activities. As discussed in section 3.5, “Air Quality,” the effects on air quality would only be minimal and would not occur as the result of new stationary sources of emissions. Because the potential for air quality effects would be insubstantial, implementation of the project alternatives is not anticipated to result in cumulatively significant adverse air quality effects.

Noise

Implementation of the project alternatives has the potential to result in minor noise effects from bulldozing dunes for habitat restoration. As discussed in section 3.6, “Noise,” the effects would be minimal. This is because the use of noise generating equipment would be infrequent and would occur for only short durations at any given site. In addition, noise from the loudest activities (temporary bulldozing for dune restoration) is not anticipated to be audible at distances beyond 274 meters (900 feet) under the quietest conditions due to ocean noise in the immediate vicinity. Because the potential for noise effects would be minimal, implementation of the project alternatives is not anticipated to result in cumulatively significant adverse noise effects.

Wildlife

Several of the covered activities under all the project alternatives have the potential to result in effects on wildlife. However, as an HCP, the project alternatives must provide assurances that the covered species (snowy plover) and its habitat will be conserved and recovered. Therefore, the cumulative effects on the snowy plover and

its habitat are inherently mitigated by the conservation program and would not contribute to a cumulatively significant effect.

The project alternatives might contribute to a cumulative effect on non-covered special-status or other wildlife species. Continued recreational use, increasing population and development, predator management, and implementation of other natural resource plans within the analysis area could result in disturbance to or loss of habitat for species not covered in the HCP. However, as indicated in section 3.7, “Wildlife,” OPRD would coordinate with the appropriate resource agencies, including USDA, FWS, and ODFW, to ensure that any potential effects of the covered activities were mitigated appropriately. This would reduce the potential for an effect such that the project alternatives, when combined with the other natural resource management plans described in section 3.13.3, would not result in adverse cumulative effects on other wildlife species.

Aquatic Species

Implementation of the project alternatives has the potential to result in minimal adverse effects on aquatic species and their habitat. Primarily, recreational activities have the potential to result in effects on marine invertebrates and fisheries resources over the course of the 25-year ITP. However, as described in section 3.8, “Aquatic Species and Their Habitat,” the effects would be minimal, and in some cases beneficial as a result of increased law enforcement activities. Therefore, implementation of the project alternatives is not anticipated to result in cumulatively significant adverse effects on aquatic species or their habitat.

Plants

Implementation of all the project alternatives would result in an overall beneficial effect on sensitive plant species. This is because natural resource management activities in areas targeted for snowy plover would include removal of non-native invasive species. In addition, OPRD would manage the remainder of the Ocean Shore in a manner to promote native species development, in accordance with a statewide invasive plant species management plan.

As described in section 3.13.3 above, the majority of land use plans that have been, are, or would be proposed in the cumulative effects analysis area contain elements focusing on natural resource enhancement. When combined with the potential effects of these plans, implementation of the project alternatives would result in an overall cumulative benefit for vegetation. This is because implementation of these plans along with the project alternatives would result in increases in native vegetation through increased management of invasive species and dune restoration activities.

Cultural Resources

In selecting the targeted areas for snowy plover management, known cultural resources were avoided. Therefore, it is unlikely that implementation of snowy plover management activities would result in potential effects on these resources. However, it is possible that unknown cultural resources could be disturbed during implementation of one of the project alternatives. The mitigation measures listed in section 3.11, "Cultural Resources," would partially offset any cumulative loss in cultural resources, thereby avoiding substantial disturbance and loss of archaeological or historical resources within the cumulative effects analysis area.

Water Quality

The project alternatives have similar potential to affect water quality as a result of increased recreational use over the course of the 25-year ITP. However, as discussed in section 3.12, "Water Quality," the potential effects would be minimal and restrictions on recreational use in sensitive areas would serve to further minimize these effects. Therefore, the individual contribution of the project to cumulative water quality considerations would also be minimal. In addition, when the individual project effects are considered in combination with other regional natural resource management plans, there could be an overall regional benefit to water quality. This is because the plans mentioned above include water quality protections that would be implemented to protect water quality.

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