



Habitat Conservation Plan

for the Western Snowy Plover • August 2010



Habitat Conservation Plan for the Western Snowy Plover

Prepared for:

Oregon Parks and Recreation Department
725 Summer Street, Suite C
Salem, OR 97301-1266
Contact: Kathy Schutt
503.986.0745

Prepared by:



317 SW Alder Street, Suite 800
Portland, OR 97204
Contact: Kim Marcotte
503.248.9507

August 2010

This document should be cited as:
ICF International. 2010. Habitat Conservation Plan for the Western Snowy Plover. August. (ICF 06537.06.) Portland, OR.
Prepared for Oregon Parks and Recreation Department.

Contents

Section 1. Executive Summary	1-1
1.1. Introduction	1-1
1.2. Purpose and Need	1-1
1.2.1. Snowy Plover Recovery Plan	1-2
1.3. Covered Lands.....	1-2
1.4. Covered Activities Included in the Habitat Conservation Plan.....	1-3
1.5. Conservation Plan.....	1-4
1.5.1. Conservation Measures.....	1-4
Snowy Plover Management.....	1-11
Snowy Plover Conservation Measures at Snowy Plover Management Areas (SPMAs).....	1-11
Snowy Plover Management Measures at Recreation Management Areas (RMAs).....	1-14
Public Use/Recreation Management	1-14
Special Considerations for Recreational Use Restrictions at Recreation Management Areas (RMAs)	1-16
Protections for Nests outside of Targeted Areas	1-17
Beach Management	1-17
1.5.2. Goals and Actions for Implementing the Conservation Measures	1-17
1.5.3. Adaptive Management.....	1-17
1.6. Implementation Considerations.....	1-18
1.6.1. Unforeseen Circumstances	1-19
1.6.2. Changed Circumstances	1-20
1.7. Alternative Actions Considered but Rejected.....	1-20
1.8. Changes to the September 2007 Draft HCP	1-21
 Section 2. Introduction/Overview.....	 2-1
2.1. Introduction	2-1
2.2. Purpose and Need	2-2
2.3. Biological Goals	2-3
2.4. Covered Species.....	2-4
2.4.1 Snowy Plover.....	2-4
2.4.2 Other Species Considered	2-4

2.5.	Covered Lands.....	2-5
2.6.	Covered Activities.....	2-6
2.7.	Timing and Duration.....	2-19
2.8.	Public Review.....	2-19
2.9.	Regulatory Background.....	2-19
2.9.1.	Federal Endangered Species Act.....	2-19
2.9.2.	Migratory Bird Treaty Act.....	2-22
2.9.3.	Clean Water Act.....	2-22
2.9.4.	National Environmental Policy Act.....	2-23
2.9.5.	Coastal Zone Management Act.....	2-23
2.9.6.	Oregon Endangered Species Act.....	2-24
2.9.7.	Oregon Statewide Land Use Planning Goals.....	2-25
2.9.8.	Oregon Comprehensive Plans.....	2-26
2.9.9.	State Ocean Shore Rules.....	2-27
2.9.10.	National Historic Preservation Act of 1966.....	2-28
2.9.11.	State of Oregon Cultural Resource Protection Laws.....	2-29

Section 3. Covered Activities..... 3-1

3.1.	The Beach as a Destination.....	3-1
3.2.	Beach Survey.....	3-2
3.3.	Covered Activities.....	3-3
3.3.1.	Public Use/Recreation Management.....	3-4
3.3.2.	Beach Management Activities.....	3-10
3.3.3.	Natural Resource Management.....	3-11

Section 4. Natural History of and Factors Affecting the Snowy Plover..... 4-1

4.1.	Description and Taxonomy.....	4-1
4.2.	Life History.....	4-2
4.2.1.	Breeding.....	4-2
4.2.2.	Productivity.....	4-5
4.2.3.	Feeding Habits and Habitats.....	4-5
4.2.4.	Migration.....	4-6
4.2.5.	Wintering.....	4-6
4.3.	Population Status and Trends.....	4-8
4.3.1.	Historical Trends.....	4-8
4.3.2.	Current Breeding Trends – Oregon Coast.....	4-9
4.3.3.	Threats and Sources of Threats.....	4-15
4.3.4.	Existing Conservation and Protection Measures in Place.....	4-21

Section 5. Conservation Plan 5-1

- 5.1. Introduction 5-1
- 5.2. Conservation Strategy 5-2
 - 5.2.1. Guiding Principles..... 5-2
 - 5.2.2. Conservation Approach to Site Selection 5-3
 - 5.2.3. Management Approach 5-9
- 5.3. Conservation Plan..... 5-10
 - 5.3.1. Conservation Measures..... 5-10
 - 5.3.2. Goals and Actions Implementing the Conservation Measures 5-20
 - 5.3.3. Adaptive Management..... 5-29
- 5.4. Summary of Conservation Measures..... 5-32
 - 5.4.1. Snowy Plover Management..... 5-32
 - 5.4.2. Public Use/Recreation Management 5-34
 - 5.4.3. Beach Management 5-36

Section 6. Direct, Indirect, and Cumulative Effects on Snowy Plovers and Snowy Plover Habitat..... 6-1

- 6.1. Introduction 6-1
- 6.2. Oregon Parks and Recreation Department Management Activities 6-2
 - 6.2.1. Public Use/Recreation Management 6-2
 - 6.2.2. Beach Management 6-7
 - 6.2.3. Natural Resource Management..... 6-8
- 6.3. Effects on Snowy Plover Designated Critical Habitat..... 6-9
 - 6.3.1. Introduction 6-9
 - 6.3.2. Public Use/Recreation Management 6-10
 - 6.3.3. Beach Management Activities 6-11
 - 6.3.4. Natural Resource Management..... 6-11
- 6.4. Effects on Federally Listed Plant Species..... 6-11
 - 6.4.1. Western Lily6-11
- 6.5. Incidental Take..... 6-12
 - 6.5.1. Introduction 6-12
 - 6.5.2. Scope of Incidental Take Permit..... 6-12
 - 6.5.3. Take Estimate Summary 6-13
 - 6.5.4. Effect of Take 6-17

Section 7. Implementation, Organization, and Structure 7-1

- 7.1. Introduction 7-1
- 7.2. OPRD Commitments 7-1

- 7.2.1. Program Administration 7-2
- 7.2.2. Management Action Implementation..... 7-2
- 7.3. Implementation Schedule 7-2
- 7.4. Implementation Needs 7-3
- 7.5. Funding 7-5
 - 7.5.1. Funding Overview 7-5
 - 7.5.2. Funding Sources..... 7-5
 - 7.5.3. Cost Analysis 7-6
- 7.6. Unforeseen and Changed Circumstances 7-9
 - 7.6.1. Introduction 7-9
 - 7.6.2. Unforeseen Circumstances.....7-10
 - 7.6.3. Changed Circumstances.....7-11
- 7.7. Permit Renewal/Amendment Procedures.....7-12
 - 7.7.1. Permit Extension/Renewal7-12
 - 7.7.2. Amendment/Modifications.....7-13
 - 7.7.3. Enforcement.....7-14
 - 7.7.4. Suspension/Revocation7-14

Section 8. Alternative Actions Considered but Rejected 8-1

- 8.1. Introduction 8-1
- 8.2. Alternatives Eliminated from Further Consideration 8-1
 - 8.2.1. No Habitat Conservation Plan Alternative..... 8-1
 - 8.2.2. Manage All Recovery Plan Areas 8-2
 - 8.2.3. Protection of Nests When and Where They Occur 8-2
 - 8.2.4. Protection of Occupied Sites Only 8-2
 - 8.2.5. Active Management of All Snowy Plover Management Areas/Recreation Management Areas for Occupancy by Oregon Parks and Recreation Department 8-2
 - 8.2.6. Implement a Captive Breeding Program 8-3
 - 8.2.7. Voluntary Compliance and Education 8-3
 - 8.2.8. Multi-Species HCP..... 8-4
- 8.3. Potential OPRD-Owned Beaches Not Included in the HCP 8-4
 - 8.3.1. Nestucca Spit..... 8-4
 - 8.3.2. Bullards Beach/Sixes River 8-5
 - 8.3.3. Pistol River 8-5

Section 9. References..... 9-1

- 9.1. Printed References..... 9-1
- 9.2. Personal Communications.....9-11

Figures

Figure 1-1. Areas Targeted for Snowy Plover Management by OPRD or Other Landowners 1-5

Figure 1-2. Ocean Shore Jurisdictional Extent 1-7

Figure 2-1. Project Vicinity 2-7

Figure 2-2. Boundary of Snowy Plover Management Area within Fort Stevens State Park 2-9

Figure 2-3. Boundary of Snowy Plover Management Area within Gearhart Ocean State Recreation Area 2-11

Figure 2-4. Boundary of Snowy Plover Management Area within Nehalem Bay State Park 2-13

Figure 2-5. Boundary of Snowy Plover Management Area within Cape Lookout State Park 2-15

Figure 2-6. Boundary of Snowy Plover Management Area within Bandon State Natural Area 2-17

Figure 4-1. Changes in Beach Profile since Introduction of European Beachgrass 4-16

Figure 6-1. Stage-Structured Life Cycle for Snowy Plover 6-14

Tables

Table 1-1. Summary of Proposed Management Actions in OPRD Owned / Leased Snowy Plover Management Areas (SPMAs) 1-9

Table 1-2. Summary of Proposed Recreation Restrictions and Enforcements for Recreation Management Areas (RMAs) Outside State Parks and on Non-Federal Lands 1-10

Table 1-3. Proposed Recreational Use Restrictions 1-15

Table 2-1. List of Species Excluded from the HCP 2-4

Table 2-2. Snowy Plover Critical Habitat Designated Along Oregon Coast 2-21

Table 3-1. Top 25 Recreation Activities Pursued by Segment and Region 3-2

Table 3-2. Beach Management Activities and Hours Spent Performing 3-11

Table 4-1. Numbers of Snowy Plovers Counted During Winter Window Surveys along the Oregon Coast 4-10

Table 4-2. Numbers of Snowy Plovers Counted During Breeding Window Surveys along the Oregon Coast 4-12

Table 4-3. Nesting and Fledging Success 2002 through 2009 4-14

Table 4-4. Nest Predation 2004 to 2009 4-20

Table 4-5. Total Number of Predators Removed from Three South Coast Snowy Plover Areas during the 2008 Breeding Season 4-23

Table 4-6.	Total Numbers of Predators Removed from the U.S. Forest Service Sites during the 2008 Season	4-23
Table 4-7.	Success of Exclosed and Unexclosed Snowy Plover Nests on the Oregon Coast, 1990 to 2006.....	4-24
Table 4-8.	Beach Restrictions by Location and Year during Nesting Season (in miles)	4-27
Table 5-1.	SPMAs and RMAs	5-4
Table 5-2.	Conservation Measures Specific to OPRD Occupied and Unoccupied Snowy Plover Management Areas.....	5-15
Table 5-3.	Public Use/Recreational Management Conservation Measures	5-16
Table 5-4.	Summary of Conservation Measures to be Implemented at Snowy Plover Management Areas (SPMAs)	5-37
Table 5-5.	Summary of Conservation Measures to be Implemented at Recreation Management Areas (RMAs)	5-38
Table 6-1.	Estimated Change in the Number of Eggs, Nests, Fledglings, and Adults per Year as a Result of Habitat Restoration, Predator Management, and Recreational Use	6-16
Table 7-1.	Management Actions for Occupied and Unoccupied Snowy Plover Management Areas.....	7-2
Table 7-2.	Roles and Responsibilities of OPRD Staff in HCP	7-4
Table 7-3.	Expenses for Snowy Plover Management at Bandon State Natural Area: 2007 to 2009.....	7-7
Table 7-4.	Anticipated Expense to Manage One Unoccupied SPMA for 2 Years.....	7-8
Table 7-5.	Anticipated Expense to Manage One Occupied SPMA for 2 Years.....	7-8

Appendices

Appendix A.	Site Management Plan Outline for Snowy Plover Management Areas
Appendix B.	Species Considered but Excluded from the HCP
Appendix C.	Record of Public Involvement
Appendix D.	Recreational Activities Occurring on the Covered Lands
Appendix E.	Activities Not Addressed in the HCP
Appendix F.	Snowy Plover Recreation Management Area Descriptions
Appendix G.	Technical Memorandum: Take Estimate for the Western Snowy Plover Habitat Conservation Plan
Appendix H.	Implementing Agreement for the Oregon Parks and Recreation Department Habitat Conservation Plan for the Western (Coastal) Snowy Plover

Acronyms and Abbreviations

ACHP	Advisory Council on Historic Preservation
APHIS	Animal and Plant Health Inspection Service
ATV	all-terrain vehicle
BLM	Bureau of Land Management
BBS	Breeding Bird Survey
USBLM	United States Bureau of Land Management
BBS	Breeding Bird Survey
BO	Biological Opinion
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cm	centimeters
Corps	U.S. Army Corps of Engineers
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
EIS	Environmental Impact Statement
ESA	Endangered Species Act
HCP	Habitat Conservation Plan
HRA	Habitat Restoration Area
IA	Implementing Agreement
ITP	Incidental Take Permit
MBTA	Migratory Bird Treaty Act
MOA	Memorandum of Agreement
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service

NRHP	National Register of Historic Places
OAR	Oregon Administrative Rule
ODEQ	Oregon Department of Environmental Quality
ODFW	Oregon Department of Fish and Wildlife
ODOT	Oregon Department of Transportation
ODSL	Oregon Department of State Lands
OPRD	Oregon Parks and Recreation Department
ORNHIC	Oregon Natural Heritage Information Center
ORS	Oregon Revised Statutes
OSU	Oregon State University
OHV	off-highway vehicle
Recovery Plan	Western Snowy Plover Pacific Coast Population Draft Recovery Plan
RMA	Recreation Management Area
ROD	Record of Decision
RTP	Recreational Trail Program
Services	U.S. Fish and Wildlife Service and National Marine Fisheries Service
SHPO	State Historic Preservation Office
SNA	State Natural Area
SOLV	Stop Oregon Litter and Vandalism
SPMA	Snowy Plover Management Area
SVL	Statutory Vegetation Line
U.S.C.	United States Code
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service

Section 1. Executive Summary

1.1. Introduction

In 1993, the Pacific coast population of the western snowy plover (*Charadrius alexandrinus nivosus*; snowy plover) was listed as a threatened species under the Endangered Species Act of 1973, as amended (ESA). The listing was due to interrelated threats such as loss of habitat, predators, and human disturbance including recreational activities.

Management of the Ocean Shore, for which the Oregon Parks and Recreation Department (OPRD) has responsibility and authority, may negatively affect snowy plover and their habitat resulting in take of the species as defined under the ESA. Therefore, OPRD is preparing this Habitat Conservation Plan (HCP) as part of its application for an incidental take permit (ITP) authorized under Section 10(a)(1)(B) of the ESA. The ITP would provide OPRD with the long-term regulatory assurance that implementation of its coastal management responsibilities would comply with the ESA, while providing protection for snowy plovers.

1.2. Purpose and Need

OPRD is pursuing an ITP from the U.S. Fish and Wildlife Service (USFWS), using the HCP process with its regional perspective on species conservation, as a mechanism for compliance with the ESA. Over the next 25 years (the permit term proposed in the HCP), OPRD will engage in a number of management and regulatory activities along the coast of Oregon that could affect the snowy plover.

Administration of ESA compliance activities for each of these actions on a project-by-project basis would likely be a less efficient process for both OPRD and USFWS, and could result in unpredictable beach use restrictions on Oregon's beaches to protect nesting populations of snowy plover. A project-by-project approach would also be less effective at addressing issues on a regional scale.

OPRD is responsible for various management activities along most of the Oregon coast, including recreation management, general beach management, and management of natural resources, including snowy plover. Since populations of

snowy plover nest, roost, forage, and raise chicks on the sandy beaches of Oregon's coast, OPRD must ensure that its management activities do not result in take of snowy plover. "Take" under the ESA is defined to mean "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." In addition, OPRD must balance snowy plover management activities with its mandate to maintain the public's access to the Ocean Shore.

At the request of Federal and State agencies and Curry County, OPRD currently restricts use on a portion of the Ocean Shore at six occupied snowy plover nesting areas during the snowy plover breeding season (March 15 to September 15) to minimize potential adverse effects on nesting populations of snowy plover. These seasonal use restrictions have been imposed annually since 1994, with such restrictions affecting anywhere from 0.5 mile (1994) to 19.8 miles (1998) of beach, although access to and the use of the wet sand areas is still available. Seasonal use restrictions limit recreational use and access in these specific areas, and vary unpredictably in scale and location.

As a result, OPRD, in collaboration with USFWS and the Oregon Department of Fish and Wildlife (ODFW), has prepared this HCP with a proposed 25-year term, to address potential effects on snowy plover resulting from OPRD management activities on the covered lands (see "Covered Lands" below for a description of the geographic boundaries of the areas covered under the HCP), and to work toward the conservation and recovery of the coastal population of the species.

1.2.1. Snowy Plover Recovery Plan

USFWS released the *Western Snowy Plover Pacific Coast Population Draft Recovery Plan* (Recovery Plan) in 2001 (U.S. Fish and Wildlife Service 2001a). The Recovery Plan was finalized in 2007 (U.S. Fish and Wildlife Service 2007). The Recovery Plan identified 19 recovery areas for snowy plover along the Oregon coast, including some areas owned or leased by OPRD. The conservation strategies for snowy plover described in this HCP were developed to implement, in part, recommendations in the Recovery Plan. These conservation strategies include management of some OPRD-owned or leased areas, and the possible implementation of recreational use restrictions at areas owned by other landowners at sites either occupied by nesting snowy plovers or at sites being actively managed to attract nesting populations. These conservation measures will minimize potential effects on snowy plover and snowy plover habitat.

1.3. Covered Lands

The area covered by the HCP 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. This area encompasses

approximately 230 miles of sandy Ocean Shore beach (total mileage of the Oregon coast is 362 miles) (Figure 1-1).

The sandy Ocean Shore is defined as the area from extreme low tide to the actual or statutory vegetation line, whichever is most landward. OPRD is responsible for managing the Ocean Shore as required under Oregon Revised Statutes (ORS) 390.635 and 390.620 and implemented under Oregon Administrative Rule (OAR) 736-020-0040(3) and in cooperation with Federal land management actions as per the CZMA. The Ocean Shore does not include estuaries or river mouths, which are under the management of the Oregon Department of State Lands (ODSL).

Covered lands for the HCP do not include the Federal lands within the Ocean Shore boundary. Federal jurisdiction within the Ocean Shore boundary extends between the mean high tide and the actual or statutory vegetation line (Figure 1-2) adjacent to federally owned lands. Any actions that occur on Federal lands, regardless of who conducts the activity, would be the responsibility of the Federal landowner and would require separate formal consultation with USFWS. If these Federal actions could result in effects on uses or natural resources within Oregon's coastal zone, the actions must be consistent with state enforceable policies, including OPRD's Ocean Shore authority as required by the Coastal Zone Management Act (CZMA).

In addition, portions of the following key State Parks, State Natural Areas, and State Recreation Areas are included in the covered lands.

- 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)
- Bandon State Natural Area

1.4. Covered Activities Included in the Habitat Conservation Plan

Activities covered under the HCP include all activities for which OPRD has responsibility within the covered lands that could result in take of snowy plover. These activities are described in greater detail in Section 3, "Covered Activities," in this HCP, and include public use/recreation management, natural resources management, and beach management.

1.5. Conservation Plan

The Conservation Plan collectively consists of the conservation measures, the related goals and actions, and the adaptive management measures described below.

1.5.1. Conservation Measures

The conservation measures included in the HCP will be implemented on the covered lands, which are described above under Section 1.3, “Covered Lands.” The conservation measures will be focused on 16 management areas that were identified to have the greatest potential to provide snowy plover habitat when considered in the context of recreational use of the Ocean Shore.

OPRD would only implement potential recreation restrictions within the covered lands. The covered lands include the five potential SPMAAs that are owned or leased by OPRD as part of the state park units, and are located at Columbia River South Jetty, Necanicum Spit, Nehalem Spit, Bandon, and Netarts Spit. The covered lands also include 11 other potential management areas, identified as recreation management areas (RMAs), which are not part of an OPRD state park unit, but are managed by OPRD as part of the Ocean Shore. Some RMAs are privately owned and some are owned by counties. Others are adjacent to Federal land that lies within and adjacent to the Ocean Shore. An RMA adjacent to Federal land extends from the extreme low tide line to the mean high tide line only. Each RMA is described in Appendix F of this HCP. Together, the 16 management areas constitute approximately 48 miles of the 230 miles of sandy Ocean Shore.

The conservation measures include 1) implementation of snowy plover management activities on OPRD owned or leased SPMAAs; 2) implementation of recreational use restrictions at SPMAAs and RMAs owned by other landowners; and 3) implementation of beach management activities in covered lands on the Ocean Shore. For more information about the Conservation Plan, see Section 5 of this HCP. The conservation commitments described in the HCP are summarized below and in Table 1-1 for SPMAAs and Table 1-2 for RMAs.

Habitat Conservation Plan

Plover recovery areas

See plan for complete details



Owned or leased by Oregon Parks and Recreation Dept.



Plovers present. Recreation **already** managed.



No plovers here, but habitat is attractive. Recreation **will** be managed after more planning.



No plovers here. Site included in plan for **possible** management because habitat is attractive to plovers.

Note: If plovers move into an unoccupied site, recreation changes instantly to match the rules used in an occupied site.



Nature
HISTORY
Discovery

Source: Oregon State Parks 2008.



Columbia River South Jetty



Necanicum Spit



Nehalem Spit

Bayocean Spit



Netarts Spit

South Sand Lake Spit

Sutton/Baker Beach

Siltcoos/Dunes/Tahkenitch

Tahkenitch South

North Umpqua River

Tenmile

Coos Bay North Spit



Bandon

New River

Elk River

Euchre River

Clatsop

Tillamook

Lincoln

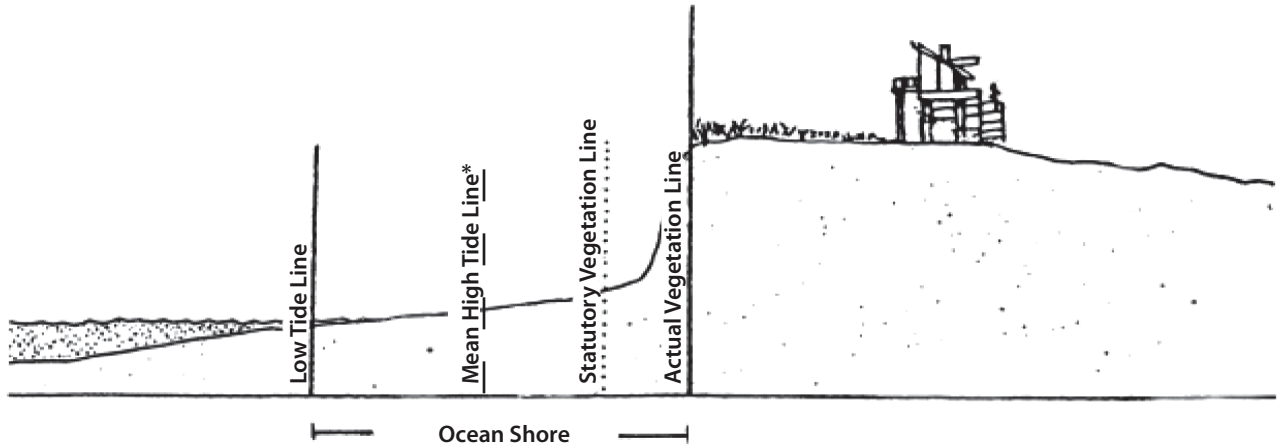
Lane

Douglas

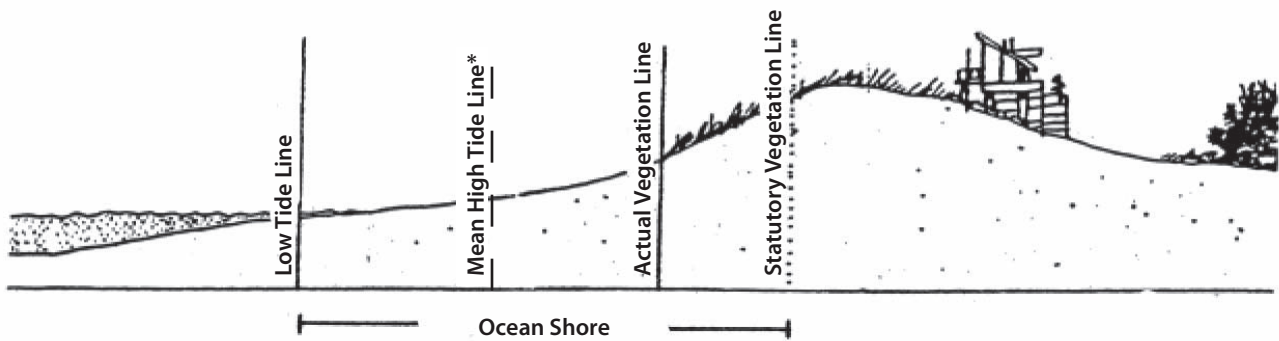
Coos

Curry

Figure 1-1
Areas Targeted for Snowy Plover Management
by OPRD or Other Landowners



Defined boundary of the Ocean Shore when the actual vegetation line is further landward than the statutory vegetation line.



Defined boundary of the Ocean Shore when the statutory vegetation line is further landward than the actual vegetation line.

*OPRD's permit jurisdiction on the Ocean Shore extends landward from the low tide line to the mean high tide line on Federal lands and from the low tide line to the statutory or actual vegetation line, whichever is most landward, on all other lands.

Table 1-1. Summary of Proposed Management Actions in OPRD Owned / Leased Snowy Plover Management Areas (SPMAs)

Currently Occupied SPMAs, Parks Owned/Leased by OPRD	Proposed Management Actions In Occupied SPMAs
Bandon SNA	<ul style="list-style-type: none"> ▪ The site management plan will define the area of restricted recreation within the SPMA. Following USFWS approval of an OPRD site management plan: ▪ Seasonal Recreation Restrictions (March 15 – September 15) ▪ Vehicles (motorized and non-motorized) prohibited on beach (except for administrative use), or as otherwise restricted by existing Oregon Administrative Rule [OAR]. ▪ Dogs and kite flying prohibited. ▪ All other recreational activities directed to the wet sand (fences, ropes, and/or signs will define the dry sand breeding areas to be avoided). ▪ Restrictions may be lifted early if no nesting by July 15. ▪ Other Site Management Plan Commitments ▪ Habitat restoration and maintenance, per the site management plan. ▪ Predator management. ▪ Public interpretation and education. ▪ Conduct detect/non-detect, breeding population monitoring, and wintering and breeding window surveys during the nesting season. Report findings to USFWS annually and work with snowy plover partners to evaluate the effectiveness of the HCP. ▪ Review the program every five years. ▪ Continue to provide three full-time beach rangers, State Park staff, local law enforcement, and additional senior State troopers, as needed, to facilitate enforcement activities. ▪ Prepare site management plan within 1 year of Incidental Take Permit (ITP) issuance.
Currently Unoccupied SPMAs, Parks Owned/Leased by OPRD	Proposed Management Actions In Unoccupied SPMAs
Columbia River South Jetty (Corps/OPRD)	<ul style="list-style-type: none"> ▪ The site management plan will define the area of restricted recreation within the SPMA. Following USFWS approval of an OPRD site management plan: ▪ Seasonal Recreation Restrictions (March 15 – September 15)
Necanicum Spit	<ul style="list-style-type: none"> ▪ Dogs required to be leashed. ▪ Vehicles (motorized and non-motorized) prohibited (except for administrative use), or as otherwise directed by existing OAR.
Nehalem Spit	<ul style="list-style-type: none"> ▪ Restrictions may be lifted early if no nesting by July 15. ▪ Habitat restoration, per site management plan.
Netarts Spit	<ul style="list-style-type: none"> ▪ Other Site Management Plan Commitments ▪ Non-lethal predator management. ▪ Public outreach and education. ▪ Detect/nondetect monitoring for snowy plover presence and nesting activity conducted twice monthly. ▪ Prepare site management plans for these OPRD sites within 2 years of obtaining ITP: Columbia River South Jetty, Necanicum Spit, and Nehalem Spit. ▪ When one of these sites becomes occupied, a new site will be managed for snowy plover occupancy. A minimum of three unoccupied areas will always be managed for snowy plover occupancy until all OPRD sites are occupied. ▪ As other land managers implement site management plans for non-OPRD unoccupied sites, those sites will be considered part of the minimum of three managed unoccupied areas. Netarts will be added if and when there are fewer than three unoccupied areas being managed collectively between OPRD and other landowners for snowy plover occupancy.

Table 1-2. Summary of Proposed Recreation Restrictions and Enforcements for Recreation Management Areas (RMAs) Outside State Parks and on Non-Federal Lands

Currently Occupied RMAs (owner/manager)	Proposed Actions In Occupied RMAs
Sutton/Baker Beach (adjacent to United States Forest Service [USFS] lands)	<ul style="list-style-type: none"> ▪ The site management plan will define the area of restricted recreation within the RMA. In the event that a site management plan does not exist, OPRD would automatically issue restrictions on the covered lands. OPRD will issue restrictions for the wet sand adjacent to Federal lands.
Siltcoos Estuary/Dunes Overlook/Tahkenitch Estuary (adjacent to USFS lands)	<ul style="list-style-type: none"> ▪ Seasonal Recreational Use Restrictions (March 15 – September 15) will be required by OPRD once a RMA site becomes occupied, including the following:
Tenmile Estuary (adjacent to USFS lands)	<ul style="list-style-type: none"> ▪ Vehicles (motorized and non-motorized except for administrative use), kite-flying, and dogs prohibited.
Coos Bay North Spit (adjacent to U.S. Bureau of Land Management [BLM], Corps lands)	<ul style="list-style-type: none"> ▪ Other public recreational use directed to the wet sand outside of roped and signed breeding areas. ▪ Restrictions may be lifted early if no nesting by July 15.
New River (adjacent to BLM lands, owned by Curry Counties, Private)	<ul style="list-style-type: none"> ▪ Other OPRD RMA Commitments ▪ Erect fences, ropes, and/or signs to define breeding areas (dry sand only) on non-Federal lands. ▪ Conduct enforcement actions on managed RMA sites.
Currently Unoccupied RMAs (owner/manager)	Proposed Actions In Unoccupied RMAs
Bayocean Spit (adjacent to Corps lands)	<ul style="list-style-type: none"> ▪ OPRD will implement the restrictions at the request of the landowner as indicated in USFWS-approved site management plan for that RMA.
South Sand Lake Spit (Private)	<ul style="list-style-type: none"> ▪ Seasonal Recreational Use Restrictions (March 15 – September 15) will be authorized for voluntary management of RMAs after coordination with USFWS, to include the following:
Tahkenitch South (adjacent to USFS lands)	<ul style="list-style-type: none"> ▪ Vehicles (motorized and non-motorized) prohibited except for administrative use or as otherwise directed by OAR.
Umpqua River North Jetty (adjacent to USFS lands)	<ul style="list-style-type: none"> ▪ Dogs required to be leashed.
Elk River Spit (Private)	<ul style="list-style-type: none"> ▪ Restrictions may be lifted if no nesting by July 15.
Euchre Creek (Private)	<ul style="list-style-type: none"> ▪ Other OPRD RMA Commitments ▪ Conduct enforcement actions on managed RMA sites.

Snowy Plover Management

Under the HCP, the Bandon State Natural Area (SNA), including the habitat restoration area (HRA) and the area extending north to the south end of the China Creek access point parking lot, will be identified and managed as the Bandon SPMA.

Within 1 year of issuance of an ITP, OPRD will complete a draft site management plan, which would be approved by USFWS within 6 months of completion of the draft plan. Active management of the Bandon SPMA will begin the season following the completion and approval of the site management plan.

In addition, as many as four currently unoccupied areas will be identified as SPMAs and targeted for management of potential nesting populations of snowy plover over the term of the 25-year ITP. Three SPMAs will initially be managed by OPRD for nesting populations of snowy plover:

- Columbia River South Jetty,
- Necanicum Spit, and
- Nehalem Spit.

Within 2 years of obtaining an ITP, OPRD will prepare draft site management plans for these three SPMAs as described below. Active management will begin the nesting season after site plans have been approved by USFWS. Approval will be granted within 6 months of completion of the draft plan.

One additional SPMA, Netarts Spit, could also be managed if (1) Columbia River South Jetty, Necanicum Spit, or Nehalem Spit becomes occupied, and (2) one of the currently unoccupied RMAs is not already under active, USFWS-approved management for snowy plover.

Under these circumstances, OPRD will commit to managing Netarts Spit for nesting populations of snowy plover to ensure that a minimum of three unoccupied SPMAs are being actively managed at any given time over the term of the 25-year permit.

Snowy Plover Conservation Measures at Snowy Plover Management Areas (SPMAs)

Site management plans will include management prescriptions specific to an individual SPMA, and could include commitments to habitat restoration, predator management, monitoring, enforcement, and public outreach and education, as necessary, as described below. Site management plans will also outline the extent of seasonal recreational use restrictions necessary for an individual SPMA and will not be implemented until approved by USFWS. Site management plan approval will be granted within 6 months of completion of the draft plan. Implementation will occur the following nesting season after USFWS approval. A sample outline of the contents of a site management plan is presented in Appendix A of this HCP.

Habitat Restoration

This management action could involve restoring coastal dune habitat through the removal of invasive species, e.g., European beachgrass and gorse, and potentially grading the upper beach to allow storm wave overwash to occur. This work will be done in areas that will not affect existing structures or cultural resources. Habitat restoration activities would be conducted within portions of an SPMA consistent with applicable local comprehensive plans and zoning ordinances as specified in each site's management plan.

Future restoration of as much as 40 acres will be conducted by OPRD at the Columbia River South Jetty SPMA and the Nehalem Spit SPMA, and, if needed, at the Necanicum Spit SPMA. The restoration efforts at Nehalem Spit SPMA, and potentially Necanicum Spit SPMA, will be conducted within 2 years of completing site management plans for these areas, if called for in the respective site management plans. Habitat restoration will be conducted within 5 years of completing the site management plan for the Columbia River South Jetty SPMA to accommodate the schedule of ongoing restoration efforts being conducted by the U.S. Army Corps of Engineers (Corps) (the lessor), in coordination with OPRD.

At the Bandon SPMA, where habitat restoration activities have already been implemented, OPRD will continue to maintain as much as 50 acres of optimal habitat for nesting snowy plovers.

Predator Management

OPRD will provide funding to manage the snowy plover predator base along the Oregon coast. The level of funding will increase as additional SPMAs are targeted for management over the term of the 25-year permit. Predator management funded by OPRD will be implemented by the U.S. Department of Agriculture (USDA) between February and August and will include both lethal (at nesting sites) and non-lethal methods (at unoccupied actively managed sites). If for some reason, the USDA discontinues predator management activities over the term of the ITP, OPRD will assume responsibility for implementing these activities at all actively managed SPMAs. For more detailed information about predator management, see Section 5, "Conservation Plan," of this HCP. Detailed information about funding of the HCP is presented in Section 7, "Implementation, Organization, and Structure."

Snowy Plover Monitoring, Reporting, and Enforcement

Detect/Non-detect Monitoring

OPRD staff will continue to participate in detect/non-detect monitoring activities along the Ocean Shore to determine whether nesting populations of snowy plovers are present. Detect/non-detect monitoring will occur at the beginning of the nesting season (March) and will continue until July 15 as described in the monitoring protocol. Detect/non-detect monitoring will be conducted at least twice monthly.

The results of the detect/non-detect monitoring surveys will be summarized in the annual compliance report submitted to USFWS, as described below.

Breeding Population Monitoring

OPRD will continue to provide funding to the Oregon National Heritage Center (ORNHIC) to monitor breeding populations at occupied sites. The level of funding will increase as additional SPMA's are targeted for management over the term of the 25-year permit. The results of breeding population monitoring will be communicated (e.g., via email) to USFWS once a month. Monthly reports will focus on ongoing concerns, such as recreational use violations or predation at a particular SPMA. This information will also be documented in an annual report provided to USFWS for review and will be used to determine the effectiveness of the snowy plover conservation management activities and to make adaptive management decisions.

Wintering and Breeding Window Surveys

OPRD will continue to provide staff to assist with conducting wintering and breeding window surveys at the currently occupied sites and will provide staff to conduct the surveys at new SPMA's as they become occupied. These surveys will be conducted as indicated in the Monitoring Guidelines for the Western Snowy Plover, Pacific Coast Populations (Appendix J in the Final Recovery Plan [U.S. Fish and Wildlife Service 2007]) and the results will be compiled annually and submitted to USFWS.

Annual Compliance Reporting and Evaluation of the HCP

OPRD will compile and provide an annual report to USFWS documenting its management actions to date; snowy plover population data, including take occurrences; recreational use enforcement issues; and anticipated management efforts needed for the following year. OPRD will work with USFWS to develop and implement protocols for assessing the effectiveness of the conservation strategies based, in part, on the information provided in the annual report. These protocols will be developed in collaboration with other snowy plover partners (Federal, State, and local agencies and private landowners) and will provide a mechanism for USFWS to evaluate the effectiveness of the HCP on an annual basis. Based on the results of this assessment, OPRD will work with other managers, USFWS, and ODFW to implement appropriate adaptive management measures, if necessary, to address declines in snowy plover populations or significant degradation of habitat within SPMA's (for more information about the adaptive management measures, see Section 5.3.3, Adaptive Management).

In addition to developing and submitting the annual report, OPRD, USFWS, and ODFW will meet every five years following issuance of the ITP to evaluate the performance and effectiveness of the conservation measures in minimizing and mitigating effects on snowy plover. This effort will be used to inform necessary adaptive management measures, should it be determined that the covered activities are resulting in a decline in snowy plover populations or degradation of habitat.

Enforcement

OPRD will continue to fund the three full-time beach ranger positions that are currently in place to encourage compliance with beach restrictions. OPRD will also work with the Oregon State Police and/or local law enforcement offices to provide additional enforcement support, where necessary and possible. Other OPRD staff will be available for OPRD-owned site enforcement and to assist with monitoring, as needed.

For more detailed information about snowy plover monitoring, reporting, and enforcement, see Section 5, “Conservation Plan,” of this HCP. Detailed information about funding of the HCP is presented in Section 7, “Implementation, Organization, and Structure.”

Public Outreach and Education

OPRD will continue to recruit and train volunteers to serve as docents for public outreach and education at the China Creek access to the Bandon SPMA. In addition, as new SPMA's are managed, OPRD will recruit and train volunteers to serve as docents for public outreach and education as specified in that site's management plan. OPRD will also provide signage at access points to inform the public of the presence of nesting snowy plovers and the importance of snowy plover protection measures. Signage indicating the presence of nesting snowy plovers and the boundaries of dry sand restrictions will also be installed at the boundaries of restricted areas within SPMA's. For more detailed information about public outreach and education, see Section 5, “Conservation Plan,” of this HCP. Detailed information about funding of the HCP is presented in Section 7, “Implementation, Organization, and Structure.”

Snowy Plover Management Measures at Recreation Management Areas (RMAs)

In addition to the commitments described above at OPRD-owned or leased SPMA's, OPRD will also review and comment during the development of site management plans at RMAs. In the event that an RMA becomes owned by OPRD and is actively managed for nesting populations of snowy plover, the snowy plover management measures described above will be implemented at that site.

Public Use/Recreation Management

OPRD will also manage the public's use of the covered lands to minimize potential adverse effects on snowy plover. In addition to its management responsibilities on the Ocean Shore, OPRD will enforce recreational use restrictions at up to five SPMA's and potentially up to 11 RMAs. Implementation of the recreational use restrictions depends on whether a site is occupied by nesting snowy plovers or is being actively managed to attract nesting snowy plovers. At occupied sites, these

restrictions include prohibition of the following recreational activities, which were determined to have the greatest potential to result in take of snowy plovers:

- Dog exercising,
- Driving / motorized vehicle use,
- Non-motorized vehicle use,
- Kite-flying, and
- All other activities within the dry sand portion of the beach. Use of the dry sand area will be prohibited, including roping off key areas of the beach around nesting sites and installing signs to indicate the presence of nesting snowy plovers and the importance of the recreational use restrictions.

Unless otherwise prohibited above, recreational use will be directed to the wet sand. At unoccupied, actively managed sites, the recreational use restrictions would include prohibition of driving (except for administrative uses, such as to provide access for emergency and enforcement vehicles, snowy plover monitoring, and land management activities) and non-motorized vehicle use and requiring dogs to be leashed during the nesting season. If the site was not occupied by July 15, the restrictions will be lifted. These restrictions are summarized in Table 1-3.

The extent of the restriction areas within an SPMA will be determined during development of site management plans for each area. Special considerations specific to implementation of these restrictions at RMAs are discussed in greater detail below.

Table 1-3. Proposed Recreational Use Restrictions

Occupied Management Areas
<p>For all occupied SPMA/RMAs, recreational use restrictions would include the following:</p> <ul style="list-style-type: none"> ▪ Dry sand recreation restrictions will be in place, including roping off key areas of the beach around nesting sites and installing signs to indicate the presence of nesting snowy plovers and the importance of the recreational use restrictions. ▪ Vehicles will be prohibited on the dry and wet sand (except in limited circumstances, and under permit from OPRD). ▪ Non-motorized vehicle use will be prohibited on the dry and wet sand. ▪ Dogs will be prohibited. ▪ Kite flying will be prohibited. ▪ OPRD will continue to provide three full-time beach rangers and additional support, as needed, to facilitate law enforcement activities.
Managed Unoccupied Management Areas
<p>For unoccupied SPMA/RMAs being actively managed for snowy plover occupancy: the following seasonal (breeding) use restrictions will be imposed, upon request, after OPRD coordination with USFWS:</p> <ul style="list-style-type: none"> ▪ Dogs will be required to be on leash. ▪ Vehicles will be prohibited on the dry and wet sand (except in limited circumstances, and under permit from OPRD). ▪ OPRD will continue to provide three full-time beach rangers and additional support, as needed, to facilitate law enforcement activities.

Special Considerations for Recreational Use Restrictions at Recreation Management Areas (RMAs)

Based on OPRD's authority to manage recreational use of the Ocean Shore, OPRD is required to provide authorization to restrict recreational activities for RMAs within the covered lands. As discussed above and in Section 2, this area extends from the extreme low tide line to the mean high tide line adjacent to Federal lands and from the extreme low tide line to the statutory or actual vegetation line, whichever is most landward, on all other lands. Under this HCP, OPRD will potentially implement recreational use restrictions at up to 11 RMAs, which include.

- Bayocean Spit (adjacent to lands owned by the Corps);
- South Sand Lake Spit (privately owned);
- Sutton/Baker Beach (currently occupied and adjacent to lands owned by the USFS);
- Siltcoos Estuary/Dunes Overlook/Tahkenitch Estuary (currently occupied and adjacent to lands owned by the USFS);
- Tahkenitch South (adjacent to lands owned by the USFS);
- Umpqua River North Jetty (adjacent to lands owned by the USFS);
- Tenmile Estuary (currently occupied and adjacent to lands owned by the USFS);
- Coos Bay North Spit (currently occupied and adjacent to lands owned by the Corps and BLM);
- New River (currently occupied and owned by Curry County and private individuals, and adjacent to lands owned by BLM);
- Elk River (privately owned); and
- Euchre Creek (privately owned).

If an RMA becomes occupied, but a site management plan does not exist, OPRD will implement the recreational use restrictions described above within the covered lands. At RMAs, OPRD will issue and continue to enforce recreational use restrictions within the full extent of the RMA until an agreement is reached between USFWS and the landowner and/or a site management plan is developed and OPRD is notified of any changes that may modify recreational use restrictions to a more focused area.

In the event that a USFWS-approved site management plan has been developed, OPRD will implement recreational use restrictions as directed by the site management plan. If an RMA is unoccupied, OPRD will only implement recreational use restrictions at the request of the landowner and after consultation with USFWS and collaboration with ODFW.

OPRD will also seek to modify the State Rule to provide an ongoing mechanism for recreational use restrictions.

OPRD will provide supervision, enforcement, and ropes or signage at RMAs because these actions cannot legally be implemented within the RMA by landowners. Roping of adjacent Federal lands will be the responsibility of the Federal landowner.

Protections for Nests outside of Targeted Areas

If a snowy plover should nest outside an occupied or unoccupied SPMA or RMA on the covered lands, OPRD will install fencing around the individual nest and will consider installing a nest enclosure after consultation with USFWS. Specifically, OPRD will install a 50-meter-radius (164-foot) roped buffer around the nest that allows access along the wet sand, and will determine if use of an enclosure to protect the nest from predation is in the best interest of the nest. OPRD will also work with USFWS and landowner to install signage, as appropriate, to indicate the presence of nesting snowy plovers.

Beach Management

All beach management activities, including marine mammal strandings and removals, public safety, external and internal law enforcement, and response to boat strandings, will continue to be conducted in a manner that attempts to avoid take of snowy plover. OPRD will consult with USFWS regarding any of these activities that will occur in an occupied or unoccupied SPMA or RMA prior to conducting the activity, unless there is an emergency situation. Emergency situations are considered to be an unforeseen circumstance, which are addressed in Section 7, “Implementation, Organization, and Structure,” of this HCP.

1.5.2. Goals and Actions for Implementing the Conservation Measures

The conservation plan also includes goals and actions that describe more specifically what the purpose of specific conservation measures (goals) are and how they will be implemented (actions) over the term of the permit. The goals and actions are described in greater detail in Section 5.3.2, “Goals and Actions for Implementing the Conservation Measures.”

1.5.3. Adaptive Management

Adaptive management is a process that allows resource managers to adjust their actions to reflect new information or changing conditions in order to reach a goal, in this case, minimization of take and conservation of the snowy plover, while limiting impacts on recreational use along the Ocean Shore. OPRD will use the adaptive management processes as part of the conservation measures to minimize take of snowy plover resulting from management of Oregon’s beaches and to ensure the

long-term survival of the snowy plover along the Oregon coast. Specific circumstances where adaptive management will be implemented include situations where:

- biological monitoring reports indicate a decline in the snowy plover population along the Oregon coast,
- a snowy plover nest is found outside of an identified SPMA 3 years in a row,
- nest enclosures have been determined to be ineffective through monitoring efforts,
- nesting at currently unoccupied, actively managed SPMA is unsuccessful, and
- OPRD purchases a RMA that seems to provide better habitat potential than the proposed SPMA.

The specific measures that would be implemented in response to these conditions are discussed in Section 5.3.3, “Adaptive Management.” Any adjustments in management practices will occur only with OPRD and USFWS consensus unless otherwise noted under the adaptive management measures or changed circumstances discussed in Sections 5 and 7, respectively.

1.6. Implementation Considerations

As the permit holder, OPRD will have authority and responsibility to implement decisions related to the ITP and HCP. Oregon law gives the Oregon Parks and Recreation Commission complete jurisdiction and authority over all park areas acquired by the State for recreation, scenic, historic, natural, and cultural purposes (ORS 390.111), and the authority to make regulations and provisions deemed necessary for use and administration of park areas (ORS 390.124, ORS 390.660) and for the Ocean Shore (ORS 390.635 and ORS 390.620) and in cooperation with Federal land management actions as per the CZMA.

The HCP will be implemented through an implementing agreement (IA) (Appendix H) agreed to by OPRD and USFWS. The IA defines the roles and responsibilities of OPRD and USFWS regarding implementation of the HCP. The IA and the HCP are complementary to each other.

The processes for addressing changed and unforeseen circumstances, amending the HCP, reviewing implementation of the HCP, and funding the management actions included in the HCP are discussed in both the HCP and the IA. Where discrepancies may occur between the HCP and the IA, the IA is considered the governing document.

Implementation considerations are discussed in detail in Section 7, “Implementation, Organization, and Structure,” which includes a discussion of the schedule for

implementation, funding commitments, and treatment of unforeseen and changed circumstances. Unforeseen and changed circumstances are discussed briefly below.

1.6.1. Unforeseen Circumstances

If unforeseen circumstances arise, USFWS will not require, without the consent of the permittee, the commitment of additional mitigation in the form of land, water, or funds nor will it require additional restrictions on the use of land, water, or funds from any permittee who is adequately implementing or has implemented an approved HCP (U.S. Fish and Wildlife Service and National Marine Fisheries Service 1998). If additional conservation and mitigation measures are deemed necessary to respond to unforeseen circumstances, USFWS may require additional measures of the permittee where the HCP is being properly implemented, but only if such measures are limited to modifications to management actions set forth in the HCP. The assurances of the No Surprises regulations apply only “where the conservation plan is being properly implemented, and apply only with respect to species adequately covered by the conservation plan” (U.S. Fish and Wildlife Service and National Marine Fisheries Service 1998).

The above paragraph notwithstanding, if, during the implementation of this HCP, an unforeseen circumstance occurs that could have a significant negative effect on snowy plovers or could affect the ability of OPRD to effectively manage activities under this HCP, OPRD will to the extent practicable, voluntarily follow the procedures below.

1. Within 10 business days of the date the unforeseen circumstance is brought to OPRD’s attention, the HCP Coordinator will notify USFWS in writing of the following:
 - Nature of the situation,
 - Geographic and temporal extent to which the beach was or will be affected by the situation,
 - Potential effect on snowy plovers within the covered lands, and
 - Any actions taken to date to respond to the unforeseen circumstance.
2. Within 5 business days of USFWS receipt of the written notification described above, OPRD will discuss the unforeseen circumstance with USFWS personnel and other affected parties, as applicable. An appropriate response to the situation, such as modifying the HCP and/or ITP, may be developed and implemented in coordination with USFWS.
3. Any additional conservation and mitigation measures deemed necessary to respond to unforeseen circumstances will be limited to modifications to the HCP’s existing operating conservation program for the snowy plover,

maintaining the original terms of the HCP to the maximum extent possible. Unless agreed to by OPRD, additional conservation and mitigation measures will not involve the commitment of additional land, water, or financial compensation or restrictions on the use of land, water, or other natural resources otherwise available for development or use under the original terms of the HCP.

1.6.2. Changed Circumstances

OPRD and USFWS foresee that circumstances could change during the term of the ITP that could affect the ability of OPRD to properly implement the HCP. Events that could occur during the term of the HCP that are identified as changed circumstances include: the listing of a new species, potential environmental changes associated with global climate change and rising sea levels, and the effects on wintering snowy plovers rising to the level of take. These circumstances are discussed in detail in Section 7.6.3, “Changed Circumstances.”

1.7. Alternative Actions Considered but Rejected

Several alternative actions to the HCP conservation measures were considered but rejected. These actions include the following:

- No HCP Alternative,
- Manage All Recovery Plan Areas,
- Protection of Nests When and Where They Occur,
- Protection of Occupied Sites Only,
- Active Management of All SPMAs/RMAs for Occupancy by OPRD,
- Implement a Captive Breeding Program,
- Voluntary Compliance and Education, and
- Multi-species HCP.

In addition to these alternative actions, OPRD eliminated four additional OPRD-owned sites as potential locations for snowy plover management. These sites include Nestucca Spit, Bullards Beach, Sixes River, and Pistol River. The reasons for not including these areas as SPMAs in the HCP are also discussed in Section 8 of this HCP.

1.8. Changes to the September 2007 Draft HCP

Based on public comments received on the draft HCP that was circulated for public review from November 5, 2007, to March 12, 2008 and again from April 17, 2009 to June 1, 2009, the following substantive changes have been made to the HCP:

- Section 1, “Executive Summary” – The Executive Summary has been updated to include a more substantive summary of the HCP proposal.
- Section 2, “Introduction/Overview”
 - Section 2.5, “Covered Lands” – This section has been updated to indicate the following changes.
 - Management of the Pistol River SPMA is no longer part of the HCP proposal. Other locations in the document that referenced Pistol River as part of the HCP proposal, including all figures, have been deleted.
 - The northern boundary of the Bandon SPMA has been extended to the south end of the China Creek access parking lot. Trail access to the beach will be rerouted to the new north access. Figure 2-7 has been updated to depict the new boundary.
 - The discussion of the covered lands has been updated to acknowledge the presence of Federal lands within the Ocean Shore. These lands have been removed as part of the covered lands because Federal land owners need to address actions on their lands. Therefore, any actions, regardless of who conducts them, on these lands would be the responsibility of the Federal landowner and would require separate consultation with USFWS.
- Section 4, “Natural History of and Factors Affecting the Snowy Plover” – The population data have been corrected based on public comments and updated to include the data through the 2007 breeding season.
- Section 5, “Conservation Plan” - This section has been updated to clarify that the conservation plan includes 1) the conservation measures: snowy plover management activities at SPMA’s, recreational use restrictions at SPMA’s and RMA’s, and beach management activities on the Ocean Shore; 2) goals and actions to implement those measures; and 3) adaptive management measures related to these activities. In addition, the following specific issues have been addressed.
 - The HCP has been updated to clarify that habitat restoration activities proposed at SPMA’s would be designed to be consistent with county comprehensive plans and zoning ordinances as indicated in the site management plan. For example, vegetation removal and grading would be

limited to those areas set aside for natural resource management as indicated by applicable comprehensive plans and zoning.

- The HCP has been updated to clarify the commitments with respect to monitoring and reporting. OPRD will continue to participate in and fund detect/non-detect monitoring, breeding season monitoring, and wintering and breeding window surveys. In addition, OPRD will complete an annual report to be used to evaluate the effectiveness of the HCP conservation measures. OPRD will review the HCP with USFWS and ODFW every five years after issuance of the ITP.
- The HCP has been updated to clarify how the recreational use restrictions would be implemented at RMAs. The extent of the restrictions will be developed in consultation with USFWS through the completion and approval of site management plans (for SPMAAs) or USFWS consultation (for RMAs) and will likely be focused around nesting sites. In the event that an RMA became occupied, but no site management plan is in place, OPRD will implement the restrictions. OPRD will continue to enforce recreational use restrictions within the full extent of the RMA until an agreement is reached between USFWS and the landowner and/or a site management plan is developed and OPRD is notified of any changes that may modify recreational use restrictions to a more focused area.
- The description of the recreational use restrictions has been streamlined to clarify that all activities, including those that were previously individually listed (e.g., camping, picnicking, pedestrian traffic, horseback riding, beach fires, etc.), will be restricted from the dry sand at occupied sites. In addition to these dry sand restrictions, key areas of the dry sand will be roped off and signs will be provided to indicate the presence of nesting snowy plovers and to explain the applicable recreational use restrictions. Certain activities that are unlikely to occur on the wet sand (e.g., camping, beach fires, and picnicking) would effectively be prohibited from occurring in occupied SPMAAs/RMAAs during the nesting season. This conservation measure is identified as restrictions on dry sand activities and may be applied to areas focused around nesting sites as refined in the approved site management plans or in the IA (Appendix H).
- The conservation measure related to treatment of nesting sites outside of SPMAAs/RMAAs has been updated to indicate that nest exclosures may not always be used at an individual nest site. Rather, OPRD will work with USFWS to determine if installation of nest exclosures is appropriate.
- Commitments to law enforcement have been clarified to note that the three existing full-time beach ranger positions will continue to be funded under the HCP, and that their responsibilities will be to enforce compliance with all Ocean Shore and State Park rules, including beach use restrictions designed

- to protect snowy plover. Other State Park staff and contracted enforcement personnel will be used as needed.
- The conservation measures have been updated to clarify OPRD’s commitment to providing signage at beach access points, at the boundaries of restricted areas within SPMAs and RMAs, and at nesting locations outside of SPMAs/RMAs, to alert the public to the presence of snowy plovers and the measures that have been put in place to protect them.
 - In Section 5.2.3, “Management Approach,” the definition of an occupied site has been updated to clarify that at RMAs adjacent to federally owned lands, the RMA will be considered occupied if at least one nest or nesting attempt has been made in the previous 2 years in the adjacent lands up to the actual or statutory vegetation line.
 - Section 6, “Direct, Indirect, and Cumulative Effects on Snowy Plovers and Snowy Plover Habitat” – This section has been updated to clarify that the potential effects on wintering snowy plovers are within a normal range of disturbance and are not anticipated to rise to the level of take.
 - Section 7, “Implementation, Organization, and Structure”
 - Section 7.5, “Funding” – The funding commitments in the HCP have been revised and clarified.
 - Section 7.6.3, “Changed Circumstances”
 - The discussion of changed circumstances has been updated to include changed circumstances associated with global climate change and rising sea levels. Specifically, in the event that global climate change adversely affects OPRD’s ability to implement the HCP, OPRD will work with USFWS to determine and implement appropriate measures with special allowances for emergency situations.
 - The discussion of changed circumstances has also been updated to include changed circumstances related to adverse effects on wintering populations of snowy plovers rising to the level of take. The potential effects on wintering snowy plovers are not anticipated to rise to the level of take. However, due to the possibility that effects on wintering populations could change over the life of the ITP and result in adverse impacts on the species, these circumstances were added to Section 7.6.3.
 - Changed circumstances related to the invasion of exotic plant species, increases in predator populations, emergency permit issuance, and emergency events were removed because these circumstances are either covered by the provisions of the HCP or are more appropriately addressed in unforeseen circumstances.

- Section 8, “Alternative Actions Considered but Rejected” – This section has been updated to include a discussion of why certain beach areas owned by OPRD, including Nestucca Spit, Bullards Beach, Pistol River, and Sixes River were not carried forward to be managed as SPMA’s as part of the HCP proposal.
- Appendix G, “Technical Memorandum: Take Estimate of the Western Snowy Plover.” The Take Assessment Memo presented in Appendix G of the HCP has been updated to include two tables, one with the actual population monitoring data (Table 4a, which includes data through the 2007 breeding season) and one with the modified data used in the take assessment analysis (Table 4b). Table 4a has been corrected to show the actual population monitoring data, which includes Necanicum Spit and Floras Lake. Table 4b presents the modified data used in the model, which excludes Necanicum Spit and Floras Lake and includes the proxy data for Sutton Beach. This information does not change the results of the model, but has been presented for clarification. For more information regarding the rationale behind modifying the population data for use in the take assessment model, see Appendix G.

The remainder of the memorandum was not updated to reflect the rest of the changes indicated above. This is because the analysis was completed based on the 2007 draft HCP and these changes do not materially affect the analysis provided in this document.

Section 2. Introduction/Overview

2.1. Introduction

The snowy plover utilizes the ocean shore¹ for nesting, feeding, rearing of chicks, roosting, and overwintering. This species' population has declined over the years primarily because of human interactions, e.g., development, increased predation, habitat modification through the encroachment of European beachgrass, and recreational activities.

The Oregon Parks and Recreation Department (OPRD) is responsible for managing and permitting of certain activities on Oregon's Ocean Shore. These management responsibilities include public recreational use, beach management, and natural resource management. These activities have the potential to impact snowy plover nests, individuals, and/or snowy plover habitat.

In 1993, the Pacific coastal population of the snowy plover was listed, under the Federal Endangered Species Act (ESA), as threatened. Under the ESA, *take* of a listed species is prohibited unless specifically authorized. The definition of take includes human actions that result in killing, harassing, or harming a listed species. Any action, including land management activities, that result in take of a listed species are prohibited under the ESA, unless specifically authorized.

To provide OPRD with assurances that neither OPRD or individuals that are using the beach, and that are in full compliance with all ongoing conservation efforts on the Ocean Shore, will be held liable for any unauthorized take of the snowy plover, OPRD is requesting the issuance of a Section 10(a)(1)(B) incidental take permit (ITP). Under Section 10 of the ESA, landowners and land managers may be authorized, through issuance of an ITP, to conduct activities that may result in take of a listed species, as long as the take is incidental to, and not the purpose of, otherwise lawful activities. OPRD is applying for an ITP to authorize any incidental take of

¹The *Ocean Shore*, for purposes of the Habitat Conservation Plan, the Incidental Take Permit, and the Implementing Agreement, is defined as that area between extreme low tide and the actual or statutory vegetation line, whichever is most landward, including all beaches adjacent to coastal State parks.

snowy plover that may occur because of the activities that are proposed for coverage under the ITP.

2.2. Purpose and Need

OPRD is seeking an ITP from USFWS pursuant to the provisions of Section 10(a)(1)(B) of the ESA, which would authorize the incidental take of the snowy plover along the Oregon coast for a period of 25 years. The purpose of the proposed State action is preparation and implementation of a Habitat Conservation Plan (HCP), which will contribute to the conservation and recovery of the snowy plover and its habitat, while allowing the OPRD to continue management activities on the Ocean Shore as defined in this document.

Due to the presence of the snowy plover at six locations along the Oregon coast, and the potential for the snowy plover to occupy other portions of the Ocean Shore, OPRD's authority for recreation management, beach management, and natural resource management along the sandy beaches in Oregon could result in the incidental take of the federally (and State-) listed snowy plover.

Before USFWS decides whether to issue an ITP to OPRD, it must ensure that OPRD will take measures to avoid, minimize, and mitigate for any impacts on the snowy plover. The land management activities that the ITP would cover are:

- Public Use/Recreation Management,
- Beach Management, and
- Natural Resource Management.

An ITP must be issued to OPRD if the USFWS makes the following determination with respect to OPRD's ITP application:

- The take will be incidental.
- The Applicant will, to the maximum extent practicable, minimize and mitigate the impacts of such taking.
- The Applicant will ensure that adequate funding for the plan will be provided.
- The taking will not appreciably reduce the likelihood of the survival and recovery of the species in the wild.
- Other measures required by the USFWS will be met, and there are assurances that the plan will be implemented.

Incidental take authorized within the scope of a Section 10(a)(1)(B) permit issued to OPRD will primarily include, under specific circumstances and limits, direct and indirect mortality, harassment, disturbance of chicks or adults during the nesting period; egg mortality occurring as a result of nest abandonment, inadequate

incubation, destruction by humans through crushing, or increased levels of predation; and the loss of habitat by human disturbance and invasive species.

As part of the requirements for the issuance of an ITP, OPRD is preparing this HCP to identify those management actions that will minimize and mitigate for the effects on the snowy plover and its habitat that may occur because of OPRD's management of activities on or related to the Ocean Shore.

2.3. Biological Goals

The long-term probability of survival and recovery of the species and the preservation and restoration of its habitat are the ultimate biological goals. This outcome will be achieved, in part, through OPRD's efforts in managing (1) disturbance to native habitat by invasive species and humans, (2) amount of human disturbance occurring during the nesting season, and (3) risk of depredation by animals (particularly corvids and mammals). These were cited as major threats in the listing of the snowy plover (U.S. Fish and Wildlife Service 1993).

Site management plans, developed in cooperation with and approved by the USFWS, will be prepared for each OPRD-owned or leased Snowy Plover Management Area (SPMA) that will address:

- Habitat restoration efforts, the location and size of site, when such efforts will be accomplished, and how they will be accomplished;
- Predator management efforts, species to be targeted, and the types and frequency of monitoring;
- Location of access routes from uplands to the wet sand for beach users;
- Extent of beach use restrictions within an SPMA;
- Public outreach and education efforts (e.g., interpretive programs, signage, brochures); and
- Law enforcement activities (see Appendix A for Site Management Plan Outline).

OPRD will not be responsible for completion of snowy plover management plans on Recreation Management Areas (RMAs) owned and managed by other landowners. However, OPRD will implement recreational use restrictions at occupied RMAs within the covered lands and at unoccupied RMAs at the request of the landowner. For more information about implementation of recreational use restrictions, see Section 5.

Management of snowy plovers and their habitat is nothing new for OPRD or other land managers within the Ocean Shore. The Bureau of Land Management (BLM) and the U.S. Forest Service (USFS) have been implementing snowy plover management activities since the early 1990s. OPRD has been implementing snowy plover management activities since the mid 1990s.

2.4. Covered Species

The ITP is being requested for take of snowy plovers only and not for other listed species or species that may be listed in the future. This HCP covers only the Pacific coast population of the snowy plover along Oregon's Ocean Shore.

2.4.1 Snowy Plover

The snowy plover is the only federally listed species that requires utilization of the sandy ocean beach (covered lands) for all of its life requisites, i.e., nesting, feeding, rearing of chicks, roosting, and overwintering. As such, Ocean Shore activities for which OPRD has management responsibility may result in incidental take of the snowy plover.

2.4.2 Other Species Considered

The presence of several State and/or federally listed threatened or endangered species has been documented along the Oregon coast (Table 2-1). However, OPRD is not seeking incidental take coverage for these species and they are not addressed in the HCP because, except for the pink sand verbena and the silvery phacelia, these species do not occupy the covered lands (sandy beaches) along the Oregon coast, (i.e., they occur offshore, on rocky outcrops, or landward of the vegetation line). The two noted plant species are not federally listed but are Federal species of concern. OPRD has an agreement with the State Department of Agriculture to manage for these two plant species while managing for snowy plover habitat restoration. A description of the species and the rationale for their exclusion from the HCP is provided in Appendix B.

Table 2-1. List of Species Excluded from the HCP

Scientific Name	Common Name	Federal Status	State Status
<i>Pelecanus occidentalis</i>	Brown pelican	Delisted	E
<i>Brachyramphus marmoratus</i>	Marbled murrelet	T	T
<i>Haliaeetus leucocephalus</i>	Bald eagle	Delisted	T
<i>Falco peregrinus anatum</i>	Peregrine falcon	Delisted	Delisted
<i>Eumetopias jubatus</i>	Steller sea lion	T	---
<i>Lilium occidentale</i>	Western lily	E	E
<i>Abronia umbellate</i> Lam. <i>Spp. breviflora</i>	Pink sand verbena	SC	E
<i>Phacelia argentea</i>	Silvery phacelia	SC	T
<i>Oenothera wolfii</i>	Wolf's evening primrose	SC	T
<i>Lasthenia macrantha</i> var. <i>prisca</i>	Large-flowered goldfields	SC	C
<i>Giliam millefoliata</i>	Manyleaf gilia	SC	---

E = endangered, T = threatened, SC = species of concern, C = candidate species, SV = vulnerable species.

2.5. Covered Lands

The area covered under the HCP (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 (Figure 2-1). The covered lands do not include land under Federal ownership for the reasons discussed in greater detail below. Figure 2-1 depicts the entire 362 miles of coastline of which approximately 230 miles is the sandy Ocean Shore beach.

The sandy Ocean Shore is defined as the area from extreme low tide to the actual or statutory vegetation line whichever is most landward. The statutory vegetation line is a historical vegetation line created during a survey of the coastline in 1967 with a series of survey points connected by lines established to approximate the actual vegetation line at the time (see Section 2.9.9 for expanded definition). Since then the actual vegetation line has moved in places either seaward or landward of this statutory vegetation line (Figure 1-2). This is important to denote because the covered lands refers to the most landward vegetation line, whether it is the statutory or actual vegetation line. The Ocean Shore does not include estuaries, as defined by Oregon statute (Oregon Revised Statute [ORS] 390). Estuaries are under the management of the Oregon Department of State Lands, who is not a party to this HCP.

The covered lands do not include Federal land ownership within the Ocean Shore because actions that may occur on Federal lands, regardless of who conducts the activity, would be the responsibility of the Federal landowner and would require separate consultation with USFWS. If these Federal actions could result in effects on uses or natural resources within Oregon's coastal zone, the actions must be consistent with state enforceable policies, including OPRD's Ocean Shore authority as required by the Coastal Zone Management Act (CZMA). Federal jurisdiction within the Ocean Shore boundary extends between the mean high tide line and the actual or statutory vegetation line, whichever is farther inland, and adjacent to federally owned lands outside of the Ocean Shore.

In addition, the covered lands also include specific portions of five OPRD park units, i.e., a State Park, a State Natural Area, or a State Recreation Area, identified as SPMA's (Figures 2-2 through 2-6):

- Columbia River South Jetty (Fort Stevens State Park),
- Necanicum Spit (Gearhart Ocean State Recreation Area),
- Nehalem Spit (Nehalem Bay State Park),
- Netarts Spit (Cape Lookout State Park), and
- Bandon (Bandon SNA).

2.6. Covered Activities

Covered activities are defined as activities that may occur on the covered lands, for which OPRD has management responsibility that have the potential to result in incidental take of snowy plovers. Covered OPRD management activities are identified below and described in detail in Section 3. Appendix D provides a full list of recreation activities in the categories identified with an asterisk (“*”).

- Public Use/Recreation Management includes:
 - Camping,
 - Dog Exercising,
 - Pedestrian Traffic^{*},
 - Picnicking,
 - Near Shore Activities/Surf Sports^{*},
 - Driving / Vehicles^{*},
 - Horseback Riding,
 - Beach Fires,
 - Beachcombing,
 - Driftwood Collection and Removal,
 - Kite Flying^{*}, and
 - Other Dry Sand Activities^{*}.
- Beach Management includes:
 - Marine Mammal Strandings and Removal,
 - Public Safety,
 - External and Internal Law Enforcement, and
 - Boat Strandings and Other Salvage Operations.
- Natural Resource Management includes:
 - OPRD Snowy Plover Management Actions, and
 - Other Habitat Restoration.



06537.06 EIS (02/10)

Figure 2-1
Project Vicinity



Figure 2-2
Boundary of Snowy Plover Management Area
within Fort Stevens State Park



Figure 2-3
Boundary of Snowy Plover Management Area
within Gearhart Ocean State Recreation Area



Snowy Plover HCP EIS 06537.06 (02/10)

Figure 2-4
Boundary of Snowy Plover Management Area
within Nehalem Bay State Park



Snowy Plover HCP EIS 06537.06 (02/10)

Figure 2-5
Boundary of Snowy Plover Management Area
within Cape Lookout State Park



Snowy Plover HCP EIS 06537.06 (02/10)

Figure 2-6
Boundary of Snowy Plover Management Area
within Bandon State Natural Area

2.7. Timing and Duration

OPRD is seeking an ITP for a 25-year duration. Should the species still be listed after the term of the permit, OPRD will meet with the USFWS to review the terms of the permit and the HCP to determine if additional or different conservation measures would be required to extend the permit term.

2.8. Public Review

A steering committee was formed consisting of representatives from Federal, State, and local governments, tribes, recreation interests, birding and environmental interests, and several interested citizens. The steering committee met approximately six times during development of the draft HCP. Four sets of public meetings were held at several coastal and inland communities to allow for public comment on the development of the HCP and the Ocean Shore Management Plan. A Record of Public Involvement is provided in Appendix C. Opportunity to comment on the draft HCP was also provided during two public comment periods, which were held from November 5, 2007 through March 12, 2008 and again from April 17, 2009 to June 1, 2009.

2.9. Regulatory Background

A number of Federal and State laws regulate the types of activities that can occur on the Ocean Shore in Oregon. These laws address protection of threatened or endangered species (Federal and State law), and regulation of recreational activities (State law) and development. A summary of laws that may affect OPRD's management activities is provided below.

2.9.1. Federal Endangered Species Act

The purpose of the Federal ESA is to conserve and recover listed species and the ecosystems upon which those species depend. Pertinent sections of the ESA are described below. Section 9 prohibits take of any listed animal species. Listing and recovery provisions are addressed in Section 4, as well as the authority to designate critical habitat. Under Section 7, Federal agency actions are required to be evaluated to ensure that their actions will not jeopardize the continued existence of any threatened or endangered species or result in the adverse destruction of critical habitat. If a *no jeopardy* determination is made, the Federal agency may proceed with their activity.

Section 10 addresses non-Federal landowners and land managers. Under Section 10, non-Federal landowners and/or land managers who wish to conduct actions on their

lands that may result in take of endangered or threatened species may obtain an ITP from the USFWS. As part of an application for an ITP, the applicant must submit a HCP describing how the applicant will minimize and mitigate for the take of a listed species or its habitat.

Section 9 – Take Prohibitions

Section 9 of the ESA prohibits take of any species listed under the ESA unless otherwise authorized by specific regulation. Take, under the ESA, means “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in such conduct.” *Harm* is defined to include significant habitat modification or degradation that results in the killing or injury of wildlife by significantly impairing essential behavioral patterns including breeding, feeding, or sheltering. *Harass* is defined as an intentional or negligent act or omission that creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns, which include, but are not limited to, breeding, feeding, or sheltering.

Section 4 – Listing, Recovery, and Critical Habitat

Listing – A species is listed in one of two categories, endangered or threatened, depending on its status and the degree of threat it faces. A species is listed when it has been determined to be endangered or threatened because of any of the following factors:

- The present or threatened destruction, modification, or curtailment of habitat or range;
- Over utilization for commercial, recreational, scientific, or educational purposes;
- Disease or predation;
- The inadequacy of existing regulatory mechanisms; or
- Other natural or humanmade factors affecting the species’ survival.

The Coastal population of snowy plover was listed as threatened in 1993.

Recovery – The ultimate goal of the ESA is to provide for species recovery so the species no longer needs protection. The ESA provides for development of recovery plans describing reasonable actions believed to be required to restore a species to health. In 2001, the USFWS published the Draft Recovery Plan (U.S. Fish and Wildlife Service 2001a). The Final Recovery Plan was completed in November 2007 (U.S. Fish and Wildlife Service 2007). Recovery plans are not binding, but merely provide guidance on how to manage for recovery of the species. Information contained in the Recovery Plan was used to develop new and/or revise existing conservation measures in this HCP designed to conserve and protect the snowy plover. Thus, this HCP is consistent with the Recovery Plan.

Critical Habitat – The ESA provides for designation of critical habitat for listed species, which includes biologically suitable habitat essential to the conservation of the species, whether the habitat is currently occupied or not. Critical habitat designations impact only Federal agency actions and federally funded or permitted activities. These designations require Federal agencies to evaluate the impacts that any activities they fund, permit, or carry out may have on listed species, and to ensure that these activities are not likely to jeopardize the survival of the listed species or adversely modify its critical habitat.

Critical habitat for the snowy plover was initially designated in December 1999 (U.S. Fish and Wildlife Service 1999). In May 2003, a Federal judge determined that the USFWS needed to rewrite the critical habitat designation for snowy plovers because the economic impacts had not been adequately addressed in the original designation. On September 29, 2005, the USFWS published a final rule to re-designate critical habitat along the coasts of California, Oregon, and Washington (U.S. Fish and Wildlife Service 2005). A total of 32 areas (or units) covering 12,145 acres was designated critical habitat along the coasts of California, Oregon, and Washington. Of the 32 critical habitat units, seven are in Oregon, totaling 2,146 acres, nearly all of which are occupied (Table 2-2).

Table 2-2. Snowy Plover Critical Habitat Designated Along Oregon Coast

Critical Habitat Site Number	Site Name	County
OR-3	Bayocean Spit	Tillamook
OR-7	Sutton*/Baker Beaches*	Lane
OR-8A	Siltcoos Breach*	Lane and Douglas
OR-8B	Siltcoos River Spit*/Dunes Overlook*/Tahkenitch Creek Spit*	Douglas
OR-8D	Tenmile Creek Spit*	Coos
OR-9	Coos Bay North Spit*	Coos
OR-10A	Bandon*/Floras Lake	Coos and Curry

* Occupied by snowy plover

Section 7 – Interagency Consultation

Section 7 of the ESA requires all Federal agencies to carry out programs for the conservation of federally listed species. Further, Federal agencies are required to consult with the USFWS to ensure that actions it carries out, funds, or permits will not jeopardize listed species. Consultations result in the USFWS evaluating the effects of the action on the listed species in a Biological Opinion (BO). In cases where USFWS believes the proposed actions will jeopardize the species, it is required to offer reasonable and prudent alternatives in the BO to modify the action that will allow the project to continue while avoiding harm to the species. For Section 10 take permits (see below), the USFWS must consult with itself on its

permitting action. Thus, USFWS will write a BO for their action of issuing an ITP to OPRD.

Section 10 – Take Authorization Permits

Incidental Take – Section 10(a)(1)(B) provides for the issuance of permits to take a listed species when such take is “incidental to, and not the purpose of, carrying out an otherwise lawful activity.” Applicants are required to prepare an HCP that, in brief, specifies the effects of the anticipated take, steps to minimize and mitigate those effects, funding that will be available to implement these steps, and alternative actions that were considered and the reasons they were not selected.

2.9.2. Migratory Bird Treaty Act

Under the Migratory Bird Treaty Act of 1918 (16 U.S.C. 703-712) (MBTA), as amended, pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting a migratory bird, its nest or eggs without a permit from USFWS is prohibited. Snowy plovers are, thus, also protected under the MBTA. The USFWS has a policy of allowing an ITP to serve as a Special Purpose Permit under 50 CFR 21.27 for the take of listed, migratory birds that are addressed in an HCP (U.S. Fish and Wildlife Service 1996). The USFWS has determined that any take authorized by the ITP will not be in violation of the MBTA.

2.9.3. Clean Water Act

Section 401

Section 401 of the Clean Water Act (CWA) requires Federal agencies to ensure that their proposed actions, including issuance of a permit, do not violate State water quality standards. In Oregon, the Oregon Department of Environmental Quality (ODEQ) is responsible for determining if an action meets State water quality standards and is eligible for water quality certification. Consideration of a Section 404 permit (see below) is an action that requires evaluation for water quality certification. If the proposed action may affect surface water quality, authorization would have to be obtained from ODEQ prior to authorization or implementation of the covered activities.

Section 404

The U.S. Army Corps of Engineers (Corps) requires project applicants to obtain a CWA Section 404 permit if a proposed action would result in the discharge of dredged or fill material into waters of the United States, including wetlands. If the proposed HCP would result in the placement of fill in waters of the United States, authorization would have to be obtained from the Corps prior to authorization or

implementation of a covered activity. This could apply to habitat restoration projects where dune sands are pushed back into the ocean.

2.9.4. National Environmental Policy Act

The National Environmental Policy Act (NEPA) is one of the primary laws governing the environmental protection process. It is a decision-making requirement that applies to proposals for Federal actions. The Council on Environmental Quality (CEQ) regulations defines, *major Federal action* as those actions with, “effects that may be major and which are potentially subject to Federal control and responsibility,” including, “projects and programs entirely or partly financed, assisted, conducted, regulated, or approved by Federal agencies.”

NEPA states that any Federal agency undertaking a major Federal action likely to significantly affect the human environment must prepare an Environmental Impact Statement (EIS). An EIS must provide a detailed statement of the environmental impacts of the action, possible alternatives, and measures to mitigate adverse effects of the proposed actions. While NEPA does not mandate any particular result, it requires the agency to follow particular procedures in its decision-making process. The purpose of these procedures is to ensure the agency has before it the best possible information to make an “intelligent, optimally beneficial decision” and to ensure the public is fully apprised of any environmental risks that may be associated with the preferred action.

Issuance of an ITP under ESA Section 10(a)(1)(B) is a Federal action subject to NEPA compliance. Although ESA and NEPA requirements overlap considerably, the scope of NEPA goes beyond that of the ESA by considering the impacts of a Federal action not only on fish and wildlife resources, but also on other resources such as water quality, air quality, and cultural resources. The EIS process culminates in issuance of a Record of Decision (ROD). The ROD documents the alternative selected for implementation, as well as any conditions that may be required, and summarizes the impacts expected to result from the action.

2.9.5. Coastal Zone Management Act

The Federal Coastal Zone Management Act (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 its 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 implemented by the Oregon Department of Land and Conservation Development, in collaboration with local

coastal jurisdictions (see “Statewide Land Use Planning Goals” below), and other State agencies, including OPRD (under the Ocean Shore Law or Beach Bill) and the Oregon Department of State Lands. Completion of an EIS and issuance of an ITP by the USFWS would constitute a Federal action subject to Federal consistency review under the CZMA.

2.9.6. Oregon Endangered Species Act

Introduction

For a species to be listed as a threatened or endangered under the Oregon Endangered Species Act (ORS 496.171 to 496.182), the Oregon Fish and Wildlife Commission must determine that the natural reproductive potential of the species is in danger of failure due to limited population numbers, disease, predation, or other natural or human actions impacting its continued existence and, to the extent possible, assess the relative impact of human actions. In addition, the commission must determine that one or more of the following factors exist:

- Most populations are undergoing imminent or active deterioration of their range or primary habitat.
- Over-utilization for commercial, recreational, scientific, or educational purposes is occurring or is likely to occur.
- Existing State or Federal programs or regulations are inadequate to protect the species or its habitat.

In 1975 the Oregon Fish and Wildlife Commission administratively (not by rule) listed the snowy plover as threatened statewide, along with a number of other species. Reasons for listing the snowy plover at that time were low population estimates, increasing human activities in known areas, coastal State park and private development along beach and spit areas utilized by snowy plovers, and sand stabilization by exotic plant species.

The snowy plover was first listed in 1987 under the new Oregon Endangered Species Act by the Oregon Fish and Wildlife Commission as threatened statewide, and reaffirmed by the Fish and Wildlife Commission by rule in 1989. This listing is for both the inland and coastal Oregon populations.

Conservation Program

In 1994, the Oregon Fish and Wildlife Commission adopted a Western Snowy Plover Conservation Program, which provides management recommendations for this species under the Oregon Endangered Species Act. These recommendations include:

- Protect all existing snowy plover sites from negative impacts.

- Monitor existing and potential impacts and direct damaging activities to minimize their adverse impacts on snowy plovers.
- Maintain a long term monitoring program to track numbers, distribution, and nesting success of snowy plovers.
- Maintain nest predator protection measures to maximize breeding success.

In 1995, The Nature Conservancy, at the request of the Oregon Department of Fish and Wildlife (ODFW), prepared draft site management plans for the following sites:

- Bayocean Spit,
- Sutton Beach,
- Siltcoos River,
- Tahkenitch North and South Spits,
- Tenmile South Spit and Estuary,
- Coos Bay North Spit,
- Bandon Beaches, and
- New River Mouth to Floras Lake/New River Overwash.

State law (ORS 496.182 [2] b) requires all State agencies to ensure that the actions on lands owned or leased by the State are consistent with this Conservation Program.

Permits

State incidental take permits may be issued by ODFW for State-listed species that are not also federally listed. An ITP issued by the USFWS is recognized by the State as a waiver of any State protection requirements (ORS 496.172 [4]).

Delisting

The Oregon Fish and Wildlife Commission may remove any wildlife species from the threatened or endangered lists, or change the status of any species on the lists, upon a determination that the species is no longer threatened or endangered (ORS 496.176[2]). The status of each species is to be reviewed at least once every 5 years to determine whether verifiable scientific information exists to justify its reclassification or removal from the lists (ORS 496.176[8]).

2.9.7. Oregon Statewide Land Use Planning Goals

The foundation of Oregon's land use planning program is a set of 19 statewide planning goals. The goals express the State's policies on land use and on related topics, such as citizen involvement, housing, and natural resources. The statewide goals are achieved through local comprehensive planning and implementation

measures. State law requires each city and county to have a comprehensive plan and the zoning and land-division ordinances needed to put the plan into effect. The local comprehensive plans must be consistent with the statewide planning goals. Goals 17 and 18 apply to coastal land uses.

Oregon's Goal 17 directs local, State, and Federal governments to conserve, protect, and, where appropriate, develop, and/or restore the resources and benefits of all coastal shore lands, recognizing their value for protection and maintenance of water quality, fish and wildlife habitat, water-dependent uses, economic resources, and recreation and aesthetics.

Oregon's Goal 18 directs cities and counties to conserve, protect, and, where appropriate, develop and/or restore the resources and benefits of coastal beach and dune areas; and to reduce the hazard to human life and property from natural or human-induced actions associated with these areas (Oregon Administrative Rules [OAR] 660-015-0010[3]). Goal 18 clearly directs local governments to protect areas of critical environmental concern, areas of scenic, scientific, or biological importance, and areas with significant wildlife habitat.

2.9.8. Oregon Comprehensive Plans

The local comprehensive plan guides a community's land use, conservation of natural resources, economic development, and public services. Each plan has two main components. One component contains a body of data and information called the inventory, background report, or factual base, describing a community's resources and features. This component must address all of the topics specified in the applicable statewide goals. The other component addresses policy. The policy component of the plan sets forth the community's long-range objectives and the policies by which it intends to achieve them. The policy element of each community's plan is adopted by ordinance and has the force of law.

Each plan is accompanied by a set of implementing measures. The two most common measures are zoning and land-division ordinances. Local plans may be changed through plan amendments or periodic review. Plan amendments are smaller, unscheduled adjustments to a plan. Periodic reviews are broad evaluations of an entire plan that occur every 4 to 10 years. A plan may be modified extensively after such a review.

Every city and county in Oregon has adopted such land-use controls. Prior to conducting any habitat restoration work, OPRD would obtain a grading permit as needed and would ensure that the proposed activities were consistent with city and county zoning and plan policies.

2.9.9. State Ocean Shore Rules

Beach Bill

In 1967, the Oregon Legislature enacted the Beach Bill to protect the right of Oregonians to the free and uninterrupted use of the Ocean Shore from the Columbia River on the north to the Oregon-California border on the south—approximately 362 miles (codified at ORS 390.610 – 390.770). This legislation established public recreational easements on beaches seaward of the vegetation line, regardless of the underlying ownership, and recognized (1) the public has acquired recreational rights to the Ocean Shore by custom (over the years the public has made frequent and uninterrupted use of the Ocean Shore); (2) the public interest to protect and preserve the public rights and easements as a permanent part of Oregon’s recreational resources, and (3) the public interest to do whatever is necessary to preserve and protect scenic and recreational use of the Ocean Shore.

Oregon law gives the Oregon Parks and Recreation Commission complete jurisdiction and authority over all park areas acquired by the State for recreation, scenic, historic, natural, and cultural purposes (ORS 360.111), and the authority to make regulations and provisions deemed necessary for use and administration of park areas (ORS 390.124, ORS 390.660).

The right of public access is not a State constitutional right. The right of public access is subject to regulation or adjustment by the Oregon legislature through legislation, or by OPRD pursuant to statutory authority.

Ocean Shore Permitting

The Beach Bill also authorized the State to “police, protect, and maintain the beach and to regulate its use” (Oregon Laws 1967, ch. 601 §7). To that end, OPRD issues permits for activities on the Ocean Shore, including the construction of shoreline protective structures, beach access ways, dune grading and various removal and fill activities, the routing of pipelines and cables beneath the Ocean Shore, and natural product removal. OPRD also regulates vehicle use on beaches closed to driving, beach salvage activities, and other activities conducted on the Ocean Shore.

Following passage of the Beach Bill in 1967, a survey of the coastline was made, and a series of survey points connected by lines was established to approximate the actual vegetation line. This line, now referred to as the Statutory Vegetation Line (SVL), was delineated to define the upland boundary of the Ocean Shore, and OPRD’s jurisdiction for Ocean Shore permits. The survey points were adopted into Oregon Statute in 1969.

In November 1999, a bill was passed by the legislature that combined OPRD’s Ocean Shore permit jurisdiction with that of another agency with permitting responsibilities

on the Ocean Shore, the Oregon Department of State Lands. Senate Bill 11 streamlined Ocean Shore permits by eliminating the overlapping jurisdictions of OPRD and the Oregon Department of State Lands and dual permit requirements. This resulted in significant changes to OPRD's jurisdiction for Ocean Shore permits.

Under Senate Bill 11, the upland boundary of the Ocean Shore "now extends to the SVL or the line of established upland shore vegetation, whichever is farther inland." In cases where the SVL is located out on the sandy beach or seaward of an eroding bluff, the upland Ocean Shore boundary is determined by locating the line of established upland shore vegetation above the beach. A permit is required for structures or alterations extending seaward of this line. In cases where land and vegetation have accreted out over the SVL, the upland boundary of the Ocean Shore continues to be the SVL, even when that line is landward of the actual line of vegetation. Thus, the Ocean Shore is defined by statute as "the land lying between extreme low tide of the Pacific Ocean and that statutory vegetation line...or the line of established upland shore vegetation, whichever is further inland" (ORS 390-605(2)). The actual vegetation lines do not include seasonal occurrences or isolated patches of vegetation lying seaward of the actual (upland) vegetation line. Illustrations of the OPRD's jurisdiction are provided in Figure 1-2.

2.9.10. National Historic Preservation Act of 1966

The National Historic Preservation Act (NHPA) of 1966 (16 United States Code [U.S.C.] 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 State Historic Preservation Office (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 ITP would require that USFWS 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]).

2.9.11. State of Oregon Cultural Resource Protection Laws

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 Ocean Shore Management Plan (Oregon Parks and Recreation Department 2005), OPRD has goals specific to protecting cultural resources on the Oregon coast.

- Complete the coastal portion of the OPRD archaeological 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 on cultural resources.

Section 3. Covered Activities

3.1. The Beach as a Destination

Oregon's Ocean Shore is nationally known as an outstanding destination and is a key tourism marketing focus for the State. Just over half of the visitors to the coast are coming primarily to visit the beach, while just under half are going to the beach as a secondary destination.

Participating in ocean-beach-related activities is one of the top 10 outdoor recreational activities for both Oregonians and out of State visitors to Oregon. A survey conducted as part of the 2001 to 2002 State Comprehensive Outdoor Recreation Plan reports 7.6 million annual ocean beach visits to coastal regions (Shelby and Tokarczyk 2002). Oregon residents made 6 million of those visits. Oregonians who are not residents of the coast made most of those visits, while coastal residents made about 2.2 million visits. Coastal residents visit the beach many more times than those who travel to the beach from elsewhere.

The beach is one of the top vacation destinations for the Portland metro population. More than twice as many Oregon residents from the Portland area go to the beach as from any other area of the State. This is particularly true on the north and north-central coasts. Farther south beaches are used primarily by local residents and by nearby inland residents, rather than by long-distance travelers. In southern Curry County beach visitors tend to include a large percentage of California residents. Those areas of the coast that are closest to population centers have more visitors, and on peak days most of the visitors on the beach are from out of town. Coast-wide, visitors come to relax, walk or jog short distances, enjoy the scenery, walk on the beach, swim and wade in the waves and picnic in the sand. About 20 percent of the same beach visitors also enjoy flying kites, appreciating nature, exercising dogs, making driftwood fires, collecting driftwood, shooting fireworks, and attending events. A smaller percentage come for birding, beach combing, surfing or boogie boarding, biking, fishing, clamming on the beach, horseback riding, driving on the beach, windsurfing, kite boarding, or kayaking (Shelby and Tokarczyk 2002).

3.2. Beach Survey

More than 40 recreation-related activities occur on the Ocean Shore (Shelby and Tokarczyk 2002; Appendix D). A list of the top 25 activities that occur within each region and within each segment (north and south) is provided in Table 3-1.

Table 3-1. Top 25 Recreation Activities Pursued by Segment and Region

North Coast		Central Coast		South Coast	
Segment 1	Segment 2	Segment 3	Segment 4	Segment 5	Segment 6
Activity %	Activity %	Activity %	Activity %	Activity %	Activity %
Walking 90.2	Walking 91.0	Walking 92.5	Walking 89.4	Walking 93.2	Walking 88.8
Scenic 70.3	Scenic 72.3	Scenic 74.0	Scenic 71.9	Scenic 81.9	Scenic 64.2
Picnicking 60.6	Picnicking 55.1	Picnicking 60.8	Picnicking 58.7	Picnicking 56.7	Picnicking 45.1
Exercise 37.1	Exercise 39.1	Kites 38.2	Exercise 35.2	Exercise 51.2	Camping 29.1
Kites 32.7	Kites 31.4	Exercise 35.2	Camping 33.8	Beachcomb 38.0	Exercise 27.5
Swimming 30.3	Dogs 29.0	Swimming 24.6	Kites 33.8	Dogs 35.2	Dogs 24.1
Dogs 21.6	Swimming 24.7	Dogs 22.1	Dogs 26.3	Driftwood 26.4	Swimming 21.1
Fires 20.7	Fires 22.2	Fires 18.8	Swimming 24.8	Birding 24.3	Kites 16.7
Bicycle 14.4	Camping 20.4	Driftwood 14.5	Fires 16.5	Kites 22.4	Driftwood 16.0
Camping 13.8	Driftwood 12.7	Camping 11.6	Driftwood 10.6	Camping 16.8	Fires 11.5
Boogie Bd 12.8	Birding 11.1	Birding 10.5	Birding 9.4	Swimming 15.1	Birding 9.9
Surfing 10.8	Fireworks 10.6	Fireworks 9.7	ATV 7.9	Events 13.2	Surfing 9.4
Birding 8.1	Boogie Bd 9.7	Beachcomb 7.1	Fishing 7.7	Fires 11.7	Fishing 8.5
Fireworks 8.1	Bicycle 8.9	Boogie Bd 6.4	Beachcomb 6.9	Fishing 9.8	Fireworks 8.3
Driftwood 7.9	Events 7.5	Crabbing 6.2	Fireworks 6.3	ATV 7.0	Boogie Bd 8.2
Clamming 6.6	Beachcomb 7.4	Events 5.7	Bicycle 6.2	Crabbing 6.6	Bicycle 7.7
Events 5.0	Surfing 6.8	Fishing 5.1	Boogie Bd 5.2	Fireworks 6.6	Wind Surf 7.7
Sand play 4.5	Fishing 6.8	Sand play 5.1	Events 5.2	Clamming 6.4	Beachcomb 5.8
Fishing 4.0	Clamming 6.6	Clamming 4.6	Sand play 5.0	Horses 4.7	Clamming 5.0
Horses 3.8	Sand play 5.4	Surfing 4.4	Surfing 3.8	Bicycle 3.6	Events 4.7
Crabbing 3.6	Crabbing 4.3	Bicycle 3.5	Clamming 3.8	Boogie Bd 3.0	Crabbing 4.2
Kayak 2.6	Horses 3.5	Horses 2.4	Crabbing 3.5	Surfing 2.1	Horses 3.1
Family 1.9	Kayak 2.1	Kayak 1.3	Horses 3.1	Sand play 1.9	Sand play 2.5
Beachcomb 1.4	ATV 1.8	Family 1.3	Sports 2.3	Kayak 1.1	Kayak 2.0
Spiritual 1.3	Sports 1.7	Tide pooling 1.2	Kayak 1.9	Wind surf 0.6	Family 1.6

Source: (Shelby and Tokarczyk 2002)

For more detail on the types and location of recreational activities that occur on the Ocean Shore, see the Ocean Shore Management Plan (Shelby and Tokarczyk 2002), incorporated here by reference.

3.3. Covered Activities

The activities for which OPRD is seeking take coverage include the management activities it has the responsibility for and that it conducts on the covered lands. These covered activities are listed below and discussed in greater detail in the following sections. Appendix D also provides a full list of recreation activities in the categories identified below with an asterisk (*).

- Public Use/Recreation Management activities include:
 - Camping,
 - Dog Exercising,
 - Pedestrian Traffic^{*},
 - Picnicking,
 - Near Shore Activities/Surf Sports,
 - Driving / Vehicles^{*},
 - Horseback Riding,
 - Beach Fires,
 - Beachcombing,
 - Driftwood Collection and Removal,
 - Kite Flying^{*}, and
 - Other Dry Sand Activities^{*}.
- Beach Management activities include:
 - Marine Mammal Strandings and Removal,
 - Public Safety,
 - External Law Enforcement,
 - Internal Law Enforcement, and
 - Boat Strandings and Other Salvage Operations.
- Natural Resource Management activities include:
 - OPRD Snowy Plover Management Actions, and
 - Other Habitat Restoration.

Each of these activities has the potential to result in the take of the snowy plover or to affect snowy plover habitat. OPRD will undertake specific management actions (see Section 5, “Conservation Plan”) to minimize and mitigate for the potential take of the snowy plover resulting from these activities.

Activities under the jurisdiction and responsibility of OPRD that are not addressed in the HCP and that will not be covered by the ITP include Ocean Shore and Special (State) Permit activities that may occur on the sandy Ocean Shore (Appendix E). These State-permitted activities will be considered on a case-by-case basis by OPRD, in consultation with USFWS, and will include permit conditions designed to avoid the risk of take of snowy plover.

3.3.1. Public Use/Recreation Management

Information about public recreational use was gathered during the various public outreach efforts and meetings conducted during the development of the HCP, during interviews with various landowning agencies and user groups, and from public comments provided over the course of developing the HCP. In addition, recreational use data were gathered and reported in the Ocean Shore Recreational Use Study as described below (Shelby and Tokarczyk 2002).

There are more than 40 different recreation-related activities that occur on the Ocean Shore (Appendix D) of which 29 are the primary reason people go to the beach (Shelby and Tokarczyk 2002). OPRD is responsible for managing the people engaged in these activities (ORS 390.635). Not all of these activities occur on each beach, and the level of intensity varies from season to season and from beach to beach. None of the activities described below are currently allowed in the roped-off dry sand portions of the occupied Bandon Habitat Restoration Area (HRA) at the Bandon State Natural Area (SNA). Some types of activities are restricted in the wet sand portion of the beach at the currently occupied nesting sites. Even with the restrictions in place, it is likely that because the snowy plover nests in dry sand areas, but forages in wet sand areas, they can be susceptible to harm or harassment from State-authorized recreational activities. Thus, the activities described below are part of the covered activities.

Camping

Very few visitors camp on the beach itself or on the dune areas next to the beach. When camping does occur, it generally occurs on the Central Coast beaches where remote sites can be reached by driving. Camping on the South Coast is most often done by backpacking. Most beach camping is done to support some other beach activity such as fishing, clamming, hiking, and surfing or wind surfing, and typically occurs between the high tide line and the vegetation line (Shelby and Tokarczyk 2002).

Overnight camping, including overnight sleeping in tents, driftwood shelters, sleeping bags, recreational vehicles, trailers, or automobiles is prohibited within the city limits of certain communities and on some beaches in Clatsop and Tillamook Counties.

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 such use. Beach camping is prohibited on beaches located within any oceanside State park, 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 Neahkahnie Mountain, and from the Necanicum River to the Columbia River. The only place camping is allowed in State parks is in specifically designated campgrounds inland from the beach. The parks with Snowy Plover Management Areas (SPMAs) include:

- Fort Stevens State Park,
- Gearhart Ocean State Recreation Area,
- Nehalem Bay State Park,
- Cape Lookout State Park, and
- Bandon SNA.

Beach camping is not allowed in the roped off areas within the dry sand at any sites currently occupied by nesting snowy plovers. Only beach camping that occurs on covered lands where it is not otherwise prohibited is considered a covered activity.

Dog Exercising

The ocean beach, coast-wide, is a popular place for people to take their dogs, with a number of people going to the beach primarily to exercise their dogs (Shelby and Tokarczyk 2002). The number of dog visits appears to be increasing in proportion to the increase in general visits. Dog owners are attracted to the beach because the majority of ocean beaches are open to dogs without a leash. In other areas as described below, dogs are allowed only on-leash although the public does not comply with the regulation very well.

Dogs are allowed unrestricted on the vast majority of the Ocean Shore. Areas where dogs are currently required to be leashed include beaches within ocean-side State parks, including the following State park units: Fort Stevens State Park, Gearhart Ocean State Recreation Area, Nehalem Bay State Park, Cape Lookout State Park, and Bandon SNA. Dogs are also currently required to be leashed at the Sutton/Baker Beach, Dunes Overlook/Tahkenitch Estuary, Coos Bay North Spit, and Tenmile Estuary nesting areas. Dogs are required to be on-leash or under voice or signal control on beaches within the cities of Seaside, Rockaway, and Cannon Beach.

However, none of these communities encompasses a proposed SPMA or Recreation Management Area (RMA).

Dogs are currently prohibited (wet or dry sand) at Siltcoos Estuary during the snowy plover nesting season. There is the potential on beaches outside of currently known nesting areas and RMAs for dogs that run off-leash legally to have some impact on snowy plovers that may occur in those areas; however, restrictions on dogs would be enforced as described in the HCP. Legally allowable dog activities under the HCP will be a covered activity.

Pedestrian Traffic

Pedestrian traffic includes walking, hiking, jogging, and running on the beach. Walking is the number-one activity across the entire coast. Only the southern portion of the Central Coast, which stretches from the Yaquina River to the Umpqua River, has a lower percentage of visitors who are at the beach primarily to walk (Shelby and Tokarczyk 2002). This is likely due to the long distances to the beach that can only be reached easily by driving on sand roads with four-wheel-drive vehicles. Some people go to the beach for the solitude, while others go to enjoy the beach with others. Portions of the Pacific Coast trail traverse the Ocean Shore, which is used by hikers. Most jogging occurs on the wet sand area while walking occurs on both the wet sand and dry sand areas of the beach between the tide line and the vegetation line. Walking is currently restricted to the wet sand in occupied nesting areas. Pedestrian activities outside of restricted areas are included as a covered activity because such activities have the potential to disturb or harm snowy plovers.

Picnicking

The highest percentage of picnicking occurs on the Central Coast, in areas that are adjacent to Lincoln City, Salishan, and Gleneden Beaches (Shelby and Tokarczyk 2002). Picnicking on the South Coast ranks lower than scenic enjoyment. This outcome may be due to the exceptional draw of the region's rocky coastline for scenic enjoyment and the remoteness of the beaches. Scenic enjoyment follows picnicking closely in the North and Central Coast regions, but occurs in lower percentages than on the South Coast. Picnicking occurs primarily during the summer months. Picnic spots are typically not far from access sites and occur in the dry sand portion of the beach between the high tide line and the vegetation line. Picnicking is currently not allowed on the dry sand of occupied nesting areas.

Near Shore Activities/Surf Sports

Near shore activities and surf sports include swimming, wading, tidepool exploration, fishing, crabbing, clamming, kayaking, surfing, boogie and skim boarding, windsurfing, and kite boarding on the beach. Of the surf sports, surfing is most prominent on the North Coast. The numerous jetties play a big role in supporting this

use, as jetties create necessary surf conditions and allow for public access. Many of the jetties are located close to larger population centers where most of the surfers originate.

The number of people surfing drops gradually from north to south, and then jumps up a bit at the far south where beaches are closer to the California population centers (Shelby and Tokarczyk 2002). Locally, surfing can be very concentrated in specific locations. Windsurfing is markedly higher on the far South Coast, where prime destination sites such as Pistol River and Floras Lake are nationally well known and heavily used. These activities occur year-round and typically entail people moving to and from the surf from the dry sand portion of beaches. These activities are not likely to occur within or near most of the SPMAs or RMAs although some wind and kite surfing does occur near Bandon from the China Creek access point. OPRD is planning to move the access point at China Creek farther north to avoid the existing nesting sites. Where near shore/surf sports activities do occur, human movement to and from the water, the presence of dogs, and gear washing up on the shore could disturb snowy plovers. People engaging in these activities would be required to comply with existing and future recreational use restrictions.

Driving / Vehicle Activities

Driving and vehicle activities include use of motorized and non-motorized vehicles and use of remote-control cars. Although, this type of recreation use is growing rapidly as shown by recent recreation surveys (Shelby and Tokarczyk 2002), all-terrain vehicle (ATV)/off-highway vehicle (OHV) riding on the beach is allowed currently only at three locations on the coast: the Sand Lake Recreation Area and on two sections of beach within the Dunes National Recreation Area. These areas may have some level of suitable snowy plover habitat, depending on the time of year and tide levels, but current ATV/OHV activity likely prevents other than occasional use by snowy plovers. All other beach segments are off limits to ATV/OHV without a drive-on-beach permit issued by OPRD.

The Ocean Shore is open to “street legal” motor vehicles, such as cars, trucks, and campers, unless otherwise posted. Beaches closed to vehicles (both motorized and non-motorized) may be accessed only after obtaining a valid permit from OPRD or for administrative uses, such as to provide access for emergency and enforcement vehicles, snowy plover monitoring, and land management activities.

Driving occurs primarily in the wet sand portion of the beach, except at access points to the beach, and has also been observed to occur on the dry sand. Currently, beaches at occupied nesting areas are seasonally closed to driving, unless otherwise already prohibited.

Nonmotorized vehicle use includes bicycling, buggying, and skateboarding, as well as three relatively new non-motorized driving activities: landsailing, kite buggying,

and kite mountain boarding. Landsailing involves steering a cart with a sail attached to it. Kite buggying involves use of a sit-down buggy that is steered with the feet, with the rider controlling a kite for power. Kite mountain boarding involves use of an all-terrain skateboard, which the rider stands on and steers like a skateboard while controlling a kite for power. These activities are more likely to occur during the winter months when the sand is hard. All these activities occur in the wet sand portion of the beach. Bicycling, buggying, and skateboarding all involve impacts on wet sand beach similar to those caused by driving, although some also involve overhead “predator-like” gear.

Horseback Riding

Horseback riding is allowed on all of portions of the coast, except within the City of Rockaway city limits where horses on the beach are prohibited. There are no proposed SPMA or RMA located within the City of Rockaway. Horseback riding typically entails walking horses (though occasionally they are cantered or galloped) in wet sand and dry sand close to the water and on dry sand access routes. It is illegal for owners to hitch or confine horses such that it causes damage to any natural resource on the Ocean Shore.

Several SPMA/RMA are popular for equestrian use. These include Nehalem Bay State Park, and the Sutton/Baker Beach area. OPRD has issued permits for horse concessions at Nehalem Bay State Park, while the U.S. Forest Service (USFS) has issued a permit for a horse concession at Baker Beach. Currently, horses are restricted from roped-off areas of the dry sand portion of the beach at occupied nesting sites during the nesting season.

Beach Fires

Building beach fires is a common activity on the coast. Small recreational beach fires are 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 25 feet of a seawall constructed of wood or other combustible material. Fires may not be left unattended and must be extinguished prior to leaving the area. OPRD has the authority to restrict or prohibit such fires due to high fire hazard conditions.

Beach fires are currently restricted from the dry sand in areas occupied by the snowy plover during the nesting season. Beach fires are allowed in other dry sand areas without restriction. Fire-building activity is typically associated with camping and picnicking activities, as well as small groups engaged in surf sports and, thus, have the potential to affect nesting and foraging snowy plovers.

Beachcombing

Beachcombing occurs coast-wide, but is exceptionally high on the South Coast (Shelby and Tokarczyk 2002). This may be due to the remoteness of many of the beaches there. Low overall recreational use numbers can assure that the beaches will not be picked clean each day, and may entice beachcombing enthusiasts to make the trek to reach these areas. Also, four-wheel-drive vehicles using rough sand roads easily access these beaches. There may also be influences from wind and wave patterns that favor the deposition of popular beach-combing items such as glass floats in this area. Beachcombing typically involves people walking (see above) along the drift line in search of collectables. However, driving of vehicles (see above) is also associated with beachcombing.

Driftwood Collection and Removal

OPRD considers driftwood found outside of State park beaches to belong to the landowners. Generally, permission of the landowner is required when driftwood is removed for commercial purposes or in large quantities.

OPRD does allow the taking of driftwood in small amounts by beach visitors for personal use or as souvenirs. Driftwood collection generally entails people walking along the drift/wrack line—although some drive—in search of collectable pieces. Anyone wishing to use mechanized loading equipment or remove large amounts of driftwood from a beach owned by a State park is required to obtain a permit from OPRD (see Appendix E).

Driftwood removal for firewood or ornamental purposes is only allowed in the following circumstances: (1) the amount collected can be loaded by hand, and (2) purpose is for personal use. The OPRD has the right to restrict the issuance of vehicle permits and to place quantity limits on firewood gathered where the driftwood supply has been depleted due to human removal activity or by an act of nature.

Kite Flying

Kite flying is also a popular activity on the Oregon Coast, although it is not the primary reason people go to the beach (Shelby and Tokarczyk 2002). Kite flying typically involves one or two people attempting to get a kite into the air and then maintaining its flight. Kite flying activity occurs in the same vicinity as other beach activities such as walking, jogging, picnicking, and beach combing, i.e., in the wet or dry sand within a few hundred feet of the water line. Kite flying is currently unrestricted on the covered lands. Hang gliding, parasailing, and use of remote-control planes that originate or land over the beach are also included in this category.

Other Recreational Activities

The Recreation Use Study also identified more than 40 different activities occurring on the Ocean Shore, with 29 activities considered as the primary reason for going to the beach. A complete list is presented in Appendix D.

3.3.2. Beach Management Activities

Other than snowy plover management, OPRD staff members also perform the following beach management activities on Oregon's sandy beaches. Each of these activities has the potential to result in the take of snowy plover by harming or harassing nesting or foraging individuals.

Mammal Strandings and Removal

This activity involves the investigation, reporting, and either burial or removal of the mammal from the Ocean Shore. Depending on the remoteness of the beach (i.e., recreational use) and the time of year, some dead marine mammals are left to decompose on the beach. In 2001, a whale beached at Pistol River and was allowed to decompose. However, in 2003, a whale that died on the beach at Seaside was removed from the beach and taken to Fort Stevens State Park where it was buried. These types of activities involve OPRD and National Marine Fisheries Service (NMFS) staffers collectively responding to the event. Activities may involve beach disturbance (in the case of a burial), driving and operating machinery by OPRD staff, and often involves groups of people and vehicles gathered on the beach. These activities may necessarily occur inside, as well as outside, SPMA's and RMA's.

Public Safety

This activity involves OPRD staff maintaining emergency access points; investigating reports of unsafe drift logs, and where necessary, the removal of those logs; monitoring, photographing, and documenting erosion and storm damage; investigating reports of hazardous materials on the beach; and closure and coordinated cleanup of spilled hazardous materials. Activities are similar to activities listed in the "Pedestrian Traffic" and "Driving" sections.

External Law Enforcement

This activity involves OPRD personnel assisting law enforcement personnel with injury/death or other crime-related investigations as requested. It also involves OPRD staff accessing and moving along the beach by walking, riding horseback, or driving a motor vehicle (including an ATV). These activities may occur near or in SPMA's or RMA's, and would have effects similar to those discussed in "Pedestrian Traffic" and "Driving" sections above.

Internal Law Enforcement

This activity involves OPRD staff members supervising and enforcing OPRD rules that include implementing SPMA and RMA recreational restrictions, monitoring and checking for valid permits and illegal taking of natural resources, patrolling beaches, compliance monitoring, and conducting outreach. Three full-time Beach Rangers conduct these activities. However, certain employees at State parks have citation authority, and occasionally patrol State park beaches and beach access sites. Conducting these activities involves walking and/or driving to areas of the beach where illegal activities may be occurring.

Boat Strandings and Other Salvage Operations

This activity involves OPRD staffers monitoring salvage operations (along with issuing the appropriate permit and answering questions of the public), and includes activities similar to those described above, i.e., Pedestrian Traffic, Driving, Horseback Riding, and Public Safety.

Table 3-2 shows the number of hours (on average over recent years) OPRD staff spends annually performing the various beach management activities described above.

Table 3-2. Beach Management Activities and Hours Spent Performing

Activity	Hours Spent Performing Activity
Marine Mammal Strandings and Removal	414
Public Safety	590
External Law Enforcement	484
Internal Law Enforcement	582
Boat Strandings/Salvage Operations	177
Total	2,247

3.3.3. Natural Resource Management

OPRD conducts a variety of projects related to natural resources on the Ocean Shore, most of which are related to snowy plover management (e.g., predator management and habitat restoration activities). Habitat restoration activities are also conducted for other species (e.g., plants) in areas not managed for snowy plover.

Snowy Plover Management

Snowy plover management activities at the Bandon SNA include predator management; managing volunteers who conduct public outreach and education to beach users; habitat restoration and maintenance work; and monitoring and reporting activities. Although there is some potential for these activities to result in take of the

snowy plover, the primary purpose of these management activities is to conserve and protect the snowy plover. The conservation measures specific to snowy plover management are discussed in greater detail in Section 5, “Conservation Plan.”

Habitat Restoration – Non-Snowy Plover Activities

In an effort to restore habitat for other species, such as the pink sand verbena (a State listed endangered species), OPRD may also conduct dune management activities within and outside of SPMA. In areas occupied by snowy plover, these activities will occur during the non-nesting season. In unoccupied areas, these activities may occur during the snowy plover nesting season, but only following a survey for nesting snowy plovers to ensure they are absent. Such restoration activities do not degrade snowy plover habitat but, in fact, help restore the ocean shore to its native condition. OPRD restoration of pink sand verbena, as well as silvery phacelia, occurs only in State Parks, but may also be conducted in the future at OPRD-owned or leased SPMA. Restoration activities include removal of exotic vegetation and plantings of native vegetation. Although these activities are designed to avoid impacts to snowy plover, some impacts may occur incidentally to the restoration activities.

Section 4. Natural History of and Factors Affecting the Snowy Plover

4.1. Description and Taxonomy

The western snowy plover (*Charadrius alexandrinus nivosus*) is a small shorebird in the family Charadriidae. Adults range from 15 to 17 centimeters (cm) long, and weigh 34 to 58 grams (Page et al. 1995a). Adults are pale brown-gray on the upperparts and white below, with a white hindneck collar and dark lateral breast patches. The bill is black and the legs are slate gray to black. In breeding plumage, males usually have black markings on the forehead, foreneck, and behind the eye. In females, these markings are generally lighter, varying from drab to mostly black. Early in the breeding season, a rufous crown may be seen on males but not on females. In non-breeding plumage, the sexes cannot be distinguished. Fledged juveniles may be distinguished from adults by the white edges on their wing coverts and scapulars until they molt to their basic plumage. Onset of this molt is determined by hatching date, and usually occurs from July to mid-September (Page et al. 1995a). In Oregon, an average of 48 percent of the banded fledglings return the following year (Castelein et al. 2002).

The American Ornithologists' Union (1957) recognizes two subspecies of *Charadrius alexandrinus* in North America. *C. a. nivosus* breeds along the Pacific Coast from southern Washington to southern Baja California, east to the Harney Valley in Oregon, Salton Sea in California, Nevada, Utah, Arizona, New Mexico, Colorado, Kansas, Oklahoma, Texas and possibly Tamaulipas, Mexico (Davis and Russell 1984). *C. a. nivosus* winters along the Pacific coast, Gulf of California, and the Gulf of Mexico. This Habitat Conservation Plan (HCP) focuses on the population of *C. a. nivosus* that winters and breeds along the Oregon coast. *C. a. tenuirostris* breeds along the Gulf of Mexico coast and in the Caribbean. This subspecies winters from western Florida and the Bahamas to the Virgin Islands, south to the coast of northern Venezuela. More recent works recognize only *C. a. nivosus* for North America (Hayman et al. 1986; Sibley and Monroe 1990). Paton (1994) estimated a mean lifespan for adult snowy plovers breeding at the Great Salt Lake in Utah of 2.7 years.

4.2. Life History

4.2.1. Breeding

Population Size and Distribution

The current Pacific coast breeding population of snowy plover extends from Damon Point, Washington, to Bahia Magdalena, Baja California, Mexico (Page et al. 1995a). There are approximately 2,230 birds breeding along the Pacific coast of California (U.S. Fish and Wildlife Service unpublished data 2006), 162 resident adults in Oregon (Lauten et al. 2006), and 70 adult birds in Washington (Pearson et al. 2007). A survey of breeding snowy plovers along the Pacific coast of Baja California, Mexico in 1991 and 1992 found 1,344 adults (Palacios et al. 1994). A current population estimate for Baja Mexico is 2,470 (U.S. Fish and Wildlife Service 2006).

The Pacific coastal population of snowy plover in Oregon was once found along the entire coast but is currently located among eight breeding areas from Florence south (Oregon Department of Fish and Wildlife 1994; Lauten et al. 2006). Oregon breeding sites in 2006 included Sutton Beach, the Siltcoos River estuary, beachgrass removal sites at Dunes Overlook, the Tahkenitch Creek estuary, the Tenmile Creek estuary, Coos Bay North Spit, Bandon State Nature Area (SNA), and the New River spit area. Other Oregon sites where snowy plovers have nested in the recent past (since 1980) include the beach between Clatsop Spit and Gearhart, mouth of the Necanicum River, Bayocean Spit, Sand Lake Spits, South Beach (Newport), mouth of the Siuslaw River, Threemile Creek/Umpqua River, Menasha Spoils (Coos Bay North Spit), and the Floras Lake area (Bruce and Walter 1981).

Arrival and Courtship

Nesting birds at coastal locations consist of both year-round residents and birds that migrate for the winter (Page et al. 1995a). Snowy plovers begin arriving at their Oregon breeding sites in early March (Wilson 1980). Since some individuals nest at multiple locations during the same year, birds may continue to arrive through July.

Although pair bonds are first noticed on the breeding grounds, they are likely to begin while birds are together in wintering flocks. Mated birds from the previous season frequently reunite (Page et al. 1995a). Old and new pair bonds may be established prior to territory defense and nest scraping (Warriner et al. 1986). In Oregon, bonding and courtship activities may begin during the winter months, but increase significantly in March.

During courtship, males appear to solicit females by calling from their territories and by using a horizontal display in which the male's bill, body, and tail are held parallel to the ground as the male walks in a partial crouch (Page et al. 1995a). Males make multiple depressions, or scrapes, in the sand, and one is selected for the nest. Prior to

copulation, the female will scrape in the nest while the male bows next to the female and simultaneously flashes the white on his tail (Page et al. 1995a).

Nests and Nesting Habitat

On the Oregon coast nesting may begin as early as mid-March (Wilson-Jacobs and Meslow 1984), with peak nest initiation occurring from mid-May to early July (Stern et al. 1990). Along the Pacific coast snowy plovers nest primarily above the high tide line on coastal beaches, sandy spits, dune-backed beaches, sparsely-vegetated dunes, beaches at creek and river mouths, and salt pans at lagoons and estuaries. Less common nesting habitats include bluff-backed beaches, dredged material disposal sites, salt pond levees, dry salt ponds, and river bars. These habitats tend to be unstable because of winds, wave action, and unconsolidated soils. 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. Driftwood and plants can also provide protection from wind. Where there is a foredune, a gentle slope down to the beach provides openings for birds to move between the relatively sheltered habitat behind the foredune and the open beach.

Nests consist of a shallow scrape or depression in the sand, lined with small bits of beach debris. Nests are typically located on sparsely vegetated sandy beaches with some driftwood and vegetation. Wilson-Jacobs and Meslow (1984) found that nests are more likely to be located within 20 meters of driftwood or vegetation than would be predicted randomly. As wind causes many nests to be buried, nests that are behind the foredune, a piece of driftwood, or some other windbreak, may be more successful than those on the open beach (Castelein and Lauten, pers. comm. 2002). Most nests are within 100 meters of water, but can be several hundred meters away when there is no vegetative barrier between the nest and the water, allowing the chicks to have easy access to the shoreline (Page and Stenzel 1981; Powell et al. 1995, 1996). Snowy plovers show a high degree of breeding site fidelity, but also disperse among breeding sites within and between years (Warriner et al. 1986; Stenzel et al. 1994).

Egg Laying, Clutch Size, and Incubation

Egg-laying usually takes 4 to 5 days (Warriner et al. 1986). The usual clutch size is three eggs (range two to six) (Page et al. 1995a). Single-egg clutches are almost always abandoned (Warriner et al. 1986). Incubation is intermittent over incomplete clutches. Sustained incubation begins after the third egg is laid and averages 28.4 to 26.9 days (Warriner et al. 1986). Both sexes incubate the eggs, with the female tending to incubate during the day and the male incubating at night. In Oregon, mean nest success (percent of nests hatching at least one egg, calculated using the Mayfield

method (Mayfield 1961, 1975) from 1990 through 2006 was 42.8 percent, with a range of 13 to 72 percent (Lauten et al. 2006). During this time, exclosures were placed around some nests to reduce losses from predators. Exclosures initially included large boxes made of fencing material designed to prevent access to the nest by predators. These evolved into smaller mini-exclosures that are now used due to ease of transport and speed of installation. Mean nest success for standard exclosures and mini-exclosures was 68.4 percent. The mean nest success for nests without exclosures was 19.7 percent (Lauten et al. 2006).

When disturbed by approaching people or predators, incubating adults typically run from the nest, usually without being seen; however, they will fly when surprised (Page et al. 1995a). During hatching, and occasionally during incubation, adults will attempt to lure people or predators away from nests with alarm calls and distraction displays (Page et al. 1995a). Young snowy plovers on the other hand have limited mobility. Their main defense against predators is to remain still and hunker down in depressions in the sand. They rely on camouflage provided by their early downy feathers to protect them from predation. Snowy plovers readily re-nest after loss of their eggs (Wilson 1980; Warriner et al. 1986). As many as five re-nesting attempts have been observed for a pair (Warriner et al. 1986). After hatching, females typically leave the male to rear the brood to fledging and attempt to re-nest with a different male. This allows the female to find a new mate and lay a second and occasionally third clutch of eggs (Page et al. 1995a). Males may also mate again and initiate second clutches after the first clutch has fledged.

Brood-rearing

Along the Oregon coast, hatching occurs from mid-April through mid-August, and the chicks fledge approximately 31 days after hatching (Warriner et al. 1986). Peak hatching occurs from June through July, and most fledging occurs from mid-July through August, though some individuals from late nests may not fledge until the third week in September.

Newly hatched young are precocial and leave the nest approximately 1 to 3 hours after hatching, usually staying within 100 meters of the nest (Boyd 1972). Chicks leave the nest permanently within hours of the last chick hatching. If the third egg of a clutch is 24 to 48 hours behind the others in hatching, it may be deserted. Chicks are able to walk, run, swim, and forage, but require periodic brooding from parents for many days after hatching (Page et al. 1995a). Most chick mortality occurs within 6 days after hatching (Warriner et al. 1986). This is the period when chicks are least mobile. Adults lead chicks to suitable feeding areas, warn chicks of approaching predators with alarm calls, use distraction displays to draw predators away from chicks, and lead larger chicks away from predators. Adults also chase and fight other snowy plovers that come too close to their broods (Page et al. 1995a).

Most broods remain within 1 mile of the nesting area until fledging, but some have traveled as far as 7 miles from the nest (Casler et al. 1993; Hallett et al. 1994), often to a river mouth. During the first 7 days following hatching, thermoregulation is an issue for snowy plovers (Lauten pers. com. 2002). The survival rate after 16 days is generally 97 percent (Page et al. 1995a).

Fledging Success

The fledging success of snowy plovers (percentage of hatched young that reach flying age) varies considerably between years, and between nesting beaches within the same year. In Oregon, between 1990 and 2006, the mean fledging success was 39 percent, with a range of 11 to 55 percent (Stern et al. 1990, 1991; Craig et al. 1992; Casler et al. 1993; Hallett et al. 1994, 1995; Estelle et al. 1996; Castelein et al. 1997, 1998, 2000a 2000b, 2001, 2002, 2003; Lauten et al. 2006). In 2004, the 55-percent rate (a total of 107 fledglings were confirmed) was the highest since monitoring began in 1990.

4.2.2. Productivity

Because female snowy plovers may lay clutches with more than one male, and because males are responsible for the majority of post-hatching parental care, the measure of reproductive success used in the Recovery Plan is the number of young fledged per adult male (Warriner et al. 1986; Nur et al. 1999). For Oregon, Nur et al. (1999) report a mean number of young fledged per adult male of 1.04 between 1993 and 1997. Between 1996 and 2001 (the period for which the best data are available), the average number of young fledged per male was 0.77, with a range of 0.58 and 1.28 (Estelle et al. 1996; Castelein et al. 1997, 1998, 2000a, 2000b, 2001, 2002, and 2003).

Since 1991, predator exclosures have been used to limit losses to nest predation. Although exclosures do nothing to improve fledging success, they have improved nest success. Without this intervention, the number of young hatched would likely have been much lower, possibly resulting in a lower number of young fledged per male.

4.2.3. Feeding Habits and Habitats

Snowy plovers are primarily visual foragers, and will look, run, stop, and then peck at prey items from the surface of the beach. They feed on terrestrial and marine invertebrates found above and below the mean high tide line, often in wrack washed up on the shore (Page et al. 1995a). They will occasionally probe in the sand at the base of low-growing plants for insects. Reported food items along the Pacific coast include sand hoppers (*Orchestoidea*), small fish, mole crabs (*Emerita analoga*), crabs (*Pachygrapsus crassipes*), polychaetes (*Neridae*, *Lumbrineris zonata*, *Polydora socialis*, *Scoloplos acmaceps*), amphipods (*Corophium* spp., *Ampithoe* spp.,

Allorchetes angustus), tanadacians (*Leptocheilia dubia*), flies (*Ephydriidae*, *Dolichopodidae*), beetles (*Carabidae*, *Buprestidae*, *Tenebrionidae*), clams (*Transenella* sp.), and ostracods (Reeder 1951; Jacobs 1986; Page et al. 1995a).

4.2.4. Migration

The Pacific coast population of the snowy plover consists of both migratory individuals and year-round residents (Warriner et al. 1986). Birds nesting along the Oregon coast have wintered in California as far south as San Diego (M. Stern, unpublished data), and it is likely that some birds also winter in Washington. In California, migrant snowy plovers leave their nesting areas from late June to late October (Page et al. 1995a); the timing along the Oregon coast is likely similar. Snowy plovers wintering in Oregon tend to disperse in March; some remain in Oregon to breed (though not necessarily at the same beach used over the winter), and some migrate to Washington or California. Likewise, some birds wintering in California or Washington return to Oregon to breed (Stern et al. 2000).

4.2.5. Wintering

Distribution and Abundance

The Recovery Plan anticipates that less than 2 percent of the wintering snowy plover population would occur in Oregon (U.S. Fish and Wildlife Service 2007), and currently less than three 3 percent of the population has been found to winter in the state (U.S. Fish and Wildlife Service unpublished data). The snowy plover winters mainly in coastal areas from southern Washington to Central America (Page et al. 1995a). Wintering locations in Oregon consist of the following sites:

- Siuslaw North Jetty,
- Sutton/Baker Beach,
- Siltcoos Breach,
- Siltcoos Estuary/Dunes Overlook/Tahkenitch,
- Tenmile,
- Coos Bay North Spit,
- Bandon SNA, and
- New River (U.S. Fish and Wildlife Service 2001).

Bayocean Spit has been used as a plover wintering site in recent history. However, few plovers have been observed at the site since 2000 (unpublished data, U.S. Fish and Wildlife Service 2008). In winter, snowy plovers are found on many of the beaches used for nesting as well as on beaches where they do not nest, in human-made salt ponds, and on estuarine sand and mud flats. Both coastal and

interior populations use coastal locations in winter (Stern pers. comm. 2002). Birds that nest on the Oregon coast have wintered as far south as San Diego, California, and some birds that nest in California and Washington winter along the Oregon coast (Page et al. 1995a). Even though less than 2 percent of the Pacific coast snowy plover population may winter on the Oregon Coast, it is thought that approximately 80 percent of those birds breeding in the state also stay through the winter. Therefore the availability of good wintering habitat is vital to the recovery of plovers in Oregon.

Fewer than 40 plovers winter on the Washington coast, and around 100 winter on the Oregon coast. More than 2,500 winter along the mainland California coast and hundreds more at the San Francisco Bay and Channel Islands (U.S. Fish and Wildlife Service 2001). Surveys of mainland coastal sites in California (including San Francisco Bay) and Oregon between November and February, 1979 to 1985, suggest that approximately a total of 3,100 snowy plovers wintered there (Page et al. 1986). The 2006 winter window survey numbers for Washington, Oregon, and California are 38, 104, and 3,524, respectively, totaling 3,666 individuals (U.S. Fish and Wildlife Service unpublished data).

Site Fidelity

There are no published data on winter site fidelity of birds from coastal Oregon. Some studies have been conducted on snowy plovers from populations further inland. While these studies are instructive the data may not be completely transferable to the coastal snowy plover population. For example, after 166 adults and 204 chicks were banded at Lake Abert in interior Oregon, 15 percent of the banded birds were relocated on their wintering grounds in California. Of those birds located during winter, 67 percent of the adult males, 73 percent of the adult females, and 60 percent of the birds banded as chicks were found in the same winter location for at least 2 consecutive years, and 33 percent of the males, 32 percent of the females, and 35 percent of the birds banded as chicks were found at the same winter location for at least 3 years (Page et al. 1995b).

Unpublished reports on winter site fidelity along the Oregon coast suggest a much stronger fidelity to overwintering sites. Observations of wintering snowy plovers following the New Carissa accident found that, of the 21 adult males and 23 adult females that wintered at sites along the Oregon coast in both 1998/1999 and 1999/2000, all of the birds wintered at the same location both seasons indicating that the [coastal] adult plovers have very strong inter-annual fidelity to individual wintering sites. Strong site fidelity to wintering sites was further demonstrated by eight adult plovers that wintered at the same sites in both 1998/1999 and 1999/2000, even though they bred elsewhere, presumably in Washington or California (Lauten pers. comm.).

Behavior

Snowy plovers tend to be gregarious in winter, often feeding and roosting in loose flocks (Page et al. 1995a). Roosting snowy plovers will often sit in small depressions in the sand, or in the lee of kelp or other debris that provides some shelter from the wind and makes the birds more difficult for predators to detect. When disturbed, roosting birds often run a few meters to new positions, sometimes displacing other individuals (Page et al. 1995a).

4.3. Population Status and Trends

4.3.1. Historical Trends

Overall, snowy plover numbers and breeding locations have declined on the U.S. Pacific coast over the past century. Between 1977 and 1980 there were an estimated 2,300 breeding snowy plovers along the coasts of Washington, Oregon, and California. In 1988–1989 this number was estimated to be 1,900 (Page et al. 1991). Historical trends within Oregon and Washington are discussed below.

Oregon Coast

Historical information on snowy plovers in Oregon prior to the 1970s is fragmented. Gabrielson and Jewett (1940) state that it was a “permanent resident of such spits as those at Bayocean, Netarts, Siletz, and Pistol River, where its lacy tracks are in evidence everywhere among the thick evergreen patches of the sand verbena (*Abronia*) that grow above the high tide line in the dry sand dunes that it frequents.” Snowy plovers are no longer found during the breeding season at any of the sites Gabrielson and Jewett listed. Snowy plovers historically bred at a minimum of 21 locations on the coast (ODFW 1981). By 1978, birds were present at only 12 of these sites (Wilson 1980); and by 2003, snowy plover were nesting at only seven sites (Castelein et al. 2003).

In addition to the reduction in the number of sites supporting snowy plovers, the numbers of snowy plovers at the remaining sites has declined. By 1972, biologists with the Oregon Department of Fish and Wildlife were concerned that the coastal population of snowy plovers was dwindling (Hoffman 1972, ODFW unpublished data). In August 1972, Hoffman counted 216 (adult and juvenile) snowy plovers at 19 beaches along the Oregon coast and estimated a maximum population of about 300 individuals; this is more than twice the size of the current statewide adult breeding population of approximately 177 to 179 (Lauten et al. 2006).

In Oregon, annual window surveys conducted by ODFW of adult snowy plovers began in 1978 and continue to the present. Window surveys are a one-time pass of a surveyor or team of surveyors through potential snowy plover nesting habitat during

January (Table 4-1), and again in May or June (Table 4-2). The surveyor counts all adult snowy plovers in the habitat and separates the adults into males and females when possible. These surveys are used as an index to examine population trends at each site and coast-wide. These surveys also allow for a comparison of the number of snowy plovers using each site during different times of the year. A lack of detections at a given location does not mean that no snowy plovers will use that site during the year.

Records for snowy plovers in Washington date from 1899 (Bowles 1918). There were at least five historic breeding areas on the Washington coast (Washington Department of Fish and Wildlife 1995). Although Bowles characterized snowy plovers as “quite common” in Pacific County in 1914, most early accounts described snowy plover abundance at specific sites with terms such as “several” or “small numbers.” Although similar descriptors could still be applied today, current field efforts are more thorough than in the past. In addition, significant habitat losses have occurred, primarily through erosion and invasion of introduced European beachgrass. Some sites no longer support nesting snowy plovers. Although a decline in the Washington population is believed to have occurred, it is difficult to quantify. Snowy plovers are currently found breeding in four areas of the Washington coast from Gray’s Harbor south to Long Beach Peninsula. The breeding population was estimated at 70 in 2006 (Pearson 2007).

4.3.2. Current Breeding Trends – Oregon Coast

Since 1993, the snowy plover population on the Oregon coast has been closely monitored, with many of the adults and chicks being uniquely color-banded. The presence of marked birds has allowed for more precise population estimates. Along the Oregon coast, the number of snowy plovers has decreased from the levels seen prior to 1980. However, without the intensive management efforts that began in 1993 (habitat maintenance, predator control, and beach access restrictions) it is likely that current snowy plover numbers would be considerably lower. The coastal snowy plover breeding population in Oregon is currently estimated at around 175 birds (Lauten 2006).

In 2009, snowy plovers nested at seven sites in Oregon: Siltcoos Estuary, Dunes Overlook, Tahkenitch Estuary, Tenmile Estuary, Coos Bay North Spit, Bandon SNA, and New River Spit (Table 4-3). In the past 20 years snowy plovers have sporadically bred at Sutton Beach, Necanicum River mouth, Bayocean Spit, Siuslaw River mouth, Threemile Creek, Menasha Spoils, and the Floras Lake area (Castelein et al. 2002).

Table 4-1. Numbers of Snowy Plovers Counted During Winter Window Surveys along the Oregon Coast

Area	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996*	1995	1994	1993	1992	1991
Columbia R-Necanicum R ¹	NH	NH	-	-	0	0	0	0	0	-	-	0	-	0	-	-	-	0	0
Nehalem Spit	0	0	0	0	0	0	0	0	0	0	-	-	-	0	-	-	0	0	0
Bayocean Spit	0	0	0	0	0	0	0	0	0	1	4	5	4	3	4	0	5	3	3
Netarts Spit	0	-	0	0	0	0	0	-	0 ²	-	-	0	-	0	-	-	-	-	-
Sand Lake Spits	0	0	0	0	0	0	0	-	0	0	0	3	-	0	-	-	-	0	0
Nestucca Spit	0	0	0	0	0	0	0	-	0	0	-	0	-	-	-	-	0	0	0
Neskowin Beach ³	NH	NH	-	-	-	0	0	-	0	-	-	-	-	-	-	-	-	-	-
Salishan Spit (Siletz River) ³	NH	NH	-	-	0	0	0	-	0	-	0	0	-	0	0	-	0	0	-
South Beach, Newport ³	NH	NH	0	-	-	-	0	0	0	-	-	-	-	-	-	0	0	0	0
Seal Rock-N Spit Alsea Bay ³	NH	NH	0	0	0	0	0	-	0	0	0	0	-	-	0	-	-	-	0
S Spit Alsea Bay-Big Creek ³	NH	NH	-	-	-	0	0	-	-	0	0	-	-	-	-	-	-	-	-
Berry Ck-Sutton Ck	9	8	13	21	9	8	17	0	25	17	14	13	14	14	0	6	10	11	6
Sutton Ck-N Jetty Siuslaw	0	4	6	0	0	11	4	9	-	-	-	-	-	-	0	-	-	-	0
Siuslaw R-Siltcoos Spit	0	0	36	26	38	20	20	5	0	0	23	26	22	3	4	18	0	11	10
Siltcoos Spits	19	26	0	0	0	0	2	24	34	20	1	0	-	7	19	-	-	0	-
Siltcoos Spit-Tahkenitch Spits	17	13	0	15	1	0	0	0	0	0	0	0	-	1	-	0	7	0	0
Tahkenitch Spits	0	0	0	0	0	0	0	0	0	1	0	0	7	2	0	0	0	0	0
Tahkenitch Spit-Threemile Ck ³	NH	NH	-	-	0	0	0	0	0	0	0	0	-	7	0	0	1	0	0
Threemile Spit-N Jetty Umpqua River ³	NH	NH	-	-	0	0	-	0	0	0	0	0	-	0	-	0	0	0	0
Umpqua River-Tenmile Spit	-	-	0	27	13	0	0	0	0	3	0	0	0	1	0	0	7	12	0
Tenmile Spits	31	34	10	0	0	0	8	-	1	11	0	12	19	5	18	0	0	0	0
Tenmile Spit-Horsfall Beach ³	NH	NH	-	-	-	0	0	-	14	0	0	0	0	19	0	12	13	0	0

Area	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996*	1995	1994	1993	1992	1991
Horsefall Beach-N Jetty Coos Bay ⁴	-	-	-	-	-	0	0	-	6	0	0	0	0	0	0	0	0	0	0
Coos Bay N Spit (N. Spoil) ³	NH	NH	Nh	Nh	Nh	Nh	Nh	-	-	-	-	0	-	0	0	0	0	0	0
Coos Bay N Spit (S Spoil and 94/95 HRA)	-	-	-	-	-	-	-	-	-	1	-	0	0	-	0	0	0	0	0
Coos Bay N Spit (S.Spoil and 94HRA)	10	0	0	0	-	0	3	0	-	-	-	0	0	-	0	0	0	0	0
Coos Bay N Spit (95/98 HRA)	0	0	-	0	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-
Coos Bay N Spit (South Beach)	0	7	6	15	9	0	-	3	0	0	7	-	-	-	-	-	-	-	-
Whiskey Run-Coquille R	0	0	0	0	0	0	-	0	0	-	0	-	0	0	0	0	2	-	0
Bandon St Pk-New River	26	41	19	27	26	0	0	1	8	6	18	19	14	2	24	0	13	17	19
New River-Floras Lake	23	1	14	23	-	0	18	15	6	6	0	0	4	4	2	0	0	0	0
Sixes River Mouth ¹	-	-	0	-	0	0	0	-	0	0	-	-	-	-	-	-	-	-	-
Elk River	0	0	-	-	-	-	0	0	-	0	-	-	-	-	-	-	-	-	-
Euchre Ck-Greggs Ck	0	0	-	0	-	0	0	0	0	0	0	-	0	-	-	0	0	-	-
Pistol River Spit	0	0	0	0	0	0	0	0	0	0	0	-	0	0	-	-	0	-	-
Total Count	135	134	104	154	96	39	72	57	94	66	67	78	84	68	71	36	58	54	38

¹ Only a small portion of survey area surveyed each year.

² Six birds reported at Netarts Spit in 2001 not confirmed.

³ Areas no longer surveyed.

⁴ Only a portion of this area surveyed.

NH = no habitat, as determined by the Western Snowy Plover Working Group.

"-" - hyphen indicates that the area was not surveyed.

Source: U.S. Fish and Wildlife Service 2009.

Table 4-2. Numbers of Snowy Plovers Counted During Breeding Window Surveys along the Oregon Coast

Area	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993	1992	1991
Necanicum Spit	NBH	0	0	0	0	0	-	2	0	-	-	-	-	-	-	-	-	-	-
Nehalem Spit	0	0	0	-	0	-	0	-	-	-	-	-	-	-	-	-	-	0	-
Bayocean Spit	0	0	0	0	0	0	-	-	-	-	-	0	0	0	6	0	2	0	-
Netarts Spit	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-
Sand Lake S. Spit	0	0	0	0	0	0	0	0	0	-	-	0	-	-	0	-	-	0	-
Nestucca Spit	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	0	-
Neskowin Beach ²	LBH	LBH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-
Salishan Spit (Siletz River) ²	LBH	LBH	-	-	-	-	-	-	0	-	-	0	-	-	-	0	0	0	-
South Beach, Newport ²	NBH	NBH	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	-	-
North Spit Alsea Bay ²	LBH	LBH	-	-	-	-	-	-	-	-	-	0	-	-	0	0	0	0	0
Berry Creek-Sutton Creek	0	0	0	2	0	-	1	-	11	-	0	2	5	5	2	0	0	2	0
Sutton Creek- North Jetty Siuslaw	LBH	LBH	-	0	-	0	0	4	-	-	-	-	-	-	0	0	0	0	0
Siuslaw River-Siltcoos Spit ²	NBH	NBH	-	-	-	0	-	0	-	-	0	-	0	-	3	1	0	1	0
Siltcoos Spits	15	11	16	18	11	5	7	7	5	-	13	4	3	5	1	-	0	0	-
Siltcoos Spit-Tahkenitch Spits	5	7	19	2	9	13	4	7	6	-	2	0	0	-	0	3	0	2	0
Tahkenitch Spits	3	0	5	1	5	8	11	14	14	-	0	2	0	9	9	-	0	0	0
Tahkenitch Spit-Threemile Creek	NBH	NBH	-	-	-	-	-	0	-	-	0	0	5	-	0	4	0	0	0
Threemile Spit-North Jetty Umpqua River	NBH	NBH	-	-	-	-	-	0	-	-	0	0	2	0	0	0	0	0	0
South Jetty Umpqua River-Tenmile Spit	-	0	-	-	-	-	-	-	-	-	0	0	0	0	1	0	-	6	6
Tenmile Spits	33	24	27	15	13	11	6	11	8	-	2	4	1	3	1	3	6	3	4

Area	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993	1992	1991
Tenmile Spit-Horsfall Beach	NBH	NBH	-	-	-	-	-	-	-	-	-	0	-	-	2	0	2	0	-
Horsfall Beach-North Jetty Coos Bay	-	-	-	-	-	-	-	-	-	-	0	3	-	0	6	11	4	7	7
Coos Bay N. Spit (North Spoil) ²	NBH	NBH	NBH	NBH	NBH	NBH	NBH	-	-	-	-	-	-	-	-	0	7	0	0
Coos Bay N. Spit (South Spoil and 94/95/98 HRA)	23	27	17	27	11	11	16	5	13	-	13	14	14	17	13	10	0	0	4
Coos Bay N. Spit (South Beach)	25	3	9	0	16	10	0	10	-	-	-	3	8	16	-	-	-	-	-
Coos Bay N. Spit (Bay Beach)	NBH	NBH	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Whiskey Run-Coquille River	-	0	0	0	0	-	0	0	0	-	-	0	0	0	0	0	0	-	-
Bandon State Park-New River	14	8	15	12	22	8	2	2	3	-	2	2	7	8	10	9	12	2	9
New River-Floras Lake	23	25	17	14	13	16	16	9	11	-	18	23	28	21	10	10	12	5	5
Sixes River Mouth ¹	0	-	-	0	-	-	0	0	0	-	-	-	0	-	0	0	-	-	-
Elk River	0	0	0	-	-	-	0	0	0	-	-	-	0	0	-	0	-	-	-
Euchre Ck-Greggs Creek	0	-	-	0	0	-	0	0	0	-	-	0	0	0	0	0	0	-	-
Pistol River Spit	0	-	0	-	-	0	0	0	0	-	-	0	0	0	-	-	0	-	-
Total Count	141	105	125	91	100	82	63	71	71	-	50	57	73	85	64	51	45	28	35

¹ Incomplete surveys for most years

² No longer surveyed during breeding window

NBH = no breeding habitat, as determined by the Western Snowy Plover Working Group. LBH – light breeding habitat, as determined by the Western Snowy Plover Working Group.

"-" – hyphen indicates that the area was not surveyed.

Source: U.S. Fish and Wildlife Service 2009. Washington Coast

Table 4-3. Nesting and Fledging Success 2002 through 2009

	*2009 eggs	2009 hatched	2009 fledged	*2008 eggs	2008 hatched	2008 fledged	*2007 eggs	2007 hatched	2007 fledged	*2006 eggs	2006 hatched	2006 fledged	*2005 eggs	2005 hatched	2005 fledged	*2004 eggs	2004 hatched	2004 fledged	*2003 eggs	2003 hatched	2003 fledged	*2002 eggs	2002 hatched	2002 fledged
Necanicum Spit	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	0
Sutton Beach	0	0	0	0	0	0	9	0	0	12	0	0	0	0	0	0	0	0	3	1	0	12	0	0
Siltcoos Estuary	54	28	17	68	22	8	67	24	11	60	22	13	44	17	9	31	18	12	16	5	2	28	8	0
Dunes Overlook	31	14	9	34	5	2	46	19	11	28	18	8	42	16	7	39	14	6	17	9	3	24	13	2
Tahkenitch North	13	6	1	14	0	0	23	6	2	12	9	4	26	14	8	21	14	6	37	17	3	30	16	1
Tenmile Estuary	117	26	16	77	21	8	89	43	27	59	28	16	49	21	8	50	29	12	43	20	10	32	14	3
Coos Bay North Spit	171	58	28	125	63	40	108	45	26	86	54	22	80	38	23	73	42	31	57	29	21	48	21	11
Bandon Beach	70	12	6	68	5	2	73	24	13	53	19	8	83	37	11	50	33	15	13	6	2	10	0	0
New River	109	49	19	92	34	10	96	47	30	69	34	16	63	36	9	70	37	21	44	25	12	39	17	6
Floras Lake	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	0
Total	565	193	96	478	150	70	511	208	120	379	184	87	387	179	75	334	187	103	230	112	53	229	91	23

* Data do not include undiscovered nests. Source: Lauten et al. 2007, 2008, 2009.

4.3.3. Threats and Sources of Threats

As mentioned above, overall, snowy plover numbers have declined on the U.S. Pacific coast over the past century. Habitat degradation caused by human disturbance, urban development, and introduced European beachgrass (*Ammophila arenaria*), as well as expanding predator populations have resulted in a decline in active nesting areas and in the size of the breeding and wintering populations. Natural factors such as inclement weather have also limited coastal snowy plover populations. The reasons for the population decline and the degree of threats are intertwined and vary by geographic location. These factors as they pertain to the Oregon Coast are discussed below.

With respect to wintering snowy plover populations, it is anticipated that the covered activities would not result in take of wintering populations of snowy plovers. This is because winter recreational use along with the other covered activities would be of relatively short duration and would likely occur in areas that would not be as attractive to wintering snowy plover populations. The normal behavior of wintering snowy plovers is also to flock and avoid disturbance. For these reasons, OPRD is not seeking take coverage under the ITP for effects on wintering populations of snowy plovers. For more information about potential effects on wintering snowy plovers, see Section 6, “Direct, Indirect, and Cumulative Effects on Snowy Plovers and Snowy Plover Habitat,” and Section 7.6.3, “Changed Circumstances.”

Habitat Degradation

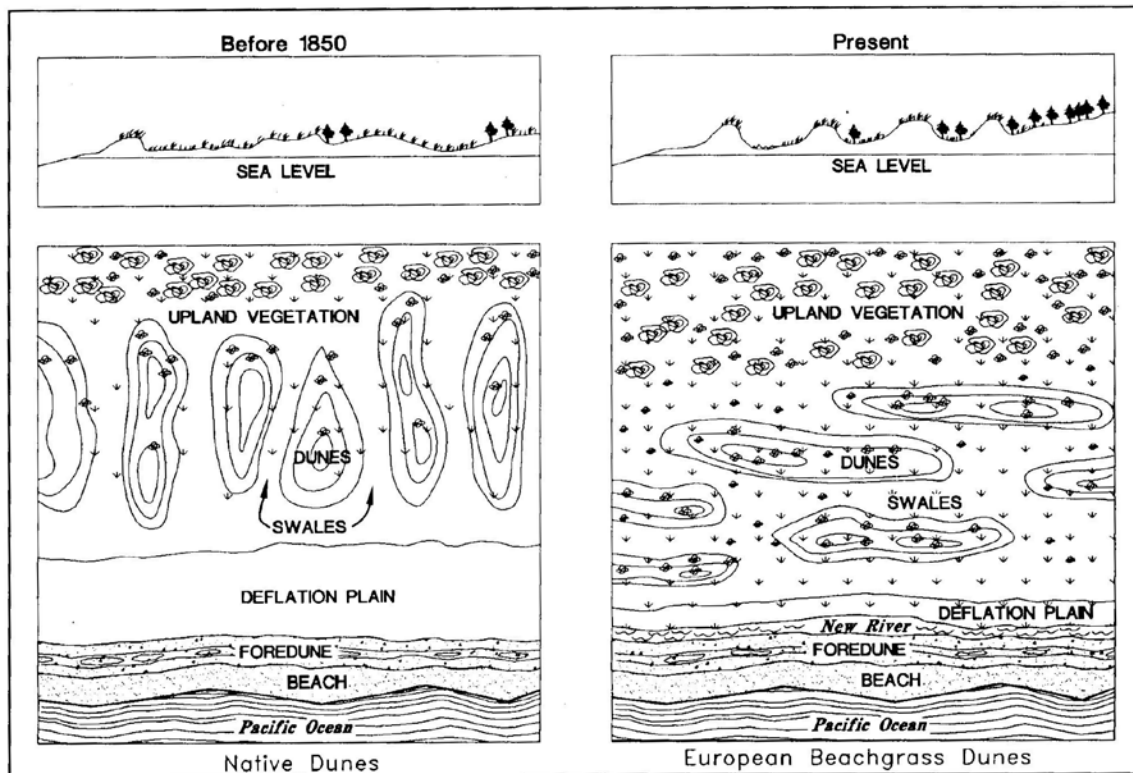
The wide, flat, sparsely vegetated beaches preferred by snowy plovers are an unstable habitat, subject to the dynamic processes of accretion and erosion and dependent on natural forces for replenishment and renewal. These habitats are highly susceptible to degradation from shoreline stabilization and development projects, driftwood removal, and especially encroachment of non-native vegetation.

Non-Native Vegetation

One of the most significant causes of habitat degradation for coastal breeding snowy plovers in Oregon has been encroachment of introduced European beachgrass. Steep foredunes dominated by European beachgrass have replaced the original low, rounded, open mounds formed by the native American dunegrass (*Elymus mollis*) and other beach plants. Native dune plants do not bind sand like European beachgrass and allow sand movement and regenerating open expanses of sand. European beachgrass on the other hand, forms tall, densely vegetated foredunes that exclude many native plant species and prevent the overwashing and scour that creates the open sand habitat favored by snowy plovers. On beaches dominated by this invasive vegetation, richness is halved in comparison with foredunes dominated by native dune grass (Barbour and Major 1990).

On the Oregon coast, the establishment of European beachgrass has produced dramatic changes in the landscape (ODFW 1994). The spread of this non-native species was greatly enhanced by aggressive dune stabilization programs in the 1930s and 1940s (Wiedemann 1987) and has provided a place for predators to hide (Figure 4-1).

Figure 4-1. Changes in Beach Profile since Introduction of European Beachgrass



In areas with European beachgrass, the open features that characterize snowy plover breeding habitat are destroyed. Stabilizing sand dunes with introduced European beachgrass has reduced the amount of unvegetated area above the tide line, decreased the width of the beach, and increased its slope. These changes have reduced the amount of potential snowy plover nesting habitat on many beaches and may hamper brood movements (U.S. Fish and Wildlife Service 2001). In Oregon, the European beachgrass community may provide habitat for snowy plover predators (e.g., striped skunks (*Mephitis mephitis*), coyotes (*Canis latrans*), red foxes (*Vulpes vulpes*) gray foxes (*Urocyon cinereoargenteus*), raccoons (*Procyon lotor*), and feral cats (*Felis domesticus*)) that historically would have been largely precluded by the lack of cover in the dune community (Stern et al. 1991).

Other non-native vegetation that has invaded coastal dunes, thereby reducing snowy plover breeding habitat includes Scotch broom (*Cytisus scoparius*), gorse (*Ulex*

europaeus), South African iceplant (*Carpobrotus edulis*), sea rocket (*Cakile maritima* and *C. edulis*), and iceplant (*Mesembryanthemum sp.*). Shore pine (*Pinus contorta*), while a native plant species, has stabilized vast areas of open dunes due to extensive planting and through plant succession accelerated by the introduction of European beachgrass.

Beach Development

Coastal habitats are highly susceptible to degradation by construction of shoreline protection structures (e.g., riprap, seawalls, etc.) breakwaters, jetties, piers, homes, hotels, parking lots, access roads, trails, bike paths, day-use parks, marinas, recreational facilities, and support services that may cause direct and indirect losses of breeding and wintering habitat for the snowy plover. Construction of homes, resorts, and parking lots on coastal sand dunes constitutes irreplaceable loss of habitat for snowy plovers. Construction of these and other facilities adjacent to sand dunes can result in increased human disturbance, rendering habitat unsuitable for snowy plover winter or breeding use.

In addition to rendering habitat unsuitable for snowy plovers, there are other potential adverse impacts from urban development. When urban areas interface with natural habitat areas, the habitat value to native animal species may be diminished by increased levels of illumination at night (e.g., building and parking lot lights); increased sound and vibration levels; and pollution drift (e.g., pesticides) (Kelly and Rotenberry 1993). Also, construction of residential development in or near snowy plover habitat attracts predators, including domestic cats.

Resource Extraction

Resource extraction, including driftwood collection, sand removal, and dredging, can negatively alter snowy plover habitat. Driftwood can be an important component of snowy plover breeding and wintering habitat, providing protection from wind and blowing sand, and providing chicks with cover from predators. Removal of driftwood can reduce suitability of habitat and can result in nests being crushed as driftwood is dragged across the beach. The likelihood of nests being crushed increases when driftwood is collected at night for beach fires. Driftwood and driftwood structures, built by beach users, are used as perches by snowy plover predators. Too much driftwood can aid in the formation of steep foredunes, making habitat behind the foredune inaccessible to chicks.

Dredging activities may be detrimental to snowy plovers when it alters natural patterns of beach erosion and deposition that maintain habitat. Activities associated with dredging may disturb breeding or wintering snowy plovers. Alternatively, dredge materials generated from dredging activities can be placed on the beach to enhance snowy plover habitat. Dredged material placed east of the foredune at Coos Bay North Spit has provided an important breeding site for many years.

Sand removal may cause erosion and loss of breeding or wintering habitat. Activity associated with sand removal can disturb snowy plovers, destroy nests or chicks, and reduce available invertebrates and wrack for snowy plovers.

Human Disturbance

The increasing level of human recreation is cited as a major threat to the breeding success of the coastal population of snowy plover (U.S. Fish and Wildlife Service 1993, 2001a and 2005). Human activities along the Oregon coast may contribute to snowy plover reproductive failures (Stern et al. 1990, 1991; Craig et al. 1992; Casler et al. 1993; USFWS 1993; Hallett et al. 1994, 1995; Estelle et al. 1996; Castelein et al. 1997, 1998, 2000a, 2000b, 2001). Incubating birds often run from their nests as people or pets approach. Such disturbances may result in clutch loss to predation or an increased incubation time (which in turn exposes nests to predation pressures for longer periods) (Warriner et al. 1986). Unattended nests may be buried by windblown sand, trampled by horses, pets or people, and may be run over by vehicles. Broods may be separated from adults, resulting in lowered fledging success. Alternatively, Page et al. (1977) noted that, “birds exposed to prolonged human activity near the nest seemed to become accustomed to it.” This decline in wariness by snowy plovers may actually make snowy plovers an easier target for predators on beaches that are subject to ongoing high levels of human disturbance (Person and Applegate 1997). Even when snowy plovers become accustomed to increased levels of human disturbance, they may be subjected to higher levels of predation. In studies conducted in Washington and California, fledging success was higher on beaches without human disturbance than on beaches with recreational activity (Saul 1982; Persons and Applegate 1997).

In 1998, all nests failed and snowy plovers abandoned the Floras Lake area by mid-June, most likely due to recreational activity (Castelein et al. 1998; USFWS 1999). Recreational activity at this site appeared to be heavier than in previous years (Castelein et al. 1998), and violations of nesting areas and beach restrictions were common (Mraz 1998).

Human disturbance also may adversely affect wintering snowy plovers, causing birds to switch from feeding and roosting activities to predator avoidance strategies. Interruption of feeding and roosting behaviors in favor of avoidance activity can negatively alter energy balances, reducing individual survival during the breeding and winter seasons (Burger 1986; Pfister et al. 1992). However, human disturbance associated with the covered activities is not anticipated to rise to the level of take.

Dogs (with or without owners) pose a serious threat to snowy plovers. In a California study, nesting snowy plovers flushed (scared off their nest) more frequently and remained off the nest longer when a person was accompanied by a dog than when alone (Page et al. 1977). Unleashed dogs may chase snowy plover

adults and chicks, cause broods to be separated from adults, crush nests, and interrupt feeding, incubating, and brood-rearing activities.

Horseback riding and use of motorized vehicles, including ATVs/OHVs and street legal vehicles, on beaches can harass wintering and nesting snowy plovers, crush nests, and destroy sensitive native dune vegetation. Snowy plover chicks and adults may crouch in OHV tracks, and chicks may not be able to get out of the ruts quickly, increasing the likelihood that they will be crushed. These activities have a greater potential to harm nesting and roosting snowy plovers because much larger distances can be covered compared to activities such as walking or hiking. Vehicles, especially ATVs/OHVs are often used for glass float hunting and other beachcombing activities. This practice is of greater concern because the search is often concentrated in the upper portions of the dry sand where snowy plovers nest and concentrate their activities. Snowy plovers roosting at night are particularly vulnerable to nighttime vehicle driving.

Camping on the beach and surf fishing can result in prolonged disturbance to nesting snowy plovers. Recreational users often leave behind food or trash, which can attract predators. Collection of driftwood for campfires can disturb incubation and even cause accidental crushing of eggs or chicks. Driftwood is an important component of snowy plover habitat as it provides protection from blowing wind and sand, and snowy plovers often nest beside chunks of driftwood on otherwise barren beaches.

Human use of the Ocean Shore can also have some benefits, such as the removal of trash by equestrian groups. At Baker Beach over the past several years, equestrian groups have worked with the U.S. Forest Service (USFS) to remove trash prior to the nesting season, rather than during the annual spring SOLV (Stop Oregon Litter and Vandalism) event, which occasionally occurs during the nesting season. The latter event is conducted under a permit issued by the Oregon Parks and Recreation Department (OPRD) with restrictions designed to avoid nesting areas during cleanup activities.

Predation

Predator pressures have contributed to limiting snowy plover populations along the Oregon coast (Table 4-4). Nests are lost to predation from American crows (*Corvus brachyrhynchos*), common ravens (*Corvus corax*), California gulls (*Larus californicus*) foxes, raccoons, coyotes, feral cats, skunks, and black rats (Oregon Department of Fish and Wildlife 1994). Other confirmed or suspected snowy plover predators along the Oregon coast include American kestrels (*Falco sparverius*), merlin (*Falco columbarius*), peregrine falcon (*Falco peregrinus*), northern harrier (*Circus cyaneus*), and great horned owl (*Bubo virginianus*). Predator density is a significant factor affecting the quality of snowy plover nesting habitat (Stenzel et al. 1994). The kind of predators along the coast will vary from site to site depending on

a number of conditions, including suitable habitat and foraging opportunities for the predator.

Table 4-4. Nest Predation 2004 to 2009

Predator	Number of Nest Failures
Corvid (species unknown)	87
Rodent (species unknown)	33
Red Fox	3
Raccoon	2
Skunk	1
Weasel	1
Coyote	3
Canine	1
Feral Cat	1
Unknown mammal	10
Unknown predator	127
Total	269

Source: Lauten et al. 2005, 2006a, 2006b, 2007, 2008, 2009

Predation can result in the loss of adults, chicks, or eggs. The snowy plover generally cannot defend itself or its nests against predation but must rely on anti-predator adaptations, including (1) pale coloration of adults, eggs, and young, which acts as camouflage against detection by predators; (2) a skulking retreat from the nest at a predator's approach; (3) extreme mobility and elusiveness of precocial young; and (4) maintenance of low nesting density (Page et al. 1983). Snowy plover chicks are brooded by an adult for approximately 1 month after hatching. The adult leads chicks to food, alerts chicks to predators, and uses distraction displays to lure potential predators away from chicks (Page et al. 1995a). The presence of predators on beaches used for brood rearing may result in separation of chicks from adults, leading to decreased fledging success (U.S. Forest Service 2002).

Although predation is a natural phenomenon that snowy plovers have evolved with, its effects are exacerbated through the introduction of non-native predators and human encouragement of larger populations of native predators in the vicinity of snowy plover populations. Signing and fencing of restricted areas on the beach may provide perches for avian predators of snowy plover adults or chicks. In 1995, corvids were known predators of snowy plovers at the Siltcoos River area in Oregon, and there was evidence they used restrictive signs as perches (Hallett et al. 1995). From 1966 to 2000, Breeding Bird Survey (BBS) data for Oregon show a long-term

increasing trend in American Crows, averaging +1.5 percent per year (Sauer et al. 2001).

On the Oregon coast, the spread of European beachgrass, Scotch broom, and shore pine, which have transformed vast areas of open sand into dense grass-shrub habitat, has provided excellent habitat for native and non-native mammalian predators, such as skunks, raccoons, foxes, and feral cats (Stern et al. 1991). Additionally, beach litter attracts predators such as skunks and coyotes.

In addition to natural predation, disturbance as a result of recreation can indirectly increase predation. Behavior responses to disturbance, such as flushing or leaving nests or chicks, can make adults more visible to predators and leaves nests and chicks unattended. These responses can inadvertently make snowy plovers more susceptible to predation.

Natural Events

Weather-related causes also contribute to low nesting success. High tides and strong winds that bury eggs and heavy rain or hail that damage eggs may cause nest failure (Wilson 1980; Stenzel et al. 1981; Warriner et al. 1986). These factors are naturally occurring aspects of the coastal environment, and the snowy plover has evolved with them. However, through habitat alterations, increased predation due to introduced species, and increased human use of beaches, human influences have reduced the snowy plover population's ability to respond to these naturally occurring weather events.

4.3.4. Existing Conservation and Protection Measures in Place

Conservation and protection measures in place for snowy plovers along the Oregon coast include:

- Yearly monitoring,
- Managing predators (including use of exclosures),
- Implementing seasonal dry sand beach restrictions,
- Conducting habitat restoration,
- Conducting outreach and education, and
- Conducting law enforcement activities.

These measures have helped to slow the decline in snowy plover populations in Oregon.

Monitoring

Snowy plover surveys began along Oregon's south coast in 1972 (Hoffman 1972) and continue to be conducted annually (Wickham 1981; Anderson and Maine 1983; Wilson-Jacobs and Meslow 1984; Wollington 1984; Wilson-Jacobs and Dorsey 1985; Herman et al. 1988; Stern et al. 1990, 1991; Craig et al. 1992; Casler et al. 1993; Hallett et al. 1994, 1995; Estelle et al. 1997; Castelein et al. 1997, 1998, 1999, 2000, 2001). After the snowy plover Federal listing in 1993, the scope and intensity of survey efforts increased. Since 1994, all current and most potential nesting sites along the Oregon coast have been counted twice each year through window surveys (Hallett et al. 1994, 1995; Estelle et al. 1997; Castelein et al. 1997, 1998, 2000a, 2000b, 2001). During the breeding season, active nests and broods are monitored at least weekly through the fledging stage. Adults and chicks are color-banded to facilitate nesting activity tracking and brood movements and estimating population dynamics over time (Craig et al. 1992; Casler et al. 1993; Hallett et al. 1994, 1995; Estelle et al. 1997; Castelein et al. 1997, 1998, 2000a, 2000b, 2001; Lauten et al. 2006). These monitoring efforts contribute to the information base on nesting success and population trends and archive important data for use in future monitoring, restoration, and other recovery efforts.

Predator Management

Some predation is a natural phenomenon that snowy plovers have evolved with; however, because of the population's low numbers and the increase in the number and type of predators as a result of human activities, snowy plovers are more vulnerable to predation. Therefore, predation can be a significant influence on snowy plover numbers making it necessary to manage for predation along with conducting other management efforts in an attempt to increase snowy plover reproductive success. In 1999, as part of an emergency response to the New Carissa grounding, Federal agencies initiated a limited predator control program at New River, with the removal of 17 red fox (Castelein et al. 2000a). Field researchers believed that introduced red fox populations suppressed fledging success from Bandon SNA to Floras Lake (Castelein et al. 2000a, 2000b, 2001). Introduced red fox were removed from this area. An analysis of the effectiveness of predator management activities can be found in Appendix C of Lauten et al. 2006.

To reduce predation of snowy plover nests, chicks, and adults on the Oregon Coast, the U.S. Fish and Wildlife Service (USFWS), the U.S. Bureau of Land Management (BLM), and the USFS entered into an Inter-Agency Agreement with the U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS) -Wildlife Services Division to implement an integrated predator damage management program at snowy plover nesting areas at Sutton/Baker Beach, Siltcoos Estuary/Dunes Overlook/Tahkenitch Estuary, Tenmile Estuary, Coos Bay North Spit, Bandon SNA, and New River (U.S.D.A. Forest Service 2002). OPRD and ODFW also contributed to this effort. Predator management activities completed in 2008 represented the eighth consecutive year of predator management at Coos Bay North

Spit, Bandon SNA, and New River, and the sixth consecutive year of predator management at Siltcoos Estuary/Dunes Overlook/Tahkenitch Estuary and Ten Mile Estuary. Predator management activities completed in 2008 also represented the fourth year of predator control at Baker /Sutton due to the presence of nesting populations of snowy plover.

Efforts to deter predation have included removing vegetation that provides predators with cover, erecting nest exclosures, removing mammalian predators, and dispersing and removing of corvids. APHIS also conducts litter removal because litter has the potential to attract predators. In 2008, an estimated 183 birds, of a total 205 predators, were removed from Bandon SNA, the New River area, and Coos Bay North Spit (Little 2009) (Table 4-5). An estimated 137 birds, of a total 140 predators, were removed from USFS sites in 2008 (Little 2009) (Table 4-6).

Table 4-5. Total Number of Predators Removed from Three South Coast Snowy Plover Areas during the 2008 Breeding Season

Predator	Coos Bay North Spit	Bandon SNA	New River	Totals
Red fox	0	3	7	10
Gray fox	0	2	0	2
Raccoon	1	1	0	2
Striped skunk	0	4	0	4
Feral cat	2	2	0	4
Common raven	1	0	15	16
American crow	58	22	20	100
Common raven (DRC)*	0	2	63	65
American crow (DRC)	0	0	2	2
Total	62	36	107	205

* Taken with DRC-1339 avicide. Total animals are estimated. Source: Little 2009

Table 4-6. Total Numbers of Predators Removed from the U.S. Forest Service Sites during the 2008 Season

Predator	Baker/Sutton	Siltcoos Estuary	Dunes Overlook	Takhenitch Estuary	Tenmile Estuary	Total
Raccoon	0	1	0	0	0	1
Coyote	0	2	0	0	0	2
Common raven	0	2	2	2	2	8
American crow	5	28	1	0	33	67
Common raven (DRC)*	23	18	5	5	11	62
Total	28	51	8	7	46	140

* Taken with DRC-1339 avicide. Total animals are estimated. Source: Little 2009

Predator Exclosures

Predator exclosures have been used on Oregon beaches to protect nests since 1990 (Stern et al. 1990b, 1991; Craig et al. 1992; Casler et al. 1993; Hallett et al. 1994, 1995; Estelle et al. 1997; Castelein et al. 1997, 1998, 2000a, 2000b, 2001). Their design and use has been modified as needed to maximize snowy plover success based on the primary predator threats in the area. Generally, exclosures are small, circular, square or triangular metal fences that can be quickly assembled and are designed to keep predators out of nests and/or prevent people from trampling nests (U.S. Fish and Wildlife Service 2007). The numbers of nests that are protected with predator exclosures each year varies, depending on when the nest was found and the likelihood that the exclosure will protect the nest rather than draw attention to it. Data collected since 1990 indicate that exclosures may be quite effective at increasing nest success (Table 4-7), and are successful in excluding both corvid and mammalian predators.

Table 4-7. Success of Exclosed and Unexclosed Snowy Plover Nests on the Oregon Coast, 1990 to 2006

Year	Number of Nests	Mayfield % Nest Success	Exclosed Nest Success Rate (Mayfield Method)	Unexclosed Nest Success Rate (Mayfield Method)
1990	36	13	Not available	13
1991	36	20	77	5
1992	36	55	79	9
1993	41	56	77	16
1994	51	72	75	68
1995	76	41	62	7
1996	89	47	66	7
1997	93	40	52	26
1998	78	52	70	15
1999	78	54	62	40
2000	100	31	46	2
2001	111	26	67	4
2002	89	38	67	13
2003	91	43	79	23
2004	117	56	86	20
2005	144	45	70	27
2006	147	38	60	40
2007	202	33	66	41
2008	196	30	45	38
2009	236	23	72	28

Source: Lauten et al. 2009.

Recently, success of nests in exclosures has been lower, although nest success with exclosures continues to be better than success of nests without exclosures (Castelein et al. 2001). Researchers are concerned that predators (particularly corvids) may key into exclosures as a way to find the cryptic nests and then learn how to get inside (Castelein et al. 2000b). For this reason, exclosure design has been adaptively modified from year to year as researchers try to find the most effective deterrent to predators while minimizing disturbance to snowy plovers. Although exclosures clearly improve hatching success, predators continue to pose a threat to adults and chicks around exclosures.

At the Coos Bay South Spoil and the 1994 Habitat Restoration Area (HRA), 71 acres of snowy plover habitat have been fenced off to deter vehicular access and mammalian predators. This practice was initially deemed successful at deterring mammalian predators and ATVs/OHVs (Stern et al. 1991). However, during a 2002 study Little observed that this fencing posed an insufficient barrier for foxes, raccoons, and skunks, as they were able to climb over or dig under fences. Additionally, the fencing provides no deterrent to avian predators (Little 2002).

Beach Restrictions

Of the approximately 230 miles of sandy Ocean Shore along Oregon's 362-mile coastline, fewer than 20 miles of snowy plover-related seasonal dry sand beach restrictions were implemented in 2004. Symbolic fencing and signage is used to restrict pedestrian, pet, or vehicular use of portions of the dry sand. Public education and outreach has been successful in increasing compliance with beach use restrictions, but field researchers document numerous violations of these restrictions annually. Continued enforcement of these restrictions will be necessary for snowy plover conservation and recovery (Castelein et al. 2001). The number of miles of Ocean Shore on which seasonal beach use restrictions have been imposed, by beach, by year is shown in Table 4-8.

Habitat Restoration

Habitat restoration work has been successful in reclaiming snowy plover habitat in Oregon. The Coos Bay District of the BLM has conducted multiple projects to clear and control European beachgrass on dredged spoil disposal sites and adjacent areas, including hand-pulling, burning, scarification, spraying with seawater, and removal with a front-end loader. At some sites, European beachgrass is bulldozed and the foredune lowered, allowing overwash areas to be created during winter storm events. At the Oregon Dunes National Recreation Area, the USFS has used mechanical, manual, and herbicide treatments to control European beachgrass (USDA Forest Service 1994). Approximately 50 acres of Bandon SNA has been restored near the mouth of Two Mile Creek. This restoration effort, begun in fall 2002, resulted in the area being used by snowy plover for nesting during the 2003 and 2004 nesting

season. Effective control of European beachgrass will require ongoing maintenance efforts at each of the sites.

Law Enforcement

Since 2006, OPRD has three full-time beach rangers who patrol all 230 miles of Oregon's coastal beaches. In addition, at beaches within State parks, park staff with citation authority can issue citations for beach rule violations, if observed. These employees occasionally patrol the State park beaches and beach accesses and respond to reported incidents. Also, coastal State troopers and local law enforcement (city and county) occasionally patrol ocean beaches, especially beaches that are open to driving, and patrol beach accesses. They also respond to OPRD calls for assistance. As needed, OPRD will contract with retired senior troopers to provide additional supervision and citation authority.

Table 4-8. Beach Restrictions by Location and Year during Nesting Season (in miles)

Location	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Sutton/Baker Beach	1.00	1.00	3.00	3.00	3.00	3.00	3.00	3.50	3.50	3.50	3.50	3.50	3.50
Siltcoos Estuary	0.30	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
Dunes Overlook	0	0	0	0	0	0.75	0.75	1.50	1.50	1.50	1.50	1.50	1.50
Tahkenitch Estuary	0.60	2.00	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30
Tenmile Estuary	1.30	1.30	0.80	0.80	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
Coos Bay North Spit	0.50	4.00	1.00	6.10	6.10	2.80	2.80	2.80	2.50	2.50	2.50	2.50	2.50
Bandon	0	0	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20
New River	0	0	0	4.80	4.80	4.80	4.80	4.90	5.35	5.35	5.35	5.35	5.35
Floras Lake	0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0	0	0	0	0
Total Miles	3.70	9.90	9.90	19.08	19.60	17.05	17.05	18.40	17.55	17.55	17.55	17.55	17.55

Section 5. Conservation Plan

5.1. Introduction

This section begins with a discussion of the conservation strategy that was used to develop the approach for addressing potential effects of the covered activities on snowy plover. The conservation strategy also considers how best to contribute to the recovery of the species within the covered lands.

Using the Federal Recovery Plan (U.S. Fish and Wildlife Service 2007) as a guide, State and Federal biologists and an appointed Steering Committee identified 17 management areas determined to be the best existing and potential snowy plover habitat. This list was further refined based on comments from the public to exclude Pistol River for a total of 16 management areas. Five of these management areas are either owned or leased by the Oregon Parks and Recreation Department (OPRD) as park unites and are identified as Snowy Plover Management Areas (SPMAs). The remaining 11 areas are identified as Recreation Management Areas (RMAs) and are not part of an OPRD park unit, but are managed by OPRD as part of the Ocean Shore. Some are privately owned or owned by counties. Others are adjacent to federally owned lands. These management areas constitute approximately 48 miles of the 230 miles of sandy Ocean Shore unless otherwise amended through implementation of the adaptive management measures. Snowy plovers that inhabit beach areas outside of these 48 miles will receive limited protection, i.e., only known active nest sites will be protected.

The conservation strategy focuses on these SPMAs and RMAs through implementation of the conservation plan as described in Section 5.3. The conservation plan includes 1) the conservation measures outlined in Section 5.3.1, 2) the goals and actions to implement these measures as outlined in Section 5.3.2, and 3) the adaptive management measures outlined in Section 5.3.3. This section concludes with a summary of the conservation measures.

5.2. Conservation Strategy

OPRD prepared a set of guiding principles to assist in determining the extent of its participation in the conservation and recovery of the snowy plover. From these principles, OPRD (working with other State and Federal agencies) identified a conservation strategy that will ensure that habitat for snowy plover is provided along the Oregon coast, not just in the southern portion of the state where most populations of nesting snowy plovers are currently located. The guiding principles used to develop the conservation strategy are discussed below.

5.2.1. Guiding Principles

The OPRD guiding principles, herein set forth in this Habitat Conservation Plan (HCP) and included below, provide that OPRD will:

- Assist with and contribute to conservation and protection of the Pacific coast population of the snowy plover in Oregon;
- Manage for conservation and recovery of snowy plover and their habitat in a manner that balances this effort with human use of the Ocean Shore;
- Identify areas along the Oregon Ocean Shore where public use will be managed to reduce the likelihood of impacts to snowy plovers;
- Protect and restore habitat in critical locations at OPRD SPMAs;
- Work with the other resource agencies to manage for predators to minimize impacts on snowy plover breeding success and improve the survival of the snowy plover in occupied SPMAs and RMAs;
- Work to increase public support and understanding of snowy plover and habitat needs, in cooperation with partners;
- Work with other resource management agencies on habitat restoration, predator management, snowy plover population monitoring, snowy plover research, and public outreach, where appropriate to achieve cost efficiencies;
- Develop strategies that complement the habitat needs of other Ocean Shore wildlife (e.g., shorebirds, marine mammals, seabirds) in addition to snowy plover;
- Use future research as one of the criteria for guiding adaptive management principles to help in management of the snowy plover; and
- Seek assurances from USFWS about future human use of Oregon's beaches by completing an HCP and submitting an Incidental Take Permit (ITP) application. Following issuance of the ITP, OPRD will comply with the permit conditions, including implementation of the HCP.

Using these guiding principles as a basis for the development of the HCP, OPRD developed the following conservation and management approaches for conducting snowy plover management along Oregon's coast.

5.2.2. Conservation Approach to Site Selection

Historically snowy plovers nested at 21 or more separate sites along the Oregon coast. Today, only six sites (represented by one OPRD-owned SPMA and five RMAs owned by other landowners) are occupied by snowy plovers for breeding and wintering. Snowy plover habitat is subject to frequent and unpredictable natural changes due to coastal formation processes (including the occurrence or lack of major storm events) that change its suitability. Selecting relatively large areas for snowy plover management would increase the opportunity for averaging the effects of natural changes on snowy plover distribution and productivity. Sufficient breeding and wintering sites along the Oregon south, central, and north coast are needed to ensure availability of sufficient habitat given the potential for human disturbances to affect snowy plovers.

Sites along the north coast have the potential to play a particularly important role in snowy plover recovery because this area is closest to historically occupied sites to the north in Washington, and would provide a protected nesting area between sites in southern Oregon and Washington. This habitat should be of sufficient quantity and quality to allow breeding, foraging, brood-rearing, and roosting activities. The north coast sites will provide habitat to accommodate breeding and wintering snowy plover as their numbers increase and in the event of a demographic disturbance that destroys existing habitat on the southern and central coast.

Criteria for Selecting SPMAs and RMAs

Based on the above conservation approach for site selection, OPRD, along with other State and Federal agencies, developed the following criteria for identifying potential SPMAs/RMAs:

- Areas should provide breeding and wintering habitat for multiple pairs of snowy plovers within SPMAs/RMAs;
- Large, wide SPMAs/RMAs should be established rather than linear areas;
- Areas should be scattered geographically to provide for a well-distributed snowy plover population, yet close enough to facilitate snowy plover dispersal between occupied and unoccupied areas;
- Areas should provide all necessary habitat components (courtship, nesting, roosting, foraging and brood-rearing);
- Areas should be managed for quality habitat in sufficient amounts to minimize impacts of tides, weather, predators, and human use of the Ocean Shore;

- Areas should be established in locations that will provide ongoing and future management certainty. For example, Federal and State-owned land are more likely to conserve resources in perpetuity than privately owned land;
- The approach should be flexible so it can be adaptively managed as new information becomes available; and
- OPRD should seek State and local community support.

Based on these criteria, 16 separate areas along Oregon’s coast were identified for snowy plover management (Table 5-1). Of these 16 areas, the HCP focuses on up to five OPRD-owned or leased SPMA’s, which are discussed in greater detail below.

Table 5-1. SPMA’s and RMAs

Recovery Unit*	Snowy Plover Management Areas	Land Ownership and Management Designation	Miles	County
OR-1	Columbia River South Jetty	Owned by Army Corps of Engineers (Corps); leased by OPRD – SPMA	0.62	Clatsop
OR-1	Necanicum Spit	OPRD - SPMA	1.00	Clatsop
OR-2	Nehalem Spit	OPRD - SPMA	2.11	Tillamook
OR-3	Bayocean Spit	Adjacent to land owned by Corps - RMA	1.73	Tillamook
OR-4	Netarts Spit	OPRD - SPMA	2.01	Tillamook
OR-5	South Sand Lake Spit	Private - RMA	1.44	Tillamook
OR-8	<i>Sutton/Baker Beach**</i>	<i>Adjacent to land owned by U.S. Forest Service (USFS) - RMA</i>	4.00	Lane
OR-9	<i>Siltcoos Estuary/Dunes Overlook/ Tahkenitch Estuary</i>	<i>Adjacent to land owned by USFS - RMA</i>	6.87	Lane
OR-10	Tahkenitch South	Adjacent to land owned by USFS - RMA	2.00	Douglas
OR - 11	Umpqua River North Jetty	Adjacent to land owned by USFS - RMA	3.00	Douglas
OR-12	<i>Tenmile Estuary</i>	<i>Adjacent to land owned by USFS - RMA</i>	4.20	Coos
OR-13	<i>Coos Bay North Spit</i>	<i>Adjacent to land owned by U.S. Bureau of Land Management (BLM), Corps – RMA</i>	3.37	Coos
OR-15	<i>Bandon</i>	<i>OPRD - SPMA</i>	3.41	Coos
OR-15	<i>New River</i>	<i>Owned by Curry County and private, landowner and adjacent to land owned by BLM - RMA</i>	8.75	Coos
OR-17	Elk River	Private – RMA	2.27	Curry
OR-18	Euchre Creek	Private – RMA	1.13	Curry
TOTAL			47.91	

* Recovery Unit identified in the USFWS Recovery Plan; duplicate Recovery Unit numbers indicate more than one Snowy Plover Management Area is located in one Recovery Unit.

****Bolded and italicized** Snowy Plover Management Areas are shaded in gray and indicate that the site was occupied by snowy plover in 2006.

Targeted Areas for Snowy Plover Management

Of the 16 snowy plover management areas located on Oregon's coast, five of these areas are owned or leased by OPRD as part of park units (SPMAs). The remaining 11 areas (identified as RMAs) are owned by private landowners or counties, or are adjacent to federally owned lands (Table 5-1) but are managed by OPRD as part of the Ocean Shore. These 16 areas are located from the Columbia River South Jetty in Clatsop County to Euchre Creek in Curry County, and range in size from approximately 0.62 mile to 8.75 miles long. Six areas are currently occupied by snowy plovers during the breeding season (Table 5-1). Most, if not all, of these areas have been used by snowy plovers in the past during both the breeding season and winter.

The goal for all landowners that have snowy plover management areas is to restore sufficient habitat for snowy plover nesting and brood rearing to occur, reduce the amount of predators present, and keep human disturbance to a minimum. While human use can continue in these areas, the type of use that can occur will be restricted through implementation of management plans, developed when OPRD and other landowners begin managing SPMAs/RMAs for snowy plover occupancy, to reduce the potential disturbance to the snowy plover.

Of the five areas owned or leased by OPRD (approximately 9.15 miles), four of these SPMAs will be the primary focus for OPRD snowy plover conservation activities (refer to Figures 2-2 through 2-6) for this HCP. These SPMAs and the order of implementation are described below.

Under the HCP, the Bandon State Natural Area (SNA), including the habitat restoration area (HRA) and the area extending north to the south end of the China Creek access point parking lot, will be identified and managed as the Bandon SPMA. Within 1 year of issuance of an ITP, OPRD will complete a draft site management plan. USFWS would have 6 months after the completion of the draft site management plan to make a decision about whether to approve it. Active management of the Bandon SPMA will begin the nesting season following the completion and approval of the site management plan.

In addition, as many as four currently unoccupied areas will be identified as SPMAs and targeted for management of potential nesting populations of snowy plover over the term of the 25-year ITP. Three SPMAs will initially be managed by OPRD for nesting populations of snowy plover:

- Columbia River South Jetty,
- Necanicum Spit, and
- Nehalem Spit.

Within 2 years of obtaining an ITP, OPRD will prepare draft site management plans for these three SPMA as described below. Active management will begin the nesting season after site plans have been reviewed for potential approval by USFWS. Approval will be granted within 6 months of completion of the draft plan.

One additional SPMA, Netarts Spit, could also be managed if (1) Columbia River South Jetty, Necanicum Spit, or Nehalem Spit becomes occupied, and (2) one of the RMAs is not already under active, USFWS-approved management for snowy plover.

The five SPMA under OPRD's ownership or lease responsibility that form the basis of the conservation plan are described below. Descriptions of the 11 RMAs are provided in Appendix F.

Columbia River South Jetty – Unoccupied (Clatsop County)

The SPMA encompasses 0.62 mile of beach along the Columbia River within the park and is located north of the south jetty of the Columbia River. This SPMA is a river beach rather than an ocean beach. It is owned by the Corps but is under lease to OPRD until 2023 as part of Fort Stevens State Park, at which time OPRD will renew the lease or purchase the land. Under the lease-related site management plan OPRD develops with the Corps, OPRD can impose HCP restrictions. OPRD has the responsibility for management of the natural resources, facilities, and visitors within the lease area, except for any jetty maintenance projects undertaken by the Corps. Snowy plovers have not been observed here since 1983. The beach is relatively flat and wide, although narrow in some places (approximately 30 feet), with a relatively low foredune. The foredune height increases with great proximity to the jetty. Inland, the beach is overgrown with shore pine, European beachgrass, and some alder.

This SPMA has the potential for playing a particularly important role in snowy plover recovery because this area is closest to historically occupied sites to the north in Washington and would provide a protected nesting area between those in southern Oregon and Washington. This SPMA is one of three northern sites considered important because it is so far north relative to where snowy plovers are currently nesting in Oregon.

Snowy plover habitat could be restored in this SPMA by grading the vegetation to make the open sand area wider and flatter. A row of trees may be left to provide a visual barrier from the lookout tower at the south jetty. Some sections of the beach collect a lot of driftwood, which may require removal. With moderate effort towards restoration and recreation management, this SPMA could easily accommodate two or more pairs of breeding snowy plovers.

The proposed SPMA is a very small portion of the 4,500-acre Fort Stevens State Park. The park has 174 full hookup sites, 303 electrical sites, 19 tent sites, 15 yurts, hiker/biker sites, a day use area with beach access, 9 miles of bike trails, 5 miles of

hiking trails, a coastal wildlife-viewing platform, large historic fort site, and large administrative area. OPRD has full-time staff at Fort Stevens State Park.

There are two parking lots near this SPMA. From both lots, the public can access the river shore. The Oregon Department of State Lands governs the wet sand up to the mean high water mark as part of the Columbia River Estuary and currently has no restrictions on river shore driving in this area. There is an access point from the park road that provides for unofficial vehicular access to the river shore. OPRD manages the upland portion of the park and prohibits driving on the dry sand within this park so this access point will be closed, at least during the nesting season. Because of the ability to control access, the same recreational restrictions that are applied to the Ocean Shore wet sand will be in place for the river shore wet sand.

Necanicum Spit – Unoccupied (Clatsop County)

This SPMA is owned by OPRD and is a portion of its Gearhart Ocean State Recreation Area. The SPMA encompasses 0.74 mile along the Ocean Shore. Snowy plovers have nested here as recently as 2002. While the nest hatched, the brood failed shortly thereafter. In 2000, a nest hatched and at least one chick fledged. Habitat for this SPMA is good because much of it is flat and open, especially near the river mouth. There is some driftwood. A local birder regularly monitors this area.

While recreation use here is primarily limited to local residents, there is heavy use in the vicinity, which attracts predators. This is a popular dog-walking beach. Also, during the 4th of July, local residents gather on the beach to let off fireworks, which is prohibited under State rules. Although OPRD owns the SPMA, it has not developed the property, and therefore does not have full-time staff stationed there. The beach is closed to vehicle driving. Habitat restoration is not likely to be needed here, but additional docent outreach and supervision will be essential in helping to keep dogs on leash and driving off this section of the beach.

Nehalem Spit – Unoccupied (Tillamook County)

OPRD owns and manages this SPMA as part of Nehalem Bay State Park. The SPMA encompasses 2.11 miles of the Ocean Shore. The beach is very linear with steep foredunes (20 feet or wider). Extensive habitat restoration work would be needed for this site at the far south end of the spit. The area of the spit with restoration potential is miles from the northern boundary of the proposed SPMA. At the end of the spit, large amounts of driftwood accumulate, and would need to be removed annually as necessary. The jetty at the end of Nehalem Spit is owned by the Corps. Snowy plover have not been observed at this site since winter 1983 (one snowy plover observed) and summer 1984.

Nehalem Bay State Park includes a campground with 276 sites, 16 yurts, 17 horse campsites (maximum capacity of 68 horses), and a day use area with beach access. This SPMA includes a very popular horse-use beach and inland horse trails on the

spit. A horse concession operates between May and September. OPRD has staff members stationed full time at Nehalem Bay State Park. Equestrian access to the wet sand will be directed away from the spit end but will allow access to the wet sand portion of most of the spit. The beach is closed to vehicle driving.

Netarts Spit – Unoccupied (Tillamook County)

OPRD owns and manages this SPMA as part of Cape Lookout State Park. The SPMA encompasses 2.01 miles of the Ocean Shore. From the Cape Lookout State Park campground to almost the end of the spit, the foredune is very high, very stable, and covered with Shore pines (*Pinus contorta*), Scotch broom (*Cytisus scoparius*), and European beachgrass. At high tide the beach is very narrow in places. At the end of the spit the dunes are much lower and covered primarily with European beachgrass at the spit. There is a broad expanse of open beach during low tide and driftwood would likely need to be removed annually as necessary. A large area could easily be restored (bulldozed). A subsurface sewage disposal system is located on the spit, north of the campground. This beach is highly erodible. Portions of the beach further south from the spit are rocky (cobbles).

Snowy plover have not been observed at this site since 1982, when three birds were observed during the breeding season. The SPMA, which begins several miles from the campground at Cape Lookout State Park, is relatively isolated. Not many people travel the entire length of the spit; however, this area is popular for fishing and crabbing in Netarts Bay. The beach is closed to vehicle driving.

Cape Lookout State Park has 38 full hookup sites, 173 tents sites, 13 yurts, 3 log cabins, 4 group tent camping areas, a hiker/biker camp, and meeting hall. There is also a day-use parking area with beach access in this portion of the park. OPRD has full time staff member stationed at Cape Lookout State Park.

Bandon State Natural Area – Occupied (Coos County)

OPRD owns the Bandon SPMA. Only the Bandon State Nature Area (SNA) is included in this SPMA. The Bandon SPMA is 3.41 miles long.

OPRD has restored approximately 50 acres of habitat at Bandon SNA near the mouth of Two Mile River. Snowy plover have nested at this SPMA as recently as 2009. There were 17 nests producing 15 fledglings on the Bandon portion of the SPMA in 2004. Since 1991, 33 chicks have fledged from Bandon. The significant increase in the number of nests is due in part to the habitat restoration work accomplished by OPRD. OPRD intends to maintain this habitat area, which extends to the south end of the China Creek access parking lot, under the HCP. Bandon is also a popular wintering area for snowy plover.

Predator management activities (lethal control) have been occurring at Bandon and New River since 2002. Park rangers from Bullards Beach State Park provide

periodic maintenance. Recreation at this SPMA is moderate due to the distance from the beach access site. Driving (street vehicles) on the beach is currently allowed on only a small portion of the beach in front of Bandon SNA. Although vehicular access to the beach is blocked, OPRD's Ocean Shore Management Plan recommends that this section of beach open to driving be closed year-round. There is a serious problem with illegal all terrain vehicle (ATV) use, especially near Lower Four Mile at the park's southern boundary. Seasonal dry sand beach restrictions, including no driving, have occurred at Bandon SNA since 1997. The site is popular for dog walking, beach walking, and surf fishing. Some use occurs at night.

5.2.3. Management Approach

OPRD's HCP conservation strategy focuses on implementing snowy plover management activities at up to five OPRD-owned or leased SPMA's, implementing recreational use restrictions at these SPMA's and up to 11 RMA's, and implementing beach management activities on the Ocean Shore.

Implementation of the conservation measures at SPMA's and RMA's will depend on whether a site was occupied by nesting snowy plovers. The definition of occupancy is provided below.

Occupied Snowy Plover Management Areas

An *occupied* SPMA/RMA is an area where there has been at least one nest or nesting attempt in the previous 2 years within the management boundary. RMA's will be considered occupied if at least one nest or nesting attempt has been made in the previous 2 years within the RMA or on adjacent lands. Status of an occupied SPMA/RMA will change to *unoccupied* when nesting or nesting activity has not occurred in the area for two consecutive nesting seasons.

On OPRD-owned or leased lands, once the SPMA is determined to be unoccupied, it will be managed as an *actively managed* unoccupied SPMA.

- Two consecutive nesting seasons refers to nesting between March 15 and September 15 in any 2 consecutive years.

For example:

- Nesting activity occurred in 2002.
- March 15, 2003, through September 15, 2003 – no nesting or nesting activity occurs.
- March 15, 2004, through September 15, 2004 – no nesting or nesting activity occurs.
- September 16, 2004 – management area is considered unoccupied.

A previously identified unoccupied SPMA/RMA will be considered occupied if at least two snowy plovers are present and/or nest scrapes are discovered. The area will then be managed as occupied until July 15th. If a nest is discovered, then the SPMA/RMA will continue to be managed as an occupied area and will be recognized the next year as occupied.

Unoccupied Snowy Plover Management Areas

An *unoccupied* SPMA/RMA is an area that has suitable or potentially suitable habitat and other characteristics that may be attractive to snowy plovers for nesting.

Unoccupied SPMA/RMAs are specific areas that have been identified in this HCP to be managed to attract snowy plovers for nesting. To verify that a SPMA/RMA is unoccupied, surveys will be conducted. If no nests are discovered by July 15th, then the SPMA/RMA will be managed as unoccupied for that given year.

5.3. Conservation Plan

5.3.1. Conservation Measures

To obtain an ITP, OPRD must develop conservation measures that avoid, minimize, or mitigate impacts on snowy plovers resulting from activities it manages on the covered lands. To this end, approximately 48 miles of Ocean Shore have been identified to be managed as SPMA/RMAs as described above unless otherwise amended through implementation of the adaptive management measures. Currently, about 19.8 miles of the Ocean Shore are actively managed for snowy plover through seasonal recreational restrictions.

The proposed conservation measures will restrict some, but not all, of the covered activities that could occur on the Ocean Shore. The activities proposed for restrictions under the HCP are those most likely to adversely affect snowy plovers should they occur in or near nesting sites or near individual birds? The restrictions proposed under the HCP are focused on the SPMA/RMAs because covered activities that occur outside of sites targeted to attract nesting populations are not likely to result in impacts on snowy plovers. However, the covered activities may inadvertently result in harm to snowy plovers if the species is located in the vicinity of the activity. The conservation measures focused on SPMA/RMAs are expected to mitigate for recreational activities that may inadvertently affect snowy plovers somewhere along the 182 miles of Ocean Shore not specifically identified as SPMA/RMAs.

The only exception will occur when a snowy plover nests outside of one of these areas (but within the Ocean Shore on non-federally owned lands) that may be discovered during the annual population monitoring surveys. For these nests a 50-meter radius buffer will be put around the nest to protect the nest from human

disturbance, and an enclosure may be put around the nest, if necessary, to minimize the potential for predation.

Conservation measures are currently being implemented by OPRD and other landowners at specific locations occupied by snowy plovers along the Oregon coast (refer to Section 4.3.4). These measures include yearly monitoring; predator management including use of exclosures; seasonal dry sand beach restrictions; habitat restoration; and law enforcement activities. These measures have helped to increase snowy plover populations in Oregon. Under the HCP, OPRD will commit to continuing these snowy plover conservation and protection measures and/or expand them, as described below, for the entire term of the ITP.

Snowy Plover Management Activities

Snowy Plover Conservation Measures at Snowy Plover Management Areas

OPRD will conduct a number of natural resource related activities on the Ocean Shore related to snowy plover management at up to five of the SPMAs listed above. Conservation measures addressing snowy plovers involve predator management, managing volunteers who conduct public outreach and education to beach users, habitat restoration and maintenance work, and monitoring activities. These activities are described below.

Predator Management

OPRD will contract with the U.S. Department of Agriculture, Animal and Plant Health Inspection Service (APHIS), Wildlife Services or other comparable provider, to perform a variety of snowy plover predator management activities depending on the location; i.e., occupied or managed unoccupied SPMAs. Activities typically begin in February or March and continue into August. Methods used to manage predators may be both lethal (at occupied sites only) and non-lethal. Predator management may entail hazing of corvids, trapping and shooting corvids or mammals, and installing nest exclosures and/or fencing. OPRD staff members will assist the APHIS contractor, as needed.

Public Outreach and Education

OPRD will recruit and train volunteers to serve as docents for public outreach and education efforts on the Ocean Shore for SPMAs. These individuals will be stationed at appropriate beach accesses for at least 20 hours per week, including weekends from May through August. They will be available to advise beach users about any beach restrictions, and to answer questions regarding snowy plovers. Occasionally these individuals will also help clean up the beach by removing litter. Informing and educating the public is an important preventive measure in protecting breeding snowy plovers. OPRD will also provide signage at access points to inform the public of the presence of nesting snowy plovers and the importance of snowy plover protection

measures. Signage will also be installed at SPMA's to indicate the presence of nesting sites and the boundaries of the restricted areas.

Habitat Restoration and Maintenance

Habitat restoration work has been successful in reclaiming snowy plover habitat in Oregon. Restoration efforts have historically included removal of European beachgrass by hand pulling, burning, scarification, spraying with seawater, and removal with a front-end loader, herbicide application, and planting with native vegetation. At some sites, European beachgrass has been bulldozed and the upper beach has been graded, allowing overwash areas to occur during winter storm events, limiting beachgrass regrowth.

Approximately 50 acres of snowy plover habitat in Bandon SNA have been restored by OPRD near the mouth of Two Mile Creek. This restoration effort, begun in fall 2002, resulted in the area being used by snowy plover for nesting during the 2003 to 2006 nesting seasons. Maintenance of this area will continue under the HCP.

Future restoration of as much as 40 acres will be conducted by OPRD at the Columbia River South Jetty SPMA and the Nehalem Spit SPMA, and, if needed, at the Necanicum Spit SPMA. The restoration efforts at Nehalem Spit SPMA, and potentially Necanicum Spit SPMA, will be conducted within 2 years of completing the site management plans if called for in their respective site management plans. Habitat restoration will be conducted within 5 years of completing the site management plan for the Columbia River South Jetty SPMA to accommodate the schedule of ongoing restoration efforts being conducted by the Corps (the lessor), in coordination with OPRD. Removal of European beach grass will be the focus of these restoration efforts, all of which will be completed by a contractor outside of the snowy plover nesting season (primarily from October through December). Effective control of European beachgrass will require ongoing maintenance efforts at each of the SPMA's, and OPRD is committed to maintaining SPMA's for which it has management responsibility so that European beachgrass does not become re-established.

Habitat restoration activities would be conducted within portions of an SPMA consistent with applicable local comprehensive plans and zoning ordinances as specified in each site's management plan.

Monitoring, Reporting, and Enforcement Activities

Monitoring, reporting, and enforcement activities are outlined below. For more information about commitments to monitoring, reporting, and enforcement, see Section 5.2.2, "Goals and Actions Implementing the Conservation Measures."

Detect/Non-detect Monitoring

OPRD staff members will continue to participate in detection/non-detection monitoring activities along the Ocean Shore to determine whether nesting populations of snowy plovers are present. Detect/non-detect monitoring will occur at the beginning of the nesting season (March) and will continue until July 15 as specified in the monitoring protocol. Detection/non-detection monitoring will be conducted at least twice monthly.

The results of the detection/non-detection monitoring surveys will be summarized in the annual compliance report submitted to USFWS, as described below.

Breeding Population Monitoring

OPRD will continue to provide funding in cooperation with several State and Federal agencies for the Oregon Natural Heritage Information Center (ORNHIC) to conduct breeding population monitoring at occupied sites. Should the current funding structure or interagency cooperation fail, OPRD will ensure that this monitoring is continued at OPRD-owned or leased SPMAAs.

Breeding population monitoring will be conducted daily during the breeding season (April to September). Monitoring activities will be designed to collect information on snowy plover population, habitat changes, and habitat use. In addition to gathering snowy plover population data, monitors will note and record footprints, vehicle tracks, and animal tracks within the restricted areas. Monitors will also note any humans or animals located within the roped off areas.

The results of breeding population monitoring will be communicated (e.g., via email) to the USFWS once a month. Monthly reports will focus on ongoing concerns, such as recreational use violations or predation at a particular SPMA. This information will also be documented in an annual report provided to the USFWS for review and will be used to determine the effectiveness of the snowy plover conservation management activities and to make adaptive management decisions. A summary of the information collected during breeding population monitoring will also be included in the annual compliance report described below.

Wintering and Breeding Window Surveys

OPRD will continue to provide staff to assist with conducting wintering and breeding window surveys at the currently occupied sites and will provide staff to conduct the surveys at new SPMAAs as they become occupied. These surveys will be conducted as indicated in the Monitoring Guidelines for the Western Snowy Plover, Pacific Coast Populations (Appendix J in the Final Recovery Plan [U.S. Fish and Wildlife Service 2007]) and the results will be compiled annually and submitted to USFWS.

Annual Compliance Reporting and Evaluation of the HCP

OPRD will compile and provide an annual report to the USFWS documenting its management actions to date and indicating anticipated efforts for the following year. The following key information will be included in the annual report.

- Summary information collected during the detection/non-detection, wintering and breeding window surveys, and breeding population monitoring efforts, including observations of snowy plover nests outside of managed SPMAs and RMAs. These data should include a summary of trends in the snowy plover breeding population (adults, fledglings, chicks, and eggs).
- Occurrences of take.
- Status of site management plans in development.
- Status of habitat restoration and maintenance efforts at each actively managed SPMA.
- Public outreach and involvement efforts.
- Predator management efforts at SPMAs.
- Recreational use observations in the vicinity of managed nesting areas, including observations by beach rangers, monitors, docents, volunteers, and other State Park staff.
- Anticipated management and conservation efforts for the following annual reporting period.

OPRD will work with the USFWS to develop and implement protocols for assessing the effectiveness of the conservation strategies based in part on the information provided in the annual report. These protocols will be developed in collaboration with other snowy plover partners (Federal, State, and local agencies and private landowners) and will provide a mechanism for the USFWS to evaluate the effectiveness of the HCP on an annual basis. Based on the results of this assessment, OPRD will work with other managers, the USFWS, and the Oregon Department of Fish and Wildlife (ODFW) to implement appropriate adaptive management measures, if necessary, to address declines in snowy plover populations or significant degradation of habitat within SPMAs. (For more information about the adaptive management measures, see Section 5.3.3, “Adaptive Management.”)

In addition to developing and submitting the annual report, OPRD, USFWS, and ODFW will meet every 5 years following issuance of the ITP to evaluate the performance and effectiveness of the conservation measures in minimizing and mitigating effects on snowy plover. This effort will be used to inform necessary adaptive management measures, should it be determined that the covered activities are resulting in a decline in snowy plover populations or degradation of habitat.

Enforcement

OPRD will continue to provide funding for the three full-time beach ranger positions that are currently in place to encourage compliance with beach restrictions. OPRD will also work with the Oregon State Police and/or local law enforcement offices to provide additional enforcement support where necessary and possible. Other OPRD staff members will be available for enforcement on OPRD-owned sites and to assist with monitoring as needed.

Table 5-2. Conservation Measures Specific to OPRD Occupied and Unoccupied Snowy Plover Management Areas

OPRD Occupied Snowy Plover Management Areas
<ul style="list-style-type: none"> ▪ Conduct habitat restoration and maintenance at SPMA's during the non-breeding season, as necessary. ▪ Conduct predator management activities. ▪ Conduct public outreach and education, including providing signage at entrance points. ▪ Conduct detect/non-detect and breeding population monitoring during the nesting season. ▪ Report findings to the USFWS annually and work with snowy plover partners to evaluate the effectiveness of the HCP. Review the program every 5 years. ▪ Continue to provide enforcement of recreational use restrictions in the form of three full time beach ranges, OPRD staff, and support from local law enforcement and State Police as needed. Install signage at all SPMA's to indicate restricted areas. ▪ Complete a draft site management plan at Bandon within one year of ITP issuance for USFWS approval within 6 months of completion of the draft plan.
OPRD Unoccupied Snowy Plover Management Areas
<ul style="list-style-type: none"> ▪ Prepare draft site management plans for the first three actively managed SPMA's within 2 years of ITP issuance for USFWS approval within 6 months of completion of the draft plans. ▪ Conduct public outreach and education; provide interpretive volunteers at selected SPMA's. ▪ Conduct detect/non-detect surveys pursuant to site management plan and USFWS protocols. ▪ Conduct habitat restoration and maintenance work, within 2 to 5 years of site management plan completion, depending on the SPMA, during the non-breeding season pursuant to the site management plan. ▪ Conduct predator management activities (e.g., garbage removal) pursuant to site management plan. ▪ Report finding to the USFWS annually and work with snowy plover partners to evaluate the effectiveness of the HCP. Review the program every 5 years

Snowy Plover Conservation Measures at Recreation Management Areas

In addition to the commitments described above at OPRD-owned or leased SPMA's, OPRD will also review and comment during the development of site management plans at RMA's. In the event that an RMA becomes owned by OPRD and is actively managed for nesting populations of snowy plover, the snowy plover management measures described above will be implemented at that site.

Public Use/Recreation Management

OPRD has management responsibility for recreational activities that occur along Oregon's Ocean Shore. It manages recreation on the State Park units, as well as all areas of the sandy Ocean Shore where snowy plovers could occur. Most recreational

activities are allowed to occur on the Ocean Shore without restrictions. However, a number of activities are currently restricted either seasonally or year-round at various location along the Ocean Shore. These restrictions are intended to protect snowy plover nesting and other natural resource components of the Ocean Shore, and to assure quality beach experiences for the public.

Proposed Recreational Use Restrictions

To minimize the impacts of the covered activities on snowy plovers, OPRD will restrict certain recreation activities on managed SPMA/RMA for the permit term as described below and summarized in Table 5-3 and described below.

Table 5-3. Public Use/Recreational Management Conservation Measures

Occupied Management Areas
<p>For all occupied SPMA/RMA, recreational use restrictions would include the following:</p> <ul style="list-style-type: none"> ▪ Dry sand recreation restrictions will be implemented, including roping off key areas of the beach around nesting sites; ▪ Vehicles prohibited on the dry and wet sand (except in limited circumstances and under permit from OPRD, and for administrative use); ▪ Non-motorized vehicle use prohibited on the dry and wet sand; ▪ Dogs prohibited; ▪ Kite flying prohibited; and ▪ Three full-time beach rangers provided as well as additional support as needed to facilitate enforcement activities.
Unoccupied Actively Managed Areas
<p>For unoccupied SPMA/RMA being actively managed for snowy plover occupancy the following seasonal (breeding) use restrictions will be imposed upon request from the landowner after OPRD coordination with USFWS:</p> <ul style="list-style-type: none"> ▪ Dogs required to be on-leash; ▪ Vehicles prohibited on the dry and wet sand (except in limited circumstances, and under permit from OPRD, and for administrative use); and ▪ Three full-time beach rangers provided as well as additional support as needed to facilitate enforcement activities.

These restrictions will differ depending on whether a site is occupied by nesting snowy plovers. The extent of these restrictions will be developed in consultation with the USFWS through the completion and approval of site management plans. Special considerations specific to implementation of these restrictions at RMA are discussed in greater detail below.

Dog Exercising – Dogs are required to be on leash year-round at all beaches adjacent to State Parks, and either on leash or under voice command within the communities of Seaside, Rockaway, and Cannon Beach. Under the HCP, dogs will be required to be on leash at all unoccupied SPMA/RMA being actively managed for snowy plover occupancy under a plan developed in coordination with the USFWS. Once a SPMA or RMA is occupied, dogs will be prohibited during the nesting season.

Driving and Non-Motorized Vehicle Use – Beach driving includes ATVs/off-highway vehicles (OHVs), ordinary motor vehicles, non-motorized vehicles, and remote-control cars. 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. None of these areas is adjacent to any of the SPMAs/RMAs, or where snowy plovers are known to occur. All other beach segments are off-limits to ATV/OHV use without a drive-on beach permit or for administrative uses, such as to provide access for emergency and enforcement vehicles, snowy plover monitoring, and land management activities. The HCP does not propose further restrictions on ATV/OHV use.

The Ocean Shore is generally open to street legal motor vehicle access unless otherwise posted. Beaches closed to driving may only be accessed with a vehicle permit issued by OPRD, or in the event of an emergency. Approval of drive-on beach permits and vehicle permits for motorized transport vehicles is contingent on the applicant's demonstration that such activities would avoid effects on snowy plover.

Driving is currently prohibited on all occupied nesting areas during the breeding season and is prohibited year-round south of Two Mile Creek near Bandon SNA. It is also prohibited in other areas as directed under Oregon Administrative Rules (OAR) (e.g., Sutton Beach, Siltcoos south to south of Tahkenitch, the Tenmile area, Nehalem, etc.). Driving is allowed on the beach at Bandon SNA north of Two Mile Creek but there is no physical access to the beach for driving at this location.

Under the HCP, driving (including non-motorized vehicle use) will be restricted from all managed SPMAs/RMAs during the breeding season whether occupied or not.

Kite Flying – Kite flying is currently unrestricted on the Ocean Shore. Under the HCP, kite flying will be prohibited during the nesting season at occupied SPMAs/RMAs. Similar activities, such as parasailing, hang gliding, and use of remote-control planes, will also be prohibited during the nesting season.

Other Dry Sand Activities – The public uses the dry sand portion of the Ocean Shore for a variety of recreational activities, including pedestrian traffic, nearshore and surf activities, camping, walking, jogging, hiking, picnicking, horseback riding, beach fires, beachcombing, driftwood collection and removal, and many other activities, as listed in Appendix D. These activities and any current restrictions are described in detail in Section 3, "Covered Activities."

As part of the HCP, these and all other activities will be prohibited from occurring within the dry sand during the nesting season at occupied SPMAs and RMAs. In addition, key areas around nesting sites and access points will be roped off and signage will be provided to indicate the presence of nesting snowy plovers and the applicable recreational use restrictions. These activities will be allowed to continue oceanward of the ropes, which includes the wet sand area and a portion of the dry

sand unless otherwise prohibited by the HCP as described above. Certain activities that are unlikely to occur on the wet sand (e.g., camping, beach fires, and picnicking) would effectively be prohibited from occurring in occupied SPMA/RMA during the nesting season. OPRD field staff will install symbolic fencing (ropes and / or signs) around nesting areas at the start of the snowy plover nesting season at OPRD-owned nesting areas, and will provide signs for all SPMA/RMA, regardless of ownership. Fencing will be installed in the dry sand area around the nest, but will not extend onto any wet sand areas.

The symbolic fencing will be checked regularly, and maintained as needed. The fencing will be removed after September 15 unless there are no broods present within the nesting area, in which case the symbolic fencing may be removed earlier. This activity will reduce the potential for take from recreational activities such as horseback riding, pedestrian traffic, and other human activities conducted on foot.

Mechanism for Implementing Recreational Use Restrictions on Lands Owned by Other Landowners (RMAs)

Based on OPRD's authority to manage recreational use of the Ocean Shore, OPRD is required to provide authorization to restrict recreational activities within the covered lands at RMAs. As discussed in Section 2, this area extends from the extreme low tide line to the mean high tide line adjacent to Federal lands and from the mean low tide line to the statutory or actual vegetation line, whichever is most landward, on all other lands. Under this HCP, OPRD will potentially implement recreational use restrictions at up to 11 RMAs, which include.

- Bayocean Spit (adjacent to land owned by the Corps);
- South Sand Lake Spit (privately owned);
- Sutton/Baker Beach (currently occupied and adjacent to land owned by the USFS);
- Siltcoos Estuary/Dunes Overlook/Tahkenitch Estuary (currently occupied and adjacent to land owned by the USFS);
- Tahkenitch South (adjacent to land owned by the USFS);
- Umpqua River North Jetty (adjacent to land owned by the USFS);
- Tenmile Estuary (currently occupied and adjacent to land owned by the USFS);
- Coos Bay North Spit (currently occupied and adjacent to land owned by the Corps and BLM);
- New River (currently occupied and owned by Curry County and private individuals, adjacent to land owned by BLM);
- Elk River (privately owned); and
- Euchre Creek (privately owned).

If an RMA becomes occupied, but a site management plan does not exist, OPRD will implement the recreational use restrictions described above within the covered lands. OPRD will issue and continue to enforce recreational use restrictions within the full extent of the RMA until an agreement is reached between USFWS and the landowner and/or a site management plan is developed and OPRD is notified of any changes that may modify recreational use restrictions to a more focused area.

In the event that a USFWS-approved site management plan has been developed, OPRD will implement recreational use restrictions as directed by the site management plan. If an RMA is unoccupied, OPRD will only implement recreational use restrictions at the request of the landowner and after consultation and collaboration with USFWS and ODFW.

OPRD will also seek to modify the Oregon State Rule of Ocean Shore Management to provide an ongoing mechanism for recreational use restrictions.

OPRD will provide supervision, enforcement, and ropes and/or signage at RMAs because these actions cannot legally be implemented within the RMA by the landowner. For RMAs adjacent to Federal land, the Federal landowner will install ropes and/or signage on their lands.

Protections for Nests Outside of Targeted Areas

If a snowy plover should nest outside of an occupied or unoccupied SPMA or RMA within the covered lands, OPRD will install fencing around the individual nest and will consider installing a nest enclosure after consultation with USFWS. Specifically, OPRD will install a 50-meter-radius roped buffer around the nest that allows access along the wet sand, and will determine if use of an enclosure to protect the nest from predation is in the best interest of the nest.

The fenced buffer will consist of ropes affixed to light poles in the dry sand area only (wet sand areas will not be roped off). Signs will be located at intervals around the buffer informing the public of the restriction. No other active management will occur in these areas, including no additional protection of broods (chicks).

Many of these areas receive high recreational use and the probability of snowy plover nesting outside of SPMAs/RMAs is quite low. However, if snowy plovers nest on OPRD lands outside an SPMA consistently and predictably (3 years in a row), and there is nesting success at least 2 of the 3 years, OPRD will consult with the USFWS to consider adding the site to the list of SPMAs. For more information about this adaptive management measure, see Section 5.3.3, “Adaptive Management Measures.”

Enforcement of Recreational Use Restrictions

OPRD will also continue to provide three full-time beach rangers to enforce compliance with all Ocean Shore and State Park rules, including beach use

restrictions designed to protect snowy plover. Additional senior State trooper support will also be solicited, where needed.

Adequacy of Recreational Use Restrictions at Unoccupied SPMAs

Recreational use restrictions at unoccupied SPMAs are limited to prohibitions on the use of vehicles and a requirement that dogs be on leash during the breeding season. Discussions between OPRD and the snowy plover working group revealed that lack of adequate habitat is considered the limiting factor at the Columbia River South Jetty and Nehalem SPMAs, and that predator management and enforcement of current recreational use restrictions are the limiting factors at the Necanicum SPMA. It was also noted that if vehicle use was prohibited and dogs were kept on leash, then snowy plovers would likely occupy the new sites. Thus, OPRD believes that placing restrictions on other recreational activities is unnecessary. The site management plans that OPRD develops in coordination with USFWS will specifically provide for habitat restoration, predator management, public outreach and education, and monitoring, reporting, and enforcement, as appropriate for each SPMA, to facilitate snowy plover occupancy. Site management plans must be approved by the USFWS.

Beach Management

All beach management activities, including marine mammal strandings and removals, public safety, external and internal law enforcement, and response to boat strandings, are conducted in a manner that attempts to avoid take of snowy plover. OPRD will consult with USFWS regarding any of these activities that will occur in an occupied or unoccupied SPMA prior to conducting the activity, unless there is an emergency situation. Emergency situations are considered to be unforeseen circumstances, which are addressed in Section 7 of this HCP.

5.3.2. Goals and Actions Implementing the Conservation Measures

Snowy Plover Management

Habitat Restoration

Goals: Increase the amount and quality of available habitat for nesting and wintering snowy plovers at OPRD-owned SPMAs.

Historically, snowy plovers nested and/or wintered at more than 21 sites along the Oregon coast. In Oregon, snowy plover nest primarily along the sandy beaches or spits. In many cases, those beaches were much wider than they are today, with little adjacent foredune. Much of the snowy plover's habitat has been lost due to the introduction and spread of European beachgrass. With the removal of this invasive species (and others), and the re-contouring of dune areas (including lowering of the

foredune where necessary), snowy plovers may once again begin to use these areas for nesting and wintering activities.

Habitat restoration efforts have proven successful at restoring and maintaining snowy plover habitat at currently occupied SPMAs/RMAs. However, some level of habitat restoration and maintenance is needed at most of these areas.

Action: This management action involves restoring coastal dune habitat through the removal of invasive species (e.g., European beachgrass and gorse) as well as lowering the foredune to allow storm wave overwash to occur. This work will be done in areas that will not impact existing structures or cultural resources.

The acreage and location of habitat restoration efforts will be specified in a site management plan to be developed by OPRD and approved by the USFWS for each SPMA with a maximum of 40 acres at each currently unoccupied SPMA (see Appendix A for a general outline of site management plans). Restoration work will begin within 2 years following the completion and approval by USFWS of each SPMA site management plan except for the Columbia River South Jetty SPMA owned by the Corps but leased by OPRD. For this SPMA, OPRD will work with the Corps and Clatsop County to obtain the necessary approval and consent to do restoration work according to the Corps schedule. Restoration work will begin within 5 years following the completion and USFWS approval of the site management plan.

Habitat Protection

Goal: Protect habitat or potential habitat in OPRD SPMAs by limiting the development of new facilities (including trails) located in an SPMA.

Action: Whenever OPRD staff members desire to develop a facility within an OPRD SPMA boundary, OPRD staffers in cooperation with ODFW and USFWS will inspect the area, review the proposed project, and determine whether the development could potentially impact snowy plover. No development that will increase the capacity of existing facilities will occur within a SPMA.

Predator Management

Goal: Improve nesting success of snowy plover by reducing predator populations.

Predators are one of the primary causes for the loss of snowy plover adults, eggs, and chicks. Predator management efforts began in 1999 and have increased in intensity over the last few years. In 2001, an interagency Predator Management Plan was prepared for the snowy plover. From this plan, an annual action plan will be prepared that addresses predator management activities for the upcoming breeding season at the occupied SPMAs/RMAs.

Predator management activities include, but are not limited to, the following lethal and non-lethal control methods:

Non-lethal Control

- Support, increase or improve trash management;
- Purchase and install special trash receptacles that prevent animal access to trash;
- Relocate live trapped animals (abandoned domestic animals, such as cats and dogs) to nearby animal shelters;
- Employ aversion methods that harass or deter predators such as electronic calls, vehicle harassment, repellants, effigies, electrified or non-electrified exclusionary nest site fencing and exclosures, and habitat removal;
- Prohibit fish cleaning on the beach;
- Remove beached marine mammals and seabirds; and
- Provide public education.

Lethal Control

- Shooting;
- Euthanizing;
- Snaring/Trapping;
- Denning;
- Employing avicide;
- Egg Oiling;
- Using Snap Traps; and
- Performing rodenticide operations.

The effects on snowy plovers of all chemicals used by OPRD for lethal control of predators were analyzed by USFWS in a Biological Opinion published in 2001 (U.S. Fish and Wildlife Service 2001b). Future changes in chemical applications and the potential effects on snowy plover would be addressed through reinitiation of consultation with the USFWS. OPRD or its contractors are required to comply with the terms and conditions of that Biological Opinion, or any amendments to that Biological Opinion, for all predator control activities undertaken in support of the HCP conservation measures.

Predator management activities will vary at each site depending on the type of predators present. The site management plans will address what predator species are present, the extent of the problem, and what efforts will be undertaken to address the problem. Corvids will be the most difficult predator to manage. At unoccupied

SPMAs/RMAs, one of the primary predator management goals is the removal of garbage, which may attract predators to the site.

Action: Continue to participate in the development and implementation of annual predator management action plans. OPRD will provide financial assistance for predator management activities on OPRD SPMAs for which it has snowy plover management control, including full funding for garbage removal at OPRD unoccupied SPMAs and implementation of the annual predator management action plans for all occupied OPRD SPMAs. In addition, OPRD will facilitate predator management efforts through a cooperative agreement with APHIS or a similar organization, for all lethal control methods, and will continue to renew the agreement as necessary based on discussions with USFWS. Exclosures will continue to be used where they are necessary and appropriate.

Monitoring and Reporting

Monitoring is an important component of any program involving the recovery of a listed species or for habitat management purposes. Baseline data established before management actions begin will serve as the starting point for knowing whether goals and objectives are being met. Three types of monitoring will occur: wintering and breeding window surveys, snowy plover breeding population monitoring, and detect/non-detect monitoring.

Wintering and Breeding Window Surveys

Goal: Continue to survey for wintering and breeding populations.

Action: OPRD will continue to provide staff to assist with conducting wintering and breeding window surveys at the currently occupied sites and will provide staff to conduct the surveys at new SPMAs as they become occupied. These surveys will be conducted as indicated in the Monitoring Guidelines for the Western Snowy Plover, Pacific Coast Populations (Appendix J in the Final Recovery Plan [U.S. Fish and Wildlife Service 2007]) and the results will be compiled annually and submitted to USFWS.

Snowy Plover Breeding Population Monitoring

Goal: Determine the nesting success of the breeding population of snowy plovers in occupied SPMAs.

Several State and Federal agencies participate in a joint effort to monitor the breeding population of the snowy plover along the Oregon Coast. This monitoring occurs each year beginning around April 1 and continuing through September 15. Each of the participating agencies, including OPRD, ODFW, USFWS, BLM, and USFS, commit financial resources for monitoring activities conducted by ORNHIC.

Action: OPRD will continue to contribute to the joint funding of annual breeding population monitoring activities of the snowy plover for occupied SPMAs for the

25-year permit term. If the joint funding effort ceases for some reason, OPRD will conduct its own breeding population surveys following accepted USFWS protocols at occupied SPMA's.

Information from the breeding bird monitoring will be reported both monthly and annually to the USFWS by ORNHIC, and will be used to determine whether the snowy plover numbers are increasing or decreasing. The information will also be used to infer possible reasons for any increase or decrease along the Oregon coast and to assess whether additional habitat restoration, predator management, law enforcement, and/or public outreach efforts are needed. A summary of the information collected during breeding population monitoring will also be included in the annual compliance report submitted by OPRD to USFWS.

Snowy Plover Detect/Non-Detect Monitoring

Goal: Determine whether snowy plovers are dispersing to unoccupied SPMA's.

Action: OPRD will perform regularly scheduled USFWS-approved detect/non-detect monitoring at unoccupied OPRD SPMA's pursuant to an established site management plan for the area. The frequency of the monitoring will be set forth in the site management plans established by OPRD, but will occur twice monthly during the nesting season. Detect/non-detect monitoring will continue until July 15 as described in the monitoring protocol. During these surveys, the monitor will record existing habitat quality, predator presence or signs of their presence, recreation use, and snowy plover food availability. If detected birds begin nesting at these locations, breeding population surveys will be implemented.

A summary of the information collected during detect/non-detect monitoring will be included in the annual compliance report submitted by OPRD to USFWS.

Annual Compliance Reporting and Evaluation of the HCP

Goal: To provide the USFWS with an annual report on management actions and conservation measures implemented by OPRD in accordance with the HCP. This information will be used by the USFWS to determine whether OPRD has been implementing the management actions required and whether the conservation measures in the HCP are effective.

Action: OPRD will compile and provide an annual report to the USFWS with the following information, including but not limited to:

- Summary of the detect/non-detect data collected over the course of the year;
- Summary of the breeding population data collected over the course of the year;
- Summary of wintering and breeding window survey data collected over the course of the year;
- Observations regarding non-compliance of recreational use restrictions;

- Take of eggs, nests, and adults;
- Snowy plover management activities conducted for the year, including but not limited to predator management activities, habitat restoration and maintenance, and public outreach and education efforts; and
- Anticipated management and conservation efforts for the following annual reporting period.

OPRD will work with the USFWS to develop and implement protocols for assessing the effectiveness of the conservation strategies based in part on the information provided in the annual report. These protocols will be developed in collaboration with other snowy plover partners (Federal, State, and local agencies and private landowners) and will provide a mechanism for the USFWS to evaluate the effectiveness of the HCP on an annual basis. Based on the results of this assessment, OPRD will work with other managers, the USFWS, and ODFW to implement necessary and appropriate adaptive management measures to address declines in snowy plover populations or significant degradation of habitat within SPMA's (for more information about the adaptive management measures, see Section 5.3.3, "Adaptive Management").

In addition to developing and submitting the annual report, OPRD will review, with the USFWS and ODFW, the performance and effectiveness of the implementation management actions described in the HCP and any site management plan. This review will be conducted every 5 years following issuance of the ITP.

Public Outreach and Education

Goal: Inform coastal park staff, volunteers, and the general public of the ecology of the snowy plover, the significance of the Oregon's sandy beaches as habitat for the snowy plover and the species' recovery, the importance of OPRD's monitoring and habitat restoration and protection efforts, the role predators play, and the importance of working together to conserve the species and its habitat.

The public outreach and education efforts needed for each OPRD SPMA will vary. Specific outreach and education efforts will be identified in the site management plans for each area.

Actions: This goal will be achieved through the measures described below.

Coordination with other Agencies

OPRD will continue to work with other State and Federal agencies in the development of outreach and educational materials to ensure a consistent message and allow for cost efficiencies. Efforts in the past have included the development of a snowy plover "Share the Beach" brochure, table tents, bookmarks, and interpretive panels.

Department Staff – Education and Interpretation

Provide training on the requirements of the HCP to all State Parks staff assigned to coastal parks and programs, and to all related volunteers. Park staff members will be trained on the natural history and identification of snowy plover so they can field questions from visitors.

Provide Visitor Information

The success of the snowy plover management measures depends on the support of the people who visit Oregon's beaches. Park visitors need to be informed about the plight of the snowy plover and the part the visitors themselves play in protecting the species.

OPRD will work with the Oregon Western Snowy Plover Working Team in coordinating outreach and education efforts. OPRD will undertake the following activities:

a) Interpretive Programs

Continue to assist with implementation of interpretive programs about snowy plovers at Bullards Beach, Honeyman, Nehalem Bay, and Sunset Bay State Parks each year. Additional programs will be offered at other State park sites, including Fort Stevens State Park, Nehalem Bay State Park, Cape Lookout State Park, and Harris Beach State Park. Programs in these areas will focus on shorebirds in general and snowy plovers in particular. OPRD will include discussions of snowy plover ecology in nature talks and walks, campfire programs, and at other direct public contact events.

b) Webpage

Develop a snowy plover webpage that contains the HCP, the management action summary matrix, the list of SPMA/RMA beaches, maps of these areas, and the efforts OPRD is currently undertaking to help recover the snowy plover. Links to other agencies that manage snowy plover habitat will be provided.

c) Brochures

Distribute copies of "Share the Beach" brochure to SPMA visitors. In addition, OPRD will prepare a snowy plover brochure describing OPRD efforts in snowy plover conservation and recovery and how park visitors can help. These brochures will be made available at all coastal State parks. OPRD will also prepare a brochure for occupied OPRD SPMA's featuring an aerial photo showing the areas with beach use restrictions, a brief description of snowy plover biology, an explanation of why OPRD is working toward snowy plover conservation and recovery, and a list of alternative beaches for recreation use.

d) Signs/Kiosks

Signage to be implemented as part of the conservation plan will include:

1. Informational signs at access points – OPRD will develop an information sign to be installed at SPMA State park kiosks at beach access points.
The purpose of these signs will be to inform the public of the presence of nesting snowy plovers, the applicable recreational use restrictions, and the importance of snowy plover protection measures.
2. Recreational use restriction signs at SPMAs/RMAs – OPRD will install signage at SPMA/RMA boundaries to indicate the type and extent of the dry sand restrictions.
3. Carsonite signs at nesting locations – In locations outside of SPMAs/RMAs where snowy plovers have been observed nesting, OPRD will work with the USFWS to install signage as appropriate to indicate the presence of nesting snowy plovers and the applicable recreational use restrictions.

e) Park Reservations

Many coastal campsites are reserved by telephone. Receipts are sent to each person making a reservation. For those located in areas where there are beach restrictions, a statement will be included on the receipt notifying individuals of the beaches with use restrictions and requesting their cooperation in adhering to any restrictions.

f) Volunteers

Volunteers will continue to serve at occupied OPRD SPMAs. OPRD has volunteers who contribute 20 hours per week from May through August at the China Creek parking lot at Bandon SNA. These volunteers provide information to visitors about the purpose for beach restrictions and the plight of snowy plovers. They also record information on the type of recreation use that is occurring, document whether anyone is violating the restrictions, and report observed violations to the USFWS. As additional OPRD SPMAs become occupied, OPRD will provide volunteers to distribute and record the information being provided at Bandon SNA.

g) Interpretive Panels

Bandon SNA has an interpretive panel addressing snowy plover nesting and habitat protections. This panel will be replaced as needed. Similar interpretive panels will be prepared and installed for other OPRD SPMAs that become occupied.

Public Outreach

Public outreach efforts are important so the public understands the needs of the snowy plovers and the efforts OPRD is undertaking to assist in recovery of this species. OPRD will provide programs and/or information about the snowy plover to community groups, chambers of commerce, school groups, and recreational enterprises (boat charters, etc.) where the opportunity arises.

Coordination

Goal: Improve efficiencies and cost of implementation by working with other agencies through cooperative efforts.

Action: Work with land and resource managers on coordinating efforts pertaining to predator management, habitat restoration, monitoring, and public outreach and education on an annual basis and report on these efforts to the USFWS, until no longer deemed necessary by the USFWS.

Public Use/Recreation Management

Recreation Management

Goal: Reduce disturbance to snowy plover by recreational users.

Certain recreational activities have a greater potential threat to snowy plover and their habitat than other types of recreation activities. For instance, dogs off leash have the potential to flush snowy plovers off their nest or kill chicks. If the adult snowy plover is off the nest for too long a time, heat, cold, wind, or predators may kill eggs or chicks.

Action: OPRD will implement the recreational use restrictions outlined in Section 5.3.1 at SPMAs and RMAs. OPRD will also seek to modify the Oregon State Rule of Ocean Shore Management to provide an ongoing mechanism for recreational use restrictions.

OPRD will install symbolic fencing (ropes and /or signs) around the nesting areas in occupied OPRD SPMAs. Signs will be installed by OPRD at the boundaries of restricted areas in RMAs and roping will be installed by OPRD on RMAs that are not adjacent to Federal lands. No recreational use will be allowed within the roped off and/or signed areas. Dogs, kite flying, non-motorized vehicle use, and driving will also be restricted along the Ocean Shore outside the roped off areas. These restrictions will be strictly enforced (see “Law Enforcement/Beach Patrol” below).

Law Enforcement/Beach Patrol

Goal: Ensure that the public adheres to OPRD rules and regulations governing Oregon’s sandy beaches.

Action: OPRD will continue to make a minimum of three full-time staff positions available (one each for the north, central, and south coast) to patrol the beach to inform and educate beach users of park rules governing the Ocean Shore, and about beach resources, including the snowy plover. Where necessary (i.e., where violations occur), warnings and/or citations will be issued. Additionally, OPRD will take proactive action to contract with the Oregon State Police and/or local law enforcement offices to provide additional enforcement support where necessary and possible.

Beach Management

Beach Access Modifications

Goal: Reduce the potential for disturbance of snowy plover by moving beach access points located on OPRD properties within or near SPMAAs while continuing to provide public beach access on the Oregon coast.

Action: No new access points will be created within SPMAAs except where necessary to re-routing an existing access point to move it away from a snowy plover nesting area.

Adaptive Management

Goal: Allow for changing conditions or circumstances and new information in determining management actions at OPRD SPMAAs.

Action: Adaptive management is a framework that seeks to focus research on specific management questions about the snowy plover and then refine the management approach based on what is learned. Adaptive management provisions in this HCP are considered in Section 5.3.3, “Adaptive Management.” Future research efforts to inform those adaptive management measures will be undertaken through joint efforts with the other entities involved in snowy plover recovery efforts including USFS, BLM, USFWS, and ODFW. This information will assist in further refining the requirements of the HCP and will be implemented through the adaptive management framework.

During the annual reporting meetings, OPRD and USFWS will review whether snowy plover recovery efforts (e.g., habitat restoration, predator management, or recreational restrictions) are adequate. Potential changes in management because of the changing status of the snowy plover are discussed in Section 5.3.3, below.

5.3.3. Adaptive Management

Adaptive management is a process that allows resource managers to adjust their actions to reflect new information or changing conditions in order to reach a goal, in this case, minimization of take and conservation of the snowy plover, while minimizing recreational impacts. OPRD will use adaptive management processes to minimize take related to management of Oregon’s beaches and to ensure the long-term survival of the snowy plover along the Oregon coast.

Adaptive management will allow OPRD to minimize the uncertainty associated with gaps in scientific information or biological requirements. Information used in the adaptive management process will come from the activities described in Sections 5.3.1 and 5.3.2 of the HCP and from other research as it becomes available. Monitoring data will be analyzed to determine if the goals of this HCP are being met.

If the management activities are not producing the desired results, adjustments will be made to the HCP by consensus agreement between OPRD and USFWS, as described below.

Redefining Management Action

Sections 5.3.1 and 5.3.2 describe management actions to minimize and mitigate for take. If biological monitoring reports indicate consistent population declines in snowy plovers along the Oregon coast when compared to population numbers provided in previous biological monitoring reports for Oregon, then OPRD and USFWS will meet and confer to determine if inadequate management actions by OPRD are responsible for or are contributing to population declines. If inadequate management actions on the part of OPRD are determined to be responsible (in whole or in part) for such population declines, or if new techniques are available for more effectively implementing management actions, then OPRD will revise the management actions in this HCP, as agreed upon by OPRD and USFWS, as soon as practicable.

Snowy Plovers Nesting Outside Snowy Plover Management Areas

Although OPRD believes that the SPMA and RMA identified in the HCP represent the best current and potential snowy plover habitat and are adequate for conservation purposes, snowy plovers may nest outside the SPMA and RMA. If snowy plovers are discovered to nest outside a SPMA or RMA, during the population surveys conducted annually, the nest area will be exclosed (unless the USFWS determines that exclosures are unnecessary or detrimental to snowy plovers) and will receive symbolic fencing (ropes) to establish a 50-meter radius buffer around the nest while nests are active.

However, if snowy plovers begin to nest on OPRD-owned or leased lands outside a SPMA consistently and predictably (3 years in a row), and there is nesting success at least 2 of the 3 years, OPRD will consult with USFWS to add the site to the list of SPMA with the following conditions:

- The SPMA is considered to have potential to contribute to long-term recovery of the species through its size, location and suitability;
- A SPMA not currently being used by snowy plovers may be dropped in exchange for the new site that is occupied;
- The maximum number of occupied SPMA managed by OPRD will be limited to five;
- SPMA additions or “trades ” will require agreement between OPRD and USFWS, and will be made in collaboration with ODFW; and

- Adding the site to the list of SPMAs will not affect OPRD's ability to manage recreation along the Ocean Shore (i.e., management activities will be conducted as described above for occupied SPMAs).

Success of Nest Enclosures

Through monitoring efforts, OPRD will evaluate the relative success of nest enclosures in preventing predators from destroying nests and eggs. OPRD will meet annually with USFWS to review nest enclosure monitoring results to determine the relative benefits on a site-by-site basis. Continuing evaluation of the effectiveness of nest enclosures may result in elimination of the enclosure, timing changes for application of the enclosure, and/or design changes. If design adjustments are needed to exclude predators, OPRD will work with USFWS and will make the design adjustments, provided such adjustments will not result in significant impacts to existing legal recreational activities.

If nest enclosures are no longer required for nests outside of SPMAs and RMAs, OPRD will still install signs and 50-meter radius buffers around the nest during the nesting season.

Failure of Managed Unoccupied SPMAs

Although certain conservation measures will be implemented at the currently unoccupied SPMAs as they become actively managed to attract snowy plover, it is possible that the sites may not become occupied. As such, OPRD and USFWS will review annually whether snowy plover recovery efforts (e.g., habitat restoration, predator management, or recreational restrictions) are adequate to facilitate snowy plover occupancy. Following the review, OPRD and USFWS will cooperatively determine what adjustments should be made to the plan and management actions to improve the potential for successful occupancy at these SPMAs.

If none of the initial three OPRD SPMAs identified for active management for snowy plover occupancy are occupied after 5 years from the active management start date, (i.e., when the site management plan has been completed) and no RMAs owned and managed by other landowners are being managed for occupancy, then OPRD will begin active management for occupancy at Netarts Spit.

If the condition above is triggered, OPRD will complete a site management plan for Netarts Spit within 1 year, and begin managing the Netarts Spit SPMA for snowy plover occupancy. OPRD will continue to manage the original three SPMAs for snowy plover occupancy.

RMA Exchange for SPMA

RMA Not Being Managed for Occupancy

If OPRD purchases a RMA that was not being managed for occupancy and commits to manage it as a new SPMA for snowy plover management, the new SPMA will be managed instead of the Netarts Spit SPMA. This condition would be triggered only if the existing SPMA targeted for exchange is unoccupied. Under this scenario, if a site management plan does not exist for the newly purchased SPMA, OPRD will develop one within 1 year of purchase, USFWS will evaluate and make a decision about the plan within 6 months following plan completion, and begin managing the new SPMA for snowy plover occupancy the following nesting season. The exchange would only occur after consulting with USFWS and ODFW to determine whether the new SPMA has greater potential for occupancy than the SPMA being exchanged.

RMA Being Managed for Occupancy

If OPRD purchases a RMA that was being managed for occupancy and commits to continuing to manage this new SPMA, the new SPMA will be managed instead of the Netarts Spit SPMA. This condition would be triggered only if the existing SPMA targeted for exchange is unoccupied. Under this scenario, OPRD will continue management of the RMA on purchase and will review the original site management plan within 1 year of purchase, revise the plan as necessary, and begin managing the new SPMA for snowy plover occupancy. The exchange will only occur after consulting with USFWS and ODFW to determine whether the new SPMA has greater potential for occupancy than the SPMA being exchanged.

5.4. Summary of Conservation Measures

5.4.1. Snowy Plover Management

OPRD, USFWS, and other State and Federal natural resource agencies collectively identified 16 specific areas along the Oregon coast as important to snowy plover conservation and recovery. These areas were targeted for snowy plover conservation and recovery efforts based on their potential to provide quality habitat in sufficient amounts at geographically strategic locations that are believed to facilitate a well-distributed sustainable population. The areas owned or leased by OPRD are identified as SPMA's. Those sites belonging to other landowners are identified as RMA's. The conservation measures to be implemented at SPMA's and RMA's are summarized in Tables 5-4 and 5-5, respectively.

Snowy Plover Conservation Measures at Snowy Plover Management Areas

OPRD will manage its SPMA's for snowy plover occupancy according to a USFWS-approved site management plan. A combination of activities will be used including predator management, protection of nesting areas from the recreating public, habitat restoration and maintenance as needed, public outreach and education, and a program for monitoring the breeding population.

Of OPRD's five SPMA's, one area, Bandon SNA, is already occupied. OPRD will develop a draft site management plan within 1 year of ITP issuance for USFWS approval within 6 months of completing the draft plan. The site management plan will be implemented the following nesting season after USFWS approval. OPRD will continue to protect nesting areas at Bandon during the breeding season (March 15 through September 15) with symbolic fencing designed to minimize impacts from human activities on the beach. OPRD will also continue to implement natural resource management activities as described in the site management plan, including habitat maintenance of as much as 50 acres.

Of the four remaining unoccupied OPRD SPMA's, OPRD will manage three of these areas (Columbia River South Jetty, Necanicum Spit, and Nehalem Spit) as soon as site management plans are developed (all three draft plans will be developed within 2 years of permit issuance for USFWS review within 6 months of completion of the draft plans). These areas are believed to have higher potential for snowy plover occupancy than Netarts Spit based on existing habitat quality, area size, and geographic location. The site management plans will be put in place the following nesting season after USFWS approval.

Establishment of an SPMA at Netarts Spit is believed by OPRD and USFWS field staff to be far less important to snowy plover recovery than most of the remaining targeted snowy plover areas, known as RMAs. OPRD will manage Netarts Spit for occupancy, based on a site management plan developed with the USFWS, if one of the following conditions exist: 1) there are fewer than three unoccupied SPMA's and/or targeted snowy plover RMAs, combined, being managed for occupancy by OPRD and other landowners. (This situation could occur either because most of the SPMA's and other targeted areas are occupied or because some landowners are not contributing to recovery of snowy plover by managing their unoccupied targeted snowy plover areas for occupancy.); or 2) after 5 years of OPRD management, none of the SPMA's have become occupied.

Snowy Plover Conservation Measures at Recreation Management Areas

In addition to the commitments described above at OPRD-owned or leased SPMA's, OPRD will also review and comment on the development of site management plans

at RMAs. In the event that an RMA becomes owned by OPRD, the snowy plover management measures described above will be implemented at that site.

5.4.2. Public Use/Recreation Management

In addition to implementing the snowy plover management measures described above at OPRD-owned or leased SPMA, OPRD will implement recreational use restrictions as described below. Implementation of the recreational use restrictions at SPMA and RMA will depend on whether a site was occupied by nesting snowy plovers or being actively managed to attract nesting populations.

Occupied SPMA/RMA

OPRD will implement the following recreational restrictions at occupied SPMA/RMA during the breeding season (March 15 through September 15) within the covered lands. The geographic extent of these restrictions will be developed in consultation with the USFWS during preparation of site management plans.

- Prohibition of motorized (except for administrative and permitted uses) and non-motorized vehicles on SPMA beaches;
- Prohibition of dogs on wet and dry sand;
- Prohibition of kite flying on wet and dry sand;
- Prohibition of activities within the dry sand area of the beach;
- Erection of fences, ropes, and /or signs to define breeding areas in the dry sand; and
- Provision of three full-time beach rangers and additional senior troopers as needed for enforcement of State Park and Ocean Shore regulations, including restrictions to protect snowy plover populations.

Unoccupied SPMA/RMA

OPRD will implement recreational restrictions during the breeding season (March 15 through September 15¹) and enforcement activities in SPMA/RMA unoccupied by snowy plovers as follows:

- Prohibition of motorized (except for administrative and permitted uses) and non-motorized vehicles on SPMA/RMA beaches; and
- Requirement that dogs be on leash on SPMA/RMA beaches.

¹ OPRD may lift the restrictions early if no nesting has occurred by July 15 at a site.

Special Considerations for Recreational Use Restrictions at Recreation Management Areas

Based on OPRD's authority to manage recreational use of the Ocean Shore, OPRD is required to provide authorization to restrict recreational activities at RMAs. Under this HCP, OPRD will implement recreational use restrictions at potentially up to 11 RMAs as the areas become occupied.

The 11 areas include the five RMAs that currently support nesting populations of snowy plover (Sutton/Baker Beach; Siltcoos Estuary/Dunes Overlook/Tahkenitch Estuary; Tenmile Estuary; Coos Bay North Spit; and New River), and six RMAs that may be managed in the future by the appropriate landowner (Bayocean Spit, South Sand Lake Spit, Tahkenitch South, Umpqua River North Jetty, Elk River, and Euchre Creek).

Restrictions on recreational use in these areas are summarized in Table 5-5. The specific restrictions to be implemented depend on the presence of nesting populations of snowy plovers when the permit application is approved.

In the event that a USFWS-approved site management plan has been developed, OPRD will implement recreational use restrictions as directed by the site management plan. If an RMA is unoccupied, OPRD will only implement recreational use restrictions at the request of the landowner and after consultation with USFWS and collaboration with ODFW.

If an RMA becomes occupied, but a site management plan does not exist, OPRD will implement the recreational use restrictions within the covered lands. OPRD will issue and continue to enforce recreational use restrictions within the full extent of the RMA until an agreement is reached between USFWS and the landowner and/or a site management plan is developed and OPRD is notified of any changes that may modify recreational use restrictions to a more focused area. OPRD will also seek to modify the Oregon State Rule of Ocean Shore Management to provide an ongoing mechanism for recreational use restrictions.

OPRD will also work with County and private landowners of RMAs to provide supervision, enforcement, and signage at their RMAs because such restrictions (ropes, signs, enforcement) cannot be implemented by a private landowner without OPRD approval.

Protections for Nests Outside of Targeted Areas

If a snowy plover should nest outside an occupied or unoccupied SPMA or RMA on the covered lands, OPRD will install fencing around the individual nest, and will consider installing a nest enclosure after consultation with the USFWS. Specifically, OPRD will install a 50-meter radius roped buffer around the nest that allows access

along the wet sand, and will determine if use of an enclosure to protect the nest from predation is in the best interest of the nest.

5.4.3. Beach Management

All beach management activities, including marine mammal strandings and removals, public safety, external and internal law enforcement, and response to boat strandings, will continue to be conducted in a manner that attempts to avoid take of snowy plover. OPRD will consult with USFWS regarding any of these activities that will occur in an occupied or unoccupied SPMA or RMA prior to conducting the activity, unless there is an emergency situation. Emergency situations are addressed in Section 7, “Implementation, Organization, and Structure,” of this HCP.

Table 5-4. Summary of Conservation Measures to be Implemented at Snowy Plover Management Areas (SPMAs)

Currently Occupied SPMAs, Parks Owned/Leased by OPRD	Proposed Management Actions In Occupied SPMAs
Bandon SNA	<p>The site management plan will define the area of restricted recreation within the SPMA. Following USFWS approval of an OPRD SPMA site management plan:</p> <p>Seasonal Recreation Restrictions (March 15 – September 15)</p> <ul style="list-style-type: none"> ▪ Vehicles (motorized and non-motorized) prohibited on beach or as otherwise restricted by existing OAR, except for administrative use. ▪ Dogs and kite flying prohibited. ▪ All other recreational activities directed to the wet sand (fences, ropes, and/or signs will define the dry sand breeding areas to be avoided). ▪ Restrictions possibly lifted early if no nesting by July 15. <p>Other Site Management Plan Commitments</p> <ul style="list-style-type: none"> ▪ Habitat restoration and maintenance per site management plan. ▪ Predator management. ▪ Public interpretation and education. ▪ Monitoring, reporting, and evaluation activities. ▪ Continued provision of three full-time beach rangers by OPRD, as well as State Park staff, local law enforcement, and additional senior State troopers, as needed, to facilitate enforcement activities. ▪ Site management plan prepared within 1 year of ITP.
Columbia River South Jetty (Corps/OPRD)	<p>Site management plan will define the area of restricted recreation within the SPMA. Following USFWS approval of an OPRD SPMA site management plan:</p> <p>Seasonal Recreation Restrictions (March 15 – September 15)</p>
Necanicum Spit	<ul style="list-style-type: none"> ▪ Dogs required to be leashed.
Nehalem Spit	<ul style="list-style-type: none"> ▪ Vehicles (motorized and non-motirzed) prohibited or as otherwise directed by existing OAR, except for administrative use.
Netarts Spit	<ul style="list-style-type: none"> ▪ Restrictions possibly lifted early if no nesting by July 15. <p>Other Site Management Plan Commitments</p> <ul style="list-style-type: none"> ▪ Habitat restoration, per site management plan. ▪ Non-lethal predator management. ▪ Public interpretation and education. ▪ Performance of detect/non-detect monitoring for snowy plover presence and nesting activity twice monthly. ▪ Preparation of site management plans by OPRD within 2 years of obtaining an ITP for the following OPRD SPMAs: Columbia River South Jetty, Necanicum Spit, and Nehalem Spit. ▪ Management of a new site for snowy plover occupancy when one of these sites becomes occupied. A minimum of three unoccupied areas will always be managed for snowy plover occupancy until all OPRD sites are occupied. ▪ Inclusion of other sites among the minimum of three managed unoccupied areas as other land managers implement USFWS-approved site management plans for non-OPRD unoccupied sites. Netarts Spit will be added if and when there are fewer than three unoccupied areas being managed collectively between OPRD and other landowners for snowy plover occupancy.

Table 5-5. Summary of Conservation Measures to be Implemented at Recreation Management Areas (RMAs)

Currently Occupied RMAs (owner/manager)	Proposed Actions In Currently Occupied and Future Occupied RMAs
Sutton/Baker Beach (adjacent to land owned by USFS)	The site management plan will define the area of restricted recreation within the RMA. In the event that a site management plan does not exist, OPRD would automatically issue restrictions within the covered lands.
Siltcoos Estuary/Dunes Overlook/Tahkenitch Estuary (adjacent to land owned by USFS)	Seasonal Recreational Use Restrictions (March 15 – September 15) will be required by OPRD once a RMA site becomes occupied, including the following:
Tenmile Estuary (adjacent to land owned by USFS)	<ul style="list-style-type: none"> ▪ Vehicles (motorized and non-motorized) except for administrative use, kite-flying, and dogs prohibited. ▪ Other public recreational use directed to the wet sand outside of roped and signed breeding areas.
Coos Bay North Spit (adjacent to land owned by BLM, Corps)	<ul style="list-style-type: none"> ▪ Restrictions possibly lifted early if no nesting by July 15.
New River (Owned by Curry County and private landowner; adjacent to land owned by BLM)	<p>Other OPRD RMA Commitments</p> <ul style="list-style-type: none"> ▪ Erect fences, ropes, and/or signs to define breeding areas (dry sand only) at County and privately owned RMAs. ▪ Conduct enforcement actions on managed RMA sites.
Currently Unoccupied RMAs (owner/manager)	Proposed Actions In Managed Unoccupied RMAs
Bayocean Spit (adjacent to land owned by Corps)	OPRD will implement the restrictions at the request of the landowner as indicated in USFWS-approved site management plan for that RMA.
South Sand Lake Spit (Private)	Seasonal Recreational Use Restrictions (March 15 – September 15) will be authorized for voluntary management of RMAs after coordination with USFWS, to include the following:
Tahkenitch South (adjacent to land owned by USFS)	<ul style="list-style-type: none"> ▪ Vehicles (motorized and non-motorized) prohibited except for administrative use or as otherwise directed by OAR. ▪ Dogs required to be leashed.
Umpqua River North Jetty (Department of State Lands and adjacent to land owned by USFS)	<ul style="list-style-type: none"> ▪ Restrictions possibly lifted if no nesting by July 15.
Elk River Spit (Private)	<p>Other OPRD RMA Commitments</p> <ul style="list-style-type: none"> ▪ Conduct enforcement actions on managed RMA sites.
Euchre Creek (Private, Oregon Department of Transportation)	

Section 6. Direct, Indirect, and Cumulative Effects on Snowy Plovers and Snowy Plover Habitat

6.1. Introduction

This section discusses the effects of the covered activities on snowy plover and suitable snowy plover habitat, as well as critical habitat designated under Endangered Species Act (ESA) Section 4, that may result in take or adverse effects. A take estimate, as a result of implementation of the covered activities and provisions of the Habitat Conservation Plan (HCP), is provided in Appendix G.

Direct effects are those that are directly caused by the covered activities outlined in this HCP. Examples include crushing of nests or failure of broods because of intentional or unintentional disturbance by beach users or their pets.

Indirect effects are those that are caused by the covered activities that may happen later, but still are reasonably certain to occur. An example of an indirect impact would be the loss of particular beach segment as suitable snowy plover breeding habitat due to increased recreational use of that beach segment or through the spread of invasive species, such as European beachgrass.

Cumulative effects are the incremental environmental effects of the action together with the effects of past, present, and reasonably foreseeable future actions, regardless of which agency or person undertakes those actions.

The potential effects on wintering populations of snowy plovers are discussed in this section. However, it should be noted that it is not anticipated that the effects of the covered activities on wintering populations would rise to the level of take. Therefore, Oregon Parks and Recreation Department (OPRD) is not seeking take coverage of wintering snowy plovers as part of the Incidental Take Permit (ITP). This is because it is anticipated that the covered activities would occur at very low levels during the winter and would likely occur in areas that would not be as attractive to nesting snowy plover populations. The normal behavior of wintering plover is also to flock

and avoid disturbance. For more information on this topic, see Section 7.6.3, “Changed Circumstances.”

6.2. Oregon Parks and Recreation Department Management Activities

6.2.1. Public Use/Recreation Management

Camping

The effects of camping on the beach are similar to those described for general pedestrian use or picnicking, but may be compounded if people remain in sensitive areas for extended periods. Nighttime gatherings of people around a campfire may cause serious harm by disrupting incubation and brooding for long periods, thereby increasing the exposure of nearby chicks and eggs to hypothermia.

Debris left behind by campers may attract predators to areas being used by snowy plovers. Prolonged human presence near a nest site may also increase predator detection of nests or chicks, particularly by avian predators such as ravens and crows.

As described in Section 5, camping is not allowed on beaches adjacent to State parks.

Dog Exercising

Dogs, particularly those that are not restrained on a leash, represent a significant threat to both nesting and wintering snowy plovers (Fahy and Woodhouse 1995; Lafferty 2001). Unleashed dogs can chase snowy plover adults and chicks, cause chicks to become separated from adults, and trample nests. Unrestrained pets may traverse a much larger area and thus disrupt a greater percentage of nesting or foraging habitats than restrained animals. Leashed or unleashed dogs can interrupt brooding, incubating, and foraging behavior, much as pedestrians can.

Snowy plovers will flush sooner and remain off their nests longer when approached by pedestrians with a dog as opposed to pedestrians alone (Page et al. 1977). This condition leaves the nest exposed for longer periods, making it vulnerable to predation, extreme temperatures, and risk of being buried or blown by wind. Brooding and incubating snowy plovers respond to dog presence with avoidance or active distraction displays, thus exposing chicks or eggs to inadvertent trampling or predation; these disturbances may lead to the eventual separation of chicks from adults.

A study in Santa Barbara County, California, found wintering snowy plovers were more likely to fly from dogs and horses than from humans (Lafferty 2001). This study also found that wintering snowy plovers reacted to disturbance at half the

distance reported for snowy plovers in breeding areas in California. Dogs are not likely to affect wintering snowy plovers directly, but repeated disturbance may indirectly harm populations by reducing time spent feeding and roosting and increasing time spent in predator avoidance behaviors. As mentioned previously, these effects are not anticipated to rise to the level of take. By decreasing the time snowy plovers can spend feeding and roosting, dogs may negatively alter the birds' ability to successfully survive the winter and breed the following summer although this level of disturbance on wintering populations is not anticipated to rise to the level of take.

As described in Section 5, dogs are required to be leashed within State parks, including the beaches that front them. Although this is difficult to enforce and poorly understood by the public, the provisions of the HCP focusing on increased enforcement and outreach efforts will help to address this concern.

Pedestrian Traffic

Pedestrian traffic at both high and low levels can negatively affect nests and nesting birds directly or indirectly. The highly cryptic nature of nest scrapes, eggs, and chicks make them nearly undetectable by most people. Nests may be easily crushed underfoot by walkers or joggers. As snowy plover chicks crouch to the ground to avoid detection by humans or predators they may be crushed. In one California study, three times as many chicks were lost on weekends and holidays as on weekdays, suggesting that increased recreational activity is linked to increased chick loss (Ruhlen et al. 2003). At South Beach in Newport, the number of snowy plovers declined from more than 25 in 1969 to 15 in 1971 when South Beach State Park was opened (Hoffman 1972). No snowy plovers have used the area since the early 1980s.

People can disturb birds if they approach too closely or quickly (Lafferty 2001). Pedestrians may flush adult birds incubating a nest or brooding chicks. Page et al. (1977) found that adult snowy plovers flushed off the nest 78 percent of the time when humans approached on foot to within 1 to 50 m (3 to 164 feet). The response was only slightly lower, with a 65-percent flush rate, when people approached to within 50 to 100 m (164 to 328 feet). Pedestrians who passed within 100 to 250 m (328 to 820 feet) flushed adult birds off the nest 34 percent of the time. High levels of pedestrian traffic may cause repeated flushing of the adults.

Repeated flushing can result in eggs becoming overheated or excessively cooled to the point that the nest fails. Nests that are not continuously incubated may take longer to hatch, rendering the nest and incubating adults vulnerable to predation for a longer period. Suspended feeding and the expenditure of energy during a flushing event may affect both reproduction and survival (Lafferty 2001). Even short flights are energetically costly for small birds and these birds may not be able to gain the necessary fat reserves, an outcome that affects their survival rate (Brown et al. 2000).

On beaches that experience moderate to high levels of pedestrian traffic, repeated and frequent flushing of birds off their nests may result in disruption of normal incubation and increased predation on adult birds, eggs, or chicks that otherwise would have been protected by motionless, camouflaged adults. Snowy plovers that become acclimated to human intrusion and thereby exhibit a reduction of the tendency to flush from the nest have been found to suffer higher levels of natural predation (Persons and Applegate 1977).

Snowy plovers nesting on beaches that experience low levels of pedestrian traffic may be highly sensitive to human intrusion and may flush off nests and stay off nests for much longer periods than snowy plovers nesting on beaches with higher levels of pedestrian traffic. Pedestrian traffic may also limit snowy plover use of otherwise suitable nesting habitats (U.S. Fish and Wildlife Service 1985).

Walkers or joggers may displace broods from optimal foraging locations. Prolonged pedestrian disturbances may prevent chicks from resting and foraging. Chicks separated from adults are more vulnerable to predators and trampling and have little chance of survival. In a study of piping plovers in Nova Scotia, chicks foraged less and were brooded less often when humans were within 160 meters, and significantly fewer chicks survived in areas with heightened levels of disturbance (Flemming et al. 1988).

Pedestrians may leave behind trash that attracts predators to snowy plover breeding areas. Pedestrian traffic is likely to increase at Oregon's beaches over time; therefore, the chances for direct and indirect effects on snowy plovers will increase.

Picnicking

Picnicking can cause the same direct and indirect effects as pedestrian traffic, but when picnicking occurs near snowy plover nests, these impacts occur over a longer period. Birds flushed from a nest by picnickers may not return to the nest for an extended period, exposing the eggs to the weather and increased risk of predation. Under windy conditions, eggs may be buried or blown out of the nest. Picnickers may also leave behind garbage that may attract predators to the area. Prolonged human presence near a nest site may also increase predator detection of nests or chicks, particularly by avian predators such as ravens and crows.

Picnicking on Oregon beaches occurs primarily during the nesting season, but picnicking activity may disturb wintering birds as well. Repeated disruption of wintering birds' feeding and roosting activities may alter energy balances, making the birds less likely to survive to breed the following summer. As mentioned previously, this disturbance is not anticipated to rise to the level of take.

Near Shore Activities/Surf Sports

The use of sandy shorelines for small boat, surfboard, or kayak launchings and landings may result in disturbance similar to that described for general pedestrian use. These activities may disrupt a large percentage of waterfront area, thus displacing adults and broods from critical foraging areas. Intensive use of an area for these purposes may result in the displacement of both nesting and wintering snowy plovers (Neuman 2001). Fishing and clamming activities, while they occur on the Ocean Shore, are regulated by ODFW.

Driving / Vehicles

Vehicle use (motorized or non-motorized, including all-terrain vehicle [ATV]/off-highway vehicle [OHV] use) on beaches has the potential to adversely affect snowy plovers and their habitat. Unrestricted vehicle use can disturb large areas of both remote and readily accessible beach, and vehicle traffic has been known to result in the destruction of eggs, chicks, and adults (Burton et al. 1996; Warriner et al. 1986). Chicks harassed by vehicles may die of exhaustion (Powell et al. 1995, 1997) or be separated from adults (Stern et al. 1990b). Adults and chicks may roost and move about in tire tracks. Chicks may be unable to climb out of tire tracks and are consequently more vulnerable to vehicular traffic since most people use the same tracks when they return. Vehicle use can also cause displacement of foraging, roosting, brooding, or incubating adult snowy plovers. Extensive vehicle use may destroy or prevent snowy plovers from using the wrack line, where they forage. Newly emerging, non-motorized recreation vehicles, such as kite buggies, land sailing, and others, are expected to have similar impacts on snowy plovers as motorized vehicles.

As described in Section 5, during the snowy plover breeding season, permits are required for public vehicle use at five of the 16 SPMA/RMA. At some of these areas where vehicle use is prohibited, illegal vehicle use occurs on a regular basis.

Horseback Riding

Although most equestrian traffic is on the wet sand area and therefore not as likely to directly affect snowy plovers, equestrians often enter the beach via dune accesses. Some equestrians may also ride in the dune area. Horses can significantly affect nesting and wintering snowy plovers in ways similar to pedestrians. As mentioned previously, this disturbance is not anticipated to rise to the level of take for wintering populations. Additionally, horses may trample nests. At New River, horses came close to crushing a nest before it was protected with an enclosure (Craig et al. 1992; Lauten pers. comm. 2004). Monitors have documented at least four clutches on Morro Spit, California that were destroyed by horses trampling the nests, during the 2000 and 2001 breeding season (Persons & Ellison 2001; Ellison 2001). Horses and other pack animals leave depressions in an otherwise naturally flat wave-washed

shoreline that can disrupt or impede the movement of chicks and adults (Neuman 2001). Unleashed dogs are also frequently associated with equestrians.

Beach Fires

As with camping, the presence of people around fires can disturb nearby nesting snowy plovers, causing the nest to be left unattended for long periods and eggs to be exposed to predators and extreme temperatures. Collecting driftwood or other naturally occurring materials such as wrack, shells, and rocks for fires may crush eggs (especially in the dark) and may reduce the quality of natural cover for chicks and adults used by snowy plovers for shelter from wind or predators.

When used for cooking, fire rings and discarded debris may attract predators such as coyotes, foxes, and corvids, thereby increasing the potential for adult, egg, or chick predation.

Beachcombing

Effects of beachcombing are very similar to pedestrian traffic described above and driftwood collection described below.

Driftwood Collection and Removal

Some amount of naturally occurring driftwood is an essential part of snowy plover nesting habitat. Wintering and breeding snowy plovers often use driftwood to provide shelter from wind. They may also hide behind driftwood to escape detection by predators. However, too much driftwood can change the open nature of the habitat. Large driftwood also provides perches for hunting avian predators.

Collection of driftwood by individuals for personal use from occupied snowy plover nesting areas could reduce the suitability of the habitat, and may result in disturbances similar to those listed above for pedestrians. Cumulatively, driftwood removal can render habitat unsuitable by removing shelter and nesting material. Commercial removal of driftwood can have more direct effects on snowy plovers. Vehicles used for collecting driftwood can crush eggs or chicks and leave ruts in the sand that chicks may not be able to escape. Human activity associated with driftwood removal can disturb nesting or wintering snowy plovers in ways similar to pedestrian activity. As mentioned previously, this disturbance is not anticipated to rise to the level of take for wintering populations.

Kite Flying

Biologists believe snowy plovers perceive kites as potential avian predators. Reactions to kites have ranged from increased vigilance while roosting, to walking or running away (U.S. Fish and Wildlife Service 2001a). Studies of other plover species found them to be intolerant of kites compared to other human disturbances

such as pedestrian movement or dogs. Kites caused the birds to flush or move a greater distance from the disturbance, to move the longest distance away from the disturbance, and to stay away the longest compared with other human disturbances (Hoopes et al. 1993). It is expected that stunt kites would cause a greater response from snowy plovers than traditional, more stationary kites because of the fluttering tails and noisy, rapid, erratic movements. Remote-control planes and other recreational flying craft that originate on, land on, or are controlled from the covered lands are also expected to result in similar responses from snowy plovers.

6.2.2. Beach Management

Mammal Strandings and Removal

Removal or burial of dead mammals found on the Ocean Shore usually requires heavy equipment to be brought onto the beach. This process can disturb wintering or nesting snowy plovers for an extended period, separate broods from adults, and can result in the crushing of eggs or chicks although these activities are not anticipated to rise to the level of take. As mentioned previously, this disturbance is not anticipated to rise to the level of take for wintering populations. Burial of mammals can disturb a large area of sandy beach and may disrupt foraging areas. However, removal or burial mammals may be preferable to leaving carcasses on the Ocean Shore, where they will attract predators, possibly exposing snowy plovers to increased levels of predation.

Public Safety

Activities related to maintaining emergency access points and removing public hazards such as beach logs or toxic material spills can involve multiple vehicles having unrestricted access to the beach. By their nature, these activities are difficult to predict. Impacts on snowy plovers are similar to those described for pedestrian use and driving. Removal of hazardous materials from the beach can benefit snowy plovers by reducing their potential exposure to these hazardous materials. Toxins that may not themselves directly affect snowy plovers may accumulate in their prey and affect snowy plovers' ability to survive and reproduce.

External Law Enforcement

Vehicle use by OPRD personnel may cause unpredictable disturbances, often involving multiple vehicles and unrestricted access to the shoreline. Patrol activities also involve emergency medical and law enforcement responses, important for maintaining human safety, but high-speed travel necessary for response or the introduction of vehicles into areas not frequently accessed (e.g., SPMA/RMA) may result in significant effects on adult birds, nests, or chicks during the nesting season.

Internal Law Enforcement

Park staff members spend considerable time investigating large gatherings on the beach. The effects these patrols may have on snowy plovers are offset by the benefits of enforcement of beach restrictions and removal of groups gathering in restricted areas.

Boat Strandings and Other Salvage Operations

OPRD's involvement in salvage operations is to issue the necessary permits and to monitor the activities as they are occurring. Monitoring activities will involve vehicle use and may result in potential effects on adult birds, nests, or chicks during the nesting season.

6.2.3. Natural Resource Management

Snowy Plover Management

Although OPRD's management of snowy plovers has the potential to impact snowy plovers, these actions are typically of short duration and offset by the benefits provided to the birds in the way of reduced human disturbance and exposure to predation, and improved habitat. Installing and maintaining fencing and signs around snowy plover nesting areas can temporarily disturb the nesting pair and cause eggs to be unattended, exposing them to extreme temperatures, wind, and predation. Prolonged human presence at a nest site may also increase predator detection of nests or chicks, particularly by avian predators such as ravens and crows. Habitat restoration work is conducted outside of the breeding season but may disturb wintering snowy plovers in the area, potentially causing birds to move to an alternate area. Because restoration tends to result in improvement of native habitats, restoration of dune vegetation can be a considerable benefit to snowy plovers, if done carefully and if the habitat is restored to the appropriate habitat type. Volunteers at beach accesses benefit snowy plovers because they inform the public and encourage compliance with beach restrictions. The effects of restoration activities on wintering populations of snowy plover are not anticipated to rise to the level of take.

Scientific Research and Collection

Monitoring, scientific research, and collection activities can be disruptive to nesting and wintering snowy plovers, with impacts similar to those described for pedestrian and vehicle use. Some research can adversely impact habitat by collecting or damaging native plants or encouraging non-native species. Snowy plover monitoring activities may involve extended or repeated visits to nesting sites, potentially intensifying negative impacts. Erecting nest exclosures and banding adults and chicks results in significant, if temporary, disturbance of birds. Nest abandonment has occurred subsequent to exclosure construction, and occasionally through

vandalism of the enclosure fence (Page et al. 1994). Exclosed nests may also encounter higher levels of disturbance by curious people and may attract perching avian predators. Nonetheless, monitoring of nesting snowy plovers, when carried out in a careful manner that minimizes these effects, provides information that is critical to the development of conservation, protection, and management strategies.

Habitat Restoration/Invasive Species Removal

Habitat restoration work for species other than snowy plover has the potential to affect snowy plover during both the nesting and non-nesting season, although most restoration activities will occur outside the nesting season. In the long-term, restoration efforts would have a positive effect on snowy plover since the restoration efforts tend to result in improvement of native habitats.

6.3. Effects on Snowy Plover Designated Critical Habitat

6.3.1. Introduction

Critical habitat formally designated by the U.S. Fish and Wildlife Service (USFWS) under the ESA includes areas found to be essential to the recovery and conservation of a listed species, and may include habitat that is or is not occupied at the time of listing. Critical habitat requires Federal agencies to ensure that the activities they fund, authorize, or carry out do not jeopardize the survival of the listed species or adversely affect its critical habitat. Designating critical habitat does not, in itself, lead to recovery of a listed species, but is one of several tools that can be used to achieve recovery. Designation of critical habitat can help focus conservation activities for a listed species by identifying areas that contain the physical and biological features that are essential for the conservation of that species. Designation of critical habitat alerts the public as well as land-managing agencies to the importance of these areas.

Critical habitat for the snowy plover was initially designated in December 1999 (U.S. Fish and Wildlife Service 1999). In May 2003, a Federal judge determined that the USFWS must rewrite the critical habitat designation for snowy plovers because USFWS did not adequately address economic impacts when designating critical habitat for the snowy plover. On September 29, 2005, the USFWS published a final rule to re-designate critical habitat along the coasts of California, Oregon, and Washington (U.S. Fish and Wildlife Service 2005). A total of 32 areas (or units) covering 12,145 acres was designated critical habitat along the coasts of California, Oregon, and Washington. Of the 32 critical habitat units, seven are in Oregon (refer to Table 2-2), totaling 2,146.5 acres.

The 16 Snowy Plover Management Areas/Recreation Management Areas (SPMAs/RMAs) in the HCP were identified as the best existing and potential snowy plover habitat by State and Federal biologists who used the Draft Recovery Plan as guidance. Many designated critical habitat areas coincide with existing occupied areas. However, some of the SPMAs/RMAs include additional potential habitat not originally included in designated critical habitat (e.g., Netarts Spit, Nehalem Spit, Necanicum Spit, and Columbia River South Jetty). The following passage describes the potential effects of the covered activities on critical habitat.

6.3.2. Public Use/Recreation Management

Heavy recreational use of critical habitat may render existing snowy plover habitat unsuitable for nesting or wintering activities. For example, snowy plovers regularly nested at what is now South Beach State Park until shortly after the park was developed and began to receive heavy public use (Hoffman 1972). In some cases snowy plovers may continue to use areas heavily used by humans, but their productivity may suffer. Although several of the public use/recreation management activities covered in the HCP may occur in critical habitat, the impacts from such activities are relatively small. However, driving and driftwood collection have the potential adversely to affect snowy plover critical habitat, as described below.

Driving

Vehicle use (either motorized or non-motorized) on beaches has the potential to adversely affect snowy plover critical habitat. Unrestricted vehicle use can disturb large areas of both remote and readily accessible beach, and vehicle traffic has been known to result in the destruction of eggs, chicks, and adults (Burton et al. 1996; Warriner et al. 1986). Adults and chicks may roost and move about in tire tracks. Chicks may be unable to climb out of tire tracks and are consequently more vulnerable to vehicular traffic since most people use the same tracks when they return. Vehicle use can also cause displacement of foraging, roosting, brooding, or incubating adult snowy plovers. Extensive vehicle use may destroy or prevent snowy plovers from using the wrack line, where they forage.

Driftwood Collection and Removal and Beach Logging

Driftwood removal and beach logging may adversely impact critical habitat for snowy plovers. Snowy plovers benefit from some level of driftwood being left on the beach. Driftwood provides shelter from the wind and cover from predators for snowy plover adults and chicks. Removal of driftwood can negatively impact critical habitat. Alternatively, in some areas there is so much driftwood that the beach is no longer an open habitat. In these cases, removal of a portion of the driftwood would benefit snowy plovers.

Management of public access ways may or may not adversely affect critical habitat, based largely on whether the access is within an SPMA. Public access will be limited in SPMAs, and should not harm critical habitat.

6.3.3. Beach Management Activities

Although activities associated with beach management may disturb snowy plovers, they should not adversely impact snowy plover critical habitat. In fact, beach cleanup activities can positively affect critical habitat by removing unnatural debris from the beach. Removal or burial of stranded marine mammals can temporarily affect critical habitat by digging up the beach and wrack line; however, leaving carcasses can attract additional predators and scavengers, and this outcome may be more harmful to snowy plovers than the disturbance involved in burial or removal.

6.3.4. Natural Resource Management

Snowy plover management activities covered under this HCP will not adversely impact critical habitat.

6.4. Effects on Federally Listed Plant Species

The Federal Endangered Species Act does not prohibit the incidental take of federally listed plant species; however, Section 7 prohibits jeopardizing the continued existence of listed plants. Only one species, the Western lily (*Lilium occidentale*), is a federally listed plant species.

6.4.1. Western Lily

The western lily is a perennial with attractive crimson flowers. The lily was listed as federally endangered in 1994 (U.S. Fish and Wildlife Service 1994b); it is listed by the State of Oregon as endangered. Critical habitat has not been proposed. The western lily has an extremely restricted distribution within 4 miles (6 kilometers) of the Pacific coast, from Hauser, Coos County, Oregon, to Loleta, Humboldt County, California. This range encompasses approximately the southern one-third of the Oregon coast and the northern 100 miles (161 kilometers) of the California coast.

The western lily grows at the edges of sphagnum bogs and in forest or thicket openings along the margins of ephemeral ponds and small channels. This species also grows in coastal prairie and scrub near the ocean where fog is common. Habitat destruction due to development is the primary threat to the western lily. Other threats include forest succession, cranberry farm development, livestock grazing, plant collectors, and highway construction. Although the western lily occurs in close proximity to snowy plover habitat, it is not a dune species and should not be

impacted by activities associated with snowy plover management on OPRD properties. Appendix B provides additional information on the western lily.

6.5. Incidental Take

6.5.1. Introduction

The USFWS will issue an ITP on a finding that the actions proposed by OPRD will not appreciably reduce the likelihood of the survival and recovery of the species in the wild, and that OPRD has minimized and mitigated for the effects of their activities to the maximum extent practicable. The management actions described in Section 5 have the ability to reduce both direct and indirect effects of the covered activities managed by OPRD, and provide benefits to the snowy plover, such that the USFWS should be able to make a finding that meets the two most critical criteria above.

6.5.2. Scope of Incidental Take Permit

Permit Period and Area

OPRD is seeking a 25-year ITP for the snowy plover. This HCP identifies the measures intended to assure that the effects of the incidental take will, to the maximum extent practicable, be minimized and mitigated.

The ITP is for all 230 miles of sandy Ocean Shore, including the 126.5 miles of Ocean Shore identified as snowy plover habitat in the Recovery Plan. A complete definition of the covered lands is provided in Section 2.5, Covered Lands.

Type of Take

The ITP will cover potential incidental take occurring in connection with otherwise lawful OPRD management activities on the Ocean Shore. Incidental take is anticipated to occur if the covered activities are allowed to occur on the Ocean Shore in snowy plover habitat. The two types of take anticipated to occur are (1) mortality or harassment of breeding snowy plovers, their eggs, and chicks during the breeding season due to any of the activities managed by OPRD and covered by the ITP; and (2) harm due to significant habitat modification or degradation that results in death or injury to snowy plovers by significantly impairing essential behavioral patterns, including breeding, feeding, and sheltering.

Take can result from direct or indirect effects. Direct effects include, but are not limited to stepping on eggs, and crushing eggs by means of vehicles, horse hoofs, or feet. Indirect effects include, but are not limited to, the deliberate feeding of gulls and corvids (ravens and crows) and the leaving of food scraps, trash, and fish waste

that can attract large numbers of these predators, and the flushing of adults off the nest that may result in eggs being buried by wind-blown sand, or the eggs becoming too hot or too cold thereby killing the embryo. Repeated disturbances of this type may cause nest abandonment. Indirect effects may also include disturbance of foraging or resting birds on beaches during the winter, although the potential effects on wintering birds are not anticipated to rise to the level of take.

Description of Take

A description of the amount and extent of incidental take that is expected to occur because of implementing the covered OPRD management activities (including the conservation measures) addressed in the HCP is provided in Appendix G and summarized below.

6.5.3. Take Estimate Summary

Population data indicate that the Pacific Coast population of western snowy plover is increasing. However, some take of eggs, hatchlings, fledglings, and adults from recreational activities on the Oregon Coast is ongoing as the population increases. Egg, hatchling, and fledgling stages are directly exposed to take from recreational activities. Breeding adults are generally able to avoid take in the form of mortality or bodily injury from recreational activities because they are strong flyers (Lauten et al. 2006; USFWS unpublished data); however, they may still experience take in the form of harassment.

Natural resource management activities at SPMA's, including habitat restoration and predator control measures, and recreational use restrictions at SPMA's and RMA's are expected to help compensate for the take. Egg, hatchling, and fledgling stages can benefit directly from management activities due to reduced predation, reduced exposure to dogs, and improved foraging habitat. Nesting birds can benefit from management due to improved nesting habitat and reduced harassment from predators, which would likely express itself in terms of greater egg production.

Approach

The take assessment, fully described in Appendix G, is based on trends in the number of snowy plover nests, eggs, chicks, and adults at the occupied site (Bandon Habitat Restoration Area [HRA]) and the five occupied sites owned by other landowners that are not part of OPRD park units on the Oregon Coast between 2000 and 2006. Necanicum Spit and Floras Lake were excluded from the model analysis because of low numbers over a limited number of years. Surrogate or proxy data for Sutton Beach was developed to allow this site to be included in the model. Population performance at the currently occupied sites depends on recreation activities, management activities, and natural/environmental conditions. Recreational activities degrade the performance of habitat; natural resource management activities are in

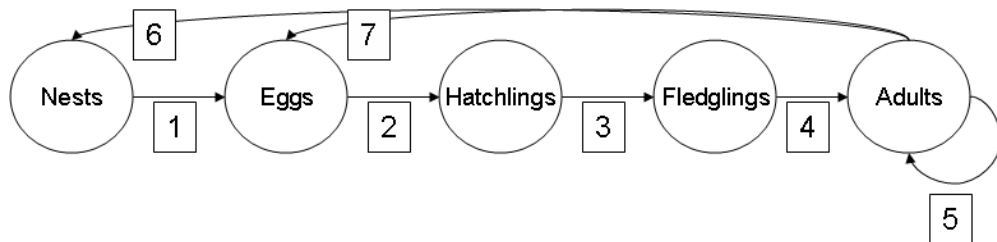
place to improve conditions, and natural/environmental conditions may either improve or degrade habitat for snowy plovers.

For the take assessment it was assumed that the local conditions and local breeding performance were known with a reasonable level of certainty. It was estimated that a similar level of future take would occur if OPRD maintains a similar set of conditions for the snowy plover population along the Oregon Coast in the future. A statistical model was used to estimate the relationships between conditions (recreation, natural resource management, and environmental) and snowy plover production at the occupied sites during the past 6 years.

Nests, eggs, hatchlings, fledglings, and adult birds are all important to the production of snowy plovers on Oregon’s Ocean Shore beaches. An additional useful indicator of population performance is the rate of historical or future population change expressed as the intrinsic capacity for change or “lambda.” Individual birds must survive each of the pathways to mature to adult-hood and produce young (Figure 6-1). Therefore, there are several phases where recreation, natural resource management actions, and the environment can affect snowy plovers. Life-tables and lifecycle models were used to organize the snowy plover population information.

The peak number and proportion of beach visitors participating in specific activities was previously estimated using field observations and mail-in surveys (Shelby and Tokarczyk 2002). In addition, the number, density, and proximity of public access sites were estimated at each management area using aerial photos. The location and extent of management activities were estimated by OPRD. The snowy plover population information was used in conjunction with estimates of recreational and management activities to estimate the impacts of conditions (natural and human-caused) on performance.

Figure 6-1. Stage-Structured Life Cycle for Snowy Plover



Note: The numbered arrows represent survivals and fecundities; 1) eggs per nest, 2) egg to hatchling survival, 3) hatchling to fledgling survival, 4) fledgling to adult survival, 5) annual adult survival, 6) nest production, and 7) fecundity (eggs per adult).

Results

Recreational use appears to have a negative impact on snowy plover populations. The recent historic and future potential for population growth (lambda) was lower at sites that receive greater levels of recreation ($r^2=0.78$, $p=0.007$) in terms of the

density of access points at each management area. Other performance indicators such as fecundity and survival through the egg, hatchling, and fledgling stages also appeared to be lower at sites that received greater levels of recreation. These indicators were more strongly related to the combined effects of all recreation than to specific recreational use types.

Previous recreational use studies found that approximately one third (35 percent) of all visitors brought one to two dogs with them to the beach (Shelby and Tokarczyk 2002). The majority of dog walkers (61 percent) admitted they did not leash their dog sometime during their typical visits. The majority of this use occurred during the snowy plover breeding season. Most visitors (93 percent) did not ride horses or drive on the beach. The majority of visitors (90 percent) were groups of family and friends. Most (76 percent) were unaware of restrictions associated with snowy plovers. These surveys suggest that increased recreational use will express itself primarily in the form of groups of family and friends with their dogs.

Life-table calculations showed that recreational activities resulted in snowy plover production loss of 30 hatchlings and 11 fledglings, or the equivalent of 5 adult birds on the Oregon coast each year (Table 6-1). During the 25-year period of the ITP it is estimated that recreational use will result in snowy plover production losses of approximately 750 hatchlings and 275 fledglings, or the equivalent of 125 adult birds.

Conversely, management activities appear to have a positive impact on snowy plover populations. The recent historic and future potential for population growth was higher in areas that had more years of predator management ($r^2=0.61$, $p=0.02$). Other performance indicators such as fecundity also appear to be higher at sites that receive greater levels of predator control; however, the number of years of predator management was more strongly related to these performance indicators than other management actions such as habitat restoration.

Life-table calculations showed that predator management benefited Oregon snowy plover populations through an increase of 138 eggs and 9 fledglings, or the equivalent of 8 adult birds annually (Table 6-1). During the 25-year period of the ITP it is estimated that management activities will improve snowy plover production by approximately 3,450 eggs and 225 fledglings, or the equivalent of 200 adult birds.

Table 6-1. Estimated Change in the Number of Eggs, Nests, Fledglings, and Adults per Year as a Result of Habitat Restoration, Predator Management, and Recreational Use

	6-Year Average ¹	Habitat Restoration/ Predator Management Benefits ²	Recreation Activity Impacts ³	Annual Net Gain/Loss	25-Year Total for Occupied Sites
Number of Eggs (% of 6-year average)	300	+ 138 (+46%)	--	+ 138 (+46%)	+ 3,450
Number of Hatchlings (% six year average)	136	--	- 30 (22 %)	- 30 (22 %)	- 750
Number of Fledglings (% of 6-year average)	62	+ 9 (+14%)	- 11 (-17%)	- 2 (-3%)	- 50
Number of Adults (% of 6-year average)	13.8	+ 8 (+58%)	- 5 (-36%)	+ 3 (+22%)	+ 75

¹ Represents the number of eggs, hatchlings, fledglings, and adults produced each year on the covered lands (including SPMA and RMA) between 2000 and 2006.

² Represents the number of eggs, fledglings, and adults estimated to be present on the covered lands each year as a direct result of ongoing restoration activities, snowy plover management, and predator management at sites currently occupied by snowy plover. These figures are based on benefits realized between 2000 and 2006 on lands managed by OPRD and owned by other landowners (areas not part of OPRD park units), and are not specific to restoration, predator management efforts, or snowy plover management efforts at Bandon SPMA, the only currently occupied SPMA owned by OPRD. As such, these estimates may overstate the net benefit to plover because of OPRD actions. Of note, the figures in the table do not capture the restoration benefit that would be realized at currently unoccupied SPMA in the future should nesting populations of plover utilize those areas. It is anticipated that restoration of up to a total of 120 acres at the Columbia River South Jetty SPMA, the Necanicum SPMA, and the Nehalem SPMA, and future predator management activities, would result in additional habitat restoration benefits not captured in this table.

³ Figures represent the number of hatchlings, fledglings, and adults lost each year because of recreational use on the covered lands. Associated percentage represents the percentage of the 6-year average.

Conclusion

Activities covered under this HCP have the potential to result in take of snowy plovers during the 25-year ITP term, most specifically from the effects of recreational use activities. Take would occur because of recreational activities harassing adults foraging or tending nests and harassing young foraging on the dry and wet sand. Take is not likely to occur as a result of natural resources management or beach management activities. While the covered activities may result in some harassment of adults or fledglings and the loss of eggs and nests, when considered in the context of proposed management and restoration activities, there is not anticipated to be any take of eggs; however, there is anticipated to be potential take of hatchlings and fledglings. In spite of hatchlings and fledglings being affected, overall, there is expected to be an increase in the number of adults on the Oregon Coast.

6.5.4. Effect of Take

The level of anticipated take is not likely to result in jeopardy of the Pacific Coast population of the western snowy plover in Oregon. The management actions outlined in the HCP and incorporated into the ITP and the Implementing Agreement by reference will not permanently degrade suitable nesting habitat for the snowy plover within the OPRD-owned and leased SPMA's. The protections provided by the HCP for SPMA's and the recreation restrictions at RMA's will minimize the adverse effects of authorized activities to snowy plover habitat. Over the term of the permit, the management actions (conservation measures) outlined in this HCP will create additional suitable habitat for snowy plovers.

Adverse effects on habitat may include crushing and burying wrack, creating ruts that may impede movements of young chicks, physically occupying habitat and making it unavailable to breeding or wintering snowy plovers, and creating temporary disturbances that deter snowy plovers from using some habitat areas. The habitat affected will be a relatively small portion of all suitable habitats at a given site, and OPRD believes that the HCP management actions will not jeopardize the species. Rather, they will ensure that local populations will have sufficient habitat of adequate quality to move towards recovery.

Winter disturbances are expected to be insignificant because covered activities are greatly reduced and presently there is low winter use of Oregon beaches by snowy plovers (see Section 4.2.5, "Wintering," for more information on current locations of wintering populations). In addition, the SPMA locations, based on the Recovery Plan, were chosen to avoid areas of high winter use by humans. In the event that disturbance occurs, it is expected that bird movement would be within the snowy plover's normal range of activities. Given these factors, disturbance is likely to be minimal and unlikely to result in take of wintering snowy plovers.

Section 7. Implementation, Organization, and Structure

7.1. Introduction

As the permit holder, the Oregon Parks and Recreation Department (OPRD) will have authority and responsibility to implement decisions related to the Incidental Take Permit (ITP) and the Habitat Conservation Plan (HCP). Oregon law gives the Oregon Parks and Recreation Commission complete jurisdiction and authority over all park areas acquired by the State for recreation, scenic, historic, natural, and cultural purposes (Oregon Revised Statutes [ORS] 390.111), and the authority to make regulations and provisions deemed necessary for use and administration of park areas (ORS 390.124, ORS 390.660) and for the Ocean Shore (ORS 390.635, ORS 390.620). This management authority is implemented under Oregon Administrative Rule (OAR) 736-020-0040(3) and in cooperation with Federal land management actions as per the Coastal Zone Management Act (CZMA).

The HCP will be implemented through an Implementing Agreement (IA) (Appendix H) agreed to by OPRD, the U.S. Fish and Wildlife Service (USFWS), and the Oregon Department of Fish and Wildlife (ODFW). The IA defines the roles and responsibilities of OPRD regarding implementation of the HCP. The IA and the HCP are complementary to each other.

The processes for addressing changed and unforeseen circumstances, amending the HCP, reviewing implementation of the HCP, and funding of the management actions included in the HCP are discussed in both the HCP and/or the IA. Where discrepancies may occur between the HCP and the IA, the IA is considered the governing document.

7.2. OPRD Commitments

For the duration of the ITP, OPRD will provide staff members and resources for implementation of the HCP as described below.

7.2.1. Program Administration

OPRD’s Ocean Shore Manager will be designated as the agency’s HCP Coordinator, with the task of providing program implementation oversight, development of management guidelines and development of site management plans for the Snowy Plover Management Areas (SPMAs).

7.2.2. Management Action Implementation

The day-to-day activities to be implemented will be carried out by field staff members with assistance from OPRD’s Resource Management and Planning Division, Public Services Division, and Recreation Management Division staff assigned to the project. The following management action measures will be undertaken by OPRD:

- Recreation Management,
- Predator Management,
- Habitat Restoration and Maintenance,
- Monitoring,
- Public Education and Outreach, and
- Law Enforcement.

7.3. Implementation Schedule

Table 7-1 provides a schedule for implementation of the various management actions for occupied and unoccupied sites.

Table 7-1. Management Actions for Occupied and Unoccupied Snowy Plover Management Areas

Management Action	Implementation Schedule	
	Occupied Snowy Plover Management Area	Managed Unoccupied Snowy Plover Management Area
Site Management Plan Development	Within 1 year of permit issuance for Bandon SPMA. USFWS decision within 6 months of draft plan completion.	Within 2 years of permit issuance for three OPRD-owned or leased, managed, unoccupied SPMAs (i.e., Columbia River South Jetty, Necanicum Spit, and Nehalem Spit). Within 1 year of Netarts Spit becoming eligible for management. USFWS approval within 6 months of draft plan completion.
Recreation Management	Recreation management occurs same season SPMA deemed occupied.	For managed unoccupied SPMAs, the next breeding season following completion of the site management plans.

Management Action	Implementation Schedule	
	Occupied Snowy Plover Management Area	Managed Unoccupied Snowy Plover Management Area
Breeding Population Monitoring	Annually, during the breeding season. Formal report submitted monthly and annually, at the end of the breeding season.	NA
Detection/ Non-Detection Monitoring	At the beginning of each breeding season to confirm occupancy.	For managed unoccupied SPMA's, at least twice per month during the breeding season.
Wintering and Breeding Window Surveys	Annually, report within two weeks of completion of survey	Annually, report within two weeks of completion of survey
Predator Management	Ongoing, primarily focused on management during the breeding season, depending on the requirements outlined in the site management plan.	Ongoing, primarily focused on management during the breeding season, depending on the requirements outlined in the site management plan.
Nest Site Protection	Immediately	Immediately
Public Outreach	Pursuant to recommendations in site management plans.	Pursuant to recommendations in site management plans.
Law Enforcement	Immediately.	Following approval of site management plans by USFWS.
Habitat Restoration and Maintenance	Ongoing at Bandon SPMA, as outlined in site management plan.	Within 5 years of completion of the site management plan for the Columbia River South Jetty SPMA, and within 2 years for the Necanicum and Nehalem SPMA's. Habitat restoration efforts undertaken will be pursuant to site management plan.
Annual Compliance Reporting and Evaluation of the HCP	Annually following issuance of the permit.	Annually following issuance of the permit.
Program Review	Every 5 years following issuance of the permit.	Every 5 years following issuance of the permit.

7.4. Implementation Needs

Implementation of the HCP will occur through the efforts of many individuals within OPRD. Overall coordination of the program will be the responsibility of the Ocean Shore Management Division. Coastal Regional Managers will have responsibility for the implementation of the day-to-day management activities as identified in the site management plans. Support services will be provided by other divisions within the agency as needed. Table 7.-2 provides a summary of the staff responsible for the management actions identified in the HCP.

Table 7-2. Roles and Responsibilities of OPRD Staff in HCP

Management Actions	Lead	Assist
Overall Program Coordination (including contracting)	Ocean Shore Program Manager	Ocean Shore and Natural Resource Section Staff
SITE MANAGEMENT PLANS		
Development	Ocean Shore Manager	Region Manager/Natural Resource Section Staff
Implementation	Planning Manager	Planning Staff
Habitat Restoration and Maintenance (Project Management)	Region Manager/Park Manager	Natural Resource Section Staff
Installation/Maintenance/Removal of Symbolic Fencing	Region Manager/ Park Manager	Natural Resource Section Staff
Beach Access Management	Region Manager/ Park Manager	Park staff
Breeding Population Monitoring	Natural Resource Staff	NA
Wintering and Breeding Window Surveys	Natural Resource Staff	NA
Detect/Non-Detect Surveys	Natural Resource Staff	NA
RECREATION COMPLIANCE MONITORING		
Volunteer Coordination	Region Manager/ Park Manager	Natural Resource Staff/Recreation Management Section
Report to HCP Coordinator	Ocean Shore Manager	NA
Report to USFWS	Ocean Shore Manager	NA
PUBLIC OUTREACH		
Program Design	Ocean Shore Manager/Recreation Management Staff/Public Services Staff/Park Manager	Interpretation Team/ Natural Resource Section Staff
Program Implementation	Area Manager/Park Manager	Natural Resource Section Staff
Law Enforcement	Area Manager/Park Manager	NA
Predator Management (project management)	Area Manager/Park Manager	Natural Resource Section Staff
Research	Natural Resource Staff	
RECREATION MANAGEMENT		
Rule Change	Natural Resource Staff/Coastal Program Manager	Park Manager
Rule Implementation	Area Manager/Park Manager	

The HCP Coordinator will prepare management guidelines for use by OPRD in implementing the HCP. These management guidelines will be prepared within 2 years of the issuance of an ITP.

7.5. Funding

7.5.1. Funding Overview

The Oregon Western Snowy Plover Working Team, of which OPRD is a member, has committed to working together on management issues associated with the snowy plover. Because of this shared interest, the agency members are able jointly to fund a number of activities to ensure efficiency in, and avoid duplication of, efforts related to monitoring, predator management, habitat restoration, and public education and outreach efforts. OPRD will continue to participate in these jointly funded programs.

OPRD will commit to funding implementation of the HCP from various sources as described below, and will fund certain work separately from Working Group agreements as is appropriate to the task.

7.5.2. Funding Sources

Administrative costs to implement the management actions described in the HCP will be borne through the following funding mechanisms:

- State lottery dollars or other State funding if the lottery funding is discontinued;
- Land Rental Sinking Funds (limited to habitat restoration and monitoring work); and
- Other funds (e.g., day-use fees, Salmon Plate revenues, Recreational Vehicle tax revenues).

OPRD commits to protecting this funding as a core function if OPRD budgets are reduced.

Biennium Budget

OPRD will include in its biennium budget funding for:

- Site management plan completion and approval;
- Monitoring (breeding/population and detect/non-detect);
- Habitat restoration and maintenance efforts, either as match for Federal and/or State grants, or for the full amount;
- Predator management activities;
- Law enforcement/beach patrol activities;
- Public outreach and education programs;
- Project administration; and
- Agency coordination.

OPRD cannot guarantee State funds for future activities to administer the requirements set forth in the ITP, IA, and the HCP, which are not yet appropriated by the State legislature. The State of Oregon operates on a biennium basis, with fiscal years beginning on July 1. Additionally, OPRD cannot guarantee acceptance of grant monies unless it has received authorization from the Oregon legislature to apply for and accept these monies. However, OPRD can guarantee that it will request sufficient funding from the legislature on a biennial basis to properly implement the HCP and fulfill the terms and commitments of the ITP.

Whenever funding for implementation of the HCP conservation measures are considered insufficient to meet the commitments outlined in the HCP and the IA, or to properly implement the HCP, OPRD will consult with the USFWS to determine what actions may be necessary with respect to meeting the commitments of the permit and/or avoiding the risk of take of snowy plovers.

Grants

The grant opportunities listed below have been identified and will be explored as a possible offset for other OPRD funding.

- Federal:
 - USFWS “Coastal Program,”
 - USFWS Conservation and Reinvestment Act Funds, and
 - Land and Water Conservation Fund Coastal Planning Assistance.
- State of Oregon:
 - OPRD All Terrain Vehicle Grant Program,
 - Recreational Trails Program, and
 - Oregon Watershed Enhancement Board.

7.5.3. Cost Analysis

Introduction

OPRD staffing commitments to program administration and management action administration are summarized in Table 7-2. Given that it is difficult to ascertain how much staff time would be required on an annual basis to complete these responsibilities, in-kind costs associated with staff time are not presented as specific costs below.

Costs associated with implementation of the HCP fall into two broad categories: management action implementation and program administration. Current costs for management at the Bandon SNA and anticipated expenses for management of

SPMAs in the future are presented in Tables 7-3 through 7-5 to approximate the cash costs associated with implementing the HCP.

Table 7-3 lists the current expenses in 2007 dollars incurred by OPRD in providing for snowy plover management at Bandon SNA. These costs are based on the most recent data available for an entire nesting season, and are presented as biennial costs for a 2-year budget period. These costs are presented to estimate the cost of management actions at the SPMAs in the future and over the term of the ITP.

Table 7-3. Expenses for Snowy Plover Management at Bandon State Natural Area: 2007 to 2009¹

Activity	Biennial Cost	Comments
Habitat Maintenance ²	\$60,000	The Bandon SPMA requires maintenance of 50 acres of habitat. Habitat maintenance occurred on 15 of those 50 acres each year between 2007 and 2008. Biennial cost reflects the cost to maintain approximately 30 acres of habitat over a 2-year period. This equates to an average cost of \$2,000 to maintain 1 acre of habitat per year.
Breeding Population Monitoring	\$50,000	Contract with Oregon Natural Heritage Information Center for monitoring at Bandon SNA.
Public Education and Outreach	\$5,000	Interpretive programs offered at two State Parks, with docents on site during nesting season. Costs are associated with reimbursing docents for travel.
Predator Management	\$16,000	Covers the portion of the U.S. Department of Agriculture (USDA) Animal and Plant Health Inspection Service (APHIS) wildlife services contract used for snowy plover related work at the Bandon SNA.
Beach Patrol/Law Enforcement	\$20,000	Covers the cost of hiring senior State Troopers or county sheriff personnel to augment other enforcement activities by OPRD staff members and beach rangers, as necessary.
Beach Access Modifications	\$10,000	Cost associated with equipment and materials and to relocate trail in the vicinity of China Creek.
Symbolic fencing	\$600	Cost for rope, signs, and fence posts.
Total	\$161,600	

¹ Based on the most recent (2007) data for an entire nesting season. Costs are extrapolated for a 2-year budget period (2007 to 2009) and only reflect cash costs. Additional in-kind costs, such as staff salaries to implement management actions and administer the program, are not reflected in this table.

² Habitat restoration at the Bandon SNA was completed between 2001 and 2003. It was contracted out at an approximate cost of \$60,000.

The snowy plover habitat area that was restored at the Bandon SPMA is 50 acres and is located on a dune. Extensive grading was required to create the restored site, and ongoing grading has been required to maintain it. The costs associated with habitat restoration at the Bandon SPMA are likely higher than what will be needed at the other SPMAs, which are more accessible and characterized by lower elevations. These differences are considered and reflected in Tables 7-4 and 7-5.

Table 7-4 lists the anticipated expense associated with management of one unoccupied SPMA. These costs are presented as biennial costs for a 2-year budget period.

Table 7-4. Anticipated Expense to Manage One Unoccupied SPMA for 2 Years¹

Activity	Biennial Cost	Comments
Site Management Plan Development	\$10,000 maximum	Costs associated with hiring a contracted biologist. This cost would only be incurred once, prior to the first year of management.
Habitat Restoration/Maintenance ²	\$50,000 maximum ³	Cost associated with restoration of as much as 40 acres of habitat by a contractor. This cost would only be incurred once, after approval of the site management plan. After restoration activities are complete, habitat would be maintained at an approximate cost of \$2,000 per acre per year, not to exceed \$50,000 in any biennium.
Public Outreach and Education	\$2,000	Costs associated with materials for interpretive program start up and decent travel.
Total	\$62,000 maximum	

¹ Costs are in 2007 dollars and must be inflated at a rate of 3 percent for each year after 2007 that the HCP is implemented. Costs are also extrapolated for a 2-year budget period and only reflect cash costs, including costs to hire contract workers. Additional in-kind costs, such as staff salaries to implement management actions and administer the program, are not reflected in this table.

² Both habitat restoration and maintenance are reflected as a common line item in this table because neither would occur in the same biennium (i.e., it would likely take as long as 2 years to initially restore habitat at an SPMA, at which point it would be maintained in perpetuity).

³ It is likely that costs associated with habitat restoration at each SPMA would be less than \$50,000 in a biennium. Habitat restoration at the Columbia River SPMA is expected to be done as part of the U.S. Army Corps of Engineers jetty reconstruction project, using Federal funding. Restoration at the Nehalem Bay SPMA may be smaller than 40 acres (as outlined in the approved site management plan), and would likely be constructed to avoid woody debris and dune lowering. It's unlikely that habitat restoration would be needed at the Necanicum SPMA at all. The Netarts SPMA may be too inaccessible to complete any costly dune grading.

Table 7-5 lists the anticipated expenses associated with management of one occupied SPMA. These costs are also presented as biennial costs for a 2-year budget period.

Table 7-5. Anticipated Expense to Manage One Occupied SPMA for 2 Years¹

Activity	Biennial Cost	Comments
Habitat Maintenance	\$60,000 maximum ²	Cost associated with maintaining as much as 50 acres of restored habitat at Bandon SPMA and 40 acres of habitat at other occupied SPMA's. Based on assumed cost of \$2,000 per acre per year, not to exceed \$60,000 in any biennium at the Bandon SPMA and \$50,000 per biennium at other occupied SPMA's.
Breeding Population Monitoring	\$16,700	Contract with Oregon Natural Heritage Center for 2 years. Costs are approximate and based on an estimate provided by Oregon Natural Heritage Information Center to complete breeding population monitoring of the three northern SPMA in a given year (i.e., \$25,000 per year to monitor three northern SPMA's divided by three to obtain the cost per SPMA multiplied by two to obtain a biennium cost).

Activity	Biennial Cost	Comments
Public Education and Outreach	\$5,000	Costs are associated with reimbursing docents for travel.
Predator Management	\$16,000	Covers the portion of the USDA APHIS contract for snowy plover related work at one SPMA for 2 years.
Beach Patrol/Law Enforcement	\$20,000	Covers the cost of hiring senior State Troopers or county sheriff personnel to augment other enforcement activities by OPRD staff and beach rangers, as necessary.
Beach Access Modifications	—	This cost is unknown. The cost approximations provided for the Bandon SPMA in Table 7-2 are site-specific and cannot be used to estimate possible beach access modification costs at other SPMA's.
Symbolic fencing	\$1,000	Cost for rope, signs, and fence posts.
Total*	\$118,700 maximum	

¹ Costs are in 2007 dollars and must be inflated at a rate of 3 percent for each year after 2007 that the HCP is implemented. Costs also only reflect cash costs, including costs to hire contract workers. Additional in-kind costs, such as staff salaries to implement management actions and administer the program, are not reflected in this table.

² It is likely that costs associated with habitat maintenance would be less than \$50,000 due to site-specific conditions.

Between 2007 and 2009, OPRD spent approximately \$161,600 on snowy plover management activities at the Bandon SNA, excluding in-kind staff or program administration costs. Once the ITP is issued, these costs are anticipated to increase as additional activities are required of OPRD at actively managed unoccupied SPMA's (Table 7-4) and the occupied SPMA's (Table 7-5). Nothing in this HCP, the ITP, or the IA requires OPRD to incur costs associated with unoccupied SPMA's that are not being actively managed by OPRD or any other entity. Nor do the HCP, the ITP, or the IA require OPRD to incur costs associated with snowy plover management at any occupied Recreation Management Area (RMA) except as specifically outlined in the IA. Over the term of the HCP costs will be incremental and will depend on whether sites are occupied or unoccupied but actively managed, and the number of sites in each category.

7.6. Unforeseen and Changed Circumstances

7.6.1. Introduction

Unforeseen circumstances and changed circumstances were defined and clarified in the HCP Assurances "No Surprises" Final Rule by USFWS and the National Marine Fisheries Service (NMFS) (collectively referred to as the Services) (U.S. Fish and Wildlife Service and National Marine Fisheries Service 1998). These two types of circumstances are key elements of the Services' No Surprises Rule developed to provide ITP applicants with long-term regulatory certainty. It is important to distinguish between *unforeseen* and *changed* circumstances because, depending on

the type of event that occurs, OPRD may or may not be responsible for implementing additional conservation measures.

Unforeseen circumstances are changes in circumstances affecting a species or geographic area covered by an HCP that could not reasonably have been anticipated by plan developers or the Services at the time of the HCP's negotiation and development, and that result in a substantial and adverse change in the status of a covered species.

Changed circumstances are defined as additional conservation measures deemed necessary to respond to changes in circumstances that were provided for in the HCP's operating conservation program. The phrase "changes in circumstances" is defined to mean changes during the course of an HCP that can reasonably be anticipated and planned for in the HCP (e.g., fire or other natural catastrophic event in areas prone to such events).

7.6.2. Unforeseen Circumstances

If unforeseen circumstances arise, the USFWS will not require, without the consent of the permittee, the commitment of additional mitigation in the form of land, water, or funds nor will it require additional restrictions on the use of land, water, or funds from any permittee who is adequately implementing or has implemented an approved HCP (U.S. Fish and Wildlife Service and National Marine Fisheries Service 1998). If additional conservation and mitigation measures are deemed necessary to respond to unforeseen circumstances, the USFWS may require additional measures of the permittee where the HCP is being properly implemented, but only if such measures are limited to modifications to management actions set forth in the HCP. The assurances of the No Surprises regulations apply only "where the conservation plan is being properly implemented, and apply only with respect to species adequately covered by the conservation plan" (U.S. Fish and Wildlife Service and National Marine Fisheries Service 1998).

The above paragraph notwithstanding, if, during the implementation of this HCP, an unforeseen circumstance occurs that could have a significant negative effect on snowy plovers or could affect the ability of OPRD to effectively manage activities under this HCP, OPRD will to the extent practicable, voluntarily follow the procedures below:

1. Within 10 business days of the date the unforeseen circumstance is brought to OPRD's attention, the HCP Coordinator will notify USFWS in writing of the following:
 - Nature of the situation;
 - Geographic and temporal extent to which the beach was or will be affected by the situation;

- Potential effect on snowy plovers in the covered lands; and
 - Any actions taken to date in response to the unforeseen circumstance.
2. Within 5 business days of USFWS receipt of the written notification described above, OPRD will discuss the unforeseen circumstance with USFWS personnel and other affected parties, as applicable. An appropriate response to the situation, such as modifying the HCP and/or ITP, may be developed and implemented in coordination with the USFWS.
 3. Any additional conservation and mitigation measures deemed necessary to respond to unforeseen circumstances will be limited to modifications to the HCP's existing operating conservation program for the snowy plover, maintaining the original terms of the HCP to the maximum extent possible. Unless agreed to by OPRD, additional conservation and mitigation measures will not involve the commitment of additional land, water, or financial compensation or restrictions on the use of land, water, or other natural resources otherwise available for development or use under the original terms of the HCP.

7.6.3. Changed Circumstances

OPRD and USFWS foresee that circumstances could change during the term of the ITP that could affect the ability of OPRD to implement the HCP properly. Events that could occur during the term of the HCP that are identified as changed circumstances include the listing of a new species, the potential environmental changes associated with global climate change, and the effects on wintering populations of snowy plover rising to the level of take. This circumstance is addressed below.

Listing of a New Species

If a currently unlisted species is federally listed as endangered or threatened pursuant to the Endangered Species Act (ESA) after the ITP has been issued, OPRD will request that USFWS make a determination if there is a potential for incidental take of the newly listed species to occur while conducting Ocean Shore management activities covered by the HCP. If so, OPRD can choose to modify their management actions in coordination with USFWS to ensure incidental take of the species will be avoided, and/or request that the USFWS add the newly listed species to the ITP according to the provisions in the IA and HCP, and in compliance with the provisions of Section 10 of the ESA.

If OPRD requests ITP coverage for the newly listed species, the process by which this will occur will entail a USFWS review of the HCP and conservation strategy to determine if the conservation measures addressing the snowy plover are adequate for conservation of the newly listed species. If the measures are determined adequate by USFWS, OPRD will request addition of the newly listed species to the ITP.

If conservation of the species is not adequately covered by the HCP and OPRD is unable to avoid the risk of take, then OPRD will submit a revised or supplementary HCP and supporting documentation. This documentation will include a conservation strategy that addresses the newly listed species that will accompany a request to add the species to the ITP.

Global Climate Change and Rising Sea Levels

A growing body of research has documented changes in the biotic and abiotic environment that are a result of an increase in global temperature and the continued concentration of greenhouse gases in the Earth's atmosphere.

In coastal areas, one of the primary concerns associated with global climate change is the potential for sea levels to rise and for the frequency and intensity of coastal storm events to increase. In the event that rising sea levels result in a net loss of snowy plover nesting habitat over the term of the ITP, OPRD will discuss with the USFWS appropriate implementation measures to address these changes. Future actions responding to this changed circumstance will be determined by consensus agreement between OPRD and the USFWS, and will be based on the nature and extent of the effects associated with rising sea levels.

Non-Breeding Season Management

The potential effects on wintering snowy plovers are not anticipated to rise to the level of take. Therefore, OPRD is not seeking take coverage under the ITP for effects on wintering snowy plovers. This is because only a small percentage of birds winter in Oregon where recreational use is low during the winter months. In addition, the normal behavior of wintering snowy plovers is to flock and avoid disturbance. Although snowy plovers may be less susceptible to recreation impacts during the non-breeding season, they could be negatively affected by activities that disrupt or destroy foraging areas or unnecessarily disturb birds that are roosting or foraging. If adverse effects on snowy plovers are determined to be occurring in the future, OPRD will either avoid take of snowy plovers or will amend its permit.

7.7. Permit Renewal/Amendment Procedures

7.7.1. Permit Extension/Renewal

When the ITP expires, OPRD is no longer protected from take that may occur as a result of their management of the Ocean Shore, provided that the snowy plover is still listed at the expiration of the permit. However, OPRD may apply for an extension or renewal of their ITP. If a written request for ITP renewal is on file with USFWS at least 180 days prior to the permit's expiration, the permit will continue to be valid while the renewal request is processed. The renewal request must certify that the

statements and information in the original HCP are still valid and/or include a list of proposed changes. The renewal request must also specify what take has occurred under the permit and what conservation measures will be added to, or eliminated from, the HCP. Extension or renewal of the permit constitutes extension of the HCP and this agreement for the agreed-upon time, subject to any modifications that the Services may require at the time of extension. Extension of the permit is addressed in Provision 6.4 of the IA.

7.7.2. Amendment/Modifications

Amendments

An amendment is a significant action requiring new analysis as to the effects of that action on the snowy plover or its habitat. Any action that significantly increases the level of take or decreases the mitigation, thereby triggering a National Environmental Policy Act (NEPA) analysis, would require an amendment to the HCP. Amendments are addressed in Provisions 12.1 (c) and 12.2 of the IA.

Either OPRD or the USFWS may propose amendments to the ITP, the IA, and the HCP. The party proposing the amendments will provide the other party with a written statement of the reasons for the amendments and analysis of the effects of the amendments on the environment, the covered species (snowy plover), and implementation of the HCP. The ITP may be amended in accordance with all applicable laws and regulations.

Minor Modifications

The USFWS or OPRD may make minor modifications to the ITP, IA, or HCP. Except when another process is specifically identified under the terms of the HCP or the IA with respect to particular types of modifications or as provided below, the party proposing the minor modification or amendment must provide the other with notice as specified in the ITP. The parties agree to use their best efforts to respond to proposed modifications within 60 days of receipt of such written notice. The minor modifications will be approved upon agreement of both parties. Minor modifications are addressed in Provision 12.1 of the IA.

Minor modifications to the HCP and/or the IA may include, but are not limited to, the following:

- Correction of typographic, grammatical, and similar editing errors that do not change the intended meaning of the document;
- Correction of any maps or exhibits to correct errors in mapping or to reflect previously approved changes in the ITP, IA, or HCP;
- Minor changes to survey, monitoring, or reporting protocols; and

- Any other type of modifications to the ITP, IA, or HCP, which are minor in relation to the HCP goals agreed to by the parties.

Minor modifications do not include actions that would:

- Result in operations under the HCP that are significantly different from those analyzed in connection with the original HCP,
- Result in adverse effects on the environment that are new or significantly different from those analyzed in connection with the original HCP, or
- Allow significant additional take not analyzed in connection with the original HCP.

7.7.3. Enforcement

Enforcement of Incidental Take Permit, Implementation Agreement, and Habitat Conservation Plan

The provisions in this HCP are enforceable through the terms and conditions of the IA and the ITP issued by the USFWS.

Notice

Any notice required to be given pursuant to the terms and conditions of the ITP must be given to OPRD by personal delivery or by certified mail/return receipt requested as described in the ITP.

7.7.4. Suspension/Revocation

The USFWS may suspend or revoke the ITP if OPRD fails to implement the HCP in accordance with the terms and conditions of the ITP, or Federal law requires suspension or revocation. Suspension or revocation of the ITP, in whole or in part, by the USFWS shall be in accordance with 50 Code of Federal Regulations (CFR) 13.27-29, 17.22 (b)(5), and 17.32 (b)(5), as may be amended over time, and with the IA. Suspension/revocation is addressed in Provision 6.2 of the IA.

Section 8. Alternative Actions Considered but Rejected

8.1. Introduction

This section includes a description of the different management alternatives that were previously considered for the Habitat Conservation Plan (HCP) by the Oregon Parks Department (OPRD) and a discussion of the reasons why these alternatives were not carried forward. The section also includes a discussion of why specific OPRD-owned sites were not selected for management as snowy plover management areas (SPMAs) in the HCP.

8.2. Alternatives Eliminated from Further Consideration

8.2.1. No Habitat Conservation Plan Alternative

An alternative considered, but rejected was for OPRD not to develop a HCP and to apply for an Incidental Take Permit (ITP) (i.e., take no affirmative action). Under this alternative an ITP application would not be submitted to the U.S. Fish and Wildlife Service (USFWS) and OPRD would continue to manage for snowy plover recovery at Bandon State Nature Area (SNA) and manage its activities to avoid the risk of take of snowy plovers. As funding and resources allowed, OPRD might expand its efforts to other areas. Also, if snowy plovers were to begin using that portion of the Ocean Shore owned by OPRD, OPRD would manage their activities to protect snowy plovers at these sites.

This action was rejected because it would not enable OPRD to fulfill its purpose and need to: 1) contribute to the conservation and recovery of the snowy plover and its habitat, and 2) provide OPRD with the legal protection afforded by an ITP to continue its legislatively mandated management activities on the Ocean Shore as defined in this document.

8.2.2. Manage All Recovery Plan Areas

This alternative considers using the recovery areas identified in Recovery Plan as the areas to focus snowy plover management activities. Such activities would necessarily include recreational use restrictions. This alternative was rejected for a number of reasons, including 1) the difficulty in trying to manage for recreational use along the sandy Ocean Shore, including such areas as South Beach in close proximity to Newport, Oregon, with an estimated 500,000 visitors per year; 2) the conflict with OPRD's mandate to provide access by the public to Oregon beaches; and 3) the prohibitive costs associated with managing hundreds of thousands of tourists and local beach users to ensure the risk of take of snowy plovers would be avoided.

8.2.3. Protection of Nests When and Where They Occur

This alternative considers implementing snowy plover protection measures everywhere a snowy plover nest or brood is discovered, regardless of where the nest or brood occurs or whether they are viable. This alternative was rejected because it would not provide the public with any certainty as to what sections of beach will or will not be managed for snowy plover; management could change annually and seasonally depending on where nests were discovered in a particular year and where the brood was located and/or re-located. In theory, the entire sandy portion of the Ocean Shore could be managed for snowy plovers. This is impractical, has the potential to be too costly to implement, and would not meet the legislative mandate of providing access by the public to Oregon beaches.

8.2.4. Protection of Occupied Sites Only

A fourth alternative considered implementing snowy plover protection measures only in those areas currently occupied by snowy plovers. This alternative was rejected because it would not provide OPRD with authorization for incidental take in other areas that may become occupied in the future, and would not provide future habitat areas for snowy plovers in the event of a demographic disturbance (catastrophic event) on the south coast that would negatively affect existing snowy plover habitat. Thus, it would fulfill neither of the purposes of OPRD's action (i.e., neither contribute to the conservation and recovery of the snowy plover and its habitat, nor provide OPRD with the legal protection afforded by an ITP to continue management activities on the Ocean Shore according to its legislated mandate).

8.2.5. Active Management of All Snowy Plover Management Areas/Recreation Management Areas for Occupancy by Oregon Parks and Recreation Department

Under this alternative OPRD would actively manage all 16 identified SPMAs /Recreation Management Areas (RMAs) for nesting populations of snowy plovers.

Specific SPMAs/RMAs would be identified for management for occupancy on a priority basis. As SPMAs/RMAs become occupied, other unoccupied SPMAs/RMAs would begin to be actively managed for occupancy, with at least three areas being actively managed at any one time. This alternative was rejected because OPRD does not have the authority to implement or enforce site management plans for nesting populations of snowy plover on lands that it does not own or manage. Under this alternative, OPRD would be responsible for all management strategies occurring on the SPMA/RMAs, including those that would take place on lands owned or managed by a landowner other than OPRD. Since they would not have the ability, or authority, to ensure that site plans would be effectively implemented or adequately enforced, this alternative was considered impractical to implement.

8.2.6. Implement a Captive Breeding Program

This alternative considers implementing a captive breeding program to assist in the recovery of snowy plovers. Under this alternative, snowy plovers would be captured and maintained in captivity. Adults would be bred, and young birds bred in captivity would be released into the wild.

Maintenance costs of a successful captive breeding program would be prohibitive. In addition, little is currently known about how snowy plovers survive in captivity or how they can be effectively bred. According to USFWS policy, captive breeding “is used as a recovery strategy only when other measures employed to maintain or improve a listed species’ status in the wild have failed, are determined to be likely to fail, are shown to be ineffective in overcoming extant factors limiting recovery, or would be insufficient to ensure/achieve full recovery. In addition to the prohibitive cost and the belief that this type of action is one of last resort, this alternative does not address other conservation needs of the species or alleviate the potential for OPRD management activities (including recreation) to affect snowy plovers negatively. Thus, it would not fulfill the purpose and need and was rejected as a viable alternative.

8.2.7. Voluntary Compliance and Education

This alternative considers reliance on the public, especially recreational users of the Oregon coast, voluntarily to avoid snowy plover nest sites, chicks, and adults nesting and foraging along the Oregon coast. This would require that individuals using the Ocean Shore be aware of the location of existing nesting sites and familiar enough with snowy plovers to be able to identify and avoid the species when they are present. In addition to “self-education” under this alternative, OPRD would educate beach visitors about the biology and habitat needs of the snowy plover by recruiting and training volunteers to serve areas where nesting populations of snowy plover have been identified. Individuals would be available to advise beach users about any beach restrictions and answer questions about snowy plover.

Under this alternative, inadvertent incidental take could occur, even if visitors were aware of and avoided known nest sites. In addition, it is possible that management activities conducted by OPRD (e.g., habitat restoration activities) could result in incidental take. Without take authorization from the USFWS, individual members of the public and OPRD would be responsible for any take that may occur incidental to an otherwise lawful activity. These circumstances would not allow OPRD to meet the purpose and need stated in the HCP; thus, this alternative was rejected.

8.2.8. Multi-Species HCP

The last alternative considered but rejected was the development of a multi-species HCP that would address other species that may occur on or near the sandy Ocean Shore along Oregon's coast. In addition to the conservation plan that addresses the snowy plover, this alternative would entail developing conservation measures to minimize and mitigate for impacts to other species. This alternative was rejected because OPRD's management activities are not likely to result in impacts to any listed species that would rise to the level of take. The listed species that could be in the vicinity of the potentially covered lands do not occupy the sandy beaches along the Oregon coast: they occur offshore, on rocky outcrops, or landward of the vegetation line. A description of the species and the rationale for their exclusion from the HCP is provided in Appendix B.

8.3. Potential OPRD-Owned Beaches Not Included in the HCP

In addition to the alternative actions described above, OPRD also considered the selection of four additional sites for inclusion as potential SPMA's in the HCP. These sites include Nestucca Spit, Bullards Beach, Pistol River, Sixes River, and Camp Winema. These beaches were not included in the HCP as potential SPMA's for the following reasons.

8.3.1. Nestucca Spit

Nestucca Spit was not included as a potential SPMA under the HCP because of its limited value as potential habitat for nesting snowy plovers. During the winter months, this area is very windy and rough. The water level rises up to the foredune and the resulting wave action results in a high level of erosion. There is no suitable habitat for snowy plovers as a result. In addition, there are extremely high levels of recreational use on this beach.

8.3.2. Bullards Beach/Sixes River

Bullards Beach and Sixes River were not included as potential SPMA's under the HCP because the USFWS, the Oregon Department of Fish and Wildlife (ODFW), and OPRD determined that both sites would be too small to support nesting populations of snowy plover.

8.3.3. Pistol River

An SPMA at Pistol River was included for deferred management (i.e., management only if other SPMA's were not occupied after a certain period) in the draft HCP released for public review in November 2006. Management of the area was deferred due to biological constraints specific to the site, including high winds/blowing sand and high corvid activity. The beach in the area is also highly susceptible to the meandering Pistol River, which could alter habitat restored over time.

Comments received during the public comment period on the draft HCP included comment voicing strong local opposition for management and implementation of recreational use restrictions at the Pistol River SPMA, as well as comments voicing strong support for increased management at other areas more likely to support populations of snowy plover in the future. After considering these comments in the context of the biological constraints at the site, OPRD removed the option for management of an SPMA at Pistol River. The northern boundary of the Bandon SPMA was extended to include the China Creek area.

Section 9. References

9.1. Printed References

- American Ornithologists' Union. 1957. *The AOU Checklist of North American Birds*. Fifth Edition. 168 pp.
- Anderson, D., and N. Maine. 1983. Snowy Plover Nesting Survey South Jetty of the Columbia River to Seaside, Oregon. Unpublished report for ODFW. 32 pp.
- Animal and Plant Health Inspection Service (APHIS). 2004. Integrated Predator Damage Management Report for the Western Plover (*Charadrius alexandrinus nivosus*) 2004 Breeding Season at Sutton, Siltcoos, Overlook, Tahkenitch, Tenmile, Coos Bay North Spit, Bandon SNA, and New River Area of Critical Environmental Concern. Portland, OR. 15 pp.
- Anthony, D. L. 1985. A Report on the Distribution, Numbers and Disturbance of Snowy Plovers at Damon Point, Washington. The Evergreen State College. Olympia, WA. 24 pp.
- Blake, E.R. 1977. *Manual of Neotropical Birds*. Vol. 1. University of Chicago Press, Chicago.
- Bowles, J.H. 1918. The Limicolae of Washington. *Auk* 35:326-332.
- Boyd, R.L. 1972. Breeding Biology of the Snowy Plover at Cheyenne Bottoms Waterfowl Management Area, Barton County, Kansas. Master's Thesis, Emporia State University, Emporia, KS.
- Brennan, K., and M. Fernandez. 2002. Preliminary Summary of 2002 Snowy Plover Breeding Season at the Leadbetter Unit of Willapa NWR. Unpublished document. 2 pp.
- Brian, N. 2002. Status Report: *Phacelia argentea* A. Nelson and J. F. Macbride (silvery phacelia). Unpublished document submitted to Coos Bay U.S. Bureau of Land Management District. 23 pp.

- Brown S., S. Hickey, and B. Harrington. 2000. The U.S. Shorebird Conservation Plan. Manomet Center for Conservation Sciences, Manomet, MA. 64 pp.
- Bruce, C. and M. Walter. 1981. Compilation of Historic Records of the Snowy Plover on the Oregon Coast. Draft document. Unpublished. 13 pp.
- Casler, B. R., C. E. Hallett, M. A. Stern, and G. A. Rosenberg. 1993. Snowy Plover Nesting and Reproductive Success along the South Oregon Coast – 1993. Unpublished report by the Oregon Natural Heritage Information Center and The Nature Conservancy to Oregon Department of Fish and Wildlife, Coos Bay Bureau of Land Management, and Oregon Dunes National Recreation Area. 28 pp.
- Castelein, K. A., D. J. Lauten, B. V. Smithers, K. C. Jander, E. Elliot-Smith, E. P. Gaines. 2003. The Distribution and Reproductive Success of the Western Snowy Plover along the Oregon Coast – 2003. Unpublished report by the Oregon Natural Heritage Information Center to Coos Bay Bureau of Land Management, Oregon Dunes National Recreation Area, Fish and Wildlife Service, Oregon Department of Fish and Wildlife, and Oregon Department of Parks and Recreation. 47 pp.
- Castelein, K. A., D. J. Lauten, L. N. Renan, S. R. Pixley, and M. A. Stern. 2000a. Snowy Plover Distribution and Reproductive Success along the Oregon Coast – 1999. Unpublished report by the Oregon Natural Heritage Information Center and The Nature Conservancy to Oregon Department of Fish and Wildlife, Coos Bay Bureau of Land Management, Oregon Dunes National Recreation Area, TMM Co., LTD, and Fish and Wildlife Service. 43 pp.
- . 2000b. The Distribution and Reproductive Success of the Western Snowy Plover along the Oregon Coast– 2000. Unpublished report by the Oregon Natural Heritage Information Center and The Nature Conservancy to Oregon Department of Fish and Wildlife, Coos Bay Bureau of Land Management, Oregon Dunes National Recreation Area, and Fish and Wildlife Service. 51 pp.
- . 2001. The Distribution and Reproductive Success of the Western Snowy Plover along the Oregon Coast – 2001. Unpublished report by the Oregon Natural Heritage Information Center and The Nature Conservancy to Coos Bay Bureau of Land Management, Oregon Dunes National Recreation Area, Fish and Wildlife Service, Oregon Department of Fish and Wildlife, and Oregon Department of Parks and Recreation. 52 pp.

- . 2002. The Distribution and Reproductive Success of the Western Snowy Plover along the Oregon Coast – 2002. Unpublished report by the Oregon Natural Heritage Information Center and The Nature Conservancy to Coos Bay Bureau of Land Management, Oregon Dunes National Recreation Area, Fish and Wildlife Service, Oregon Department of Fish and Wildlife, and Oregon Department of Parks and Recreation. 54 pp.
- Castelein, K. A., D. J. Lauten, R. Swift, M. A. Stern, and K. J. Popper. 1998. Snowy Plover Distribution and Reproductive Success along the Oregon Coast – 1998. Unpublished report by the Oregon Natural Heritage Information Center and The Nature Conservancy to Oregon Department of Fish and Wildlife, Coos Bay Bureau of Land Management, and Oregon Dunes National Recreation Area. 47 pp.
- Castelein, K. A., D. J. Lauten, R. Swift, and M. A. Stern. 1997. Snowy Plover Distribution and Reproductive Success along the Oregon Coast – 1997. Unpublished report by the Oregon Natural Heritage Information Center and The Nature Conservancy to Oregon Department of Fish and Wildlife, Coos Bay Bureau of Land Management, and Oregon Dunes National Recreation Area. 32 pp.
- Craig, D. P., M. A. Stern, K. A. Mingo, D. M. Craig, and G. A. Rosenberg. 1992. Reproductive Ecology of the Western Snowy Plover on the South Coast of Oregon, 1992. Unpublished report by the Oregon Natural Heritage Information Center and The Nature Conservancy to Oregon Department of Fish and Wildlife, Coos Bay Bureau of Land Management. 18 pp.
- Darr, D. 1980. Status Report on *Lasthenia macrantha* (Gray) Greene ssp. *prisca* Ornduff. Unpublished report by Oregon Natural Heritage Program to U.S. Fish and Wildlife Service. 17 pp.
- Davis, W. A. and S. M. Russell. 1984. *Birds of Southeastern Arizona*. Tucson Audubon Society, Tucson, AZ. 169 pp.
- Eastman, D. E. 1990. *Rare and Endangered Plants of Oregon*. Beautiful America Publishing Company, Wilsonville, OR. 194pp.
- Ellison, J. 2001. The Nesting of Western Snowy Plovers on the Morro Bay Sand Spit 2001. Submitted to Fish and Wildlife Service, Ventura Fish and Wildlife Office, 2493 Portola Road, Suite B, Ventura, CA.

- Estelle, V. B., C. E. Hallett, M. R. Fisher, and M. R. Stern. 1996. Snowy Plover Distribution and Reproductive Success along the Oregon Coast – 1996. Unpublished report by the Oregon Natural Heritage Information Center and The Nature Conservancy to Oregon Department of Fish and Wildlife, Coos Bay Bureau of Land Management, and Oregon Dunes National Recreation Area. 28 pp.
- Flemming, S. P., R. D. Chiasson, P. C. Smith, P. J. Austin-Smith, and R. P. Bancroft. 1988. Piping plover status in Nova Scotia related to its reproductive and behavioral responses to human disturbance. *Journal of Field Ornithology* 59(4):321-330.
- Gabrielson, I. N. and S. G. Jewett. 1940. *Birds of Oregon*. Oregon State University, Corvallis, OR. 650 pp.
- Gamon, J., et al. 1986. Report on the Status of *Abronia umbellata* Lam ssp. *acutalata* (Standl.) Tillet. Unpublished report on file with Oregon Department of Agriculture, Salem, OR.
- Gisler, S. and R. Meinke. 1997. Status Report for *Oenothera wolfii* (Munz) Raven, Dietrich & Stubbe. Unpublished report for US Fish and Wildlife Service. 44 pp.
- Global Climate Change Center. 2006b. Projecting Future Sea Level. A report from California Climate Change Center. CEC-2005-202-SF. March.
- Hallett, C. E., B. R. Casler, M. A. Platt, M. A. Stern. 1994. Snowy Plover Distribution and Reproductive Success along the Oregon Coast – 1994. Unpublished report for the Oregon Department of Fish and Wildlife – Non-game Program, Portland, Coos Bay District U.S. Bureau of Land Management, Coos Bay, and the Dunes National Recreation Area, Reedsport.
- . 1995. Snowy Plover Distribution and Reproductive Success along the Oregon Coast – 1995. Unpublished report for the Oregon Department of Fish and Wildlife - Non-game Program, Portland, Coos Bay District U.S. Bureau of Land Management, Coos Bay, and the Dunes National Recreation Area, Reedsport.
- Hayman, P., J. Marchant, and T. Prater. 1986. *Shorebirds: An Identification Guide to the Waders of the World*. Houghton Mifflin Co., Boston. 412 pp.
- Herman, S. G., J. B. Bulger, and J. B. Buchanan. 1988. The snowy plover in southeastern Oregon and western Nevada. *J. Field Ornithol.* 59:13-21.

- Hoffman, W. 1972. A Census and Habitat Analysis of the Snowy Plovers on the Oregon Coast. Unpublished report. 12 pp.
- Hoopes, E. M. 1993. Relationships between Human Recreation and Piping Plover Foraging Ecology and Chick Survival. Unpublished Master's Thesis. University of Massachusetts, Amherst, MA. 118 pp.
- Jacobs, R. A. 1986. Snowy plover (*Charadrius alexandrinus*). Section 4.4.1, U.S. Army Corps of Engineers Wildlife Resources Management Manual, Technical Report EL-86-54, Portland, OR. 25 pp.
- Kelly, P. and J. Rotenberry. 1993. Buffer zones for ecological reserves in California: replacing guesswork with science in *Interface between Ecology and Land Development in California*. J. E. Keeley, ed. Southern California Academy of Sciences. Los Angeles. pp 85 – 92.
- Lafferty, K. D. 2001. Birds at a Southern California Beach: Seasonability, habitat use, and disturbance by human activity. *Biodiversity and Conservation*. 10:1949-1962.
- Lauten, D. J., K. A. Castelein, E. Seckinger, E. Kolkemo, and E. P. Gaines. 2005. The Distribution and Reproductive Success of the Western Snowy Plover along the Oregon Coast – 2004. The Oregon Natural Heritage Information Center Institute for Natural Resources. Oregon State University. January. Available:
<http://www.fws.gov/arcata/es/birds/WSP/documents/siteReports/Oregon/2004_WSP_Annual_Report.pdf>.
- Lauten, D. J., K. A. Castelein, E. Seckinger, and E. P. Gaines. 2006a. The Distribution and Reproductive Success of the Western Snowy Plover along the Oregon Coast – 2005. The Oregon Natural Heritage Information Center Institute for Natural Resources. Oregon State University. January 11.
- Lauten, D. J., K. A. Castelein, S. Weston, K. Eucken, and E. P. Gaines. 2006b. The Distribution and Reproductive Success of the Western Snowy Plover along the Oregon Coast – 2006. The Oregon Natural Heritage Information Center Institute for Natural Resources. Oregon State University. December 30. Available:
<http://www.fws.gov/arcata/es/birds/WSP/documents/siteReports/Oregon/2006_WSP_Annual_Report.pdf>.

- Lauten, D.J., K.A. Castelein, R. Pruner, M. Friel, and E.P. Gaines. 2007. The Distribution and Reproductive Success of the Western Snowy Plover along the Oregon Coast – 2007. The Oregon Natural Heritage Information Center Institute for Natural Resources. Oregon State University. December 27. Available: <http://www.fws.gov/arcata/es/birds/WSP/documents/siteReports/Oregon/2007_WSP_Annual_Report.pdf>.
- Lauten, D.J., K.A. Castelein, D.C. Bailey, T. Lewis, and E.P. Gaines. 2008. The Distribution and Reproductive Success of the Western Snowy Plover along the Oregon Coast – 2008. The Oregon Natural Heritage Information Center Institute for Natural Resources. Oregon State University. December 30. Available: <http://www.fws.gov/oregonfwo/FieldOffices/Newport/WesternSnowyPlover/Documents/2008OSU-Dist-ReproSuccess.pdf>>.
- Lauten, D.J., K.A. Castelein, J.D. Farrar, H.G. Herlyn, and E.P. Gaines. 2009. The Distribution and Reproductive Success of the Western Snowy Plover along the Oregon Coast – 2009. The Oregon Natural Heritage Information Center Institute for Natural Resources. Oregon State University. December 30. Available: <<http://oregonstate.edu/ornhic/publications.html>>.
- Little, D. 2002. Progress Report for the Western Snowy Plover Integrated Predator Damage Management Program for May 6 – May 16, 2002. Unpublished report. U.S. Fish and Wildlife Service.
- . 2009. Integrated Predator Damage Management Final Report for the Western Snowy Plover 2008 Breeding Season at Baker/Sutton, Siltcoos, Overlook, Tahkenitch, Tenmile, Coos Bay North Spit, Bandon State Natural Area, and New River Area of Critical Environmental Concern. Prepared in collaboration with USDA-APHIS-wildlife services. Prepared for USFS, Siuslaw National Forest, BLM, Coos Bay District, USFWS, and OPRD.
- Mayfield, H. F. 1961. Nesting success calculated from exposure. *Wilson Bulletin*. 73:255-261.
- . 1975. Suggestions for calculating nest success. *Wilson Bulletin*. 87:456-466.
- Meinke, Robert J. 1982. *Threatened and Endangered Vascular Plants of Oregon: An Illustrated Guide*. Fish and Wildlife Service. 352 pp.

- Mraz, L. 1998. 1998 Western Snowy Plover Nesting Season at Floras Lake: Report in Public Monitoring Data and Interpretative Program. Report to the Bureau of Land Management, Coos Bay District, North Bend, OR. 10 pp.
- Nur, N., G. W. Page, and L. E. Stenzel. 1999. Population Viability Analysis for Pacific Coast Snowy Plovers *In* Fish and Wildlife Service. 2001. Western Snowy Plover (*Charadrius Alexandrinus Nivosus*) Pacific Coast Population Draft Recovery Plan. Portland, OR. 40 pp.
- Oregon Department of Fish and Wildlife (ODFW). 1987. Recovery and Management Plan for the Western Snowy Plover (*Charadrius alexandrinus nivosus*) in Oregon. Part I. Draft.
- . 1994. Oregon Conservation Program for the Western Snowy Plover (*Charadrius alexandrinus nivosus*). Oregon Department of Fish and Wildlife, Portland, OR. 56 pp.
- Oregon Parks and Recreation Department. 2005. Ocean Shore Management Plan. Last updated: November 5, 2007. Available: <http://www.oregon.gov/OPRD/PLANS/osmp_hcp.shtml>. Accessed: February 2, 2010.
- Oregon Coastal Conservation and Development Commission. 1974. Fish and Wildlife Resources, Oregon Coastal Zone. Portland, OR.
- Page, G. W., F. C. Bidstrup, R. J. Rammer, and L. E. Stenzel. 1986. Distribution of wintering snowy plovers in California and adjacent states. *Western Birds*. 17:145-170.
- Page, G. W. and L. E. Stenzel (eds.). 1981. The breeding status of the snowy plover in California. *Western Birds*. 12(1):1-40.
- Page, G. W., L. E. Stenzel, W. D. Shuford, and C. R. Bruce. 1991. Distribution and abundance of the snowy plover on its western North American breeding grounds. *J. Field Ornithol.* 62:245-255.
- Page, G. W., J. S. Warriner, J. C. Warriner, and P. W. C. Paton. 1995a. Snowy Plover (*Charadrius alexandrinus*) in *The Birds of North America, No. 154* (A. Poole and F. Gill, eds.). The Academy of Natural Sciences, Philadelphia, PA and The American Ornithologists' Union, Washington, D.C. 24 pp.
- Page, G. W., M. A. Stern, and P. W. C. Paton. 1995b. Differences in wintering areas of snowy plovers from inland breeding sites in western North America. *Condor*. 97:258-262.

- Palacios, E. P., L. Alfaro, and G. W. Page. 1994. Distribution and abundance of breeding snowy plovers on the Pacific coast of Baja California. *J. Field Ornithol.* 65(4):1106-1109.
- Parker, Patricia L. and Thomas F. King 1990. National Register Bulletin 38 – Guidelines for Evaluating and Documenting Traditional Cultural Properties. Last revised: 1998. Available: <<http://www.nps.gov/nr/publications/bulletins/nrb38/>>. Accessed: February 2, 2010.
- Paton, P. W. C. 1994. Survival estimates for snowy plovers breeding at Great Salt Lake, Utah. *Condor.* 96:1106-1109.
- Persons, P. E. and T. E. Applegate. 1997. Monitoring of the Western Snowy Plover at Vandenberg Air Force Base in 1997: Population Size, Reproductive Success, and Management. Point Reyes Bird Observatory, Stinson Beach, CA. 30 pp.
- Persons, P. E., J. Ellison. 2001. Nesting of the Western Snowy Plover at Morro Bay Sand Spit San Luis Obispo County, California in 2000. Submitted to the U.S. Fish and Wildlife Service, Ventura Fish and Wildlife Office, 2493 Portola Road, Suite B, Ventura, CA.
- Powell, A. N., J. M. Tarp, C. L. Collier, and B. L. Peterson. 1995. The Status of Western Snowy Plovers (*Charadrius alexandrinus nivosus*) in San Diego County, 1995. Report to the California Department of Fish and Game, Sacramento, CA, and U.S. Fish and Wildlife Service, Carlsbad, CA, and Portland, OR. 24 pp.
- Powell, A. N., B. L. Peterson, and J. M. Terp. 1996. The Status of Western Snowy Plovers (*Charadrius alexandrinus nivosus*) in San Diego County, 1996. Report to the California Department of Fish and Game, Sacramento, CA, and U.S. Fish and Wildlife Service, Carlsbad, CA, and Portland, OR. 25 pp.
- Reeder, W. G. 1951. Stomach analysis of a group of shorebirds. *Condor.* 53:43-45.
- Ruhlen, T. D., S. Abbott, L. E. Stenzel, and G. W. Page. 2003. Evidence that human disturbance reduces snowy plover chick survival. *J. Field Ornithol.* 74(3):300-304.
- Sauer, J. R., J. E. Hines, and J. Fallon. 2001. The North American Breeding Bird Survey, Results and Analysis 1966 – 2000. Version 2001.2, USGS Patuxent Wildlife Research Center, Laurel, MD.

- Saul, S. M. 1982. Clam diggers and snowy plovers. *Washington Wildlife*. 32(1):28-30.
- Shelby, Bo, and John Tkarczyk. 2002. Oregon Shore Recreational Use Study. Oregon State University. Corvallis, OR. June. Unpublished.
- Sibley, C. G. and B. L. Monroe, Jr. 1990. *Distribution and Taxonomy of Birds of the World*. Yale University Press, New Haven and London. 1,111 pp.
- Stenzel, L. E., J. C. Warriner, J. S. Warriner, K. S. Wilson, F. C. Bidstrup, and G. W. Page. 1994. Long distance dispersal of snowy plovers in western North America. *Journal of Animal Ecology*. 63:887-902.
- Stern, M. A., K. A. Kristensen, and J. F. Morawski. 1990a. Investigations of Snowy Plovers at Abert Lake, Lake County, Oregon. The Nature Conservancy, Portland, OR.
- Stern, M. A., D. J. Lauten, K. A. Castelein, K. J. Popper, and J. A. Fukuda. 2000. Impact Assessment of Oil Spilled from the New Carissa on the Western Snowy Plover along the Oregon Coast. Unpublished report by the Oregon Natural Heritage Information Center and The Nature Conservancy to TMM Co., LTD; Coos Bay Bureau of Land Management; Oregon Department of Fish and Wildlife; Oregon Dunes National Recreation Area; U.S. Fish and Wildlife Service. 32 pp.
- Stern, M. A., J. S. McIver, and G. A. Rosenberg. 1990b. Investigations of the Western Snowy Plover at the Coos Bay North Spit and Adjacent Sites in Coos and Curry Counties, Oregon, 1990. Unpublished report by the Oregon Natural Heritage Information Center and The Nature Conservancy to Oregon Department of Fish and Wildlife. 34 pp.
- . 1991. Nesting and Reproductive Success of Snowy Plovers along the South Oregon Coast – 1991. Unpublished report by the Oregon Natural Heritage Information Center and The Nature Conservancy to Oregon Department of Fish and Wildlife and Coos Bay Bureau of Land Management. 19 pp.
- U.S. Department of Agriculture Forest Service. 1994. Management Plan for the Oregon Dunes National Recreation Area, Siuslaw National Forest. Pacific Northwest Region. 104 pp + app.
- . 2002. Predator Damage Management to Protect the Federally Threatened Pacific Coast Population of the Western Snowy Plover in Oregon. Decision notice and finding of no significant impact. Siuslaw National Forest. 13 pp.

- U.S. Fish and Wildlife Service. 1993. Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the Pacific Coast Population of the Western Snowy Plover; Final Rule. *Federal Register* 58(42):12864-12874.
- . 1994a. Guidelines for Managing Recreational Activities in Piping Plover Breeding Habitat on the U.S. Atlantic Coast to Avoid Take under Section 9 of the Endangered Species Act. Northeast Region. 21 pp.
- . 1994b. Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for *Lilium Occidentale* (Western Lily); Final Rule. *Federal Register* 59(158):42171-42176.
- . 1996. Memorandum from Director to Regional Directors: Incidental Take of Migratory Birds and Bald Eagles. Washington, D.C. 7 pp.
- . 1998. Biological Opinion for the Overlook Dunes Restoration Project, Oregon Dunes National Recreation Area, Siuslaw National Forest, Douglas County, Oregon (1-7-98-F225). Portland, OR. 20 pp.
- . 1999. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Pacific Coast Population of the Western Snowy Plover. Final Rule. *Federal Register* 64(234):68507-65544.
- . 2001a. Western Snowy Plover (*Charadrius alexandrinus nivosus*) Pacific Coast Population Draft Recovery Plan. Portland, OR. xix + 630 pp.
- . 2001b. Biological Opinion that resulted from Formal Consultation on the Integrated Predator Damage Management Program for the Pacific Coast Population of Western Snowy Plover in Oregon, 2002 to 2007 (USFWS #1-7-02-F119). December 21, 2001. Oregon Fish and Wildlife Service Office. Portland, OR.
- . 2005. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Pacific Coast Population of the Western Snowy Plover. Final Rule. *Federal Register* 70(188):56970-57119.
- . 2007. Western Snowy Plover (*Charadrius alexandrinus nivosus*) Pacific Coast Population Recovery Plan. Portland, Oregon.
- . 2009. Unpublished data from Winter and Breeding Window Snowy Plover Surveys. Available: U.S. Fish and Wildlife Office. Newport, OR.

- Warriner, J. S., J. C. Warriner, G. W. Page, and L. E. Stenzel. 1986. Mating system and reproductive success of a small population of polygamous Snowy Plovers. *Wilson Bull.* 98:15-37.
- Washington Department of Fish and Wildlife. 1995. Washington State Recovery Plan for the Snowy Plover. Olympia, WA. 87 pp.
- Western Snowy Plover Working Group. 2005. Western Snowy Plover Integrated Predator Damage Management Program Final Action Plan for 2005. Prepared for the U.S. Fish and Wildlife Service, U.S. Bureau of Land Management, USDA Forest Service, Oregon Natural Heritage Information Center, and Animal and Plant Health Inspection Service. North Bend, OR. 14 pp.
- . 2006. Western Snowy Plover Integrated Predator Damage Management Program Final Action Plan for 2006. Prepared for the Fish and Wildlife Service, Bureau of Land Management, USDA Forest Service, Oregon Natural Heritage Information Center, and Animal and Plant Health Inspection Service. North Bend, OR. 15 pp.
- Wilson, R. A. 1980. Snowy Plover Nesting Ecology on the Oregon Coast. Master's Thesis, Oregon State University, Corvallis. 41pp.
- Wilson-Jacobs, R. and E. C. Meslow. 1984. Distribution, abundance, and nesting characteristics of snowy plovers on the Oregon coast. *Northwest Science.* 58 (1):40-48.

9.2. Personal Communications

- Lauten, D. J. Biologist, Oregon Natural Heritage and Information Center—comment letter received in response to the public draft of this document.

Appendix A

Site Management Plan Outline for Snowy Plover Management Areas

Site Management Plan Outline for Snowy Plover Management Areas

The Oregon Parks and Recreation Department (OPRD) will be preparing site management plans for each of the occupied and unoccupied snowy plover management areas (SPMAs) that OPRD owns and manages. These sites are:

- Columbia River South Jetty (Fort Stevens State Park),
- Necanicum Spit (Gearhart Ocean State Recreation Area),
- Nehalem Spit (Nehalem Bay State Park),
- Netarts Spit (Cape Lookout State Park), and
- Bandon (Bandon State Natural Area).

These plans will describe how the department will manage these sites both for recreational use and for snowy plover management. The site management plans will contain the following:

1. Legal Description and Map
 - a. Township/Range/Section
 - b. Topography map showing boundaries
 - c. Aerial photo showing boundaries
2. Landownership and Management History
 - a. Who currently owns the property
 - b. Current land uses
 - c. Historic land uses
3. Site Description (both historical and current)
 - a. Beach morphology

- b. Upland conditions
- c. Plover habitat conditions
- 4. Regulations governing the site
 - a. Local, state, and federal laws and regulations that may affect implementation of the site management plan
- 5. Status of snowy plover at this site (historical and current)
 - a. Population
 - b. Nest success
- 6. Human Use
 - a. Recreation
 - b. Non-recreation uses
- 7. Management Issues
 - a. Human disturbance
 - i. Recreation
 - ii. Non-recreation
 - a. Habitat
 - b. Predation
- 8. Conservation Measures
 - a. Habitat restoration and maintenance
 - i. When and where habitat will be restored
 - ii. When and where maintenance will occur
 - b. Predator management
 - i. What predators are present
 - ii. What types of non-lethal and lethal methods will be used
 - c. Monitoring
 - i. Breeding season monitoring, where applicable
 - ii. Presence/Absence Monitoring - Frequency

9. Recreation Management Measures

- a. Symbolic fencing
- b. Access
 - i. Identify recognized access points and related corridors to the wet sand
 - ii. What access points will remain versus access points that may be re-routed to keep recreational users out of key habitat areas
- c. Signage
 - i. Interpretive signs
 - ii. Plover Management Area boundary signs
- d. Public outreach and education
 - i. Types of outreach efforts that will be undertaken
- e. Enforcement
 - i. Who will perform enforcement of restrictions
 - ii. When will enforcement be performed (year-round, seasonally)
 - iii. Whether any special permitting or contracting is required

For recreational management areas (RMAs) listed below that are not owned or leased by OPRD, site management plans will be prepared either by the Oregon Department of Fish and Wildlife or the responsible land management agency in consultation with the U.S. Fish and Wildlife Service.

- Bayocean Spit
- South Sand Lake Spit
- Sutton/Baker Beach
- Siltcoos Estuary/Dunes Overlook/Tahkenitch Estuary
- Tahkenitch South
- Umpqua River North Jetty
- Tenmile Estuary
- Coos Bay North Spit
- New River
- Elk River Spit
- Euchre Creek

Appendix B

Species Considered but Excluded from the HCP

Species Considered but Excluded from the HCP

1. Brown Pelican

The Brown pelican (*Pelecanus occidentalis*) is delisted under the Federal Endangered Species Act (ESA) and listed as endangered under the Oregon ESA. The brown pelican can be found along the entire Oregon coast, from the Columbia River to the California Border.

The brown pelican is a warm weather species that thrives near coasts and on islands. The California brown pelican generally uses the rocky islands along the California coast for their group or “colonial” nest sites. These islands typically feature steep, rocky slopes and little vegetation, and they must be without terrestrial predators or human disturbances.

Nearby high-quality marine habitat is also essential. Brown pelicans rely in part on the actions of marine predators such as sharks, salmon, and dolphins to force schools of fish to the surface where they can catch them. Pelicans will only breed in areas and at times with enough food to support the breeding colony. Roosting and resting or “loafing” sites where brown pelicans can dry their feathers and rest without disturbance are also important. Pelicans are known to live for approximately 30 years, but the average may be much less than that due to predation, disease, starvation, etc.

Brown pelicans migrate along the Pacific coast as far north as Vancouver Island. The brown pelican is a common spring, summer, and fall visitor along the Oregon coast however this species has wintered in the Charleston and Coos Bay area. Brown pelicans are often seen frequenting the rocky shoreline but rarely occur on the ocean shore. A large number of pelicans have been congregating at the mouth of the Columbia River for the past several years and there is the possibility of breeding occurring on East Sand Island.

The brown pelican is not included as a covered species as there is no known nesting habitat in the area covered by the HCP, i.e. the sandy ocean shore, they perch or rest

on rocky outcrops which are not covered lands, and they forage at sea. Thus, there is little, if any, risk of take of the brown pelican by OPRD management activities on the ocean shore.

2. Marbled Murrelet

The Washington, Oregon, and California population of the marbled murrelet (*Brachyramphus marmoratus marmoratus*) was federally listed as threatened in 1992, and as threatened under the Oregon ESA in 1995. This bird can be found along the entire Oregon coast from the Columbia River to the California border.

The North American subspecies of marbled murrelet ranges from the Aleutian Islands and southern Alaska south to central California, with the largest portion of the population occurring in Alaska and British Columbia. The California, Oregon, and Washington population of the marbled murrelet is declining due to loss of older forests used for nesting sites. Along the Oregon coast, surveys have shown a decline in murrelet numbers during the 1990's. Loss and fragmentation of nesting habitat leading to nesting failure is thought to be a primary factor responsible for an estimated annual 4% to 7% decline in marbled murrelet populations. The population numbers are not expected to increase rapidly due to the naturally low reproductive rate and the continued loss of nesting habitat. Recovery is estimated to take decades.

The marbled murrelet is a small robin-sized diving seabird feeding primarily on fish and invertebrates in near-shore marine waters. The murrelet spends the majority of its time on the ocean, roosting and feeding, but comes inland up to 80 kilometers (50 miles) to nest in forest stands with old growth characteristics. This species nests in stands varying in size from several acres to thousands of acres. However, larger, unfragmented stands of old growth appear to be the highest quality habitat for marbled murrelet nesting. Nesting stands are dominated by Douglas-fir (*Psuedotsuga menziesii*) in Oregon.

The primary cause of marbled murrelet population decline is the loss and modification of nesting habitat in old growth and mature forests through commercial timber harvests, human-induced fires, land conversions, and, to a lesser degree, through natural causes such as wild fires and wind storms. Increased forest fragmentation can reduce nesting success by allowing increased predation of nests by raptors (great horned owls, sharp-shinned hawks, peregrine falcons) and corvids (jays, ravens, crows). In the murrelet's marine habitat, oil spills and gill-net fishing also threaten the population. Recent oil spills off the coasts of California and Oregon have contributed to direct mortality of marbled murrelets and other seabirds.

The marbled murrelet is not included as a covered species as this species does not nest, roost, or forage on the sandy beaches of the HCP covered lands. As such, there is no risk of take from OPRD covered management activities.

3. Bald Eagle

The bald eagle (*Haliaeetus leucocephalus*) is listed as threatened under the Oregon ESA. The bald eagle can be found along the entire coast, from the Columbia River to the California border.

The bald eagle is unique to North America, ranging from central Alaska and Canada to northern Mexico. The majority of nesting bald eagles in Oregon occur in the following areas: Columbia River below Portland, the Oregon coast and Coast Range, the High Cascades, Klamath Basin, and the upper Willamette River Basin. In a statewide nesting survey in 2007, 512 breeding pairs were recorded in Oregon. Wintering migratory bald eagles are found throughout the state.

Bald eagle nest site selection varies widely from deciduous, coniferous, and mixed forest stands. Nest trees are usually large diameter trees characterized by open branching and stout limbs. Nests are in dominant or co-dominant trees often located near a break in the forest such as a burn, clearcut, field edge (including agricultural fields), or water. Most nest sites are within 1/2 mile of a body of water such as coastal shorelines, bays, rivers, lakes, ponds, and dammed up rivers (i.e., beaver dams, log jams, etc.), and that have an unobstructed view of the water. Bald eagle habitat occurs primarily in undeveloped areas with little human activity.

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, tundra, suburban areas, etc.) where other prey species (e.g., rabbit, rodents, deer, carrion) are abundant.

These large, powerful raptors can live for 30 or more years in the wild and even longer in captivity. Nests are often reused year after year, and with additions made annually, the nests can become enormous. The bald eagle is an opportunistic predator that feeds primarily on fish but also takes a variety of birds, mammals, and turtles (both live and as carrion) when fish are less abundant or these other species are readily available. Waterfowl are the most common avian prey, but shorebirds and land birds are also eaten. A variety of mammals are also taken as prey, although mammals are less important than fish and birds. Mammals are taken as live prey or carrion in all seasons but become more important during the winter months.

The major factor leading to the decline and subsequent listing of the bald eagle was disrupted reproduction resulting from contamination by organochlorine pesticides.

Loss of habitat and human disturbance are potential threats. Habitat loss results from the physical alteration of habitat as well as from human disturbance associated with development or recreation (i.e., hiking, camping, boating, and ORV use). Activities that can and have negatively impacted bald eagles include logging, mining, recreation, overgrazing (particularly in riparian habitats), road construction, wetland filling, and industrial development. These activities are particularly damaging when they occur in shoreline habitats.

Important conservation measures include (1) Avoidance of disturbance to nests during the nesting season: January – August, (2) Avoidance of disturbance to roosts during the wintering season: November – March, (3) Protection of riparian areas from logging, cutting, or tree clearing, (4) Protection of fish and waterfowl habitat in bald eagle foraging areas, and (5) development of site-specific management plans to provide for the long-term availability of habitat.

The bald eagle is not included as a covered species because OPRD management activities along the ocean shore are not likely to result in disturbance of nesting bald eagles, i.e. nest trees are located remotely relative to the sandy ocean shore covered lands. Potential impacts to bald eagles that may within coastal state park units that have specifically identified portions designated as covered lands will be avoided through implementation of eagle site management plans designed to eliminate the risk of take of bald eagles.

4. Peregrine Falcon

The federal government delisted the peregrine falcon (*Falco peregrinus anatum*) in 1999, and the State of Oregon delisted this species in 2007. Peregrine falcons are not known to nest along Oregon's ocean shoreline.

In North America, peregrine falcons can be found breeding from the Arctic Coast south to Baja. Once an endangered species, these falcons can be found on all continents with the exception of Antarctica. Peregrines use cliff ledges within close proximity to water for nest sites in what are called aeries. Their diet is made up mostly of other birds (including snowy plovers) as well as rodents and fish, which they strike and capture with their sharp talons. Peregrine falcons are most susceptible to human activities during the nesting season. However, no nest sites are known to occur within the HCP covered lands.

The peregrine falcon is not included as a covered species because OPRD management activities along the ocean shore are not likely to result in disturbance of nesting peregrine falcons, should they become established. Thus, impacts to peregrine falcons as a result of OPRD management activities are expected to be negligible.

5. Steller Sea Lions

The Steller sea lion (*Eumetopias jubatus*) is listed as a threatened species in Oregon under the Federal ESA. Steller sea lions are found in the Pacific Ocean from Japan to southern California.

Steller sea lions tend to remain offshore or haulout in unpopulated areas. They roar rather than bark and are much larger and lighter in color than California sea lions. Steller males weigh up to 2,200 pounds and can be 8 to 11 feet long. Females are smaller, weighing 600 to 800 pounds and growing 6 to 8 feet long. Reproduction occurs on offshore islands during the months of June and July, which is also when pups are born. The main haulout areas in Oregon are Rogue Reef, Three Arch Rocks, and Shell Island although they may haulout on other rocky outcrops along the Oregon coast.

The Steller sea lion is not included as a covered species because they do not occur on the HCP covered lands. As such, there is a very low risk of take of Steller sea lion by OPRD management activities in the area covered by the HCP.

6. Western Lily

The western lily (*Lilium occidentale*) is both federal and state listed as endangered. In Oregon it is known to occur only in Coos and Curry Counties.

This species grows up to 5 feet tall, and has as many as ten nodding flowers per stem. They are crimson red shading to yellow and green at the base. The yellow and green areas are dotted with purple. The tepals, 2 inches long, are recurved only halfway. The deep red anthers are one half inch long and closely surround the pistil. The leaves generally are single along the stem except for 1 whorl near the middle, and blooms from late June through July.

This extremely rare lily grows only on the periphery of bogs near the sea, on soils that are poorly drained, and on highly organic soils of sphagnum origin. Although located in close proximity to the beach, the western lily is not a dune species.

The Western lily was not included as a covered species because it is not likely to occur on HCP covered lands or where OPRD management activities occur. Thus, there is a very low risk of take of this species. However, to ensure there will be no risk of take while restoration activities are conducted, OPRD will survey for the western lily on HCP covered lands where the species could potentially be present.

7. Pink Sand Verbena

The pink sand verbena (*Abronia umbellata ssp. breviflora*) is a state listed endangered species, and is considered a species of concern by the U.S. Fish and Wildlife Service. This species has historically occupied beaches from Vancouver Island, British Columbia to northern California. Only a few populations are known to exist in Oregon and California, and the species is believed to be extinct in Washington.

The pink sand verbena is a succulent, annual perennial native herb, in the four o'clock family (*Nyctaginaceae*). Stems are prostrate with ovate to diamond shaped leaves. Inflorescences are slender with 8 to 27 light to bright pink to purple flowers, arranged in umbrellate heads. Pink sand verbena can be found in disturbed sandy areas and coastal dunes below 100 meters.

The primary threat to pink sand verbena is competition from invasive European beachgrass (*Ammophila arenaria*) and habitat disturbance from motor vehicles. With the decline of pink sand verbena, there has been a corresponding decrease in other plant and wildlife species. This species is frequently found in association with yellow sand verbena (*Abronia latifolia*).

The U.S. Forest Service, Siuslaw National Forest and the Bureau of Land Management, Coos Bay District have undertaken projects to transplant and seed pink sand verbena at several beaches and dune habitats along the coast since 1997.

Pink sand verbena was not included as a covered species because it is not likely to occur on HCP covered lands or where OPRD management activities occur. Thus, there is a very low risk of take of this species. In fact, the habitat restoration efforts to be undertaken may result in the recovery of this species at particular beaches. OPRD, as part of their restoration efforts, will work with the Oregon Department of Agriculture and the Institute of Applied Ecology in re-introducing this species to restored areas. A survey of the restoration sites will be undertaken prior to any restoration work to ensure that newly planted populations are not damaged during European beachgrass removal efforts.

8. Silvery Phacelia

Silvery phacelia (*Phacelia argentea*) is listed as a threatened species under the Oregon ESA and is a federal species of concern. Silvery phacelia is a local endemic, occurring in coastal dunes in Coos and Curry counties, Oregon.

Silvery phacelia is a member of the *Hydrophyllaceae* (waterleaf family) that grows in open sand or dunes. This species has stout stems, with many branched at the base. Leaves are silvery pubescent. Inflorescences are dense, with white flowers.

Silvery phacelia was not included as a covered species because OPRD covered recreation activities are not likely to cause take of this species during the permit period. The known locations for this species are behind the foredunes and, thus, do not occur on the sandy beach covered HCP lands. Any area that will be restored for snowy plover habitat will be surveyed to ensure that such actions will not impact the species.

9. Wolf's Evening Primrose

The Wolf's evening primrose (*Oenothera wolffi*) is listed as threatened under the Oregon ESA. Wolf's evening primrose is found mainly in sandy soil on bluffs above the ocean beach, and is known only from a few sites in Curry County in Oregon.

Wolf's evening primrose is a perennial, or sometimes a biennial plant, growing erectly from 20 to 60 inches tall. The entire plant is covered with coarse, stiff hairs. The flowers are densely arranged along the smaller leaves near the top of the stem. The four petals are about an inch long, yellow turning to orange with age. The sepals are long, triangular, ciliate, and reflexed backward against the stem. The inflorescence is glandular and sticky. This species reportedly blooms from June to October.

Wolf's evening primrose was not included as a covered species because it is not likely to occur in the HCP covered lands and, thus, unlikely to be affected by OPRD covered activities, i.e. the risk of take is extremely low.

10. Large-Flowered Goldfields

The large-flowered goldfields (*Lasthenia macrantha*) is an Oregon Department of Agriculture candidate species. This rare daisy-like flower grows in a few isolated populations in Curry County, Oregon, on seaward slopes, rocky cliffs, and sandy areas above the beach, and is rare throughout its range and its numbers seem to vary with the year.

The large-flowered goldfields is a showy plant about sixteen inches tall. The flower heads are singular on each stem, are about an inch in diameter, and usually have about twelve bright yellow ray flowers. The disk flowers are yellow also. The leaves are linear, untoothed, and generally villous. This species flowers in June and July.

The large-flowered goldfields was not included as a covered species because it is unlikely to occur on HCP covered lands and, thus, the risk of take as a result of covered activities is extremely low. This species is, however, found on the trails leading to the beach. OPRD will conduct a survey of its beach trails to determine whether the species is present and take appropriate action to protect the species and avoid the risk of take.

11. Manyleaf Gilia

Manyleaf gilia (*Gilia millefoliata*) is a federal species of concern but has no state listing status. The manyleaf gilia historically occurred along the Pacific coast from the San Francisco Bay area to the central Oregon coast. There currently are three known populations along the Oregon coast, from Floras Lake to the California state line (Rittenhouse 1995).

This species is found on semi-stabilized sand dunes within 200 yards of the ocean. This species is threatened by habitat development, heavy highway vehicle use, and competition from exotic plants, particularly European beachgrass.

The manyleaf gilia was not included as a covered species because OPRD management activities are not likely to cause take of this species during the permit period. This species will benefit from the removal of European beachgrass associated with snowy plover habitat management and from restrictions placed on locations where recreational activities may occur. Potential sites will be surveyed by OPRD prior to any habitat restoration work to avoid harming existing populations.

Appendix C

Record of Public Involvement

Record of Public Involvement

Steering Committee Membership

Sybil Ackerman/Samantha Murray, Audubon Society of Portland

Bob Altman, American Bird Conservancy

Ed Becker/Paul Thomas, Siuslaw National Forest

Charlie Bruce, Oregon Department of Fish and Wildlife

Brian Cole, representative assigned by Lane County Board of Commissioners

Mandy Cole, Oregon Tourism Commission

Pete DeMain/John Griffith, Coos County Board of Commissioners

Nan Evans/Paul Klarin, Department of Land Conservation and Development

Jim Good, Oregon State University, Sea Grant Program

Bob Green/Bill Gregory, Oregon Parks and Recreation Commission

John Griffith, Member at Large

Chuck Hurliman, Tillamook County Board of Commissioners

Onno Hussing, Oregon Coastal Zone Management Association

Mark Johnson, Coos Bay District, US Bureau of Land Management

Cheryle Kennedy, Confederated Tribes of Grand Ronde

Robert Kentta, Confederated Tribes of Siletz Indians

Mike Knapp, Member at Large

Lucie LaBonte, Curry County Board of Commissioners

Richard Lee, Clatsop County Board of Commissioners

Al LePage, National Coast Trail Association

John Lilly, Oregon Department of State Lands

Jack Peasley, Oregon Equestrian Trails

Jeff Powers, representative assigned by Douglas County Board of Commissioners

Foncy Prescott, Kalmiopsis Audubon Society

Fran Recht, Oregon Shores Conservation Coalition

David Revell/Marcus Mead, Surfriders

Arnold Ryland, Northwest Sand Dunes and off highway vehicle riders

Fred Seavey, U.S. Fish and Wildlife Service

Terry Thompson, Lincoln County Board of Commissioners

Dave Tovey, Coquille Indian Tribe

Isaiah Ursprung, Confederated Tribes of Coos, Lower Umpqua and Siuslaw Indians

Steering Committee Meetings

- April 2002, Coos Bay
- June/July 2002, South Beach/Newport
- October 2002, Seaside
- March 2003, Newport
- July 2003, Florence
- December 2003, South Beach/Newport
- June 29 2004, Reedsport
- August 23-24, 2004, Florence

Public Meetings

- Late April and early May 2002, evening meetings in Coos Bay, Gold Beach, Florence, Newport, Tillamook, Seaside and Portland

- October 2002, evening meetings in Coos Bay, Gold Beach, Portland, Eugene, Florence, Newport, Tillamook and Seaside
- March 2003, evening meetings in Coos Bay, Newport, Tillamook and Portland (included informal scoping for NEPA EIS process)
- Late January and early February 2004, evening meetings in Seaside, Salem, Coos Bay, Gold Beach and Newport, March 2004 Tillamook and Pacific City

Appendix D

Recreational Activities Occurring on the Covered Lands

Recreational Activities Occurring on the Covered Lands

According to the Oregon Shore Recreational Use Study (Shelby and Tokarczyk 2002), beachgoers reported participating in more than 40 different recreation activities during trips to the Oregon Coast. Coast-wide, the most popular beach recreational activities included walking (37%), relaxing at a stationary location (21%), and scenic enjoyment (12%). The survey and observation data from the study were gathered on-site during a time-period between June 29, and September 3, 2001, the higher-use summer months. Additional and more detailed information was also collected from a follow-up mailed questionnaire. Below is a comprehensive list from the study of recreational activities known to occur on the Oregon Coast.

Primary Activities

1. Relaxing
2. Scenic enjoyment
3. Walking
4. Playing in the sand
5. Beachcombing
6. Camping
7. Exercising dogs
8. Motorcycles/ATV's
9. Surfing
10. Swimming/wading
11. Tidepool exploration
12. Exercise

13. Windsurfing
14. Picnicking
15. Boogie boarding
16. Crabbing from the beach
17. Fishing from the beach
18. Kite flying
19. Photography
20. Horseback riding
21. Bird watching
22. Clamming/mussel collection
23. Driftwood fires
24. Driving street legal vehicles on the beach
25. Bicycling
26. Fireworks¹
27. Ranger-led programs
28. Visitor center/exhibits

All Activities

1. Walking for pleasure
2. Exercise; jogging; running; walking
3. Picnicking, relaxing at stationary position, includes sunbathing
4. Camping
5. Exercising dogs
6. Swimming: wading, jumping waves, chasing waves, getting feet wet
7. Kite flying: remote-control planes

¹ The use of fireworks is illegal on the Oregon Coast without an appropriate permit.

8. Driftwood fires
9. Surfing
10. Informal driftwood collection
11. Bike riding
12. Boogie boarding
13. Birding
14. Participating in special events
15. Kayaking
16. Clamming
17. Fishing from the beach
18. Windsurfing from the beach
19. Horseback riding
20. Crabbing from the beach
21. Hang gliding (landing on the beach)
22. Scenic enjoyment
23. Fireworks²
24. Beachcombing: Shells, rocks, sand dollars, agates, floats, beach glass, fossils, seaweed, kelp, metal detecting, gold prospecting, collecting flowers
25. Sandplay: Sand castles, sand sculpting, digging holes, climbing on dunes
26. Family activities: Playing with kids, entertaining kids, out of town visitors or grandkids
27. Beach vehicle recreation: ATVs, cars, motorcycles, four wheelers, sandrails, jeeps, dune buggies
28. Artistic pursuits: Painting, sketching, drawing, writing
29. Sports: Frisbee, soccer, baseball, football, volleyball, bocce, croquet, golf
30. Photography

² The use of fireworks is illegal on the Oregon Coast without an appropriate permit.

31. Spiritual endeavors: Tai chi, yoga, meditation, praying, church activities
32. Reading
33. Tidepooling: Viewing tidepools, anemones, crabs
34. Beach cleanup: Pickup litter and dead animals
35. Remote control vehicles / cars
36. Wildlife viewing: Whales, sea lions, birds, plants
37. Skim boarding
38. Land sailing
39. Jet skiing
40. Paragliding
41. Dory fishing/landing/launching
42. Rock climbing
43. Kissing
44. Kiteboarding

The recreational activities identified in Oregon Shore Recreational Use Study were consolidated into groups to facilitate the analysis of the covered activities in the HCP. Twelve recreational activities (camping, dog exercising, pedestrian traffic, picnicking, near shore activities / surf sports, driving / vehicles, horseback riding, beach fires, beachcombing, driftwood collection and removal, kite flying, and other dry sand activities) were identified as covered activities, and specifically as subcomponents of Public Use / Recreation Management (See Chapter 3.3, Covered Activities). Table D-1 provides a summary of how the recreational activities noted in Shelby and Tokarczyk 2002 were considered in the HCP.

Table D-1. Consideration of Recreational Activities Identified in the Oregon Shore Recreational Use Study as Covered Activities in the HCP

HCP Covered Activity	Oregon Shore Recreational Use Study Recreational Activity
Camping	Camping
Dog Exercising	Exercising Dogs
Pedestrian Traffic	Walking for pleasure Exercise: jogging, running, walking
Picnicking	Picnicking
Near Shore Activities / Surf Sports	Surfing Swimming / wading Tidepool exploration Windsurfing Boogie boarding Crabbing from the beach Fishing from the beach Clamming/mussel collection Shell fish collecting and fishing from the beach Kayaking Windsurfing from the beach Skim boarding Kite boarding
Driving / Vehicles	Motorcycles / ATVs Driving street legal vehicles on the beach Bicycling Beach vehicle recreation Remote control cars Land sailing Jet skiing Dory fishing
Horseback Riding	Horseback riding
Beach Fires	Driftwood fires
Beachcombing	Beachcombing
Driftwood Collection and Removal	Informal driftwood collection

HCP Covered Activity	Oregon Shore Recreational Use Study Recreational Activity
Kite Flying	Kite Flying
	Hang gliding
	Paragliding
	Remote control planes
Other Dry Sand Activities	Relaxing
	Scenic enjoyment
	Playing in the sand
	Photography
	Bird watching
	Ranger led programs
	Visitor center / exhibits
	Relaxing at stationary position
	Sunbathing
	Participating in special events
	Scenic enjoyment
	Sandplay
	Family activities
	Artistic pursuits
	Sports
	Spiritual endeavors
	Reading
Beach cleanup	
Wildlife viewing	
Rock climbing	
Kissing	

Source: Shelby and Tokarczyk 2000

References

Shelby, Bo, and John Tokarczyk. 2002. Oregon Shore Recreational Use Study. Oregon State University. Corvallis, OR. June. Unpublished.

Appendix E

Activities Not Addressed in the HCP

Activities Not Addressed in the HCP

Activities under the jurisdiction and responsibility of Oregon Parks and Recreation Department (OPRD) that are not addressed in the habitat conservation plan (HCP) and will not be covered by the Incidental Take Permit (ITP), include Ocean Shore and Special Permit activities that may occur on the sandy ocean shore. These permitted activities will be addressed on a case-by-case basis, in consultation with the U.S. Fish and Wildlife Service (USFWS) as necessary, and, if issued, will include permit conditions designed to avoid the risk of take of the snowy plover.

Ocean Shore Permit Activities

Permits on the ocean shore are separated into six types:

- Shoreline Protection Structures
- Access ways / Other Miscellaneous Projects
- Sand Alteration
- Natural Product Removal
- Marine Algae Collection
- Pipeline, Cable or Conduit

Shoreline Protection Structures

Permits for shoreline protective structures may be issued only where development existed on January 1, 1977, as required under Statewide Planning Goal 18, Beaches and Dunes. “Development” is defined as houses, commercial and industrial buildings, and vacant subdivision lots which are physically improved through construction of streets and provision of utilities to the lot, or where an exception has been granted to the local city or county comprehensive plan.

Applicants for shoreline protection structures are asked to assess the hazards affecting the property, examine hazard alleviation alternatives, evaluate potential adverse impacts associated with each feasible technique, and propose actions that help to minimize short and long-term impacts. For shoreline protection structures 50 feet or greater in length, a geologist’s report is required to address a number of

factors, including potential adverse impacts from the proposed structure, erosion rates, non-structural alternatives, and known seismic or geologic hazards in the area.

Applications for shoreline protective structures also must address the alternative of hazard avoidance, which may involve building relocation or increasing oceanfront setbacks to avoid the hazard. Where cost is used as a reason why a building cannot be relocated, documentation is required in the form of a written estimate from a professional to show the cost of relocation.

Issuance of Shoreline Protection Structure ocean shore permits was not included as a covered activity in the HCP because these permits would only be issued for areas where development currently exists, and outside areas either occupied or with the potential to be occupied in the future by snowy plover. If there is a possibility that snowy plovers could be affected by activities authorized by these permits, OPRD will include permit conditions designed to avoid the risk of take of the snowy plover.

Access Ways / Other Miscellaneous Projects

This type of permit application includes beach access stairways, pathways, boat ramps, viewing platforms, boardwalks and other miscellaneous projects. When private beach access improvements are proposed, the department assesses the need for the project by reviewing the location of the nearest public beach access facilities.

Issuance of ocean shore permits for access ways and other miscellaneous projects was not included as a covered activity in the HCP because they typically would only be authorized in areas directly adjacent to waterways, and outside of nesting snowy plover habitat. As such, there is a very low likelihood that this activity could affect snowy plover populations. However, if there is a possibility that snowy plovers could be affected by activities authorized by these permits, OPRD will include permit conditions designed to avoid the risk of take of the snowy plover.

Sand Alterations

Sand alterations include dune enhancement projects, stream channel alterations, dune management plans, and other projects that involve fill or relocation of beach sand.

Although sand alteration projects could occur in snowy plover habitat, OPRD has committed, through the permit review process, to ensuring that such activities are not authorized if there would be a potential for take of snowy plover. If there is a possibility that snowy plovers could be affected by activities authorized by these permits, OPRD will include permit conditions designed to avoid the risk of take of the snowy plovers. As such, issuance of ocean shore permits for sand alternations was not included as a covered activity in the HCP.

Natural Product Removal

Proposals that call for the removal of material from the ocean shore fall under the category of natural product removal. This includes material such as sand, rock, or other mineral resources, and other natural products from the ocean shore, collected for reasons other than personal souvenirs.

Although the removal of natural products from the ocean shore could affect snowy plover, OPRD has committed, through the permit review process, to ensuring that such activities are not authorized if there would be a potential for take of snowy plover. If there is a possibility that snowy plovers could be affected by activities authorized by these permits, OPRD will include permit conditions designed to avoid the risk of take of the snowy plovers. As such, issuance of ocean shore permits for natural product removal was not included as a covered activity in the HCP.

Marine Algae Collection

A permit for collection of marine algae is required when collection will exceed 10 pounds (wet weight) per person, per day. Collection of marine algae may be for personal consumption, commercial sale, use as a soil amendment, scientific research, or for other purposes. Collection of algae is prohibited within designated marine gardens and habitat refuges. Within Intertidal Research Reserves, collection is limited to scientific or educational purposes.

Although the collection of marine algae from the ocean shore could affect snowy plover, OPRD has committed, through the permit review process, to ensuring that such activities are not authorized if there would be a potential for take of snowy plover. If there is a possibility that snowy plovers could be affected by activities authorized by these permits, OPRD will include permit conditions designed to avoid the risk of take of the snowy plovers. As such, issuance of ocean shore permits for marine algae collection was not included as a covered activity in the HCP.

Pipelines, Cables or Conduit

Projects involving the placement of underground pipelines, outfall lines, fiber optic cables, or other conduits across the ocean shore fall within this category. Pipelines, cables, conduits, and similar facilities are limited to routes that cross the beach from land to sea. Administrative rule policies prohibit the use of the ocean shore as a north-south utility corridor.

Although the placement of underground pipelines, cables, or conduits across the ocean shore could affect snowy plover or their habitat, OPRD has committed, through the permit review process, to ensuring that such activities are not authorized if there would be a potential for take of snowy plover. If there is a possibility that snowy plovers could be affected by activities authorized by these permits, OPRD will

include permit conditions designed to avoid the risk of take of the snowy plovers. As such, issuance of ocean shore permits for placing pipelines, cables, or conduit was not included as a covered activity in the HCP.

Special Permit Activities

Miscellaneous Use Permits

OPRD has been issuing miscellaneous use permits for a variety of non-traditional activities since 1967. Between 1997 and 2001, over 150 miscellaneous use permits have been issued for activities occurring on the ocean shore, with over half of these activities occurring within Clatsop and Tillamook Counties. Forty of the 150 permits were issued for weddings. In some cases, permits are issued for activities that will occur within multiple counties, such as the Stop Oregon Litter and Vandalism Legacy walk in 2002.

Through the permit review process, OPRD has committed to ensuring that activities authorized under a Miscellaneous Use Permit would not result in take of snowy plover. If there is a possibility that snowy plovers could be affected by activities authorized by these permits, OPRD will include permit conditions designed to avoid the risk of take of the snowy plovers. As such, issuance of Miscellaneous Use permits was not included as a covered activity in the HCP.

Drive-on-Beach Permits

OPRD has authority to issue permits to allow individuals to drive on sections of beach that are normally closed to vehicular traffic. Permits are issued for operation of vehicles only during the daylight hours, and are issued to a specific person, vehicle, use, and ocean shore area. Drive-on-beach permits have been issued for collection of driftwood and for rock removal, snowy plover related activities (monitoring, predator management, and law enforcement), for beach cleanups, activities related to the New Carissa incident in 1999, commercial filming (generally car commercials), handicap access, construction activities generally related to riprap repair, and weddings. This is not an inclusive list of activities.

Between 1997 and 2002, OPRD issued over 200 drive-on-beach permits, and demand is expected to increase. A number of these permits were issued for work associated with snowy plover monitoring, enforcement, research, and predator management. Another purpose is the retrieval of driftwood on beaches closed to driving. OPRD has issued 41 drive-on-beach permits for the collection of driftwood since 1997.

Through the permit review process, OPRD has committed to ensuring that activities authorized by Drive-on-Beach Permits would not result in take of snowy plover. If there is a possibility that snowy plovers could be affected by activities authorized by

these permits, OPRD will include permit conditions designed to avoid the risk of take of the snowy plovers. As such, issuance of these permits was not included as a covered activity in the HCP.

Beach Logging and Salvage Permits

Beach logging is prohibited on the ocean shore unless it can be shown that removal will provide a significant public benefit. One of the factors considered in determining whether to allow the removal of beach logs is the protection of wildlife habitats that may be impacted by the accumulation of beach logs (OAR736-026-0005(e)). Prior to allowing the removal of beach logs, the department consults with the local government, upland property owners, and affected State agencies (Oregon Department of State Lands, Oregon Department of Fish and Wildlife, Department of Land Conservation and Development, Oregon Department of Environmental Quality, and the Department of Geology and Mineral Industries) to establish interests to be protected and considered.

A permit is required for a person to remove or convert to his own use or possession any salvage from the ocean shore. Salvageable objects include "... any object, thing or material, exclusive of driftlogs, which is not in its natural state, and is not a natural product of the ocean shore." OAR 736-027-0010(1). The exception to this rule is for those items such as glass floats, length of rope or cable less than 100-feet, and other minor objects normally collected while beachcombing. OPRD has issued an estimated 10 permits for this activity within the past ten years.

Although the removal of beach logs or the salvage of materials from the ocean shore could affect snowy plover or their habitat, OPRD has committed, through the permit review process, to ensuring that such activities are not authorized if there would be a potential for take of snowy plover. If there is a possibility that snowy plovers could be affected by activities authorized by these permits, OPRD will include permit conditions designed to avoid the risk of take of the snowy plovers. As such, issuance of beach logging and salvage permits was not included as a covered activity in the HCP.

Fireworks

Fireworks are a moderately popular activity coast-wide, with the highest percentage of use occurring in the north and north-central coast and the far south coast. However, OPRD rules prohibit the possession and/or discharge of fireworks and other related devices (e.g., explosive, torpedoes, rockets) without a permit. Since 1997, the department has issued approximately 19 miscellaneous use permits to local communities for the discharge of fireworks. Of these, only one was issued for activities within a Plover Management Area. However, permits were issued to the communities of Seaside and Manzanita, each located within close proximity to a

Plover Management Area. Most of these permits were issued for Fourth of July activities, which occurs during the snowy plover nesting season.

Through the permit review process, OPRD has committed to ensuring that firework displays would not occur in a PMA or result in take of snowy plover. If there is a possibility that snowy plovers could be affected by firework displays authorized by permit, OPRD will include permit conditions designed to avoid the risk of take of the snowy plovers. As such, issuance of permits for firework displays was not included as a covered activity in the HCP.

Scientific Research and Collection Permits

OPRD issues permits to individuals wishing to conduct scientific research or collection of natural resources from the Ocean Shore and State Park properties. If the research or collection involves a listed species, the applicant is required to obtain the necessary State and Federal permits before an OPRD permit is valid. An average of 30 permits are issued statewide annually, with some of these activities occurring on the ocean shore or adjacent uplands.

Given that scientific research or collection actions that could affect snowy plover would have to be separately authorized by USFWS, this activity was not included as a covered activity in the HCP.

ATV/OHV Permits

OPRD has responsibility for the issuance of all-terrain vehicle permits. There are three classes of permits: Class One (off-road vehicles), Class Two (dune buggies) and Class Three (motorcycles). There is no age restriction as to who can obtain a permit, and not all individuals who receive a permit to operate an all terrain vehicle (ATV)/off highway vehicle (OHV) will drive their ATV/OHV on the ocean shore, however each of these individuals has the opportunity to do so. Table E-1 lists the number of ATV/OHV permits the department has issued between 2000 and 2002, statewide.

Table E-1. Number of ATV Permits Issued Statewide by OPRD for 2000-2002

Year	Number of Permits
2000	42,996
2001	51,242
2002	58,040
2003	73,449
2004	67,812
2005	76,937
2006	86,171

ATV/OHVs may operate on the sandy beaches that are closed to driving pursuant to a drive-on-beach permit issued by the department. Additionally, ATV/OHV use is allowed within portions of the Oregon Dunes National Recreation Area, including portions of the dry sand, as well as the Sand Lake Recreation Area. Illegal ATV/OHV use does occur on the ocean shore, i.e. individuals who ride their ATV/OHV on closed beaches without an OPRD drive-on-beach permit and those who drive ATVs on the beach in areas only open to street legal vehicles.

Through the permit review process, OPRD has committed to ensuring that ATV/OHV use would not result in take of snowy plover. If there is a possibility that snowy plovers could be affected by activities authorized by these permits, OPRD will include permit conditions designed to avoid the risk of take of the snowy plovers. As such, issuance of permits for ATV/OHV use on the ocean shore was not included as a covered activity in the HCP.

Appendix F

Snowy Plover Recreation Management Area Descriptions

Snowy Plover Recreation Management Area Descriptions

Bayocean Spit – Unoccupied (Tillamook County)

This Recreation Management Area (RMA) is adjacent to land owned by the U.S. Army Corps of Engineers (Figure F-1). The RMA encompasses 1.73 miles of the ocean shore. The beach is closed to vehicle driving (street and OHV/ATVs). The habitat at the northern end of the RMA is suitable for snowy plover nesting with a wide flat upper beach area extending south. Further south the foredunes increase in height (to 20+ feet). The interior area is tree-covered. Snowy plover have not been seen at this site since 2000, when one bird was observed during the winter months. Nesting at this site has not occurred since 1995. This site used to have high numbers of snowy plovers. In 1989, 39 adults were observed during the winter at Bayocean Spit. During the breeding season, there have been as many as 17 birds (1976) spotted during a breeding survey.

The U.S. Air Force conducts military maneuvers (survival training) within the last 0.25 miles (southern portion) of this RMA and to the south, under a permit from OPRD. This permit is effective through 2010. These operations generally take place during a two-week period in April and September. The U.S. Air Force has obtained a biological opinion from the U.S. Fish and Wildlife Service (USFWS) for its activities. While recreation use here is low, this is a popular area for horse back riding. There are currently five access points to the beach, and a paved parking lot that holds approximately 20+ vehicles. Hunting is allowed. There are a number of private landowners to the south of the RMA; however, these sites have been developed.

South Sand Lake Spit – Unoccupied (Tillamook County)

This RMA is privately owned. The entire RMA is approximately 1.44 miles in length (Figure F-2). Snowy plover have not been observed at Sand Lake since 1984, when four snowy plover were observed. Habitat restoration would be required at this

RMA. The mouth of the river changes periodically. The spit is open, low, and relatively flat. However, further south the dunes become stabilized.

The beach is closed to driving from May 1 to September 30 and from sunrise to sunset weekends and holidays from October 1 through April 30th. Recreation use on this beach is primarily by residents of or visitors to Tierra Del Mar and Pacific City.

Sutton/Baker Beach – Occupied (Lane County)

This is the most northern occupied RMA (Figure F-3). The U.S. Forest Service owns land adjacent to this RMA, which encompasses 4.00 miles of the ocean shore. Snowy plovers have nested here as recently as 2007, but nesting has been inconsistent in recent years. This is a very linear beach, and one of the most challenging sites for snowy plover management due to the winds and sand movement. Many times the sand buries the ropes and signs.

European beachgrass has stabilized the foredune and allowed it to build to its present height of 25 –30 feet. The spread and colonization of European beachgrass, and associated invasion of Scotch broom, gorse and shore pine in the foredune-deflation plain, has transformed vast areas of open sand into dense grass-shrub habitat. In addition, the beach has narrowed due to beachgrass invasion and the high tide occasionally reaches the foredune during the breeding season, effectively precluding the potential for successful nesting.

The U.S. Forest Service is undertaking habitat restoration efforts on lands adjacent to this RMA, which includes lowering the foredune and European beachgrass removal on up to 140 acres over a ten-year period. Approximately 30 acres of habitat have been restored since 1993.

The beach is closed to vehicle driving (street and OHV/ATVs). Recreation use here is low, but higher than other RMAs due to its proximity to Florence, Oregon. This is also a popular beach for equestrians. Seasonal dry sand restrictions have been imposed at this RMA since 1995. Since 1996, five chicks have fledged from this site. This RMA is an important wintering area for snowy plover.



Note: The landward boundaries of this RMA do not extend beyond the mean high tide line. Federal lands located within the Ocean Shore, but landward of the mean high tide are not part of the covered lands and are the responsibility of the Federal landowner.

Snowy Plover HCP EIS 06537.06 (02/10)

**Figure F-1
Bay Ocean Spit
RMA Boundary**



Snowy Plover HCP EIS 06537.06 (02/10)

Figure F-2
South Sand Lake Spit
RMA Boundary





Siltcoos Estuary/Dunes Overlook/Tahkenitch Estuary– Occupied (Lane and Douglas Counties)

This RMA is adjacent to part of the Oregon Dunes National Recreation Area (Figure F-4). The U.S. Forest Service owns and manages the adjacent land. This RMA encompasses 6.87 miles of the ocean shore and includes land adjacent to three sites where birds have nested in the past: Siltcoos Estuary, Dunes Overlook, and Tahkenitch Estuary.

The U.S. Forest Service offers camping at various locations within the Oregon Dunes National Recreation Area. This RMA is closed year-round to vehicle driving (both street legal and ATV/OHV's).

Siltcoos Estuary

Birds have nested here as recently as 2009. The area is wide, open, and flat with the Siltcoos River meandering through the area. No habitat restoration is needed at this site at this time. Between 1994 and 2007, 74 chicks have fledged from Siltcoos Estuary. The Siltcoos Estuary is an important wintering and breeding site for snowy plovers.

The upper beach area has been modified by the coast-wide introduction and spread of European beachgrass (*Ammophila arenaria*) that began in the 1930s (Weidemann 1969). The beachgrass has vegetated and stabilized dunes to the north and south of this site, restricting snowy plover habitat to the area immediately west of the foredune and to the north and south spits of the river. The foredune is moderately developed, but still has a gradually sloping west face and small patches of unstabilized dunes. Mean high tides generally do not cut into the foredune, restricting snowy plover nesting habitat to a swath of beach between the foredune and the high tide line. The spit is unvegetated near the mouth of the river, and gradually becomes more vegetated to the north and south. Approximately 35 acres of habitat have been restored since 1995, all of which will likely need to be maintained in the future.

Seasonal dry sand restrictions, including a prohibition of dogs, have been imposed at this RMA and on adjacent federally owned land since 1995. The biggest human disturbance problem comes from people who cut through the restricted area to get to the beach, followed by kayakers and canoers who disembark within the restricted area. There is a lot of vandalism and theft of ropes and signs at this location. Predator management (lethal) activities began here in 2004.

Dunes Overlook

Snowy plovers have nested here as recently as 2009. The U.S. Forest Service has restored approximately 40 acres of habitat at this site. Initiated in 1998, the overriding objective of the Overlook Dunes Restoration Project was to restore natural dune processes on approximately 516 acres. Secondary objectives were to enhance the unique scenic and recreational qualities of this popular visitor access site and to restore snowy plover and open dune habitat. Since 1998, European beachgrass has been removed and foredune height lowered on approximately 40 acres of foredune. The treated area is divided into two areas, approximately 20 acres north of the Overlook trail and 20 acres to the south. This project is ongoing until 2008. Area of treatment will expand as funding allows. There are approximately 108 acres of foredune within the project area.

Incidental take has been issued to the U.S. Forest Service for this site. Predator management (lethal) activities began here in 2004. Between 1999 and 2007, 49 chicks have fledged from this site.

Seasonal dry sand restrictions have been imposed at this RMA and on adjacent federally owned land since 2000. Recreation use is primarily beach walkers with or without dogs. Access to this site is from the Dunes Overlook day-use area, just off Highway 101. Driving is prohibited year-round.

Tahkenitch North

Birds have nested here as recently as 2009. Predator management (lethal) activities began here in 2004. Between 2000 and 2007, 31 chicks have fledged from this site. Seasonal dry sand restrictions have been imposed at this RMA since 1995. Driving is prohibited year-round.

In 2004 Tahkenitch creek moved southward to the base of the high foredune. All snowy plover nesting habitat was on the north side of the creek. The north spit is mostly open sand, although European beachgrass is encroaching. Beachgrass has built up a moderate (10-15') foredune on the north side and 5'-10' on the south side. Open areas behind the foredune are also being filled in by encroaching beachgrass and control measures should be taken to prevent these openings from being totally overgrown. Approximately 40 acres of habitat have been restored or maintained since 1995.



Snowy Plover HCP EIS 06537.06 (02/10)



Figure F-4
Siltcoos Estuary / Dunes Overlook / Tahkenitch
RMA Boundary

Tahkenitch South – Unoccupied (Douglas County)

This RMA is adjacent to part of the Oregon Dunes National Recreation Area (Figure F-5). The U.S. Forest Service owns the adjacent land. The area is approximately 2.00 miles in length. The beach is closed to driving.

European beachgrass has stabilized the foredune area preventing wave-wash from sweeping through and clearing vegetation from areas that were previously open sand. The foredune is low in height ranging from 5'-10'. The spread and colonization of European beachgrass and associated invasion of Scotch broom and shore pine in the foredune deflation plain has transformed vast areas of open sand into dense grass-shrub habitat. Snowy plovers were last observed nesting at this site in 2003. The site has produced 44 fledglings (Lauten et al. 2007).

The U.S. Forest Service does not anticipate implementing management actions adjacent to this RMA until around 2011 to 2015. This beach is closed year-round to vehicle driving (both ATV/OHV and street legal vehicles).

North Jetty, Umpqua River – Unoccupied (Douglas County)

The southern portion of the RMA is adjacent to part of the Oregon Dunes National Recreation Area owned and managed by the U.S. Forest Service (Figure F-6). This RMA encompasses 3.00 miles of the ocean shore.

This area is characterized by moderately high foredune (12' -15') that has been stabilized by European beachgrass, Sitka spruce and shore pine. The foredune area ranges from narrow (several hundred feet) at the northern boundary of the emphasis area, widening to the south, to just over one-third mile at its widest point. European beachgrass dominates the western most edge of the foredune. Just inland from the beach there are very dense stands of Sitka spruce and shore pine. Moving inland, the dense conifer stands give way to patches of conifer intermixed with open sand and European beachgrass. Habitat restoration work would be required at this site.

One small snowy plover habitat restoration project was initiated in this area in 1993. The project proposed to spread dredge material from the Umpqua River on a 6-10 acre area along the river approximately 1.25 miles north of the North Jetty. This project was one of the first attempts to create snowy plover habitat and was probably not large enough in scale to be viable. The U.S. Forest Service does not anticipate implementing management actions adjacent to this RMA until between 2016 and 2020.

The beach is open to street legal vehicle driving Recreation use is quite low, with use primarily by surf fisherman.

Tenmile Estuary – Occupied (Coos County)

This RMA is adjacent to part of the Oregon Dunes National Recreation Area (Figure F-7). The U.S. Forest Service owns and manages land adjacent to this RMA, encompassing 4.20 miles of the ocean shore. Snowy plover have nested here as recently as 2007.

European beachgrass is rapidly invading open areas on Tenmile spit resulting in a direct loss of nesting habitat. The stabilized foredune prevents wave-wash from sweeping through and clearing vegetation from some areas that were previously open sand. The spread and colonization of European beachgrass and associated invasion of Scotch broom and shore pine in the foredune-deflation plain has transformed vast areas of open sand into dense grass-shrub habitat. Approximately 25 acres of habitat have been restored since 1995.

Seasonal dry sand restrictions have been imposed at this RMA and on adjacent land since 1995. Predator management (lethal) activities began here in 2004. Between 1992 and 2007, 140 chicks have fledged from this RMA. This RMA and adjacent lands are important wintering areas for snowy plover.

Recreation use at this site is relatively low, although there are a number of illegal ATV and street legal vehicle use on the ocean shore. The beach is closed year-round to vehicle driving (street and ATV/OHVs).

Coos Bay North Spit – Occupied (Coos County)

The U.S. Army Corps of Engineers and the Bureau of Land Management own land adjacent to this RMA, encompassing 3.37 miles of the ocean shore (Figure F-8).

Snowy plover have nested here as recently as 2007. This site is a very productive site with as many as 39 nests in one season (2007) (Lauten et al. 2007). A U.S. Army Corps of Engineers Section 1135 project was completed on their property restoring 70 acres of habitat, with 50 acres of disking and 20 acres of herbicide application.

An incidental take statement has been issued to BLM for lands adjacent to this RMA. The BLM has done habitat restoration and maintenance work at lands adjacent to this RMA – on over 170 acres.



Snowy Plover HCP EIS 06537.06 (02/10)



Snowy Plover HCP EIS 06537.06 (02/10)

Figure F-6
Umpqua River North Jetty
RMA Boundary



Snowy Plover HCP EIS 06537.06 (02/10)



Snowy Plover HCP EIS 06537.06 (02/10)

Predator management activities have been occurring since 2002. From 1990 through 2004, 263 snowy plover chicks have fledged from this site. This RMA and lands adjacent to it are important wintering and breeding areas for snowy plovers.

This beach is open to street legal vehicle driving only, but is closed during the breeding season. There is illegal ATV use on this beach. Recreation use here is low, but higher than other RMAs due to its close proximity to Coos Bay/North Bend/Charleston. The area is a popular surfing site.

New River – Occupied (Coos and Curry Counties)

This RMA is owned by Curry County and private individuals and is adjacent to land owned by BLM. It encompasses 8.75 miles (Figure F-9).

This RMA and adjacent land is a significant snowy plover production area. Between 1990 and 2007, 166 chicks fledged here due, in part, to the habitat restoration work accomplished by the BLM. The BLM has restored approximately 160 acres of habitat since 1998.

In the past, snowy plovers nested at Floras Lake. However, recent strong winter storms have reshaped the beach, and snowy plovers have not successfully nested at this area since 2000. In 2003, the BLM, OPRD, and Curry County entered into a cooperative management agreement whereby BLM's property in front of Floras Lake will remain open to recreation. However, Curry County's property to the north (approximately 0.5 miles of ocean shore) will be subject to seasonal dry sand restrictions and symbolic fencing installation.

Elk River Spit – Unoccupied (Curry County)

This RMA is in private ownership and encompasses 2.27 miles of the ocean shore. (Figure F-10) There is no formal record of snowy plover use at this RMA. The beach at Elk River is flat, but narrow, and backed by solid European beachgrass on tall foredunes (15+), which exist behind the river. Some habitat restoration work is needed at this RMA. The Elk River spit area has lots of driftwood, with some removal needed on an annual basis, as necessary.

Three of the private landowners and the USFWS are working on an agreement whereby the landowners will either sell fee title or allow a conservation easement to be placed on this RMA (dry sand portion). The USFWS has received a grant to purchase the conservation easement, which will be held by a land trust. Over a two year period, in 2006 and 2007, approximately 10 acres of coastal dune was restored on the Elk River Spit. European beach grass was removed and the foredune was lowered to 19 feet in elevation to allow for wave overwash during winter storm events. Overwash restores and maintains coastal dune processes by reshaping the

foredune and eliminating non-native vegetation. Restoration will continue in 2008, focusing on adjacent dune to the north of the restored area. A minimum of 10 more acres will be treated.

The area is open to driving (street vehicles) year round, with public access from Paradise Point to the south and Cape Blanco State Park to the north. There is illegal ATV/OHV use on this beach, generally south of the RMA. This area is used heavily in late fall for salmon fishing. Driftwood removal occurs frequently along this beach.

Euchre Creek – Unoccupied (Curry County)

This RMA is privately owned, and encompasses 1.13 miles of the ocean shore (Figure F-11). Snowy plover have not been observed at this site since 1989, when one nest was observed. The habitat at this RMA is suitable for nesting populations of snowy plover, with a wide flat beach especially at the mouth of the Euchre Creek, which currently bisects the RMA.

The RMA is closed to driving (street and OHV/ATVs); however, further south the beach is open to driving (street vehicles only). Recreation use at this site is low. Access is fairly limited, and occurs primarily from highway pull-off areas.



Snowy Plover HCP EIS 06537.06 (02/10)



Snowy Plover HCP EIS 06537.06 (02/10)

Figure F-10
Elk River Spit
RMA Boundary



Figure F-11
Euchre Creek
RMA Boundary

Appendix G

Technical Memorandum

Take Estimate for the Western Snowy Plover Habitat Conservation Plan

Technical Memorandum Take Estimate for the Western Snowy Plover Habitat Conservation Plan

Western Snowy Plover Habitat Conservation Plan ■ U.S. Fish and Wildlife Service and Oregon Parks
and Recreation Department ■ August 2010

Technical Memorandum
Take Estimate for the Western Snowy Plover
Habitat Conservation Plan

Prepared for:

U.S. Fish and Wildlife Service
2127 SE OSU Drive
Newport, OR 97365
Contact: Laura Todd
541.867.4558

and

Oregon Parks and Recreation Department
725 Summer Street, Suite C
Salem, OR 97301-1266
Contact: Kathy Schutt
503.986.0745

Prepared by:



317 SW Alder Street, Suite 800
Portland, OR 97204
Contact: Paul Whitney
503.248.9507

August 2010

This document should be cited as:
ICF International. 2010. Technical Memorandum. Take Estimate for Western Snowy Plover Habitat Conservation Plan.
August. (ICF 06537.06.) Portland, OR. Prepared for U.S. Fish and Wildlife Service and Oregon Parks and Recreation
Department.

Executive Summary

Population data presented in this technical memorandum indicates the Pacific Coast population of western snowy plover (snowy plover) (*Charadrius alexandrinus nivosus*) is increasing. Some take of eggs, hatchlings, fledglings and adult equivalents from recreational activities on the Oregon Coast is ongoing as the population increases. The level of take is highest (absolute numbers and percentage) for the fledgling and hatchling stages. Natural resource management activities, including recreational use restrictions, habitat restoration, and predator control measures at Snowy Plover Management Areas (SPMA) and Recreation Management Areas (RMA), appear to compensate for the estimated take through increased fecundity and hatchling to fledgling survival. Fledglings appear to be the most vulnerable as they rear and forage on the wrack line at the edge of the wet sand. The fledglings are not strong fliers and are likely to be negatively influenced by recreational activities compared to adults. Future take of hatchlings and fledglings could be reduced by natural resource management planning to reduce recreation conflicts with juveniles at occupied and unoccupied sites.

Table of Contents

Executive Summary	ES-1
Chapter 1. Introduction	1-1
1.1. Area Covered.....	1-2
1.2. Covered Activities	1-2
1.2.1. Public Use/Recreation Management.....	1-3
1.2.2. Natural Resources Management.....	1-6
1.2.3. Beach Management.....	1-9
1.2.4. Changed Circumstances.....	1-10
Chapter 2. Methods	2-1
2.1. Approach.....	2-1
2.2. Assessing Population Performance	2-1
2.2.1. Linking Recreation Activities and Population Performance.....	2-5
2.2.2. Take Assessment Modeling	2-6
2.3. Uncertainty and Assumptions	2-7
Chapter 3. Population Performance	3-1
3.1. Siltcoos Estuary Recreation Management Area.....	3-4
3.2. Dunes Overlook Recreation Management Area.....	3-5
3.3. Tahkenitch Estuary Recreation Management Area.....	3-6
3.4. Tenmile Estuary Recreation Management Area	3-7
3.5. Coos Bay North Spit Recreation Management Area.....	3-8
3.6. Bandon State Natural Area SPMA	3-9
3.7. New River Recreation Management Area.....	3-10
3.8. Columbia River South Jetty, Nehalem Spit and Netarts Spit SPMA	3-11
3.9. Necanicum Spit.....	3-12
3.10. Breeding or Wintering Habitat outside of SPMA and Recreation Management Areas within the Covered Lands.....	3-13

Chapter 4. Regression Analysis	4-1
4.1. Relationship between Vital Rates and Intrinsic Capacity (lambda)	4-1
4.1.1. Survival.....	4-2
4.1.2. Fecundity.....	4-5
4.2. Relationship between Recreational Activities and Vital Rates.....	4-6
4.2.1. Survival.....	4-7
4.2.2. Fecundity.....	4-10
4.2.3. Abundance	4-10
4.2.4. Impacts of Specific Recreation Activities	4-11
4.3. Correlation with Restoration Activities	4-12
4.3.1. Survival.....	4-13
4.3.2. Fecundity.....	4-15
4.3.3. Abundance	4-16
Chapter 5. Take Assessment	5-1
5.1. Public Use / Recreation Management	5-1
5.1.1. Eggs and Nests	5-1
5.1.2. Hatchlings.....	5-2
5.1.3. Fledglings	5-3
5.1.4. Adult Equivalent.....	5-4
5.1.5. Wintering Snowy Plover Populations.....	5-4
5.1.6. Habitat	5-5
5.2. Natural Resources Management.....	5-5
5.2.1. Snowy Plover Management.....	5-5
5.2.2. Other Habitat Restoration (Dune Management and Invasive Species Removal)	5-6
5.3. Beach Management	5-6
5.4. Changed Circumstances	5-7
Chapter 6. Conclusion	6-1
6.1. Eggs and Nests	6-2
6.2. Hatchlings.....	6-2
6.3. Fledglings.....	6-2
6.4. Adults	6-3
Chapter 7. References	7-1
7.1. Printed References.....	7-1
7.2. Personal Communications.....	7-3

Tables

Table 1.	Stage-Based Matrix Model Structure and the Vital Rates for Snowy Plover Used In This Take Assessment.....	2-4
Table 2.	Size of and Access to the Occupied Management Areas.....	2-8
Table 3.	Number of Acres Restored at SPMAS and Recreation Management Areas along the Oregon Coast.....	2-9
Table 4a.	Life Table for All Snowy Plover Monitoring Sites within the Covered Lands.....	3-2
Table 4b.	Snowy Plover Metrics Used in Regression Models	3-3
Table 5.	Vital Rates for All Snowy Plover Monitoring Sites within the Covered Lands.....	3-4
Table 6.	Correlations between Specific Recreation Activities and Western Snowy Plover Vital Rates (r^2 /p-value/slope of the fit line).....	4-12
Table 7.	Estimated Change in the Number of Eggs, Nests, Fledglings, and Adults per Year as a Result of Habitat Restoration, Predator Management, and Recreational Use	5-2

Figures

Figure 1.	Stage-Structured Life Cycle for Snowy Plover.....	2-2
Figure 2.	Changes in Snowy Plover Population along the Oregon Coast (2000 To 2006)	3-2
Figure 3.	Changes in Snowy Plover Population at Siltcoos Estuary Recreation Management Area (2000 To 2006)	3-5
Figure 4.	Changes in Snowy Plover Population at Dunes Overlook Recreation Management Area (2000 To 2006)	3-6
Figure 5.	Changes in Snowy Plover Population at Tahkenitch Recreation Management Area (2000 To 2006)	3-7
Figure 6.	Changes in Snowy Plover Population at Tenmile Estuary Recreation Management Area (2000 To 2006)	3-8
Figure 7.	Changes in Snowy Plover Population at Coos Bay North Spit Recreation Management Area (2000 To 2006)	3-9
Figure 8.	Changes in Snowy Plover Population at Bandon SPMA (2000 to 2006).....	3-10
Figure 9.	Changes in the Snowy Plover Population at New River Recreation Management Area (2000 to 2006).....	3-11
Figure 10.	Relationship between Egg to Hatchling Survival and the Intrinsic Capacity (λ) from 2000 - 2006 along the Oregon Coast.....	4-2

Figure 11.	Relationship between Number of Eggs per Nest and Intrinsic Capacity (Lambda) from 2000 - 2006 along the Oregon Coast	4-3
Figure 12	Relationship between Hatchling to Fledgling Survival and the Intrinsic Capacity (Lambda) from 2000 - 2006 along the Oregon Coast	4-4
Figure 13.	Relationship between Fecundity and Intrinsic Capacity (Lambda) from 2000-2006 Along the Oregon Coast	4-5
Figure 14.	Relationship between the Density of Access Points (Points per Acre) and Lambda	4-7
Figure 15.	Relationship between Egg to Hatchling Survival and the Density of Access Points (2000-2006)	4-9
Figure 16.	Relationship between Hatchling to Fledgling Survival and Peak Number of People Walking/Running along the Oregon Coast (2000-2006)	4-10
Figure 17.	Relationship between Years of Predator Management and Lambda	4-13
Figure 18.	Relationship between the Years of Predator Management and Nest Productivity	4-14
Figure 19.	Relationship between Hatchling to Fledgling Survival and the Acres of Restored Habitat Available at Sites along the Oregon Coast (2000-2006)	4-15
Figure 20.	Relationship between Fecundity and the Years of Predator Management at Sites along the Oregon Coast (2000-2006)	4-16

Acronyms

ATV/OHV	all-terrain vehicle/off-highway vehicle
Corps	U.S. Army Corps of Engineers
ESA	Endangered Species Act
HCP	habitat conservation plan
HRA	Habitat Restoration Area
ITP	Incidental Take Permit
ODSL	Oregon Department of State Lands
OPRD	Oregon Parks and Recreation Department
ORNHIC	Oregon Natural Heritage Information Center
SNA	State Natural Area
SPMA	Snowy Plover Management Area
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service

Chapter 1. Introduction

Non-Federal landowners who wish to conduct activities that might incidentally harm (or take) wildlife listed as endangered or threatened under the Federal Endangered Species Act (ESA) must first obtain an incidental take permit (ITP) from the U.S. Fish and Wildlife Service (USFWS). Take is generally defined as the act of harming, harassing, and hunting, pursuing, or killing a protected species, or adversely affecting their habitat.

The Oregon Parks and Recreation Department (OPRD) has submitted an application to the USFWS for an ITP in accordance with Section 10(a)(1)(B) of the ESA, as amended. The issuance of an ITP from the USFWS would provide OPRD with the long-term regulatory assurance that implementation of their coastal management responsibilities would comply with the ESA, while providing protection to the snowy plover, a species listed as threatened under the ESA.

Permit issuance criteria prescribed in the Code of Federal Regulations (50CFR 17.22(b)(2), 50 CFR 17.32(b)(2)), and Section 10(a)(2)(B) of the ESA state:

- The taking must be incidental.
- The applicant will, to the maximum extent practicable, minimize and mitigate the impacts of such taking.
- The applicant will ensure that adequate funding for the habitat conservation plan (HCP) and procedures to deal with unforeseen circumstances will be provided.
- The taking will not appreciably reduce the likelihood of survival and recovery of the species in the wild.
- Other measures may be required as necessary or appropriate for the purposes of the HCP.

An HCP that documents compliance with Section 10 of the ESA must be submitted by a project applicant for an ITP to be issued by USFWS. OPRD has prepared the *Habitat Conservation Plan for the Western Snowy Plover* (HCP) to meet those requirements (Oregon Parks and Recreation Department 2010). Among other things, OPRD's HCP must specify the impact that will likely result from the taking of covered species and the steps the applicant will take to monitor, minimize, and mitigate such activities.

The purpose of this technical memorandum is to estimate the level of take that may result from implementation of the addressed activities covered by the HCP (covered activities), over the term of the proposed 25-year ITP. Given that this memorandum was originally prepared in 2007, the 25-year term assumed in this analysis is from 2007 to 2032. Although a more recent version of the HCP has been prepared (2010), there have been no changes to the HCP since 2007 that would materially affect the analysis provided in this document. Therefore, no substantive changes to the analysis presented below have been made since 2007. This section summarizes the management area and activities covered in the HCP.

1.1. Area Covered

The geographic area covered under the HCP (the covered lands), includes the 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). The Ocean Shore includes the area from extreme low tide to the actual or statutory vegetation line, whichever is most landward. The Ocean Shore does not include estuaries or river mouths, which are under the jurisdiction of the Oregon Department of State Lands. The covered lands also do not include land under Federal ownership because actions that may occur on Federal lands, regardless of who conducts the activity, would be the responsibility of the Federal landowner and would require separate consultation with USFWS. Federal jurisdiction within the Ocean Shore boundary extends between the mean high tide line and the actual or statutory vegetation line, whichever is further inland, and adjacent to federally owned lands outside of the Ocean Shore.

In addition, specific portions of the following State Parks, State Natural Areas, and State Recreation Areas are included in the covered lands. The parenthetical reference after each listing reflects the name of the associated SPMA included in the HCP.

- 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),
- Bandon State Natural Area (Bandon), and

1.2. Covered Activities

Activities covered in the HCP are described according to three categories:

- public use and recreation management,

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

1.2.1. Public Use/Recreation Management

One of OPRD's responsibilities is to regulate activities on beaches and lands under its jurisdiction. Permissible recreational uses commonly observed on the covered lands include dog exercising, kite flying, non-motorized vehicle use, driving, and other dry sand activities such as camping, walking, jogging, and picnicking.

Under the proposed HCP, OPRD would manage the public's use of the covered lands to minimize potential effects on snowy plover. Recreational use restrictions currently in place, such as limitations on beach camping in State Parks, would remain in place in the future. Additional recreational use restrictions associated with management of SPMA's and RMA's would also be implemented, as summarized under *Snowy Plover Management*. The following provides a description of permissible recreational uses on the covered lands, and the recreational use restrictions that would be implemented under the HCP.

Dog Exercising

Under the HCP, dogs would be required to be on leash year-round at all beaches adjacent to Oregon State Parks, and on a leash, or under voice or signal command along the beaches in the communities of Seaside, Rockaway Beach, and Cannon Beach. This is both to protect the biological resources found along the beach, and to ensure the safety of beach visitors. Additional restrictions on dog exercising would be implemented at occupied and targeted SPMA's and RMA's, as described under *Snowy Plover Management* below.

Kite Flying

Restrictions on kite flying would be implemented at occupied SMPA's and RMA's, as described under Section 1.2.2, *Natural Resources Management - Snowy Plover Management* below.

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-buggying (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). Under the HCP, non-motorized vehicle use would be prohibited at both occupied and targeted SPMA's and RMA's, as described under Section 1.2.2, *Natural Resources Management - Snowy Plover Management* below.

Driving

Driving includes use of all-terrain vehicles/off-highway vehicles (ATV/OHV) and “street legal” motor vehicles, such as cars, trucks, and campers. Under the HCP, ATV/OHV use would continue to be allowed on certain beaches at Sand Lake Recreation Area and Dunes National Recreation Area. Driving would continue to be prohibited year round at several locations along the Oregon Coast, including Necanicum Spit, Nehalem Spit, Netarts Spit, Pistol River, Bayocean Spit, portions of the Bandon State Natural Area, New River, Sutton/Baker Beach, Siltcoos Spit, and Tenmile Estuary. Current restrictions are in place to protect the biological resources found along the beach, and also to ensure the safety of beach visitors. Seasonal driving restrictions would continue to be implemented at South Sand Lake Spit and Coos Bay North Spit. Beaches closed to driving would be accessible only with a motor vehicle permit issued by OPRD, or in the event of an emergency. If not already prohibited, additional driving restrictions at both occupied and targeted SPMAs and RMAs, and at managed unoccupied SPMAs and RMAs, would be implemented under the HCP, as described under Section 1.2.2, Natural Resources Management - Snowy Plover Management below.

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, nearshore activities, beach fires, beachcombing, and driftwood collection and removal. The following restrictions on dry sand activities would continue to be implemented under the HCP.

- **Camping.** Camping would continue to be allowed on the beach and dune areas next to beaches along the Oregon Coast, unless otherwise specified by a State rule that disallows that use (e.g., certain beaches in Tillamook County). Beach camping would continue to be 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 Neahkahnie Mountain; and from the Necanicum River to the Columbia River. The only places that camping would be allowed in State Parks would be in specifically designated campgrounds inland from the beach.
- **Horseback riding.** Horseback riding would continue to be 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 would continue to be allowed at Nehalem Bay State Park, Pistol River State Park, and Baker/Sutton Beach.
- **Beach Fires.** Small recreational fires would continue to be 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 25-feet of a seawall

constructed of wood or other combustible material. Under OPRD authority, fires could be restricted or prohibited during high fire hazard conditions.

Additional restrictions on dry sand activities would be implemented at occupied and targeted SPMAs and RMAs, as described under Section 1.2.2, Natural Resources Management - Snowy Plover Management below.

Recreation Management Areas

Within the covered lands, there are several other potential Recreation Management Areas (RMAs) that are not part of an OPRD State Park unit, but are managed by OPRD as part of the Ocean Shore. Some RMAs are privately owned and some are owned by counties. Others are adjacent to Federal land that lies within and adjacent to the Ocean Shore. An RMA adjacent to Federal land extends from the extreme low tide line to the mean high tide line only.

Under the HCP, OPRD is responsible for considering applications from RMA land owners requesting that limits on recreational use be authorized to manage for occupancy and for immediately limiting recreational use if occupied.

Under the HCP, OPRD would implement recreational use restrictions at up to 11 RMAs as the areas become occupied, or if unoccupied, are actively managed under a USFWS-approved site-management plan. These 11 areas would include the five RMAs adjacent to Federal lands that currently support nesting populations of snowy plover (Sutton/Baker Beach; Siltcoos Estuary/Dunes Overlook/Tahkenitch Estuary; Tenmile Estuary; Coos Bay North Spit; and New River), and six RMAs that may be targeted by other landowners for management in the future (Bayocean Spit; South Sand Lake Spit; Tahkenitch South; Umpqua River North Jetty; Elk River; and Euchre Creek). For the purpose of this analysis sites were delineated based on their unique habitat characteristics, and the availability of habitat, plover, and recreation data.

Restrictions on recreational use in these areas would be similar to those described for occupied and/or targeted SPMAs, depending on the presence of nesting populations of snowy plover at the time the permit application is approved. The geographical extent of the restrictions within the RMA would be determined in consultation with the landowner and USFWS.

OPRD would also seek to modify the State Rule to implement and enforce seasonal recreational activities on an annual basis, if they meet certain terms and conditions. Petition to implement the State Rule would occur after an ITP had been issued by the USFWS, and would require that eligible landowners provide OPRD with documentation describing the following:

- management activities they would implement (e.g., installing fences and signs, enforcing access restrictions, and conducting public outreach and education);

- locations where those activities would take place; and
- documentation from USFWS stating that the proposed management actions were reviewed and approved (e.g., an ESA Section 7 biological opinion or an approved ESA Section 10 HCP).

1.2.2. Natural Resources Management

Snowy Plover Management

Management of Occupied Snowy Plover Management Areas

Under the HCP Bandon SPMA would be managed as an occupied SPMA over the term of the 25-year ITP. Within 1 year of issuance of an ITP, a site management plan would be developed for USFWS review and approval. The site management plan would specify management prescriptions, including information on recreational use restrictions and enforcement, habitat maintenance, predator management, monitoring, and public outreach and education.

Recreational use restrictions at occupied SPMA's during the nesting season, including the Bandon SPMA, would include prohibitions on non-motorized vehicle use, kite flying, and dogs. Beach driving would be prohibited for areas where driving restrictions were not already officially in place.

Management of Targeted Snowy Plover Management Areas

Under the HCP, up to five currently unoccupied areas would be identified as SPMA's and targeted for possible restoration and management of nesting populations of snowy plover over the term of the 25-year ITP. Three SPMA's would initially be managed by OPRD for nesting and occupancy by populations of snowy plovers.

- Columbia River South Jetty;
- Necanicum Spit; and
- Nehalem Spit.

These three areas were identified by OPRD, the Oregon Department of Fish and Wildlife, and USFWS as the areas under OPRD ownership with the greatest opportunities to implement snowy plover restoration and management activities. In addition, the resource agencies determined that these three areas could help support the viability of the Pacific Coast population by distributing the population along the Oregon Coast, while minimizing potential conflicts with continued recreational use in occupied areas.

Within 2 years of obtaining an ITP, OPRD would prepare site management plans for these three SPMA's. Similar to the site management plan for the Bandon SPMA, these plans would outline measures for attracting nesting populations of snowy

plover, and would identify a series of management prescriptions, including seasonal recreational use restrictions (e.g. dogs on leash and driving prohibited), habitat restoration activities, predator management activities, monitoring and enforcement activities, and public outreach and education activities. Active management would begin after site plans have been approved by the USFWS.

An SPMA at Netarts Spit could also be managed under the HCP if (1) Columbia River South Jetty, Necanicum Spit, or Nehalem Spit become occupied and (2) one of the following RMAs is not already under active USFWS approved management for snowy plover.

- Bayocean Spit (adjacent to land owned/managed by the U.S. Army Corps of Engineers [Corps]);
- South Sand Lake Spit (under private ownership/management);
- Tahkenitch South (adjacent to land owned/managed by the U.S. Forest Service [USFS]);
- Umpqua River North Jetty (adjacent to land owned/managed by the USFS/Oregon Department of State Lands [ODSL]);
- Elk River (under private ownership/management);
- Euchre Creek (under private ownership/management);

Under these circumstances, OPRD would commit to managing Netarts Spit for nesting snowy plover to ensure that a minimum of three unoccupied SPMAs would be actively managed at any given time over the term of the 25-year permit. In addition, if Columbia River South Jetty, Necanicum Spit, or Nehalem Spit is not occupied within 5 years of active site management, and none of the other RMAs identified above are being actively managed by other landowners, OPRD would prepare a site management plan for Netarts Spit.

Protections for Nests Outside of Targeted Areas

Under the HCP, if a nesting site is found outside of an occupied or targeted SPMA on OPRD owned or leased land, OPRD would install a nest enclosure and 50-meter buffer around the individual nest to restrict recreational activities in the vicinity of the nest.

Predator Management

Under the HCP, OPRD would provide funding to manage snowy plover predators along the Oregon Coast. The level of funding would increase as additional SPMAs are targeted for management over the term of the 25-year permit.

Predator management funded by OPRD would be implemented by the U.S. Department of Agriculture (USDA) between February and August and would include

both lethal and non-lethal methods. If for some reason the USDA discontinued predator management activities over the term of the ITP, OPRD would assume responsibility for implementing these activities at all actively managed SPMA.

Snowy Plover Monitoring and Enforcement

Under the HCP, OPRD would provide funding to the Oregon Natural Heritage Information Center (ORNHIC) to monitor snowy plover numbers, evaluate habitat, and conduct compliance monitoring. The level of funding for these activities would increase as additional SPMA are targeted for management over the term of the 25-year permit.

In addition, three full time beach ranger positions would be funded to ensure compliance with beach restrictions. OPRD would also work with the Oregon State Police and/or local law enforcement offices to provide additional enforcement support, where necessary and possible.

Public Outreach and Education

Under the HCP, OPRD would continue to recruit and train volunteers to serve as docents for public outreach and education at the China Creek access to the Bandon SPMA. As new SPMA became occupied, OPRD would recruit and train volunteers to serve as docents for public outreach and education as specified in that site's site management plan.

Adaptive Management

As described in Chapter 5 of the HCP, three adaptive management actions have been incorporated into the HCP to allow monitoring data or other relevant scientific research to inform the conservation strategies describe above, and to allow OPRD and the USFWS to minimize the uncertainty associated with gaps in scientific information or biological requirements. These three actions are summarized below.

Redefining Management Actions

If biological monitoring reports indicate consistent population declines in snowy plover along the Oregon Coast when compared to population numbers provided in previous biological monitoring reports for Oregon, OPRD and USFWS would work together to determine if inadequate management actions on the part of OPRD are determined to be responsible, in whole or in part, for such population declines. If new techniques are available for more effectively implementing management actions, then revisions to the management prescriptions associated with the HCP would be considered.

Snowy Plover Nesting Outside SPMA

If snowy plover begin to nest on OPRD lands outside of a designated SPMA three years in a row (and there is nesting success at least two of those three years), OPRD would consult with USFWS to consider managing that area as a SPMA. Such

consultation would be conditioned on USFWS and OPRD agreeing that the new area could replace a targeted, unoccupied SPMA identified for management by OPRD; that no more than six occupied SPMAs would have to be managed by OPRD; and that management of the new area would not affect OPRD's ability to provide for recreation at that beach.

Success of Nest Exclosures

Through ORNHIC monitoring efforts, OPRD would evaluate the relative success of nest exclosures in preventing predators from destroying nests and eggs on their property. OPRD would meet annually with USFWS to review the relative benefits of nest exclosures on a site-by-site basis, and to determine if changes in the management application (e.g., elimination of the exclosure, timing changes for application of the exclosure, design changes) should be considered.

Other Habitat Restoration - Dune Management and Invasive Species Removal

Under the HCP, OPRD would manage dunes and remove targeted invasive species to provide habitat for native species, as called for in each approved site management plan, in addition to the habitat restoration activities targeted toward snowy plovers (see Section 1.2.2, Natural Resources Management - Snowy Plover Management). These habitat restoration activities would be implemented on the portions of the SPMA that are defined in the approved management plan for that SPMA outside of the nesting season in areas occupied by snowy plover.

1.2.3. Beach Management

Under the HCP, OPRD personnel would respond to boat and marine mammal strandings; would implement public safety activities, and would participate in law enforcement activities in accordance with existing management practices and to minimize potential effects on snowy plover.

Response to Boat and Marine Mammal Strandings

OPRD personnel would respond to boat strandings and monitor salvage operations in accordance with existing management practices. Similarly, OPRD personnel would investigate, report, bury, or remove marine mammals from the Ocean Shore, as necessary. Depending on the remoteness of the beach and the time of year, some dead marine mammals would be left to decompose on the beach.

Responses to boat and/or mammal strandings may involve beach disturbance, driving and operating machinery, and increased pedestrian traffic. These activities would be conducted in a manner that minimizes potential effects on snowy plover, to the extent possible. In areas where nesting populations of snowy plover are known to be

present, OPRD would work collaboratively with ODFW and USFWS to ensure that encroachment into occupied SPMAs and RMAs would be minimized.

Public Safety

Public safety activities involve maintaining emergency access points on lands owned by OPRD or leased by OPRD under agreement with the landowner; and, on all Oregon beaches, investigating reports of dangerous logs; where necessary removing those logs; monitoring, photographing, and documenting erosion and storm damage; investigating reports of hazardous materials on the beach; and implementing closures and coordinating the clean-up of spilled hazardous materials when necessary. OPRD would implement public safety activities in accordance with existing management practices and to minimize potential effects on snowy plover, to the extent possible.

Law Enforcement

Law enforcement activities include assisting law enforcement personnel with human injury/death investigations, as requested; monitoring and checking for valid recreational use permits; issuing citations; and patrolling beaches. Law enforcement activities would be completed by OPRD staff in accordance with existing management practices and to minimize potential effects on snowy plover, to the extent practical. Enforcement activities related to ensuring that recreational use restrictions associated with SPMAs are adhered to are described in Section 1.2.2, Natural Resources Management - Snowy Plover Management.

1.2.4. Changed Circumstances

Under the Federal ESA, changed circumstances are those changes during the course of an HCP that can reasonably be anticipated and planned for. OPRD and USFWS have identified three circumstances that could occur during the term of the ITP, and that could affect the ability of OPRD to properly implement the conservation strategies described in the HCP.

Listing of a New Species

If a currently unlisted species is federally listed as endangered or threatened pursuant to the ESA after the ITP has been issued, OPRD would request that USFWS determine if there is potential for incidental take of that species to occur as a result of the covered activities in the HCP. If take is possible, OPRD would work with the USFWS to either modify their management actions to avoid take of the species, or would request that the ITP coverage be extended to the newly listed species.

Global Climate Change and Rising Sea Levels

A growing body of research has documented changes in the biotic and abiotic environment that are a result of an increase in global temperature and the continued concentration of greenhouse gases in the Earth's atmosphere.

In coastal areas, one of the primary concerns associated with global climate change is the potential for sea levels to rise and for the frequency and intensity of coastal storm events to increase. In the event that rising sea levels result in a net loss of snowy plover nesting habitat over the term of the ITP, OPRD will discuss with the USFWS appropriate implementation measures to address these changes. Future actions responding to this changed circumstance will be determined by consensus agreement between OPRD and the USFWS, and will be based on the nature and extent of the effects associated with rising sea levels.

Non-Breeding Season Management

The potential effects on wintering snowy plovers are not anticipated to rise to the level of take. Therefore, OPRD is not seeking take coverage under the ITP for effects on wintering snowy plovers. This is because only a small percentage of birds winter in Oregon where recreational use is low during the winter months. In addition, the normal behavior of wintering snowy plovers is to flock and avoid disturbance. Although snowy plovers may be less susceptible to recreation impacts during the non-breeding season, they could be negatively affected by activities that disrupt or destroy foraging areas or unnecessarily disturb birds that are roosting or foraging. If adverse effects on snowy plovers are determined to be likely to occur in the future, OPRD will either avoid take of snowy plovers or will amend its permit.

Chapter 2. Methods

2.1. Approach

This technical memorandum evaluates take based on trends in the number of snowy plover nests, eggs, chicks, and adults at the Bandon SPMA and at five other occupied RMAs on the Oregon Coast between 2000 and 2006. Conclusions about the take of individuals and habitat from covered activities were based on both quantitative analyses and qualitative estimates. Whenever possible, a quantitative approach was used. Specifically, existing data on the level and types of recreational use on Oregon beaches (Oregon Parks and Recreation Department 2005) were used to assess the potential effects of public recreational use on snowy plover. A qualitative approach was used for other covered activities (e.g., beach management) because data were not available on the frequency of those other activities.

Our take assessment for covered activities included the following steps:

1. Assess population performance at occupied sites during the past 7 years of monitoring data for nests, eggs, hatchlings, fledglings, and adults using life tables and population models.
2. Link recreation activities to population performance based on the correlation between life table information and OPRD estimates of the frequency of each activity.
3. Qualitatively assess which activities are resulting in take based on the strength and shape of the correlations developed in step #2.
4. Model “take” for all relevant activities by estimating the annual production of nests, eggs, hatchlings, fledglings and adult equivalents with and without each recreational activity.

2.2. Assessing Population Performance

The snowy plover uses the ocean shore for nesting, feeding, rearing of chicks, and roosting. This species’ population has declined over the years primarily as a result of human interactions (e.g. development, introduction of predators, habitat modification

through the introduction of European beachgrass [*Ammophila arenaria*], and recreational activities).

Nesting birds at coastal locations consist of both year-round residents and birds that migrate for the winter (Page et al. 1995). Snowy plovers begin arriving at their Oregon breeding sites in early March (Wilson 1980). Since some individuals nest at multiple locations during the same year, birds may continue to arrive through July. On the Oregon coast nesting may begin as early as mid-March (Wilson-Jacobs and Meslow 1984), with peak nest initiation occurring from mid-May to early July (Stern et al. 1990).

Egg-laying usually takes 4 to 5 days (Warriner et al. 1986). The usual clutch size is three eggs (with a range of two to six eggs) (Page et al. 1995). Single egg clutches are almost always abandoned (Warriner et al. 1986). Sustained incubation begins after the third egg is laid and lasts approximately 27 days (Warriner et al. 1986). Snowy plovers readily re-nest after loss of their eggs (Wilson 1980, Warriner et al. 1986). Up to five re-nesting attempts have been observed for a pair (Warriner et al. 1986). After hatching, females typically leave the male to rear the brood to fledging and attempt to re-nest with a different male. This allows the female to find a new mate and lay a second and occasionally third clutch of eggs (Page et al. 1995). Along the Oregon coast, hatching occurs from mid-April through mid-August, and the young fledge approximately one month (mean = 31 days) after hatching (Warriner et al. 1986). Peak hatching occurs from June through July, and most fledging occurs from mid-July through August, though some individuals from late nests may not fledge until the third week in September.

The life-cycle of snowy plover operates on the daily and monthly timescales described above. In contrast, the data describing nest, egg, hatchling, fledgling, and adult abundance by site are based on annual counts. Individual bird, nest, and clutch performance estimates are not available. To address inconsistencies in the time scale of different life stages, an annualized stage-structured life-cycle was used to create life-tables and assess population performance (Figure 1).

Figure 1. Stage-Structured Life Cycle for Snowy Plover

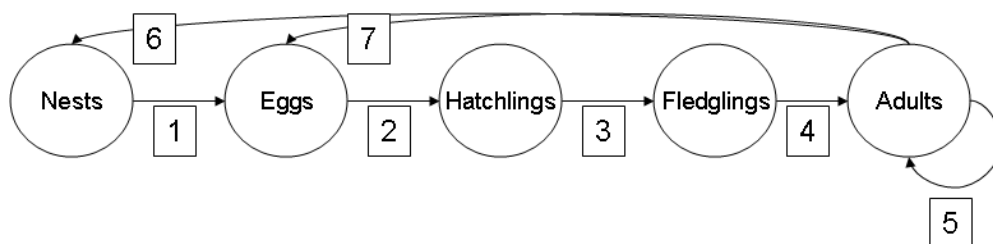


Figure 1 Notes: The numbered arrows represent survivals and fecundities: 1) eggs per nest, 2) egg to hatchling survival, 3) hatchling to fledgling survival, 4) fledgling to adult survival, 5) annual adult survival, 6) nest production, and 7) fecundity (eggs per adult).

Population performance was assessed by comparing the number of individuals in one life stage to the number of individuals in the next life stage (e.g. survival from egg to hatchling or hatchling to fledgling). Population data were organized by site, year, and life stage to produce life tables, which were used to describe population performance in terms of:

- Abundance: number of individual animals
- Fecundity: number of offspring produced per adult (as explained below)
- Survival: the annual rate of change in abundance one life stage to the next.

Abundance provides a useful measurement of population performance. A time series of nest attempts, egg, chick, hatchling, and adult abundance were developed for each site, and for all sites combined. Due to the high-mobility of snowy plover and the multiple life stages they pass through, however, abundance alone could not be used to assess population performance or take from covered activities. For example, a site might be attracting many adult birds year after year, but fail to produce many hatchlings or fledglings, resulting in a long-term population decline. As a result, fecundity and survival metrics were also used to evaluate population performance.

Fecundity can be expressed in a variety of ways. Often, it is expressed in terms of eggs per female, number of female young per female, or eggs per mating pair. However, due to the high-mobility of snowy plover, multiple nest attempts of both males and females, and the species' promiscuous behavior, it is not reasonable to directly assess the number of eggs or chicks that any particular female "produced." Instead, fecundity was estimated in terms of the number of eggs produced in one year divided by the maximum number of birds that were surveyed at a site during the same year.

Survival can be expressed in numerous ways as well. For organisms that have simple continuous reproduction and indeterminate growth (e.g., earthworms), survival is often expressed in terms of the survival from one week, month, or year to the next. The survival of snowy plover is more complex because a) the life-span of individual adults is not known, b) survival occurs across multiple discrete life stages (i.e., nests, eggs, hatchlings, fledglings, adults), c) the length of each life stage differs (i.e., adults live throughout a year, whereas other stages are shorter), d) multiple nesting attempts are made annually, and e) due to their migratory nature, snowy plover survival is affected both in and outside of the management areas.

In this memorandum, snowy plover survival has been expressed in terms of average survival from one life stage to the next for all juvenile life stages. In terms of adult survival, the modeling conventions used in the snowy plover viability analysis from the draft Recovery Plan (U.S. Fish and Wildlife Service 2001) were followed. It was assumed that annual adult survival was the same for all age classes and sites, and averaged 75%. Since the sex ratio of the juvenile life stages is unknown, a 1:1 ratio

was assumed. Similarly, although emigration and immigration likely contribute to population performance at any given management site, these elements were not considered since they operate at scales that are larger than the covered areas and activities.

Life Tables and Lambda

Abundance, fecundity, and survival, collectively called “vital rates,” are indicators of population performance. An additional useful indicator of population performance is the rate of historical or future change expressed as the intrinsic capacity for change or “lambda.” Lefkovitch (1965) described the process for calculating the intrinsic capacity (lambda) life tables for stage-structured populations, such as snowy plover. This process was used and average abundance, fecundity, and survival for each population and life stage between 2000 and 2006 were estimated. Ramas EcoLab version 2.0 was used to estimate lambda for each site and the collection of all sites (Caswell 2001). The matrix configuration used for these estimates is described below (Table 1).

Table 1. Stage-Based Matrix Model Structure and the Vital Rates for Snowy Plover Used In This Take Assessment

	Eggs	Hatchlings	Fledglings	Adults
Eggs	--	--	--	Fecundity (eggs per adult)
Hatchlings	Egg to hatchling survival	--	--	--
Fledglings	--	Hatchling to fledgling survival	--	--
Adults	--	--	Fledgling to adult survival	Annual adult survival (75%)

Notes:

Due to limitations in the data, this take assessment did not directly address the impacts of activities on adult recruitment or survival, except as they relate to the production of eggs, hatchlings, or fledglings. These variables were set to 100% for the take assessment modeling described below.

Lambda is a fairly intuitive measurement of population performance in its application. In theory, a lambda greater than 1 means that the population abundance will increase in the future. A lambda less than 1 suggests that population abundance will decrease in the future. However, since lambda is usually calculated using historical information, it is not always a good predictor of future performance. Rather, it is best to consider lambda in terms of a population’s past performance, and its likely performance in the very near term: next year perhaps. An even more conservative use of lambda might be to consider it as an indicator of the population’s preparedness for growth (i.e., is the population poised to increase or face additional decline). In combination with life-stage-specific estimates of abundance, fecundity,

and survival through time, lambda is a useful indicator of population performance on the whole.

2.2.1. Linking Recreation Activities and Population Performance

A simple correlation analysis was used to assess whether covered activities might be related to population performance. The benefit of simple correlation analysis is that the analysis works well with relatively small sample sizes. The disadvantage of simple correlations is that the analysis is not sensitive to spurious relationships. For example, if multiple factors are impacting population performance in different ways at all sites, it may not be immediately apparent in the results. Therefore, some interpretation and careful scrutiny is required. A more sophisticated approach would involve what is called “de-trending.” De-trending analysis involves removing the effects of all variables on population performance, and then re-assembling the relationship between covered activities and population performance site-by-site, and activity-by-activity. A de-trending analysis was attempted with the snowy plover data set; however, the sample size (number of sites and years) was too small to produce valid models. This analysis might be more informative if conducted using a longer time series; however, this is not appropriate for the snowy plover dataset because the management regime has changed dramatically in recent history.

A simple Pearson’s correlation coefficient analysis was used to assess the relationship between recreation activities and population performance. This analysis included a simple line-fitting exercise where the outcomes (abundance, fecundity, survival, or lambda) were graphed against the recreation activities by site. The results of the analysis include a simple line formula that describes the relationship between the activity (x) and the outcome or performance metric (y), using a line function where:

Equation 1: $y = mx + b$

The variables m (slope) and b (intercept) describe the line of fit between the level of recreation and the performance metric. The analysis also includes the Pearson’s correlation coefficient; a statistic from 0 to 1 that describes the percent “*goodness of fit*” between the level of each activity and the outcome across all sites. In short, the correlation coefficient demonstrates how much of the variability in the outcome (population performance) can be explained by the impact of the activity (recreation or restoration). Variables that are positively related and have a strong correlation (i.e. more restoration results in more eggs over time) would have a positive slope and a large correlation coefficient. Variables that are not related to each other could have any slope, but would have a comparatively small correlation coefficient. For this analysis, variables (recreation activities) of interest include those that have a negative relationship and a strong correlation, suggesting decreased population performance associated with a specific covered activity. For some relationships, a non-linear

version of Equation 1 known as the quadratic equation was used, but the formula still holds the form of slope (m), intercept (b), and the dependent and independent variables x and y.

A simple decision tree was used to determine which estimates of activities (recreation and restoration) most clearly explained activities that might be negatively impacting the performance of populations. First, correlations between all activities and all performance measurements were calculated. Next, these correlations were evaluated to determine if, a) the slope of the relationship was greater than or less than 1, and b) the correlation coefficient was greater than 0.10 (e.g. does the presence of the activity explain at least 10% of the variability observed in the population performance). If the correlation coefficient was less than 0.10 the relationship between the activity and population performance was too weak to make judgments about how the activity could be impacting performance. Overall, this approach determined whether increased activity was resulting in decreased population performance for a given life stage.

2.2.2. Take Assessment Modeling

There is no “right” or “correct” model for estimating take. Qualitative, quantitative, and Bayesian approaches have all been used. Quantitative assessments can be more informative, but require more data and careful thought (Caswell 2000; Hitchcock 1996). In determining which model to use, it is important to design an approach that produces a reasonable and scientifically supported estimate of take, based on the data and information that is available. In addition, take assessment modeling should produce results in terms that are easily translated into management actions, and which can be readily explained to stakeholders. The most robust approach to assessing the impacts of anthropogenic activities is to construct a simulation that assesses population performance under different scenarios through long time periods (Caswell 1989). However, these more complex analyses are not appropriate for models constructed from data where the abundance or environmental conditions (such as the availability of habitat or predator management activities in this case) have changed dramatically during the period of record. In the instance of snowy plover, where both population performance and environmental conditions have changed recently, a more simplistic approach is recommended (Burnham 1998).

Caswell (2001) recommends assessing the relationship between environmental conditions (including recreation activities) and each vital rate independently. In the case of snowy plover there are multiple vital rates (four survival rates plus fecundity) and multiple activities (recreation and restoration). The activities occur at multiple sites. This variable set is too complex for a simple factorial or “experimental” design and requires a multiple regression analysis.

Standard least squares multivariate regression modeling was used to estimate take associated with each of the activities. For each vital rate (fecundity, survival, and lambda), a standard least squares regression was run for the activities that passed the screening exercise described above (i.e. $r^2 > 0.10$, and $p < 0.20$). This threshold is considered to be biologically significant. The multivariate regression model produced a line function that described the relationship between the vital rate (y) and the combined influence of the recreation activities (x) in the form of:

$$\text{Equation 2: } y = m_1X_1 + m_2X_2 + \dots + m_xX_x + b$$

As with the simple regression, the variables m_x (slope) and b (intercept) describe the line function for the relationship. This analysis also generated an R^2 (note: “ r^2 ” was used for simple correlations and “ R^2 ” for multivariate regressions) value that describes the “goodness of fit” between the multivariate model and the performance metric, and a “ p ” that describes the statistical significance of the multivariate model. An estimate of the vital rate that might result in the absence of the activity was then calculated for each site. This was accomplished by setting the variables “ x ” to zero, thus removing their influence on the estimate “ y .” This modeled estimate of “ y ” described what the population performance might be if the relevant activities were absent, but all other conditions remained the same. This evaluation was completed for each recreational activity and each vital rate. This information was organized into a new life table that described snowy plover survival and fecundity without the influence of each individual activity, as well as one table that described survival and fecundity in the absence of all recreation activities.

Finally, the changes in survival and fecundity associated with each activity were translated into estimates of abundance. An average life table was developed for all currently occupied SPMA and RMA. The modeled survival and fecundity estimates were inserted, and the resulting annual abundance was estimated. The difference between the current level and the modeled production of nests, eggs, hatchling, and chicks was equal to the modeled estimate of take associated with the recreation activities.

2.3. Uncertainty and Assumptions

The snowy plover population has been monitored consistently along the Oregon Coast since the early 1990’s. Data has been collected on the number of breeding birds along with nest and fledgling success each year. Due to the level of information available on the species, it is possible to carry out a more rigorous assessment of how the covered activities will impact the population during the ITP term rather than using habitat loss as a surrogate for impact on species, as is done in most HCPs. As described above, in this analysis, take was calculated by looking for correlations between covered activities and population performance and then quantified by the number of nests, chicks, adults, and habitat that might be lost during

the ITP term. Still, there is a level of uncertainty associated with any take estimate. That uncertainty and how it was dealt with in this analysis is discussed below.

Controlling for Habitat Quality

As discussed in Warriner et al. (1986), Lafferty (2001a), Ruhlen et al. (2003), and USFWS (2001a, 2001b, and 2005), there is an inherent uncertainty associated with assessing take in terms of nests, chicks, and adults. On beaches that are used for recreation the difficulty is often how to assign impacts to natural versus human causes. Further, directly associating take with particular discrete activities can be difficult. For example, studies assessing the impacts of recreation on snowy plovers during the breeding season (Warriner et al. 1986; Persons 1998; Applegate and Schultz 2000; Ruhlen et al. 2003), and during the winter (Lafferty 2001b), noted that most of the time, the causes of mortality (such as nest failure) are unknown. Although biologists have been able to determine natural causes of impact, such as abandonment (i.e., when no humans were near) or nests being covered by windblown sand (Lauten et al. 2006), mortality resulting directly from human activity (e.g., chick being eradicated from nest by dog) is not typically documented. Take in the form of harassment can and has been documented; however, determining when cumulative instances of harassment equate to the loss of an individual or a nest was not possible. Therefore, this estimate of take includes direct take (i.e., mortality) and harassment of any kind. The results do not distinguish between these two forms of take.

Site size and access to each management site will impact habitat quality. Larger sites can offer larger “buffer” zones surrounding recreational versus nesting areas. Access points can increase traffic and the probability of encountering juvenile life history phases. These elements were included in the take assessment to account for their impacts on population performance. Access information for the currently occupied management areas is presented in Table 2.

Table 2. Size of and Access to the Occupied Management Areas.

Site	Total Size of Site (acres)	Number of Access Points Adjacent to the Management Area
Sutton	384	3
Siltcoos North and South	140	3
Dunes Overlook	44	1
Tahkenitch North	119	0
Tenmile	95	2
Coos Bay North Spit	221	2
Bandon	154	2
New River	256	0

Also, the snowy plover breeding habitat quality on the Oregon Coast has changed in the last two decades. Management activities since 1994 have included habitat restoration and maintenance, monitoring, and predator control measures. These resource management activities have generally contributed to the creation of more, higher quality habitat for breeding snowy plovers on the Oregon Coast, and the population has increased substantially since that time. Most habitat restoration took place between 1994 and 2000, and since then the number of acres of restored breeding habitat has remained relatively stable (Table 3). Although snowy plover population data is available since 1992, the conclusions presented in this memorandum are based on an analysis of data collected on population performance between 2000 and 2006 following the restoration process. As a result pre- and post-restoration data are not mixed, and the data used for the take assessment represent the ongoing effects of resource management activities, including habitat restoration. The decision to use the post-restoration data set reduces variation in the environmental conditions, increases certainty in the vital rates, and increases certainty in the take assessment.

Table 3. Number of Acres Restored at SPMAS and Recreation Management Areas along the Oregon Coast

	Year Restored	Number of Restored Acres
Sutton/Baker Beach	1996	20
Tahkenitch	1995	25
Dunes Overlook North	1998	20
Dunes Overlook South	1998	20
Tenmile South	1995	25
Coos Bay North Spit	1998	170
Bandon	1998	50
New River	1998	160

It is anticipated that populations of snowy plover on covered lands would either continue to reside primarily in areas where they have been documented in the recent past, or would use areas proposed for management in the future. These include areas owned or leased by OPRD under the HCP (i.e., SPMAs [up to five]) and areas managed by other landowners or adjacent to Federal lands (i.e., RMAs [up to 11]). For this analysis, it was assumed that the potential for take of snowy plover would only occur in these areas, and the locations have been summarized in Chapter 1. This assessment does not incorporate individual bird movements or metapopulation dynamics. In other words, it was assumed that the adult birds that were observed on a site were part of the population of birds that were contributing to nest, egg, and chick production. While this is not completely “biologically accurate” it serves as an

index of the number of adults present relative to the overall productivity of a site and allows for modeling of the population.

The conclusions drawn in this memorandum assumed that impacts to snowy plovers in the future would be similar to what has been observed in the recent past (2000-2006), and that management of SPMA and RMA would be similar to ongoing management (i.e., habitat restoration/maintenance, recreational use restrictions, predator control). Further, it was assumed that management at the unoccupied SPMA would be similar to the management at Bandon SPMA. This assessment should be reconsidered if management of any of these areas, including lands owned by other landowners (RMAs), would be significantly altered during the term of the 25-year ITP.

It should also be noted that the dynamics of the snowy plover population along the Oregon Coast would change over time. Although the assessment was based on population performance metrics between 2000 and 2006, these metrics would likely change over the 25-year permit term. As such, the assessment of take should also change to reflect the most current population performance. During the 25-year permit term, it is recommended that the thresholds for incidental take be reassessed every 5-years to reassess assumptions made in this assessment.

Uncertainty and Assumptions in Modeling

Most real-world ecological phenomena are multifaceted, interrelated, and difficult to explain. Ecologists and population biologists use models to support management and planning because ecological systems are so complex. Models are simply representations or simulations of the “real-world” and are neither correct nor incorrect. They are neither true, nor false, and should be judged in terms of their explanatory power and utility. Two types of modeling were used in this take assessment; life table modeling and regression analysis. A formal decision tree was used to design each of the models. Caswell (2001) outlines the process for selecting and designing life-table based models. Life tables are collections of historic observations from different life-stages, and vital rates describing movement from one stage to the next. Although there were no assumptions or uncertainties associated with the life-tables themselves, their quality was subject to uncertainty in the data that went into them. For this take assessment, it was assumed that the nest, egg, hatchling, fledgling, and maximum adult observations were representative of recent performance.

Lambda was calculated directly from life tables for each site and for all sites combined. The estimation of lambda is subject to uncertainties in life-table data, and to assumptions in the design of the matrix, as described above. For this take assessment adult mortality was not considered. In addition, “nest to egg survival” was not considered, based on the assumption that nests themselves do not limit production, but that adults do. Localized impacts of covered activities on vital rates

were also used, rather than metapopulation dynamics (immigration and emigration). The re-sighting of color-banded snowy plovers has shown that the Oregon snowy plover population is immigrating and emigrating adults annually (Lauten et al. 2006). These dynamics could be addressed in the future using a metapopulation matrix model based on bird movement data, but it would have limited applicability because migration and over-wintering survival operate at scales that are larger than the covered areas and activities.

Numerous assumptions and uncertainties were also associated with the regression modeling. Regression models are based on the correlation between variables. A correlation exists between two variables when one of them is related to the other in some way. Correlations have a shape, slope, statistical power, and significance level. The shape of correlations were not considered in this analysis due to the small number of sites and vital rates available; concerns of non-linearity are best reserved for larger data sets where non-linear regressions can be carefully designed. Slope, statistical power (r value), and significance levels (p value) were considered to reduce uncertainty in the take assessment. The slope of each correlation was used to include or exclude specific relationships when analyzing take in association with a specific vital rate.

Some indicators (proxies) of recreation and restoration were statistically significant, and were used to estimate take. For this analysis it was assumed that the relationship was having an effect if the model had a negative slope, explained at least 10% of the variability in the vital rate, and was biologically significant ($p < 0.20$). Several correlations that did not meet these parameters were excluded from the assessment. These exclusions may have increased uncertainty in the take assessment because activities that were excluded may be impacting a vital rate in some way that is not apparent in the data, or could result in take in the future.

Several specific activities appeared to be positively correlated with survival (Table 6), although the significance of these correlations was relatively low. It is possible that these recreational activities are cross-correlated with each other, that their impacts are confounding, or that the activities are correlated with some other variable unrelated to (but somehow correlated with) snowy plover performance. However, the true impacts of specific recreational activities on snowy plover performance remain somewhat uncertain.

Finally, correlation and regression models are used to associate one variable with one or more other variables. They do not determine cause-effect relationships. The data that directly describe take for snowy plover are rare or do not exist. For example, there has not been a robust study of the direct displacement of adults or fledglings by joggers. For this take assessment, it was assumed that the recreational activities that have been regularly observed and documented are the likely causes of take. Other indirect and undocumented causes are conceivable. These should be explored in the future if new information becomes available.

Chapter 3. Population Performance

The breeding snowy plover population has been increasing on the Oregon Coast since consistent monitoring started in 1992. The number of breeding snowy plovers and the productivity of nesting individuals at each occupied site have fluctuated between years, likely depending on management regime, restoration activities, habitat quality, food availability, and the presence of potential mates.

The snowy plover population along the Oregon coast increased from 2000 – 2006 as did the number of nests, eggs, hatchlings and fledglings (Figure 2). Offspring appear to be increasing faster than adults, but overall, the increase in adults over time has a “good fit” for linear growth ($R^2 = 0.73$). These data are presented for all years in Table 4a and include data from Sutton Beach, Siltcoos Estuary RMA, Dunes Overlook RMA, Tahkenitch Estuary RMA, Tenmile Estuary RMA, Coos Bay North Spit RMA, Bandon State Recreation Area SPMA, and New River Estuary RMA.

The following individual analyses (presented in this chapter) and the coast-wide analysis (presented in Chapter 4) are based on the population information presented in Table 4a with some modifications. Necanicum Spit, Floras Lake, and Sutton Beach were excluded from the individual analyses because there were inadequate data for these sites due to the low number of observations collected over a limited number of years. In addition, proxy data for Sutton Beach were used in the coast-wide analysis (presented in Chapter 4) in order to be able to include information from this site. The number of nests and fledglings recorded at Sutton Beach were used to determine 1) the number of eggs that were likely present and 2) the number of young that hatched during each year based on similar relationships at other sites. Without these proxies the data from Sutton Beach would have been incomplete and unusable for model development. The modified data used in the coast-wide analysis is presented in Table 4b.

Figure 2. Changes in Snowy Plover Population along the Oregon Coast (2000 To 2006)

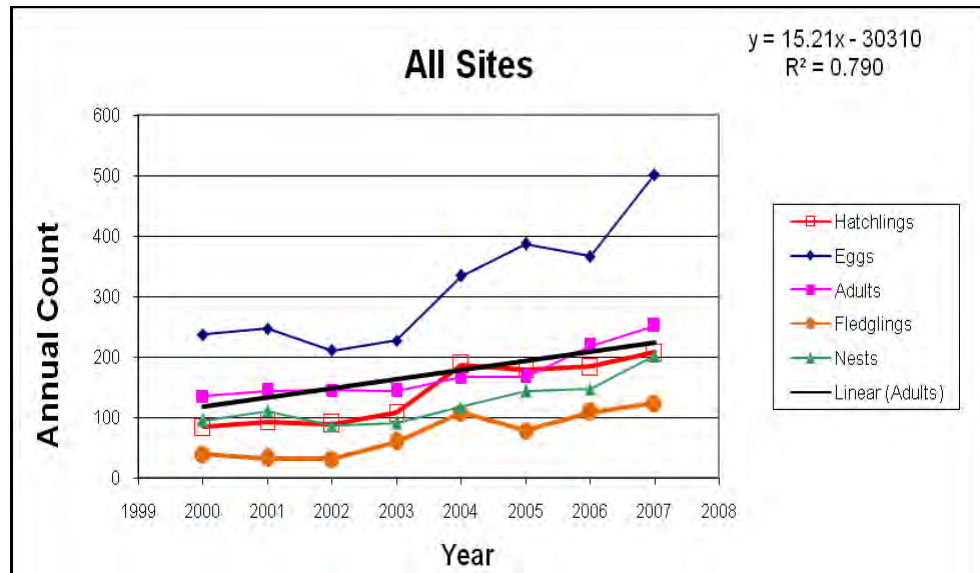


Table 4a. Life Table for All Snowy Plover Monitoring Sites within the Covered Lands

Year	Number of nests	Number of eggs laid ¹	Number of hatchlings ²	Number of fledglings	Maximum number of adults observed
2000	100	237	84	43	136
2001	111	247	93	32	144
2002	89	211	89	31	145
2003	91	227	108	60	144
2004	117	334	187	108	166
2005	144	387	179	78	167
2006	147	367	184	110	219
2007	202	502	208	123	252
All years	799	2010	924	462	1121
Annual Average	114	287	132	66	160

¹ This column does not include number of eggs laid at Necanicum Spit, Sutton Beach, or Floras Lake.

² This column does not include number of hatchlings at Necanicum Spit, Sutton Beach, or Floras Lake.

Table 4b. Snowy Plover Metrics Used in Regression Models

Year	Number of nests ¹	Number of eggs laid ²	Number of hatchlings ²	Number of fledglings ¹	Maximum number of adults observed
2000	95	258	94	39	136
2001	111	292	114	32	144
2002	86	220	93	31	145
2003	91	230	109	60	144
2004	117	334	187	108	166
2005	144	387	179	78	167
2006	147	379	190	110	219
All years	791	2100	966	458	1121
Annual Average	113	300	138	65	160

¹ The numbers in this column do not include data from Necanicum Spit or Floras Lake. Those sites were not included in the analysis because they did not meet minimum data requirements.

² The numbers in this column do not include data from Necanicum Spit or Floras Lake. The numbers do include a proxy data set created for Sutton Beach that was derived from the relationship of other variables. For example, the number of eggs laid at Sutton Beach was based on the number of nests recorded there and derived from the nest-to-egg ratio observed coast-wide.

With the exception of migration, the Oregon snowy plover population's life cycle is discretely contained within the stages listed in Table 4a, and depicted in the life-cycle diagram in Figure 1. The annual vital rates for all sites combined are presented in Table 5, and provide a picture of population performance within years, as well as summed across years. Lambda was positive during this period ($\lambda = 1.072$), and each nest held an average of 2.65 eggs. The probability that an individual survived from egg to hatchling and hatchling to fledgling was 45% for both rates (Table 5). Nests-per-adult was less than one because the rate includes males, females, and non-reproductive adults. The intrinsic capacity for all sites peaked in 2004 due to high fecundity and strong egg and hatchling survival. It was lowest in 2001 due to low fecundity and low survival.

Table 5. Vital Rates for All Snowy Plover Monitoring Sites within the Covered Lands

Year	Fecundity	Nests per adult	Eggs per nest	Egg to hatchling survival	Hatchling to fledgling survival	Fledgling to adult survival	Lambda
2000	2.15	0.70	2.72	0.36	0.42	2.51	1.02
2001	1.53	0.77	2.63	0.39	0.28	3.69	0.98
2002	1.59	0.60	2.56	0.42	0.33	4.52	1.01
2003	2.33	0.63	2.53	0.48	0.55	4.63	1.12
2004	2.33	0.70	2.85	0.56	0.58	2.77	1.16
2005	2.27	0.86	2.69	0.46	0.44	1.55	1.07
2006	1.37	0.67	2.58	0.50	0.57	2.80	1.13
All years	1.94	0.70	2.65	0.45	0.45	3.21	1.072

Notes: Lambda is calculated using the matrix depicted in Table 1, and assumes birds that survive to adulthood survive throughout the time period (i.e. no post-fledgling mortality).

Following is a brief summary of population change and vital rates for each of the monitoring sites that were used in this take assessment. Some of the detailed data and vital rates were omitted for brevity. They are graphed in the sections below, and in the regression graphs in the following chapter.

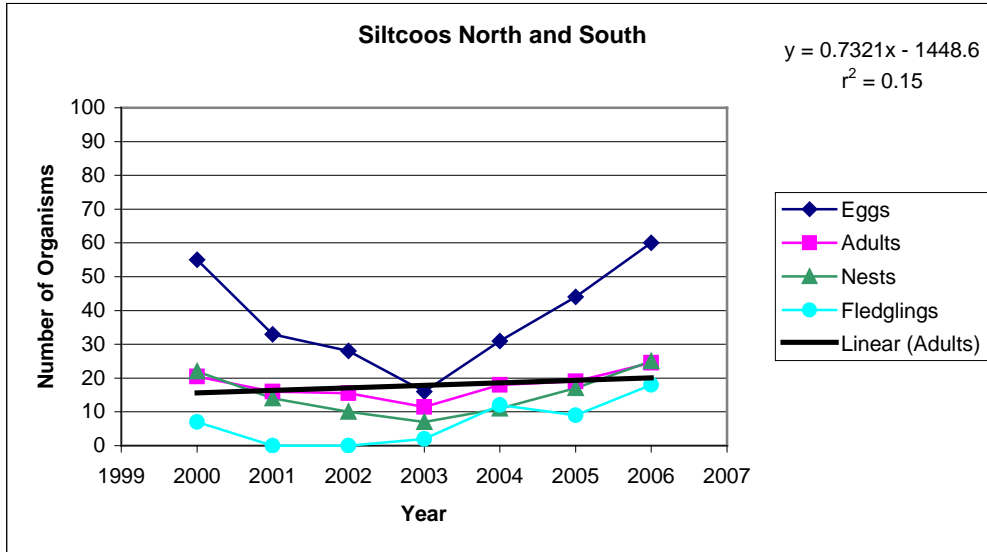
3.1. Siltcoos Estuary Recreation Management Area

The Siltcoos Estuary RMA is owned and managed by the U.S. Forest Service (USFS). Snowy plovers have nested at this site since 1993. Predator management activities were started in 2004. Seasonal dry sand restrictions at this site have included restrictions on dog use during the snowy plover nesting season and year-round prohibitions on driving.

There were 12.63 people per mile reported along this section of beach during peak use with a dispersed distribution of visitors (Oregon Parks and Recreation Department 2005). The primary reasons that the public accesses the beach in this area is to walk/run (37%) or to relax (31%). None of the visitors surveyed reported bringing dogs to the beach and only 3% were flying kites. Kayakers and canoers at Siltcoos Estuary resulted in the most disturbances to snowy plovers, but these impacts were typically the result of the public accessing restricted areas (Oregon Parks and Recreation Department 2007).

The breeding population at the Siltcoos Estuary Recreation Management Area increased ($\lambda = 1.01$) between 2000 and 2006, with a down period in 2002 and 2003 (Figure 3). The number of eggs yielded by each nest at this site and the probability of survival from one life stage to the next is presented in Table 5.

Figure 3. Changes in Snowy Plover Population at Siltcoos Estuary Recreation Management Area (2000 To 2006)



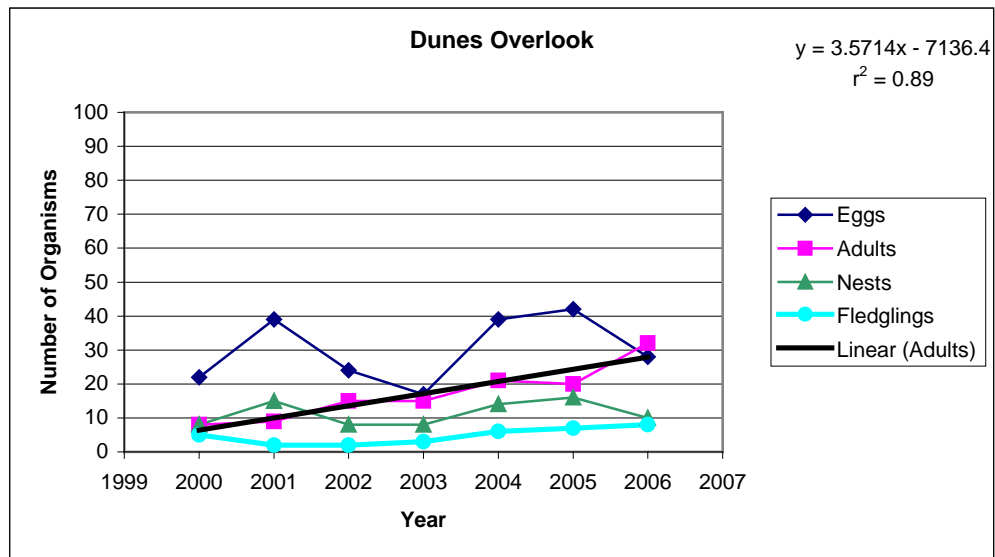
3.2. Dunes Overlook Recreation Management Area

The Dunes Overlook RMA is owned and managed by the USFS. Snowy plovers have nested at this site since 1999. Predator management activities were started in 2004. Seasonal dry sand restrictions at this site have included restrictions on dog use during the snowy plover nesting season.

There were 4.91 people per mile reported along this section of beach during peak use with a dispersed distribution of visitors (Oregon Parks and Recreation Department 2005). The primary reasons that the public accesses the beach in this area is to walk/run (52%) or to relax (29%). Only 2% of those surveyed reported bringing dogs to the beach while 5% reported flying kites (Oregon Parks and Recreation Department 2005).

The breeding population at the Dunes Overlook RMA increased ($\lambda = 1.06$) between 2000 and 2006 (Figure 4), with down periods in 2002 and 2003. The number of eggs yielded by each nest at this site and the survival from one life stage to the next is presented in Table 5.

Figure 4. Changes in Snowy Plover Population at Dunes Overlook Recreation Management Area (2000 To 2006)



3.3. Tahkenitch Estuary Recreation Management Area

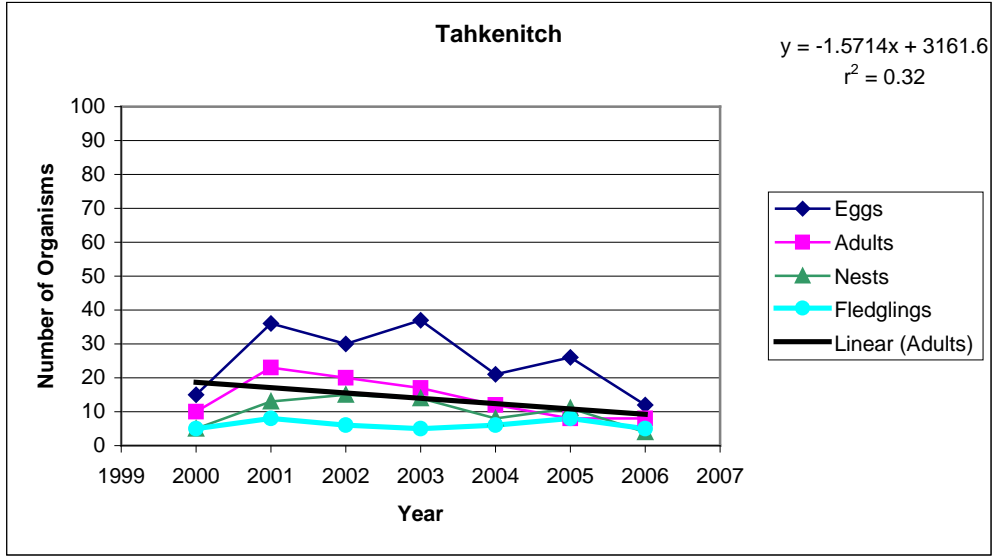
The Tahkenitch Estuary RMA is owned and managed by the USFS. Snowy plovers have nested at this site since 1994. Predator management activities were started in 2004. Seasonal dry sand restrictions at this site have included restrictions on dog use during the snowy plover nesting season.

In 2005, 6.55 people per mile were reported along this section of beach during peak use with a dispersed distribution of visitors (Oregon Parks and Recreation Department 2005). The primary reasons that the public accesses the beach in this area is to walk/run (39%) or to relax (24%). Only 3% of those surveyed reported bringing dogs to the beach while another 3% were flying kites (Oregon Parks and Recreation Department 2005).

The breeding population at the Tahkenitch Estuary RMA increased ($\lambda = 1.14$) between 2000 and 2006 (Figure 5). Although the numbers of adults, nests, and fledglings have decreased at this site during the last 7 years, adults have continued to produce high numbers of eggs, which is likely keeping the population growth (λ) positive even though the number of adults decreased. If the number of adults at Tahkenitch continues to decline, the number of eggs will eventually decline, λ may eventually drop below 1.0, and the breeding population may eventually be lost.

The number of eggs per nest at this site and the survival from one life stage to the next is presented in Table 5.

Figure 5. Changes in Snowy Plover Population at Tahkenitch Recreation Management Area (2000 To 2006)



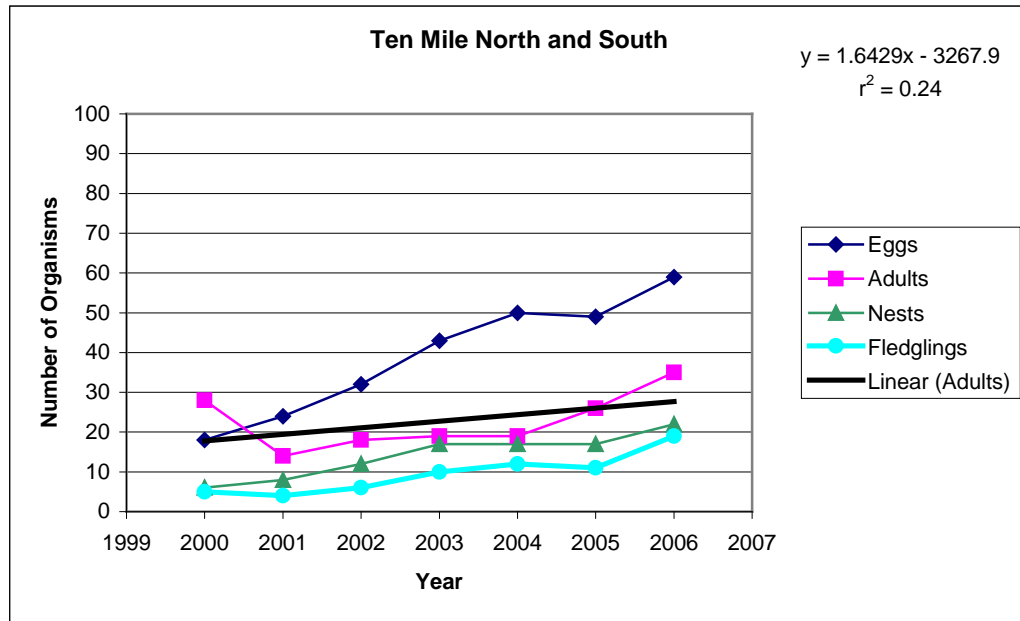
3.4. Tenmile Estuary Recreation Management Area

The Tenmile Estuary RMA is owned and managed by the USFS. Snowy plovers have nested at Tenmile Estuary habitat restoration area (HRA) since 1992. Predator management activities were started in 2004. Seasonal dry sand restrictions at this site have included restrictions on dog use during the snowy plover nesting season and year-round prohibitions on driving.

Public use at this site is low but occasional violations of imposed driving restriction have been observed (Oregon Parks and Recreation Department 2007). It was reported that there were 5.54 people per mile reported along this section of beach during peak use with a dispersed distribution of visitors (Oregon Parks and Recreation Department 2005). The primary reasons that the public accesses the beach in this area are to walk/run (26%) or to relax (31%). Of those surveyed, 7% reported bringing dogs to the beach while only 1% reported flying kites (Oregon Parks and Recreation Department 2005).

The breeding population at the Tenmile Estuary RMA generally increased ($\lambda = 1.01$) between 2000 and 2006 (Figure 6). The number of eggs yielded by each nest at this site and the survival from one life stage to the next is presented in Table 5.

Figure 6. Changes in Snowy Plover Population at Tenmile Estuary Recreation Management Area (2000 To 2006)



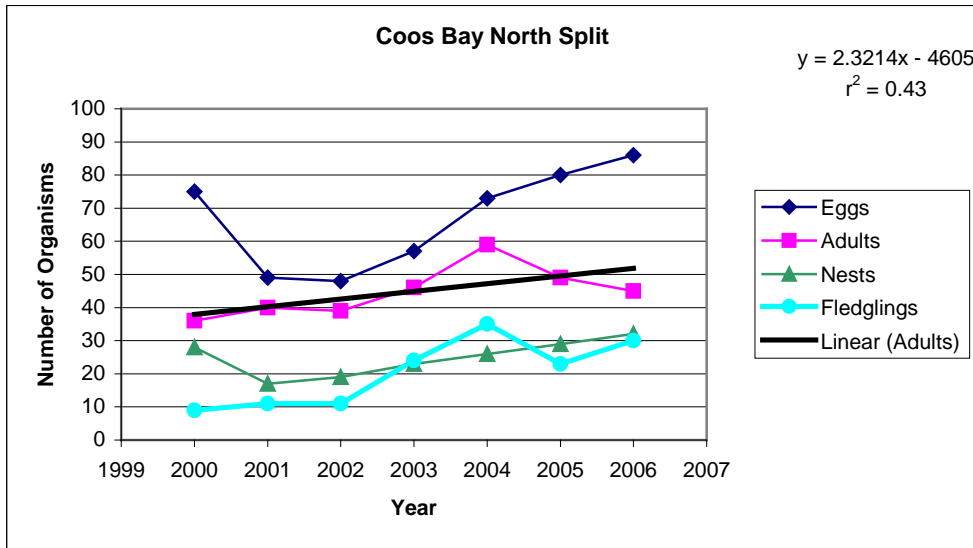
3.5. Coos Bay North Spit Recreation Management Area

The Coos Bay North Spit RMA is owned by the Bureau of Land Management (BLM). Snowy plovers have nested at the Coos Bay North Spit RMA since 1990. Predator management activities were started in 2002. Seasonal dry sand restrictions at this site have included restrictions on dog use and driving during the nesting season, although some illegal ATV/OHV use has been observed (Oregon Parks and Recreation Department 2007).

It was reported by OPRD (2005) that there were 3.84 people per mile along this section of beach during peak use with a dispersed distribution of visitors. The primary reasons that the public accesses the beach in this area are to walk/run (16%) or to relax (21%). Of those surveyed 4% reported bringing dogs to the beach; nobody reported flying kites (Oregon Parks and Recreation Department 2005).

The breeding population at the Coos Bay North Spit RMA increased ($\lambda = 1.08$) between 2000 and 2006 (Figure 7). The average number of eggs per nest at this site and the survival from one life stage to the next is presented in Table 5.

Figure 7. Changes in Snowy Plover Population at Coos Bay North Spit Recreation Management Area (2000 To 2006)



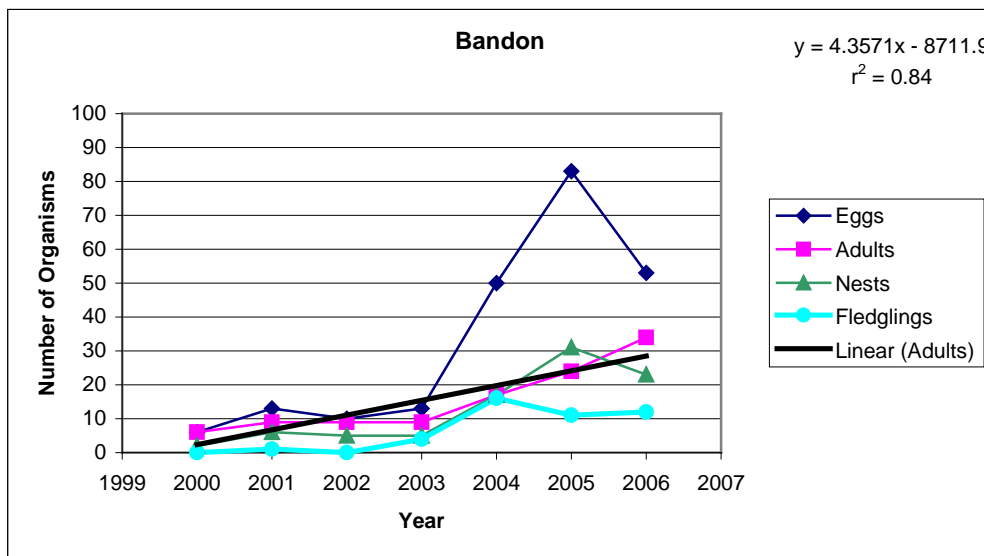
3.6. Bandon State Natural Area SPMA

The Bandon State Natural Area is owned and managed by OPRD. Snowy plovers have nested at the Bandon SNA since 1991. Predator management activities were started in 2002. Within the habitat restoration area, seasonal dry sand restrictions have included restrictions on off-leash dogs during the snowy plover breeding season and a year-round prohibition on driving.

In 2005, OPRD reported 13.22 people per mile along this section of beach during peak use, with a dispersed distribution of visitors. The primary reasons that the public accesses the beach in this area are to walk/run (47%) or to relax (27%). Of those surveyed 7% reported bringing dogs to the beach and 3% reported flying kites (Oregon Parks and Recreation Department 2005).

The breeding population at the Bandon SPMA increased ($\lambda = 1.02$) between 2000 and 2006 (Figure 8). The average number of eggs per nest at this site and the survival from one life stage to the next is presented in Table 5.

Figure 8. Changes in Snowy Plover Population at Bandon SPMA (2000 to 2006)



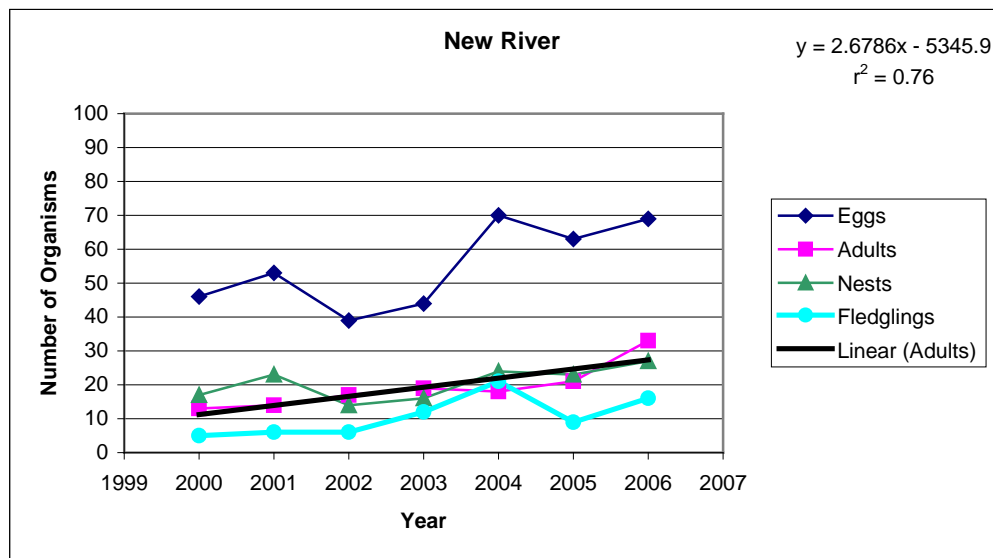
3.7. New River Recreation Management Area

The New River RMA is owned and managed by the BLM and Coos County. Snowy plovers have nested at this site since 1990. Predator management activities were started in 2002. Seasonal dry sand restrictions at this site have included restrictions on dog use and driving during the nesting season.

In 2005, OPRD reported 3.45 people per mile along this section of beach during peak use, with a dispersed distribution of visitors. The primary reasons that the public accesses the beach in this area are to walk/run (71%) or to relax (12%). Of those surveyed 4% reported bringing dogs to the beach; nobody reported flying kites. An additional 9% reported accessing the site to surf (Oregon Parks and Recreation Department 2005).

In general, the breeding population at the New River RMA increased ($\lambda = 1.14$) between 2000 and 2006 (Figure 9). The number of eggs per nest and the survival from one life stage to the next is presented in Table 5.

Figure 9. Changes in the Snowy Plover Population at New River Recreation Management Area (2000 to 2006)



3.8. Columbia River South Jetty, Nehalem Spit and Netarts Spit SPMA

Under the HCP, OPRD would manage up to four currently unoccupied areas for nesting populations of snowy plover, including SPMA's at Columbia River South Jetty, Nehalem Spit, Netarts Spit, and Necanicum Spit (see Section 1.2.2, Natural Resources Management - *Management of Targeted Snowy Plover Management Areas* for a discussion of the circumstances under which these SPMA's would be actively managed).

For this analysis, it is assumed that proposed management (i.e., habitat restoration) at the Columbia River South Jetty, Nehalem Spit, and Netarts Spit SPMA's would be similar under the HCP, that the area restored at each site would be approximately 40-acres, and that the sites would be maintained for at least the duration of the ITP term. If it were implemented, restoration at Netarts Spit would likely be completed later in the term than the other two sites, and only if other targeted RMA's are not being actively managed by other landowners (Section 1.2.2 Natural Resources Management - *Management of Targeted Snowy Plover Management Areas*).

The number of people per mile along the stretches of beach that contain all three of these SPMA's is higher than the number of people per mile at all of the occupied areas discussed above. The number of people per mile on the beaches near Columbia River South Jetty, Nehalem Spit, and Netarts Spit are 17.28, 24.85, and 21.02 people per mile, respectively (Oregon Parks and Recreation Department 2005). While these

SPMAs may be located in isolated areas away from most beach activity, in general, the number of people on the beach near these SPMAs is higher.

The reasons that people access these beaches are the same as all of the occupied areas, i.e. relaxing, walking/running, and flying kites. It is not possible to anticipate how snowy plovers will respond to restoration and management at these SPMAs. However, based on the number of people on the beach and their types of activities, it is likely that the correlation between recreation activities and the different life stages of breeding snowy plovers would be similar to those observed at the occupied areas between 2000 and 2006, assuming that populations of breeding snowy plovers began using the SPMAs following restoration.

3.9. Necanicum Spit

In addition to SPMAs at Columbia River South Jetty, Nehalem Spit, and Netarts Spit, OPRD could also manage an SPMA at Necanicum Spit for nesting snowy plovers (see Section 1.2.2 Natural Resources Management - *Management of Targeted Snowy Plover Management Areas* for a discussion of the circumstances under which these SPMAs would be actively managed).

No seasonal dry sand restrictions are currently implemented at this site. Proposed management of the Necanicum Spit SPMA is assumed to be the same in the HCP (i.e., restoration is not proposed, but a change in management to favor snowy plovers is), so the potential for nesting or foraging snowy plovers to use these sites is considered to be similar. Necanicum Spit has not been regularly occupied by nesting or foraging snowy plovers (one nest was recorded at Necanicum Spit in 2002) since data collection started in 1992.

The number of people per mile on the beaches near Necanicum Spit is 17.28. Although the Necanicum Spit SPMA would be located away from most beach activity, the number of people on the beach near this SPMA is higher than what is currently experienced at other occupied nesting areas. The reasons that people access this beach are the same as at the occupied SPMAs (Oregon Parks and Recreation Department 2005).

It is not possible to anticipate how snowy plovers would respond to changes in management at this SPMA. However, based on the number of people on the beach and the types of activities that they are doing, it is likely that the correlation between recreation activities and the different life stages of breeding snowy plovers would be similar to those observed at occupied areas between 2000 and 2006, assuming that populations of snowy plovers begin using these sites following a change in management.

3.10. Breeding or Wintering Habitat outside of SPMAs and Recreation Management Areas within the Covered Lands

The HCP covered lands include the sandy beaches of the Ocean Shore along the Oregon Coast between the mouth of the Columbia River South Jetty and the California/Oregon border (approximately 230 miles of beach). The Ocean Shore includes the area from extreme low tide to the actual or statutory vegetation line, whichever is most landward. Much of this area is outside of the specific SPMAs and RMAs described above. However, OPRD management activities that occur outside of those areas and along sandy beaches also have the potential to affect nesting populations of snowy plovers.

In particular, portions of the covered lands that were originally proposed for critical habitat designation in 2004 or that are designated as Recovery Beaches in the *Western Snowy Plover Recovery Plan* (U.S. Fish and Wildlife Service 2001), have some potential to support plovers year-round and could be affected by public use/recreation management. For reference, these sites include, but are not limited to, Bayocean Spit, South Sand Lake Spit, Tahkenitch South, Umpqua River North Jetty, Elk River, and Euchre Creek. Although none of these areas are occupied by snowy plovers currently (2006), some of them have supported the species on a limited basis in the past.

Chapter 4. Regression Analysis

The snowy plover HCP and this Take Assessment describe population change and vital rates at the various sites across time, and the relationship between those parameters and the covered activities. This will allow managers, planners, and biologists to focus efforts on the specific life-stages that are most vulnerable to take, and on the specific activities that impact these life-stages. As described in Chapter 3, the relationship between each vital rate and lambda using correlation analysis was first calculated. A formal perturbation analysis was not conducted due to limitations in the data set and the constraints these placed on the matrix models (Caswell 2001).

The activities that were impacting each vital rate were then identified using simple correlations between these variables, and screening for the models that had a positive slope, an $r^2 > 0.10$, and a significance level of $p < 0.20$. Multivariate models between each vital rate and all of the activities that appeared to be impacting each rate were constructed. The regression analysis was completed by estimating a vital rate that was free from the impacts of the associated activities. These modeled vital rates were used to produce the take assessment in the following chapter.

This quantitative analysis was only completed for one set of covered activities, public use/recreation management, due to a lack of information on the frequency of occurrence for the other covered activities (i.e., natural resource management, beach management).

4.1. Relationship between Vital Rates and Intrinsic Capacity (lambda)

Two vital rates, survival and fecundity, were used to compute lambda. Survival was measured as egg to hatchling survival, the number of eggs per nest, and hatchling to fledgling survival. Changes in adult to adult and fledgling to adult survival were excluded from this analysis because these vital rates are not reflective of local conditions in the management area, and are impacted by environmental and anthropogenic conditions in the migratory and over-wintering areas. The relationships between each vital rate and lambda for each site were examined to understand which sites had high lambdas, and which vital rates were influencing the intrinsic capacity of these sites.

4.1.1. Survival

Egg to Hatchling Survival

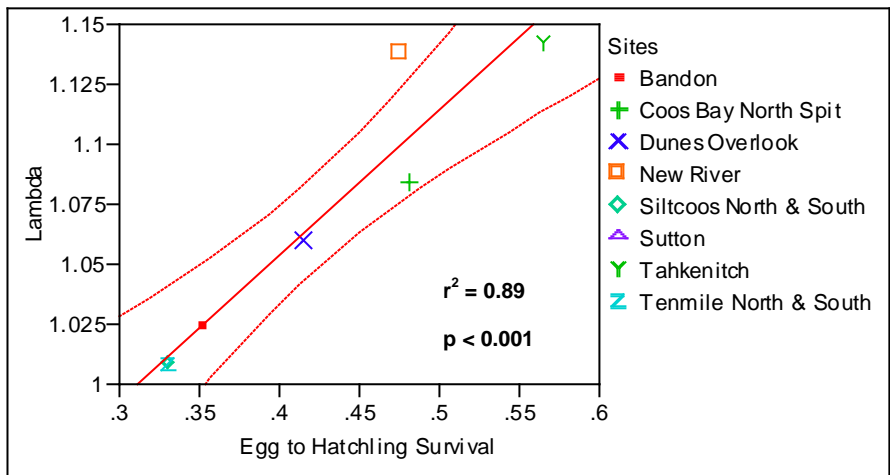
The vital rate that was the most strongly correlated with intrinsic capacity (λ) from 2000 to 2006 was survival from egg to hatchling (Figure 10). The analysis indicated that approximately 89% of the variability seen in the population’s intrinsic capacity from 2000-2006 (i.e., λ) could be explained by changes in egg to hatchling survival based on the equation:

$$\lambda = -1.536466 + 0.994177 \text{ Nest to Egg Survival}$$

As more eggs successfully hatched, the population increased; if this rate were to decrease, the growth of the population would slow.

Since egg to hatchling survival was closely tied to overall population change, egg to hatching survival was used to further examine correlations between recreation activities and population performance. That analysis is described below.

Figure 10. Relationship between Egg to Hatchling Survival and the Intrinsic Capacity (λ) from 2000 - 2006 along the Oregon Coast



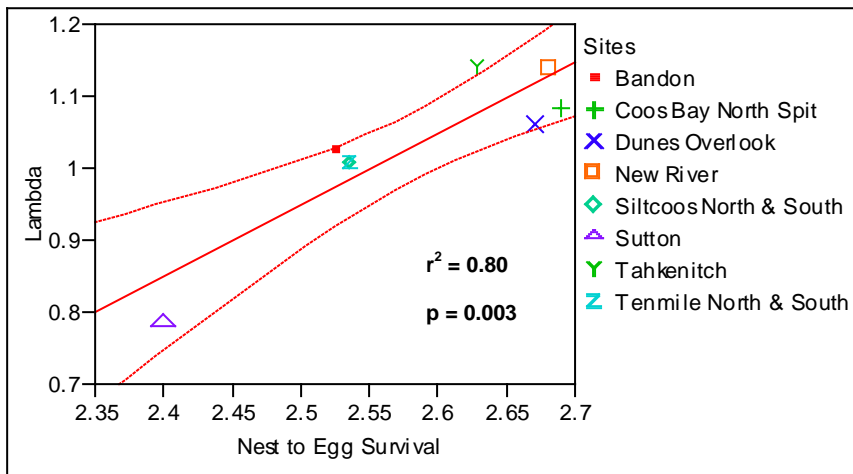
Eggs Per Nest

A second parameter that was correlated ($R^2 = 0.80$) with intrinsic capacity (i.e., lambda) from 2000 to 2006 was the number of eggs per nest (Figure 11) based on the equation:

$$\text{Lambda} = 0.8118152 + 0.605279 \text{ Egg to Hatchling Survival}$$

Therefore, this vital rate was also examined to determine whether it was correlated with activities. The number of eggs per nest had a strong correlation with lambda, but it did not seem to be influenced by recreation on the beach. All of the recreation activities were examined individually and together and no revealing correlations were detected. Due to these weak correlations no further analysis was done on the number of eggs per nest in relation to covered activities, and no discussion is presented below. Instead egg and nest production was dealt with in terms of fecundity (Section 4.1.4).

Figure 11. Relationship between Number of Eggs per Nest and Intrinsic Capacity (Lambda) from 2000 - 2006 along the Oregon Coast



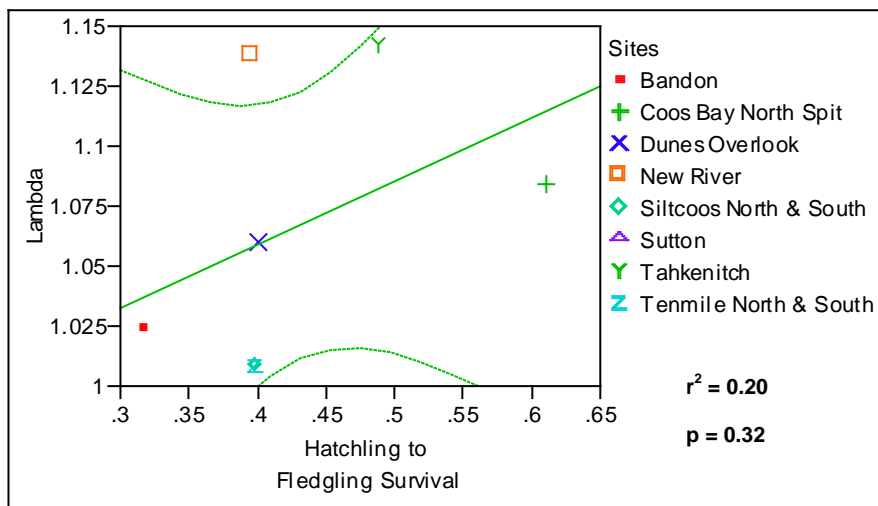
Hatchling to Fledgling Survival

A third life history parameter, hatchling to fledging survival, had a weak correlation ($R^2 = 0.18$) with intrinsic capacity (λ) for the 7-year evaluation period (Figure 12) based on the equation:

$$\lambda = 0.9535969 + 0.2631331 \text{ Hatchling to Fledgling Survival}$$

In other words, only 18% of the variability seen in λ could be explained by changes in hatchling to fledging survival. Since there was some correlation between hatchling to fledging survival and intrinsic capacity, this vital rate was also examined to determine the correlation between the vital rate and recreational use. The results of that analysis are described below in Section 4.2.

Figure 12 Relationship between Hatchling to Fledgling Survival and the Intrinsic Capacity (λ) from 2000 - 2006 along the Oregon Coast



4.1.2. Fecundity

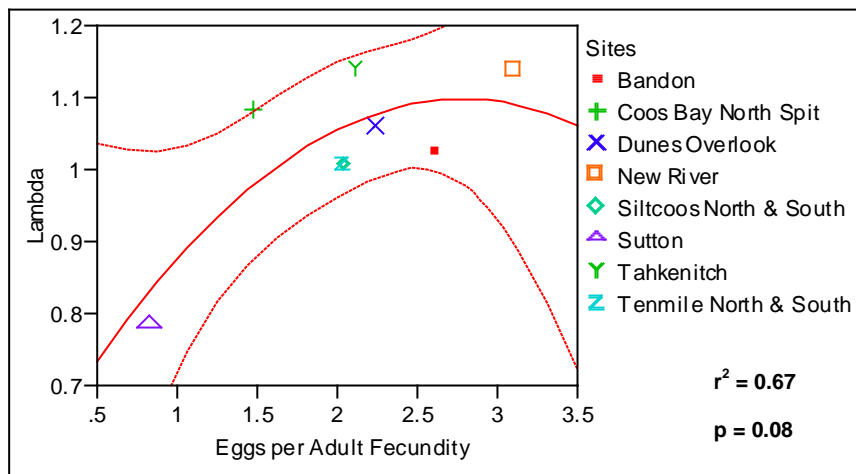
Fecundity was highly variable among sites and years. The relationship between fecundity and lambda appears to be non-linear. Fecundity at the poorest performing sites was quite low, whereas the relationship between fecundity and lambda “leveled off” across sites with higher overall lambdas.

Based on a polynomial correlation between fecundity and lambda, this vital rate was strongly correlated with intrinsic capacity as shown in Figure 13 ($R^2=0.67$) based on the polynomial equation:

$$\text{Lambda} = 0.8919843 + 0.0604255 \text{ Fledgling to Adult survival} - 0.0384818 (\text{Fledgling to Adult survival} - 2.97955)^2$$

It is difficult to imagine how covered activities might impact fecundity directly through female egg production. However, the data used in this take assessment relate to the number of eggs successfully placed in a nest by a given population of adult birds on a site per year. Covered activities could directly impact this vital rate at the courtship, copulating, or egg deposition phase, or in the lag between egg deposition and documentation by field staff. Since there was strong correlation between this vital rate and lambda, relationships between covered activities and fecundity were examined as described in the text below.

Figure 13. Relationship between Fecundity and Intrinsic Capacity (Lambda) from 2000-2006 Along the Oregon Coast



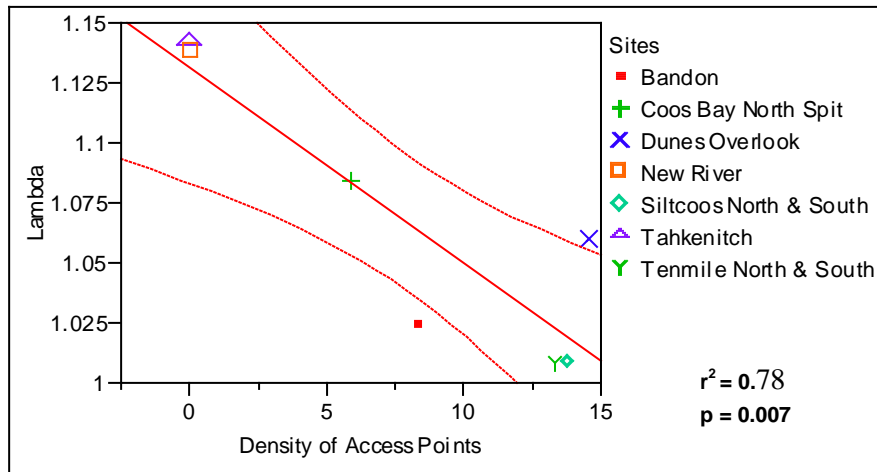
4.2. Relationship between Recreational Activities and Vital Rates

The proportion of recreationists participating in specific activities was previously estimated using field observations and mail-in surveys. In addition, the peak number of people per mile during the snowy plover breeding season was estimated by visual observations in a controlled survey (Shelby and Tokarczyk 2002).

In the field surveys, which were typically given during peak hours of visitor traffic, park visitors were asked to classify the primary reasons for their visits to the beach on that day. Mail-in surveys were given to numerous visitors who completed the forms from home, and related their recreational activities to their average experiences instead of to a single visit. The mail-in surveys suggested that approximately one third (35%) of all visitors brought one to two dogs with them to the beach; whereas in the field surveys, less than 10% of visitors classified this as the primary purpose of their visit. The majority of respondents (61%) admitted they did not leash their dogs some of the time during their typical visits. The majority of this use occurred during the snowy plover breeding season.

The majority of visitors (93%) did not ride horses or drive on the beach. The majority of visitors (90%) were groups of family and friends. Most (76%) were unaware of restrictions associated with snowy plovers. The peak number of people per mile, number of access points, distance to the nearest access point, and the number of access points per mile of beach (access point density) are all indicators of the overall traffic a management area would receive. The recreational use mail-in surveys suggested that this increased traffic would express itself primarily in the form of groups of family and friends and their dogs. Out of the group of general indicators of recreational activity levels, the density of access points was the best predictor of lambda ($r^2=0.78$, $p=0.007$) as shown in Figure 14.

Figure 14. Relationship between the Density of Access Points (Points per Acre) and Lambda



Three vital rates, egg to hatchling survival, hatchling to fledgling survival, and fecundity were regressed against recreational activities to determine how the activities were influencing them. The field estimates of dog exercising, vehicle use, and horse traffic were excluded from the analysis because they differed drastically from the mail-in surveys. Instead, the density of access points and peak number of people per mile were used as general indicators of dog exercising, vehicle use, and horse traffic. A discussion of specific recreational activities follows below and the reader is referred to the recreational use study for additional details on these activities.

The equivalent number of adults that might be lost from the population based on the number of eggs or fledglings taken through recreational activities was calculated as a measure of a third vital rate; abundance. The goal of this analysis was to estimate and help explain the overall impacts of recreation on population performance. Although these relationships do not “prove causation,” they are highly suggestive of the types of activities that should be included in the take assessment, and which vital rates these activities are associated with.

4.2.1. Survival

Nest Production

Although nests are not a component of the snowy plover biological life-cycle, they are an essential component of the reproductive process. Nest productivity can be impacted pre- or post-construction, and would be extremely difficult to detect. It is unclear from the data whether nest productivity is actually a limiting stage, or whether nests are simply correlated with some other factor such as bird densities. None of the indicators of recreation were strongly related to nest productivity.

Although direct nest loss may result from recreation such as dog-related impacts or vehicle traffic, these patterns are not evident at the site level.

Eggs per Nest

The number of eggs per nest is a biological variable related to the physiological fecundity (as opposed to the number of eggs per adult or apparent fecundity). Females lay one to three eggs per nest, and the reasons for this are not immediately clear in the literature or the data. None of the indicators of recreational activities were strongly related to the number of eggs per nest.

Egg to Hatchling Survival

The number of people per mile during peak visitation ranged from 3.45 at the New River RMA to 13.22 at the Bandon SPMA in 2003 (Oregon Parks and Recreation Department 2005). In general these numbers will increase during the term of the 25-year ITP due to human population increase. These numbers represent the number of people visiting an entire beach segment, as defined in the Ocean Shores Management Plan, and are likely an overestimate of recreational use on the portion of beach where snowy plover typically nest.

At all of the occupied snowy plover nesting areas (see Chapter 3), the distribution of people was described as dispersed, rather than clumped, and on a crowding scale of 1 to 5, all of the beach segments with snowy plover breeding sites were rated as 1 (not crowded) by beach visitors (Oregon Parks and Recreation Department 2005). The number of people per mile was a poor predictor of egg to hatchling survival ($r^2=0.38$, $p>0.19$).

Site access was considered in terms of the number of access points per acre of total habitat in each management area; the “density of access points.” Density of access points was the strongest indicator of a relationship between recreational activities and egg to hatchling survival as shown in Figure 15 ($r^2=0.68$, $p=0.002$) based on the formula:

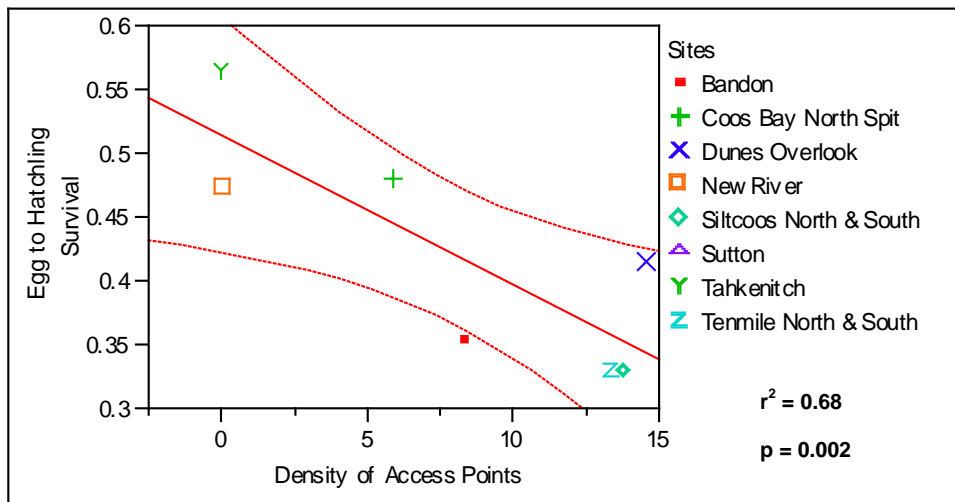
$$\text{Egg to Hatchling Survival} = 0.5144741 - 0.0117903 \text{ Density of Access Points}$$

The density of access points is an overall indicator of recreational activity. It is not possible to determine what specific activities are directly contributing to the overall impacts of recreation on survival. Dogs are likely a factor, as the 30% of the respondents from the survey of recreational activities included dogs in their beach visits. Other impacts, such as the attraction of predators from food and refuse, and harassment from recreational activities other than dogs, are likely at play. Some of these are analyzed in more detail below.

The line function relating the egg to hatchling survival rate to recreation as indicated by the density of access points provides a reference for estimating take associated

with these covered activities. The intercept with the y axis (0.52) is the predicted survival that would occur if the density of access points were similarly low at all sites, and all other factors were equal. The actual coast-wide mean egg to hatchling survival was 0.42, suggesting that recreational activities depress this survival by 10%.

Figure 15. Relationship between Egg to Hatchling Survival and the Density of Access Points (2000-2006)



The decrease in hatching rate from 0.52 (the predicted mean) to 0.42 (the actual mean) has, in theory, impacted the number of hatchlings produced between 2000 and 2006. The coast-wide average number of eggs produced was 300 per year, which resulted in an average of approximately 136 hatchlings, or 0.45 hatchlings per egg. It can be inferred (with all other conditions remaining the same), that if recreational activities had not occurred near the occupied snowy plover management areas between 2000 and 2006 there would have been an additional 30 hatchlings annually because 10% of the ~300 eggs would have survived.

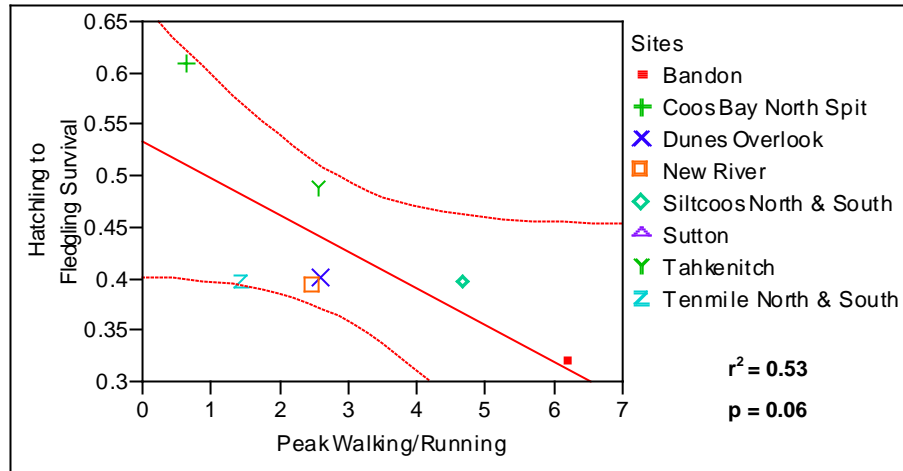
Hatchling to Fledgling Survival

Hatchling to fledgling survival was less strongly related to lambda than the egg to hatchling stage. This vital rate was not significantly related to the general indicators of recreation (peak number of people per mile and the density of access sites). The site-specific peak number of people per mile was multiplied by the proportion of various activities to determine if hatchling to fledgling survival were related to those activities (Figure 16). The peak number of people walking/running was predictive of hatchling to fledgling survival ($r^2=0.53$, $p=0.06$) based on the equation:

$$\text{Hatchling to Fledgling Survival} = 0.5334897 - 0.03575 \text{ Peak Walking/Running}$$

This is somewhat intuitive, given that walking/running is the primary recreational activity across all sites. As discussed above, most of the walking/running visitors were groups of friends and families with dogs. Further correlations with recreation specific activities are presented in Table 6 below.

Figure 16. Relationship between Hatchling to Fledgling Survival and Peak Number of People Walking/Running along the Oregon Coast (2000-2006)



If the influence of people walking/running on the beach is removed, the model indicates that the survival from hatchling to fledgling stage would be 0.53. Given that the survival from eggs to hatchlings along the Oregon Coast between 2000 and 2006 was also 0.45, the model suggests that the difference in survival when there are no people walking/running on the beach (0.53) and the survival from hatchlings to fledglings with those activities (0.45) would be 0.08.

If that survival rate (0.08) is multiplied by the average number of hatchlings on the Oregon Coast during that 7-year period (138), the average number of hatchlings that would fledge each year would have increased by 11 fledglings per year if there were no people walking/running on the beach.

4.2.2. Fecundity

None of the general or activity-specific indicators of recreation were predictive of fecundity.

4.2.3. Abundance

The equivalent number of adults that might be lost from the population based on the number of eggs or fledglings taken through recreation activities was calculated. Between 2000 and 2006, there was an annual average of 0.5 adults per egg along the

Oregon Coast, and 160 total adults in the population (Table 4a). Across all sites the Oregon snowy plover population increased by 13.8 birds per year from 2000 and 2006 by producing 138 hatchlings per year (Table 4a). Assuming that the local increase in population size was due to local production, and not immigration, each hatchling produced approximately 0.10 adult birds (13.8 birds per year/138 hatchlings per year = 0.10 adults). Based on this estimate the 30 hatchlings “taken” through recreational activities is the equivalent of approximately three adult birds per year (30 hatchlings per year x 0.10 adults per hatchling = 3 adult birds per year).

Similarly, during the 7-year time period there were 65 fledglings produced annually that resulted in the 13.8 annual increase in adults (Table 4a). Each fledgling produced approximately 0.21 adult birds (13.8 birds per year/65 fledglings per year = 0.21 adults) Based on this estimate, the loss of 11 fledglings per year to recreational activities is the equivalent of losing about 2.3 adults per year (11 fledglings per year x 0.21 adults per fledgling = 2.3 adults per year).

In total, it is estimated that between 2000 and 2006, recreational activities resulted in the loss of 30 hatchlings and 11 fledglings, which equated to the loss of up to 5 adult equivalents per year.

4.2.4. Impacts of Specific Recreation Activities

Beach visitors engage in specific activities, each of which have different mechanisms and pathways that may or may not affect snowy plover performance. The footprint of these activities differs at each site (Ecotrust 2003). Many recreational activities co-occur, making it difficult to understand their direct impacts on snowy plovers. There has been little study of the direct take through harassment or mortality associated with specific activities, further complicating the assessment of their impacts.

Nonetheless, there are some interesting relationships between recreational activities at specific sites, which may be useful in applying the results of this take assessment with professional judgment. The peak number of people per mile at each site was previously estimated based on field observations (Shelby and Tokarczyk 2002). In that same study, visitors were approached and asked to classify their primary reason for visiting the beach (it should be noted that the results of those surveys differed in many regards from those of a follow-up mail-in survey that was analyzed by the same group).

To estimate the peak number of people per mile engaged in a specific activity, the peak number of people per mile at each site was multiplied by the fraction of people primarily engaged in a specific activity. These estimates were regressed against the vital rates to estimate the impacts of specific recreation activities on snowy plover performance (Table 6). Many of the relationships were counter-intuitive, spurious, or insignificant, while some seem to show promise and could be the focus of future field

study. The results are included to inform the reader in their application of the take assessment, but were not used in calculating take due to their limited explanatory power.

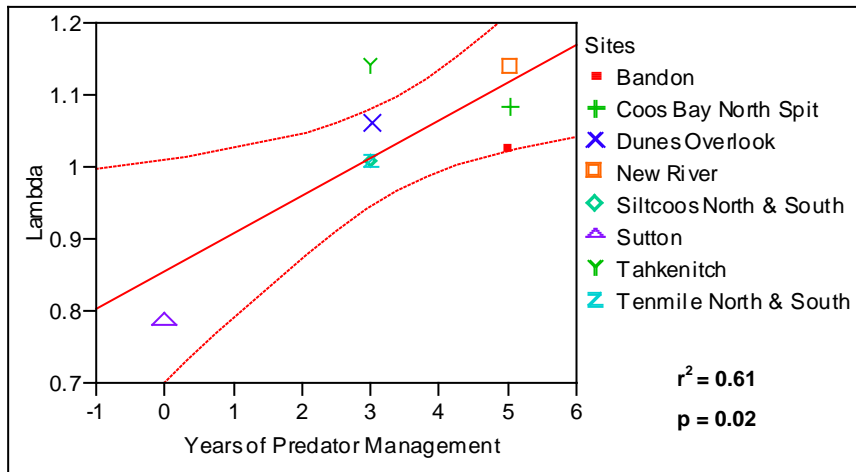
Table 6. Correlations between Specific Recreation Activities and Western Snowy Plover Vital Rates (r^2 /p-value/slope of the fit line)

Indicator	Egg to Hatchling Survival	Hatchling to Fledgling Survival	Fecundity	Lambda
Peak number of people per mile	0.31/0.19/-0.01	0.29/0.21/-0.01	0.05/0.60/+0.04	0.01/0.86/-0.00
Peak walking/running activity	0.20/0.31/-0.02	0.53/0.06/-0.04	0.40/0.09/+0.21	0.08/0.50/+0.02
Peak dog related activity	0.11/0.48/-0.09	0.23/0.28/-0.14	0.17/0.31/+0.93	0.02/0.76/+0.05
Peak relaxing activity	0.43/0.11/-0.04	0.28/0.23/-0.04	0.02/0.75/+0.07	0.02/0.73/-0.01
Peak surf sports activity	0.04/0.67/+0.17	0.04/0.68/-0.17	0.50/0.05/+4.65	0.25/0.21/+0.54
Peak kite flying activity	0.19/0.33/-0.23	0.32/0.19/-0.31	0.12/0.41/+1.38	0.01/0.78/+0.08
Peak camping activity	0.21/0.30/+0.29	0.03/0.69/+0.12	0.00/0.91/+0.24	0.14/0.36/+0.31
Peak vehicles activity	0.01/0.88/+0.01	0.61/0.07/+0.08	0.10/0.45/-0.26	0.03/0.69/+0.02

4.3. Correlation with Restoration Activities

In addition to the impacts of recreation activities, the correlation between restoration and management at the currently occupied snowy plover nesting areas and various vital rates were modeled for the period 2000 and 2006. The same model screening criteria was used for restoration activities as was used for recreation activities (i.e. $R^2 > 0.10$ and $p < 0.20$). Only models that suggested a positive relationship between restoration and each vital rate were included. The benefits of the years of restoration, the acres of restored habitat available, and the number of years of predator management at each site were all considered in this assessment. Restoration appears to be generating benefits that are detectible at the site-level, and coast wide. The years of predator management was highly correlated with lambda as shown in Figure 17 ($r^2 = 0.61$, $p = 0.02$). The impacts on specific vital rates are discussed below.

Figure 17. Relationship between Years of Predator Management and Lambda

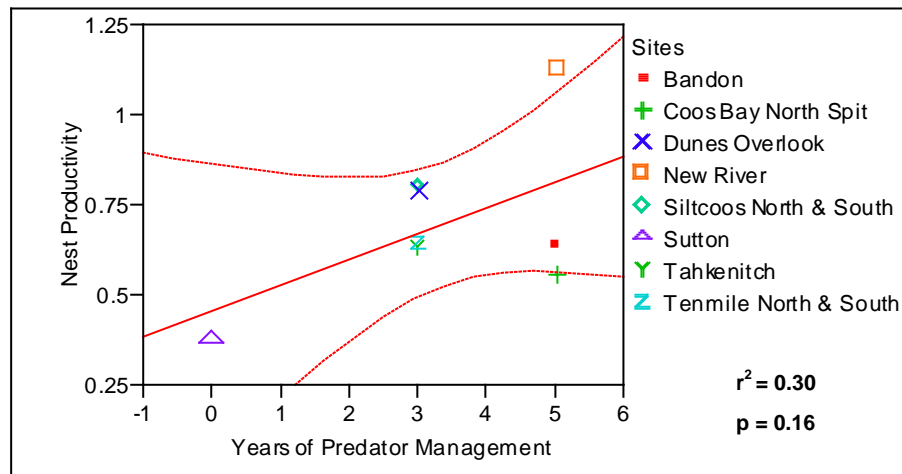


4.3.1. Survival

Nest Production

The number of nests produced per adult was correlated with the years of predator management ($r^2=0.30$, $p=0.16$) (Figure 18). It is possible that predators destroy nests before they are detected by surveyors, or that predator densities somehow disrupt the nest-construction process. It is also possible that nests are abandoned following egg predation, and are therefore not detected by surveyors. For the purpose of the take assessment, it was assumed the benefits associated with nest production are best expressed in terms of the fecundity estimate due to the strong relationships discussed below.

Figure 18. Relationship between the Years of Predator Management and Nest Productivity



Eggs Per Nest

To be consistent with the matrix models and regression analysis described above, the impacts of restoration activities on the number of eggs per nest were assessed in terms of fecundity instead of the number of eggs per nest (Section 4.3.4).

Egg to Hatchling Survival

To estimate the effect that restoration activities had on egg to hatchling survival between 2000 and 2006, a least squares multivariate regression model was used. For each activity, the regression model examined how the level of activity influenced the survival of snowy plover from the egg to hatchling life stage. None of the restoration activities appeared to have a positive and significant impact on egg to hatchling survival, therefore these models were not considered further in this analysis.

Hatchling to Fledgling Survival

Increases in the acres of restored habitat available was correlated with increased hatchling to fledgling survival ($R^2=0.40$, $p=0.13$; Figure 17). The simple regression model that explained this relationship was:

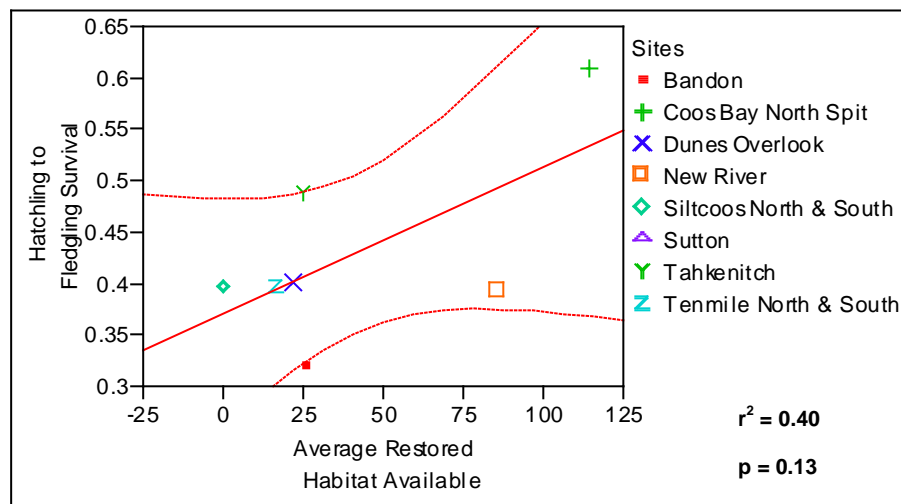
$$\text{Hatchling to Fledgling Survival} = 0.3700527 + 0.0014326 \text{ Average Restored Habitat Available}$$

The difference between hatchling to fledgling survival on the Oregon Coast with and without restoration activities was calculated using the above regression model. The average number of hatchlings produced between 2000 and 2006 was 138 per year, and the survival from hatchlings to fledglings was 0.45. If the effects of the restoration activities described above are removed (i.e. if the values in the regression equation are 'zeroed'), the model indicates that the survival of hatchlings to fledgling

would be approximately 0.37. Given that the survival from hatchlings to fledglings along the Oregon Coast between 2000 and 2006 was 0.45, the model suggests that the difference between the survival from eggs to hatchlings with the considered restoration activities (0.45) and the survival from eggs to hatchlings without those activities (0.37) would be 0.08.

The average increase in fledglings per year resulting from habitat restoration can be inferred by multiplying the modeled change in survival from restoration (0.08) times the average number of fledglings produced annually (138) (Figure 19). If restoration activities had not occurred near occupied snowy plover nesting areas between 2000 and 2006, and all other conditions remained the same, there would have been 11 fewer fledglings each year ($0.08 * 138 = 11$). There are uncertainties in this analysis because the correlation coefficients are relatively low, and several models were excluded due to their low explanatory power. The conclusions presented here and below should be viewed as estimates with some level of uncertainty, and should be tempered with best professional judgment.

Figure 19. Relationship between Hatchling to Fledgling Survival and the Acres of Restored Habitat Available at Sites along the Oregon Coast (2000-2006)

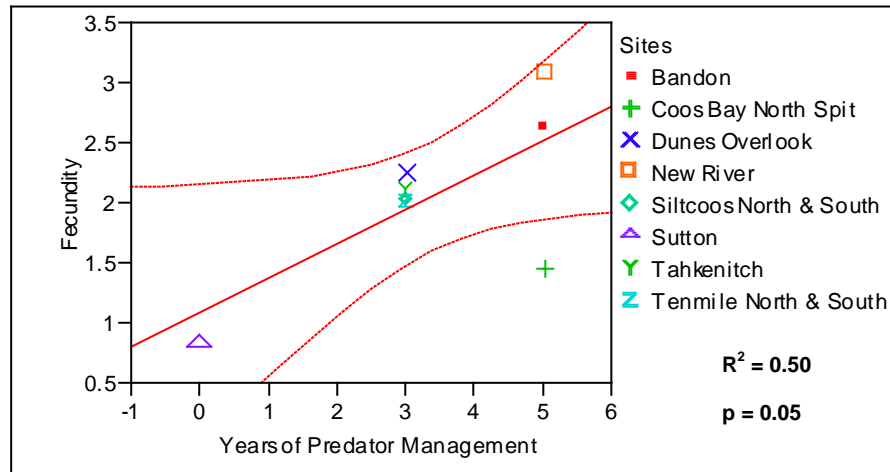


4.3.2. Fecundity

Increases in the years of predator management were correlated with increased fecundity ($R^2=0.50$, $p=0.05$; Figure 20). The simple regression model that explained this relationship was:

$$\text{Adult Fecundity} = 1.08 + 0.29 \text{ Years of Predator Management}$$

Figure 20. Relationship between Fecundity and the Years of Predator Management at Sites along the Oregon Coast (2000-2006)



The difference between fecundity on the Oregon Coast with and without restoration activities was calculated using the above regression model. The average number of eggs produced between 2000 and 2006 was 300 per year, and the number of eggs produced per adult was 1.94 (Table 4a). If the restoration activities described above are removed (i.e. if the values in the regression equation are 'zeroed'), the model indicates that the fecundity would be approximately 1.08. Given that the fecundity from hatchlings to fledglings along the Oregon Coast between 2000 and 2006 was actually 1.94, the model suggests that the difference between the fecundity with the considered restoration activities (1.94) and the fecundity without those activities (1.08) would be 0.86 eggs per adult.

The average number of adults in the population between 2000 and 2006 was 160 (Table 4a). As such, it could be inferred that, if restoration activities had not occurred near occupied snowy plover nesting areas between 2000 and 2006, and all other conditions remained the same, there would have been 138 fewer eggs each year (160 adults x 0.86 eggs per adult = 138 eggs per year). There are uncertainties in this analysis because the correlation coefficients are relatively low, and several models were excluded due to their low explanatory power. The conclusions presented here and below should be viewed as estimates with high levels of uncertainty, and should be tempered with best professional judgment.

4.3.3. Abundance

The equivalent number of adults that might be added to the population based on the number of eggs or fledglings gained through restoration efforts was calculated. Between 2000 and 2006, there was an annual average of 0.5 adults per egg along the Oregon Coast, and 160 total adults in the population (Table 4a). Across all sites, the

snowy plover population increased by 13.8 birds per year from 2000 to 2006 by laying approximately 300 eggs per year (Table 4a). Assuming that the local increase in population size was due to local production, and not immigration, each egg laid produced approximately 0.05 birds ($13.8 \text{ birds per year} / 300 \text{ eggs per year} = 0.05 \text{ birds}$). Based on this estimate, the 138 egg per year improvement related to restoration activities produced an equivalent of 7 adults per year ($138 \text{ eggs} \times 0.05 \text{ adults/egg} = 7 \text{ adults}$).

Similarly, during the 7-year time period there were 13.8 adult birds produced from the 138 birds fledged annually. Assuming that the local increase in population size was due to local production, and not immigration, each hatchling produced approximately 0.10 adult birds ($13.8 \text{ birds per year} / 138 \text{ hatchlings per year} = 0.10 \text{ adults}$). By gaining 9 fledglings per year due to restoration efforts, it is estimated that the population gained about 1 adult/year ($9 \text{ fledglings} \times 0.10 \text{ adults/fledgling} = 1 \text{ adult}$).

In summary, it is estimated that restoration efforts along the Oregon Coast between 2000 and 2006 resulted in an increase of 138 eggs and 9 fledglings, which equated to an increase of 8 adult equivalents per year.

Chapter 5. Take Assessment

The following provides an assessment of the potential for the covered activities to result in take of snowy plovers. The take assessment is based on population performance data at occupied snowy plover nesting areas between 2000 and 2006, and the correlations between population performance data and recreational activities.

The take assessment was calculated by determining how likely it was that recreation activities would lower survival from one life stage to the next at the currently occupied SPMA and other RMAs. That information was then used to arrive at a quantitative estimate for the amount of take that may occur over the 25-year ITP term at currently occupied snowy plover nesting areas.

A qualitative estimate of take is provided for currently unoccupied SPMA's, based on assumptions about proposed management prescriptions and timelines for habitat restoration. In addition, a qualitative estimate is made for take as the result of natural resource management and beach management. The beneficial effects that proposed restoration at SPMA's may have on the breeding population are also considered.

5.1. Public Use / Recreation Management

5.1.1. Eggs and Nests

As described in Chapter 4, between 2000 and 2006, there was a very low correlation between the number of eggs laid per adult and recreation activities. There was no evidence that recreation activities would directly result in take in terms of the number of nests produced. Due to this weak relationship, no further analysis was completed to quantify the potential effects of recreation on these life stages. As such, there is no data to indicate that public use/recreation management would have a negative relationship with the number of eggs laid at any of the occupied or targeted SPMA's or RMAs during the term of the 25-year ITP.

There was a positive relationship between fecundity (i.e. number of eggs laid per adult) and restoration activities; especially the number of acres of restored habitat available at each site. As a result of restoration activities, snowy plover management, and predator management, it is estimated that 138 eggs were hatched each year between 2000 and 2006 (Table 7). Understanding that the average number of eggs

laid each year between 2000 and 2006 was 300 (Table 4b), this represents a 46% increase in the total number of eggs hatched per year (138 eggs / 300 eggs hatched = 46% increase). A similar pattern would likely be observed at the new SPMA's that are restored or managed in the future. This analysis points to the importance of restoring habitat and management activity at the currently unoccupied sites as soon as snowy plover sightings are made.

Table 7. Estimated Change in the Number of Eggs, Nests, Fledglings, and Adults per Year as a Result of Habitat Restoration, Predator Management, and Recreational Use

	Six Year Average ¹	Habitat Restoration / Predator Management Benefits ²	Recreation Activity Impacts ³	Annual Net Gain/Loss	25-year Total for Occupied Sites
Number of Eggs (% of 6-year average)	300	+ 138 (+46%)	--	+ 138 (+46%)	+ 3,450
Number of Hatchlings (% of 6-year average)	136	--	- 30 (22 %)	- 30 (22 %)	- 750
Number of Fledglings (% of 6-year average)	62	+ 9 (+14%)	- 11 (-17%)	- 2 (-3%)	- 50
Number of Adult Equivalents (% of 6-year average)	13.8	+ 8 (+58%)	- 5 (-36%)	+ 3 (+22%)	+ 75

¹ Represents the number of eggs, hatchlings, fledglings, and adult equivalents produced each year on the covered lands (including SPMA's and RMA's) between 2000 and 2006.

² Represents the number of eggs, fledglings and adult equivalents estimated to be present on the covered lands each year as a direct result of ongoing restoration activities, snowy plover management, and predator management at sites currently occupied by snowy plover. These figures are based on benefits realized between 2000 and 2006 on lands owned both by OPRD and other landowners, and are not specific to restoration, predator management efforts, or snowy plover management efforts at Bandon SPMA, the only currently occupied SPMA owned by OPRD. As such, these estimates may overstate the net benefit to plover as a result of OPRD actions. Of note, the figures in the table do not capture the restoration benefit that would be realized at currently unoccupied SPMA's in the future, should nesting populations of plover utilize those areas. It is anticipated that restoration of up to a total of 120 acres at the Columbia River South Jetty SPMA, the Necanicum SPMA, and the Nehalem SPMA, and future predator management activities, would result in additional habitat restoration benefits not captured in this table.

³Figures represent the number of hatchlings, fledglings, and adult equivalents lost each year as a result of recreational use on the covered lands. Associated percentage represents the percentage of the 6-year average.

5.1.2. Hatchlings

There was a correlation between recreation activities and survival from egg to hatchling stage at occupied snowy plover nesting areas between 2000 and 2006. Taken together, it was estimated that these activities resulted in 30 fewer eggs hatching each year. Understanding that the average number of hatchlings that fledged each year on the Oregon Coast between 2000 and 2006 was 138 (Table 4b),

this represents a 22% reduction in the total number of eggs hatched during that period (30 eggs / 138 hatchlings = 22% reduction).

This rate of loss (30 eggs per year) is expected to continue during the term of the 25-year ITP at areas currently occupied by nesting plover, although the actual loss should be viewed as a percent reduction (about 22%) of eggs per year. This is due to the fact that take would likely increase as the snowy plover population grows, the human population increases, and new SPMA's are restored and occupied (Table 7). In addition, given the assumptions and application of the model (i.e., relationships were modeled using the peak number of people engaged in that activity on a given beach segment), this potential for annual take should be viewed as a maximum number.

Similar effects on hatchlings are expected at unoccupied SPMA's once they become occupied and the number of individuals increases to levels similar to the occupied sites. If the abundance and fraction of hatchlings lost at the currently unoccupied sites is similar to that of the currently occupied sites, it is possible that the sub-populations at the currently unoccupied sites will never increase to sustainable levels. It is also possible that the number of hatchlings lost at the currently unoccupied sites may be greater because levels of recreation are higher at all of the proposed SPMA's.

5.1.3. Fledglings

Relaxing and kite flying during peak recreation periods seemed to impact hatchling to fledgling survival. When these activities were lumped together they explained the loss of 11 fledglings per year between 2000 and 2006 (Table 7). Understanding that the average number of fledglings on the Oregon Coast during that period was 65 (Table 4b), this represents a 17% reduction in the total number of fledglings (11 fledglings/65 fledgling = 17% reduction).

This rate of loss (11 fledglings per year) is expected to continue during the term of the 25-year ITP at areas currently occupied by nesting plover, although the actual loss should be viewed as a percent reduction (17%) of fledglings per year due to the fact that take would likely increase as the snowy plover population grows, the human population increases, and new SPMA's are restored and occupied (Table 7). In addition, given the assumptions and application of the model (i.e., relationships were modeled using the peak number of people engaged in that activity on a given beach segment), this potential for annual take should be viewed as a maximum number.

Similar effects on fledglings are expected at unoccupied SPMA's once they become occupied, although the number of fledglings lost may be greater because levels of recreation are higher at all of the proposed SPMA's. Similar to the occupied areas, the number of fledglings lost should be considered relative to the number of hatchlings in a given SPMA.

Restoration activities, snowy plover management, and predator management could result in an estimated additional 9 fledglings each year. This would represent a 14% increase in hatchling to fledgling survival ($9 \text{ fledglings} / 65 \text{ fledglings} = 14\%$ reduction). While there will be an estimated “net loss” of 5 fledglings each year due to recreational activities, this would likely be offset through gains in fecundity from restoration activities (Table 7). A similar pattern would likely be observed in the future at unoccupied SPMAs once they were restored and managed. More hatchlings would fledge as the result of restoration activities, but recreation activities would still result in the take of some number of fledglings each year. The balance between these gains and losses at the currently unoccupied sites would depend upon the intensity of restoration versus recreational activities.

5.1.4. Adult Equivalents

Under the HCP, the rate of loss of adult equivalents would be based on the number of eggs or fledglings taken through recreation activities. In total, it is estimated that recreational activities resulted in the annual loss of 30 hatchlings and 11 fledglings between 2000 and 2006, which equated to the loss of 5 adult equivalents per year. Understanding that between 2000 and 2006, on average, the adult population increased by 13.8 adults across all occupied sites, this would represent a 36% decrease in the adult equivalent population ($5 \text{ adults} / 13.8 \text{ adults} = 36\%$).

Similar to other life stages, it is anticipated that restoration activities will have a beneficial effect on adult production. As a result of restoration activities, snowy plover management, and predator management, it is estimated that an additional 8 adults would be produced each year. This would represent a 58% increase in the adult equivalent population per year ($8 \text{ adults} / 13.8 \text{ adults} = 58\%$). Overall, there would be an estimated “net gain” of 3 adults each year at occupied snowy plover nesting areas (Table 7). A similar pattern would likely be observed at the new SPMAs that are restored or managed in the future.

The number of adult equivalents lost each year would likely increase as the snowy plover population increases, but the percentage of loss would remain similar (about 5%). This loss would be minimized by restoration activities, which would likely result in a net gain in the number of adults despite the losses due to recreation activities. Recreation management that would occur on both occupied and actively managed snowy plover nesting areas would further reduce the overall loss of adults.

5.1.5. Wintering Snowy Plover Populations

During the winter resident snowy plovers congregate into foraging groups in several sites along the Oregon Coast. In the recent past these sites have included Baker Beach, North and South Siltcoos Spit, Tenmile Spit, Coos Bay North Spit (South Beach), Bandon State Natural Area, and New River.

Recreation activities on the beaches along the Oregon Coast are lower during the winter months than they are during the spring and summer (snowy plover breeding season). In addition, the normal behavior of wintering plover is to flock, presumably to avoid disturbance. It is generally thought that the security of a large group enables an individual to relax its personal predator awareness and feed more deliberately and efficiently. Joining a flock therefore, theoretically decreases the cost that an individual endures to avoid predators and increase the benefit per individual in the group, thus placing evolutionary pressure on flock formation (Gill 1995). It is anticipated that the effects on wintering populations would be within the normal range of disturbance. Given these factors, disturbance is likely to be minimal.

Further, it is assumed that some take in the form of harassment of foraging adults does occur during the winter months, but whether that level of harassment affects the number of adults that use the Oregon beaches during the winter remains unknown. An analysis to determine the relationships between wintering birds and recreation activities was not completed because recreation data were not available solely for winter months. Future discussions of whether take on wintering populations would be adequately addressed by the HCP will continue. It is presumed that the activities covered under the HCP will not result in a loss of winter habitat for snowy plovers or a change in the winter population distribution during the ITP term.

5.1.6. Habitat

General habitat features would not be changed as a result of public use of the beach. In addition, recreational use restrictions will be implemented at these sites in the future, and loss of snowy plover habitat is not expected.

5.2. Natural Resources Management

5.2.1. Snowy Plover Management

As described in Chapter 1, snowy plover management activities include recreational use restrictions at occupied and targeted SPMA and RMA (see discussion of public use/recreational use above for take associated with recreational use); habitat maintenance/restoration; predator management; snowy plover monitoring; and public outreach and education. The net benefits of habitat restoration at occupied snowy plover nesting areas is described in Section 5.1, Public Use/Recreation Management, and summarized in Table 7.

Habitat maintenance and restoration activities (e.g., plowing to remove European beach grass) to create or enhance habitat for snowy plover on the Ocean Shore would not result in take of snowy plovers during the breeding season because restoration activities would not be carried out in occupied breeding areas during the breeding

season. Further, restoration activities are not proposed for any known snowy plover wintering sites, so take in the form of harassment would be unlikely. Overall these activities would result in a net gain of suitable breeding habitat for snowy plovers and no loss of individuals.

Other habitat maintenance activities, such as installation of fencing, nest monitoring, and predator management would occur during the breeding season. These activities bring biologists in close contact with nesting birds and could result in take in the form of harassment of nesting snowy plovers. Although it is acknowledged that these activities largely increase the productivity of the breeding population at occupied SPMA and RMA, they have the potential to flush adults from nests and force both adults and young into less suitable habitats temporarily. As such, it is likely that monitoring and predator management activities may affect snowy plover, although it is not possible to determine if these effects would rise to the level of take. However, the effects of these activities would be reduced as the monitoring staff builds experience.

5.2.2. Other Habitat Restoration (Dune Management and Invasive Species Removal)

As described in Chapter 1, OPRD is also responsible for managing dunes and removing targeted invasive species on covered lands to provide habitat for native species. These activities would be conducted outside of the nesting season in areas occupied by snowy plovers to avoid take. As a result, habitat restoration activities on the covered lands are not expected to affect nesting snowy plovers during the 25-year ITP. Restoration activities could result in harassment of wintering snowy plover. However, it is likely that the level of harassment would be low, given that snowy plovers spend most of the winter foraging on the wet sand and that restoration activities would be confined to the dunes. In addition, surveys for shorebirds would be conducted before restoration activities would be implemented. As a result, it is unlikely that habitat restoration activities would result in take of snowy plover over the term of the ITP.

5.3. Beach Management

The Chapter 1 discussion covered OPRD's responsibility for managing beaches within the covered lands, including coordinating efforts to resolve marine mammal strandings; ensuring beaches are safe for public use; assisting law enforcement personnel with pending investigations; and assisting with boat strandings and other salvage operations.

This management activity would be implemented by OPRD to minimize potential effects to snowy plover. In areas where nesting populations of snowy plovers are

present, OPRD would work collaboratively with ODFW and the USFWS to ensure that encroachment into occupied SPMAs and RMAs during the nesting season would be minimized.

Based on the above, it is possible that activities associated with public safety (i.e., removal of dangerous logs or investigation of storm erosion), law enforcement actions (i.e., injury/death investigations), or security issues (i.e., parties or bonfires) may result in take of snowy plover nests, fledglings, or adults. The activities are not predictable and the effects are not quantifiable, but the amount of take would likely be small and infrequent.

5.4. Changed Circumstances

As described in Chapter 1, the HCP includes provisions for dealing with three circumstances that may occur during the term of the ITP and that could affect the ability of OPRD to properly implement the conservation strategies described in the HCP. These include the listing of a new species, the potential environmental changes associated with global climate change, and non-breeding season management. These circumstances would only be implemented, in coordination with USFWS, if they would result in a net benefit to snowy plover and are not discussed further.

Chapter 6. Conclusion

Activities covered under this HCP have the potential to result in take of snowy plovers during the 25-year ITP term. Take would occur as a result of recreational activities harassing adults foraging or tending nests, and young foraging on the dry and wet sand. It is not likely that natural resources management and beach management would result in the loss of nests, chicks, adults, or habitat during the ITP term.

While the covered activities may result in some harassment of adults or fledglings, and the loss of eggs and nests, when considered in the context of proposed management and restoration activities, there would be an overall gain in the number of eggs and adults on the Oregon Coast (Table 7). The proposed management would not result in a net gain in hatchlings or fledglings.

It should also be noted that the dynamics of the snowy plover population along the Oregon Coast will likely change over time and that they are part of a larger coastal population that includes California and Washington. Although the assessment is based on population performance metrics between 2000 and 2006, these metrics will change over the 25-year permit term. As such, the assessment of take should also change to reflect the most current population performance. During the 25-year permit term, it is recommended that the thresholds for incidental take be reassessed every 5-years to ensure that tolerable levels remain biologically relevant, especially in areas where there is currently no data available (i.e., currently unoccupied, targeted SPMA's under OPRD ownership).

There is uncertainty in this assessment and its conclusions. Due to the limited nature of the data set, a very liberal standard was used for accepting model results ($r^2 > 0.10$, and $p < 0.20$). Despite this liberal standard numerous models were excluded due to their low explanatory powers. Due to these limitations, the take assessment and its conclusions should be applied carefully (using best professional judgment), but should serve as a useful starting point for estimating the impacts of restoration and recreation activities on snowy plover performance in Oregon.

6.1. Eggs and Nests

There was a very low correlation between the number of eggs laid per adult and recreation activities, and no evidence that recreation activities would directly result in take in terms of the number of nests produced assuming the current level of recreation management continues. Loss of eggs and nests due to recreational use would likely continue under the proposed HCP over the 25-year term of the ITP. It is likely that some of this loss would be avoided through site management planning and as a result of increased recreational use restrictions at both occupied snowy plover nesting areas and targeted SPMAs under the HCP.

Potential loss of eggs or nests as a result of beach management or other natural resources management could not be determined. There was a positive relationship between fecundity (i.e. number of eggs laid per adult) and restoration activities; specifically the number of acres of restored habitat available at each site. It is estimated that restoration activities, snowy plover management, and predator management would result in additional eggs each year over the term of the permit. Restoration seemed to be responsible for an additional 46% of the eggs observed on the Oregon Coast from 2000 to 2006 (about 138 eggs). A similar pattern would likely be observed at the SPMAs that are restored or managed in the future.

6.2. Hatchlings

Based on population data at occupied snowy plover nesting areas between 2000 and 2006, regression modeling indicated that recreation activities resulted in a reduced probability that eggs survive to hatchlings. That reduced egg to hatchling survival was estimated to result in a 22% decrease (30 fewer hatchlings) in the number of hatchlings produced per year, based on the average number of hatchlings produced per year on the Oregon Coast during that time period. Given that recreation use was expressed as the peak frequency, the actual annual loss of hatchlings could be lower than this estimate.

Loss of hatchlings due to recreational use would continue under the proposed HCP over the 25-year term of the ITP. It is possible that some of this loss would be avoided due to site management planning and as a result of increased recreational use restrictions at both occupied snowy plover nesting areas and targeted SPMAs under the HCP. Potential loss of hatchlings as a result of beach management or other natural resource management activities could not be determined.

6.3. Fledglings

Regression modeling indicated that recreation activities resulted in a reduced hatchling to fledgling survival. That reduced rate was estimated to result in a

17% decrease (11 fewer fledglings) in the number of fledglings produced each year, based on the annual average number of fledglings produced on the Oregon Coast. Given that recreation use was expressed as the peak frequency, the actual loss might be lower than estimated.

Loss of fledglings due to recreational use would continue under the proposed HCP over the 25-year term of the ITP. It is possible that some of this loss would be avoided due to site management planning and as a result of increased recreational use restrictions at both occupied snowy plover nesting areas and targeted SPMAs under the HCP. It is also possible, however, that the actual number of hatchlings that fail to fledge as the result of recreation on the beach would increase as the snowy plover population increases due to the percent lost from a larger population at the occupied sites and up to four new SPMAs. Potential loss of fledglings as a result of beach management or other natural resource management activities could not be determined.

Between 2000 and 2006, restoration, snowy plover management, and predator control activities increased hatchling to fledgling survival. It is likely that this increase was related to predator management that was occurring on each site. Restoration activities, snowy plover management, and predator management resulted in an estimated 14% increase (9 additional fledglings) each year between 2000 to 2006 on the Oregon Coast. While there was an estimated “net loss” of 2 fledglings each year (3%), restoration and management seemed to lessen that effect through gains in fecundity (Table 7). Similar results are expected at new SPMAs in the future. Losses may be offset by restoration and management, but there would still be a net loss of fledglings due to recreation on the beach.

6.4. Adults

The number of adults potentially lost due to recreation activities was calculated by extrapolating egg, hatchling, and fledgling survival to adults, and by using the correlations between recreation activities and effects to eggs and fledgling life stages, as discussed above. Between 2000 and 2006, it was estimated that 36% (5 adults) of the average number of adults observed at occupied snowy plover nesting areas were lost each year as a result of recreational activities. Given that recreation use was expressed as the peak frequency, the actual loss might be lower than estimated.

Loss of adults due to recreational use would likely continue under the proposed HCP over the 25-year term of the ITP. It is possible that some of this loss would be avoided due to site management planning and as a result of increased recreational use restrictions at both occupied snowy plover nesting areas and targeted SPMAs under the HCP. It is also possible, however, that the actual number of adults effected by recreational use would increase as the snowy plover population increases due to the percent loss from a larger population at occupied sites and up to four new SPMAs.

Potential loss of adults as a result of beach management or other natural resources management could not be determined.

From 2000 to 2006, restoration, snowy plover management, and predator control activities seemed to be responsible for an overall increase in the number of adults on the Oregon Coast. This increase was likely related to the number of acres that had been restored and the types of management that was occurring on each site. It is estimated that restoration activities, snowy plover management, and predator management resulted in a 58% increase (8 adult equivalents) in the number of adult adults on the Oregon Coast, and a “net increase” of 3 adults per year when considered in combination with the effects of recreational activities (Table 7). Similar results are expected at new SPMA's in the future, meaning that restoration and management may offset losses of adults attributed to recreation activities.

Habitat

Activities covered under the HCP would not take (remove or alter) any suitable snowy plover habitat on the covered lands. In fact, as a result of the HCP, restoration and management activities would result in a net increase in suitable breeding habitat for this species on lands under OPRD jurisdiction. This measurable increase would be realized at the Columbia River South Jetty SPMA, Nehalem SPMA, and Netarts Spit SPMA as proposed in the HCP. Restoration at these areas could increase nesting habitat by as much as 120 acres, depending upon the prescriptions in the site management plans.

As noted above, habitat restoration efforts have benefited snowy plover populations along the Oregon Coast in the past, so it is reasonable to assume that restoration attempts at other SPMA's would benefit the species in the future. Additional acreage outside of the restored area at these SPMA's would also be managed for snowy plovers (e.g. exclusion fencing, predator control, etc.), and similar management activities at the Necanicum Spit SPMA would be implemented.

Chapter 7. References

7.1. Printed References

- Applegate, T.E. and S.J. Schultz. 2000. Western snowy plover monitoring on Vandenberg Air Force Base – 1999 Final Report. BioResources. Pp. 23.
- Bennet, K.A. and E.F. Zuelke. 1999. The effects of recreation on birds: A literature review. Delaware Natural Heritage program, Division of Fish & Wildlife, Department of Natural Resources and Environmental Control. Pp. 17.
- Burnham, K. P., and D. R. Anderson 1998. Model selection and inference: a practical information-theoretic approach. Springer-Verlag, New York, New York.
- Caswell, H. 1989. Analysis of life table response experiments. I. Decomposition of effects on population growth rate. *Ecological Modeling* 46:221-237.
- . 2000. Prospective and retrospective perturbation analysis and their use in conservation biology. *Ecology* 81:617-627.
- . 2001. Matrix Population Models. Sinauer Associates, Inc., Sunderland, Massachusetts.
- Ecotrust. 2003. Data Maps that support the Ocean Shore Management Plan/Habitat Conservation Plan. Available at:
http://www.oregon.gov/OPRD/PLANS/osmp_map.shtml. Accessed on September 30, 2006.
- Gill, F.B. 1995. Ornithology, Second edition. New York. pp. 340-341.
- Haig, S. M., and E. Elliott-Smith. 2004. Piping Plover. *The Birds of North America Online*. (A. Poole, Ed.) Ithaca: Cornell Laboratory of Ornithology; Retrieved from The Birds of North American Online database:
http://bna.birds.cornell.edu/BNA/account/Piping_Plover/.
- Hitchcock, C. L., and C. Gatto-Trevor. 1996. Diagnosing a shorebird local population decline with a stage-structured population model. *Ecology* 78:522-534.

- Lafferty, K.D. 2001a. Birds at a southern California beach: seasonality, habitat use and disturbance by human activity. *Biodiversity and Conservation* 10:1949-1962.
- . 2001b. Disturbance to wintering western snowy plovers. *Biological Conservation*. 101: 315-325.
- Lauten, D.J., K.A. Castelein, S. Weston, K. Eucken, and E.P. Gaines. 2006. The Distribution and Reproductive Success of the Western Snowy Plover Along the Oregon Coast – 20065. Unpublished report by the Oregon Natural Heritage Information Center to the Coos Bay Bureau of Land Management, Oregon Dunes National Recreation Area, U.S. Fish and Wildlife Service, Oregon Department of Fish and Game, and the Oregon Department of Parks and Recreation. Pp. 82.
- Lefkovich, L. P. 1965. The study of population growth in organisms grouped by stages. *Biometrics* 21:1-18.
- Oregon Natural Heritage Information Center and Oregon Parks and Recreation Department 2004. Habitat Conservation Plan for the Western Snowy Plover. Oregon Parks and Recreation Department – 2004. Prepared by the Oregon Natural Heritage Information Center and the Oregon Parks and Recreation Department. Pp. 160.
- Oregon Parks and Recreation Department. 2010. Habitat Conservation Plan for the Western Snowy Plover. January.
- Page, G.W., J.S. Warriner, J.C. Warriner, and P.W.C. Paton. 1995. Snowy Plover (*Charadrius alexandrinus*). In *The Birds of North America*, No. 154 (A. Poole and F. Gill, eds.). The Academy of Natural Sciences, Philadelphia, PA and The American Ornithologists' Union, Washington, D.C. 24 pp.
- Persons, P.E. 1998. Differences in reproductive success of the snowy plover between recreation beaches and closed beaches at Vandenberg Air Force Base, California. Prepared for 30CES/CEVPN Environmental Flight, Vandenberg Air Force Base under contract to Point Reyes Bird Observatory. Pp. 8.
- Ruhlen, T.D., S. Abbott, L.E. Stenzel, and G.W. Page. 2003. Evidence that human disturbance reduces Snowy Plover chick survival. *Journal of Field Ornithology*. 74(3):300-304.
- Shelby, B. and Tokarczyk, J. 2002. Oregon Shore Recreational Use Study. Prepared for the Oregon Department of Parks and Recreation, 130 pages.

- Stern, M.A., J.S. McIver, and G.A. Rosenberg. 1990. Investigations of the western snowy plover at the Coos Bay North Spit and adjacent sites in Coos and Curry Counties, Oregon, 1990. Unpublished report by the Oregon Natural Heritage Information Center and The Nature Conservancy to Oregon Department of Fish and Wildlife. 34 pp.
- U.S. Fish and Wildlife Service. 2001a. Western Snowy Plover (*Charadrius alexandrius nivosus*) Pacific Coast Population – Draft Recovery Plan. Region 1. May 2001.
- . 2001b. Biological Opinion for Beach Management and The Western Snowy Plover on Vandenberg Air Force Base for the 2002 Breeding Season (1-8-02-F-7). December 20, 2001.
- . 2005. Biological Opinion for the Management of the Western Snowy Plover on Federal Lands within the New River Area of Critical Environmental Concern during 2003 to 2010 and Wintering Season, Coos and Curry Counties, Oregon (1-7-05-F-0324).
- Warriner J.S., J.C. Warriner, G.W. Page, and L.E. Stenzel. 1986. Mating System and Reproductive Success of a Small population of Polygamous Snowy Plovers. *Wilson Bulletin*. 98(1) pp 15-37.
- Wilson, R.A. 1980. Snowy plover nesting ecology on the Oregon Coast. Masters Thesis, Oregon State University, Corvallis. 41 pp.
- Wilson-Jacobs, R. and E.C. Meslow. 1984. Distribution, abundance, and nesting characteristics of snowy plovers on the Oregon Coast. *Northwest Science*. Vol. 58, no. 1, pp. 40-48.

7.2. Personal Communications

- Schutt, Kate. Planning Manager. Oregon Parks and Recreation Department. Email correspondence with Troy Rahmig (Jones and Stokes) regarding restoration acreage at OPRD sites along the Oregon Coast. September 18, 2006.
- Strong, Cheryl. Waterbird Program Manager. San Francisco Bay Bird Observatory. Email correspondence with Troy Rahmig (Jones and Stokes) regarding the 2006 western snowy plover “Window Survey” data.

Appendix H

Implementing Agreement for the Oregon Parks and Recreation Department
Habitat Conservation Plan for the Western (Coastal) Snowy Plover

IMPLEMENTING AGREEMENT

for the

Oregon Parks and Recreation Department

Habitat Conservation Plan

for the

Western (Coastal) Snowy Plover

August 2010

TABLE OF CONTENTS

1.0	PARTIES	1
2.0	RECITALS AND PURPOSES	1
2.1	RECITALS.	1
2.2	PURPOSES.	1
3.0	DEFINITIONS	1
3.1	TERMS DEFINED IN THE ENDANGERED SPECIES ACT.	1
3.2	“ADAPTIVE MANAGEMENT”	2
3.3	“CHANGED CIRCUMSTANCES”	2
3.4	“COVERED ACTIVITIES”	2
3.5	“COVERED LANDS”	3
3.6	“COVERED SPECIES”	3
3.7	“HCP”	3
3.8	“LISTED SPECIES”	3
3.9	“PERMIT”	3
3.10	“PERMITTEE”	3
3.11	“RECREATION MANAGEMENT AREA (RMA)”	3
3.12	“SNOWY PLOVER MANAGEMENT AREAS (SPMAs)”	3
3.13	“TAKE”	3
3.14	“UNFORESEEN CIRCUMSTANCES”	4
3.15	“UNLISTED SPECIES”	4
4.0	OBLIGATIONS OF THE PARTIES	4
4.1	OBLIGATIONS OF THE PERMITTEE.	4
4.2	OBLIGATIONS OF ODFW.	4
4.3	OBLIGATIONS OF THE SERVICE.	4
4.3.1	<i>Permit coverage.</i>	4
4.3.2	<i>“No surprises” assurances.</i>	4
4.4	INTERIM OBLIGATIONS UPON A FINDING OF UNFORESEEN CIRCUMSTANCES.	4
5.0	INCORPORATION OF HCP	5
6.0	TERM	5
6.1	INITIAL TERM.	5
6.2	PERMIT SUSPENSION OR REVOCATION.	5
6.3	RELINQUISHMENT OF THE PERMIT.	5
6.3.1	<i>Generally.</i>	5
6.3.2	<i>Procedure for relinquishment.</i>	5
6.4	EXTENSION OF THE PERMIT.	6
7.0	FUNDING	6
8.0	MONITORING AND REPORTING	6
8.1	PLANNED PERIODIC REPORTS.	6
8.2	OTHER REPORTS.	6
8.3	CERTIFICATION OF REPORTS.	7
8.4	MONITORING BY SERVICE.	7
9.0	CHANGED CIRCUMSTANCES	7
9.1	PERMITTEE-INITIATED RESPONSE TO CHANGED CIRCUMSTANCES.....	7
9.2	SERVICE-INITIATED RESPONSE TO CHANGED CIRCUMSTANCES.....	7
9.3	LISTING OF SPECIES THAT ARE NOT COVERED SPECIES.....	7
10.0	UNFORESEEN CIRCUMSTANCES	7

10.1	NOTIFICATION.....	8
10.2	RESPONSE.....	8
11.0	ADAPTIVE MANAGEMENT.....	8
11.1	PERMITTEE-INITIATED ADAPTIVE MANAGEMENT.....	8
11.2	SERVICE-INITIATED ADAPTIVE MANAGEMENT.....	8
11.3	REDUCTIONS IN MITIGATION.....	8
11.4	NO INCREASE IN TAKE.....	9
12.0	LAND TRANSACTIONS.....	9
12.1	ACQUISITION OF LAND BY THE PERMITTEE.....	9
12.2	DISPOSAL OF LAND BY THE PERMITTEE.....	9
13.0	MODIFICATIONS AND AMENDMENTS.....	9
13.1	MINOR MODIFICATIONS.....	9
13.2	AMENDMENT OF THE PERMIT.....	10
14.0	REMEDIES, ENFORCEMENT, AND DISPUTE RESOLUTION.....	10
14.1	IN GENERAL.....	10
14.2	NO MONETARY DAMAGES.....	11
14.3	INJUNCTIVE AND TEMPORARY RELIEF.....	11
14.4	ENFORCEMENT AUTHORITY OF THE UNITED STATES.....	11
14.5	DISPUTE RESOLUTION.....	11
14.5.1	<i>Informal dispute resolution process.....</i>	<i>11</i>
15.0	MISCELLANEOUS PROVISIONS.....	12
15.1	NO PARTNERSHIP.....	12
15.2	NOTICES.....	12
15.3	ENTIRE AGREEMENT.....	12
15.4	ELECTED OFFICIALS NOT TO BENEFIT.....	13
15.5	AVAILABILITY OF FUNDS.....	13
15.6	DUPLICATE ORIGINALS.....	13
15.7	NO THIRD-PARTY BENEFICIARIES.....	13
15.8	RELATIONSHIP TO THE ESA AND OTHER AUTHORITIES.....	13
15.9	REFERENCES TO REGULATIONS.....	13
15.10	APPLICABLE LAWS.....	14
15.11	SUCCESSORS AND ASSIGNS.....	14

1.0 PARTIES

The Parties to this Implementing Agreement (Agreement) are the State of Oregon, acting by and through the Oregon Parks and Recreation Department (OPRD or Permittee) and the Oregon Department of Fish and Wildlife (ODFW), and the United States Fish and Wildlife Service (Service), collectively as “the Parties.”

2.0 RECITALS AND PURPOSES

2.1 Recitals.

The Parties have entered into this Agreement in consideration of the following facts:

- (a) The ocean shore has been determined to provide, or potentially provide, habitat for western snowy plover (*Charadrius alexandrinus nivosus*) and support designated critical habitat;
- (b) The Habitat Conservation Plan for the Western Snowy Plover (HCP) will not formally provide habitat for other species that use the same habitat as the western snowy plover;
- (c) OPRD has developed a series of measures, described in the HCP, to minimize and mitigate to the maximum extent practicable the effects of take of the Covered Species incidental to OPRD’s Covered Activities.

2.2 Purposes.

The purposes of this Agreement are:

- (a) To ensure implementation of each of the terms of the Habitat Conservation Plan for the Western Snowy Plover (HCP);
- (b) To describe remedies and recourse should the OPRD fail to perform its obligations as set forth in this Agreement; and
- (c) To provide assurances to OPRD that as long as the terms of the HCP, the Permit, and this Agreement are performed, no additional mitigation will be required of the Permittee, with respect to Covered Species, except as provided for in this Agreement or required by law.

3.0 DEFINITIONS

The following terms as used in this Agreement will have the meanings set forth below:

3.1 Terms defined in the Endangered Species Act.

Terms used in this Agreement and specifically defined in the Endangered Species Act (ESA) or in regulations adopted by the Service under the ESA have the same meaning as in the ESA and those implementing regulations, unless this Agreement expressly provides otherwise.

3.2 “Adaptive Management”

Adaptive Management means a process that allows resource managers to adjust their actions to reflect new information or changing conditions in order to reach the purpose and goals of the HCP.

3.3 “Changed Circumstances”

Changed Circumstances means changes in circumstances affecting a Covered Species or the geographic area covered by the HCP that can reasonably be anticipated by the Parties that can reasonably be planned for in the HCP (e.g. the listing of a new species, or a fire or other natural catastrophic event in areas prone to such event.) Changed Circumstances and the planned responses to those circumstances are described in Section 7.6.3 of the HCP.

Changed Circumstances are not Unforeseen Circumstances.

3.4 “Covered Activities”

Covered Activities means certain activities carried out on Covered Lands by OPRD that may result in incidental take of the Covered Species. Covered Activities are described in section 3 and Appendix D of the HCP and include:

- Public Use/Recreation Management
 - Camping
 - Dog Exercising
 - Pedestrian Traffic
 - Picnicking
 - Near Shore Activities/Surf Sports
 - Driving
 - Horseback Riding
 - Beach Fires
 - Beachcombing
 - Driftwood Collection and Removal
 - Kite Flying
 - Other Dry Sand Activities
- Beach Management
 - Marine Mammal Strandings and Removal
 - Public Safety
 - External Law Enforcement
 - Internal Law Enforcement
 - Boat Strandings and Other Salvage Operations
- Natural Resource Management
 - OPRD Snowy Plover Management Actions
 - Habitat Restoration – Non-Snowy Plover Activities

3.5 “Covered Lands”

Covered Lands means the lands upon which the Permit authorizes incidental take of the Covered Species and the lands to which the HCP's conservation and mitigation measures apply. These lands are described in Section 2.5 of the HCP.

3.6 “Covered Species”

Covered Species means the western (coastal) snowy plover, which the HCP addresses in a manner sufficient to meet all of the criteria for issuing an incidental take Permit under ESA §10(a)(1)(B).

3.7 “HCP”

HCP means the Habitat Conservation Plan for Western (Coastal) Snowy Plovers prepared by OPRD.

3.8 “Listed species”

Listed species means a species (including a subspecies, or a distinct population segment of a vertebrate species) that is listed as endangered or threatened under the ESA.

3.9 “Permit”

Permit means the incidental take Permit issued by the Service to OPRD pursuant to Section 10(a)(1)(B) of the ESA for take incidental to the Covered Activities on Oregon’s ocean shore, as it may be amended from time to time.

3.10 “Permittee”

Permittee means Oregon Parks and Recreation Department.

3.11 “Recreation Management Area (RMA)”

Recreation Management Areas (RMAs) are all sites identified in the HCP as plover sites that are owned by entities other than OPRD. OPRD manages RMAs as described in section 1.5.1 of the HCP.

3.12 “Snowy Plover Management Areas (SPMAs)”

Snowy Plover Management Areas (SPMAs) consist of the five sites identified in the HCP that are owned or leased by OPRD as part of a State Park Unit and are either occupied by plovers or targeted for future plover management.

3.13 “Take”

Take means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect any listed or unlisted Covered Species. Harm means an act that actually kills or injures a member of a Covered Species, including an act that causes significant habitat modification or degradation where it actually kills or injures a member of a Covered Species by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.

3.14 “Unforeseen Circumstances”

Unforeseen Circumstances means changes in circumstances affecting a species or geographic area covered by a conservation plan that could not reasonably have been anticipated by plan developers and the Service at the time of the conservation plan’s negotiation and development, and that result in a substantial and adverse change in the status of the Covered Species.

3.15 “Unlisted species”

Unlisted species means a species (including a subspecies, or a distinct population segment of a vertebrate species) that is not listed as endangered or threatened under the ESA.

4.0 OBLIGATIONS OF THE PARTIES

4.1 Obligations of the Permittee.

The Permittee will fully and faithfully perform all obligations assigned to it under this Agreement, the Permit, and the HCP.

4.2 Obligations of ODFW.

ODFW will fully and faithfully perform all obligations assigned to it under the HCP.

4.3 Obligations of the Service.

Upon execution of this Agreement by the Parties, and satisfaction of all other applicable legal requirements, the Service will issue the Permittee a Permit under Section 10(a)(1)(B) of the ESA, authorizing incidental take of the Covered Species resulting from Covered Activities on Covered Lands.

4.3.1 Permit coverage.

The Permit issued by the Service will identify all Covered Species. The Permit will take effect for listed Covered Species at the time the Permit is issued.

4.3.2 “No surprises” assurances.

Provided that the Permittee has complied with its obligations under the HCP, this Agreement, and the Permit (including any provisions for changed circumstances, adaptive management or any other contingency measures), the Service can require the Permittee to provide mitigation beyond that provided for in the HCP only under Unforeseen Circumstances, and only in accordance with the “no surprises” regulations at 50 C.F.R. §§ 17.22(b)(5), 17.32(b)(5).

4.4 Interim obligations upon a finding of Unforeseen Circumstances.

If the Service makes a finding of Unforeseen Circumstances, during the period necessary to determine the nature and location of additional or modified mitigation, the Permittee will avoid contributing to appreciably reducing the likelihood of the survival and recovery of the affected species.

5.0 INCORPORATION OF HCP

The HCP and each of its provisions are intended to be, and by this reference are, incorporated herein. In the event of any direct contradiction between the terms of this Agreement and the HCP, the terms of this Agreement will control. In all other cases, the terms of this Agreement and the terms of the HCP will be interpreted to be supplementary to each other.

6.0 TERM

6.1 Initial Term.

This Agreement and the HCP will become effective on the date that the Service issues the Permit. This Agreement, the HCP, and the Permit will remain in effect for a period of 25 years from issuance of the original Permit, except as provided below.

6.2 Permit suspension or revocation.

The Service may suspend or revoke the Permit for cause in accordance with the laws and regulations in force at the time of such suspension or revocation (See 5 U.S.C. § 558; 50 C.F.R. §§ 13.27 - 13.29). Such suspension or revocation may apply to the entire Permit, or only to specified Covered Species, Covered Lands, or Covered Activities. In the event of suspension or revocation, the Permittee's obligations under this Agreement and the HCP will continue until the Service determines that all take of the Covered Species that occurred under the Permit has been fully mitigated in accordance with the HCP.

6.3 Relinquishment of the Permit.

6.3.1 Generally.

The Permittee may relinquish the Permit in accordance with the regulations of the Service in force on the date of such relinquishment. (These regulations are currently codified at 50 C.F.R. § 13.26). Notwithstanding relinquishment of the Permit, the Permittee will be required to provide post-relinquishment mitigation for any take of Covered Species that the Service determines will not have been fully mitigated under the HCP by the time of relinquishment. The Permittee's obligations under the HCP and this Agreement will continue until the Service notifies the Permittee that no post-relinquishment mitigation is required, or that all post-relinquishment mitigation required by the Service is completed. Unless the Service and the Permittee agree otherwise, the Service may not require more mitigation than would have been provided if the Permittee had carried out the full term of the HCP.

6.3.2 Procedure for relinquishment.

If the Permittee elects to relinquish the Permit before expiration of the full term of the HCP, the Permittee will provide notice to the Service at least 120 days prior to the planned relinquishment. Such notice will include a status report detailing the nature and amount of take of all Covered Species, the mitigation provided for those species prior to relinquishment, and the status of the Permittee's compliance with all other terms of the HCP. Within 120 days after receiving a notice and status report meeting

the requirements of this paragraph, the Service will give notice to the Permittee stating whether any post-relinquishment mitigation is required and, if so, the amount and terms of such mitigation, and the basis for the Service's conclusions. If the Service determines that no post-relinquishment mitigation is required, all obligations assumed by the Parties under this Agreement will terminate upon the Service's issuance of such notice. If the Permittee disagrees with the Service's determination, the Service or the Permittee may choose to use the dispute resolution procedures described in Section 14 of this Agreement. The Permittee will continue to carry out its obligations under the HCP until any such dispute is resolved. If the Service and the Permittee are unable to agree, the Service will have the final authority to determine whether the Permittee is required to provide post-relinquishment mitigation.

6.4 *Extension of the Permit.*

Upon agreement of the Parties and compliance with all applicable laws, the Permit may be extended beyond its initial term under regulations of the Service in force on the date of such extension. If the Permittee desires to extend the Permit, it will so notify the Service at least 180 days before the then-current term is scheduled to expire. Extension of the Permit constitutes extension of the HCP and this Agreement for the same amount of time, subject to any modifications that the Service may require at the time of extension.

7.0 *FUNDING*

The Permittee warrants that it will provide and expend such funds as may be necessary to fulfill its obligations under the HCP. The Permittee will promptly notify the Service of any material change in the Permittee's financial ability to fulfill its obligations. In addition to providing any such notice, the Permittee will provide the Service with a copy of its annual report each year of the Permit or with such other reasonably available financial information that the Service and the Permittee agree will provide adequate evidence of the Permittee's ability to fulfill its obligations.

8.0 *MONITORING AND REPORTING*

8.1 *Planned periodic reports.*

As described in the HCP, the Permittee will submit periodic reports describing its activities and results of the monitoring program provided for in the HCP.

8.2 *Other reports.*

The Permittee will provide, within 30 days of being requested by the Service, any additional information in its possession or control related to implementation of the HCP that is requested by the Service for the purpose of assessing whether the terms and conditions of the Permit and the HCP, including the HCP's adaptive management plan, are being fully implemented.

8.3 *Certification of reports.*

All reports will include the following certification from a responsible company official who supervised or directed preparation of the report:

“I certify that, to the best of my knowledge, after appropriate inquiries of all relevant persons involved in the preparation of this report, the information submitted is true, accurate, and complete.”

8.4 *Monitoring by Service.*

The Service may conduct inspections and monitoring in connection with the Permit in accordance with its regulations (See 50 C.F.R. § 13.47).

9.0 *CHANGED CIRCUMSTANCES*

9.1 *Permittee-initiated response to Changed Circumstances.*

The Permittee will give notice to the Service within seven days after learning that any of the Changed Circumstances listed in the HCP has occurred. As soon as practicable thereafter, but no later than 30 days after learning of the Changed Circumstances, the Permittee will modify its activities in the manner described in the HCP, to the extent necessary to mitigate the effects of the Changed Circumstances on Covered Species, and will report to the Service on its actions. The Permittee will make such modifications without awaiting notice from the Service.

9.2 *Service-initiated response to Changed Circumstances.*

If the Service determines that Changed Circumstances have occurred and that the Permittee has not responded in accordance with the HCP, the Service will so notify the Permittee and will direct the Permittee to make the required changes, as described in HCP section 7.6.3. Within 30 days after receiving such notice, the Permittee will make the required changes and report to the Service on its actions. Such changes are provided for in the HCP, and hence do not constitute Unforeseen Circumstances or require amendment of the Permit or HCP.

9.3 *Listing of species that are not Covered Species.*

In the event that a non-Covered Species that may be affected by Covered Activities becomes listed under the ESA, the Service will work with the Permittee to identify measures necessary to avoid take of, jeopardy to, or adverse modification of critical habitat of the species as a result of implementation of Covered Activities. The Permittee will implement these measures until the Permit is amended to include such species, or until the Service notifies the Permittee that such measures are no longer needed to avoid jeopardy to, take of, or adverse modification of the critical habitat of, the non-Covered Species.

10.0 *UNFORESEEN CIRCUMSTANCES*

If, during the implementation of this HCP, an unforeseen circumstance occurs that could have a significant negative effect on snowy plovers or could affect the ability of OPRD to effectively manage activities under this HCP, OPRD will to the extent practicable, follow the procedures

below:

10.1 Notification.

Within 10 business days of the date the unforeseen circumstance is brought to OPRD's attention, the HCP Coordinator will notify Service in writing of the following:

- (a) Nature of the situation;
- (b) Geographic and temporal extent to which the beach was or will be affected by the situation;
- (c) Potential effect on snowy plovers in the Covered Lands; and
- (d) Any actions taken to date in response to the unforeseen circumstance.

10.2 Response.

Within 5 business days of Service receipt of the written notification described above, OPRD will discuss the unforeseen circumstance with Service personnel and other affected Parties, as applicable. An appropriate response to the situation, such as modifying the HCP and/or ITP, may be developed and implemented in coordination with the Service.

11.0 ADAPTIVE MANAGEMENT

11.1 Permittee-initiated adaptive management.

The Permittee will implement the adaptive management provisions in the HCP, when changes in management practices are necessary to achieve the HCP's biological objectives, or to respond to monitoring results or new scientific information. The Permittee will coordinate with the Service on what kind of actions will be undertaken, and will report to the Service on any actions taken pursuant to this section.

11.2 Service-initiated adaptive management.

If the Service determines that one or more of the adaptive management provisions in the HCP have been triggered and that the Permittee has not changed its management practices in accordance with the HCP, the Service will so notify the Permittee and will direct the Permittee to make the required changes. Within 30 days after receiving such notice, the Permittee will make the required changes and report to the Service on its actions. Such changes are provided for in the HCP, and hence do not constitute Unforeseen Circumstances or require amendment of the Permit or HCP, except as provided in this section.

11.3 Reductions in mitigation.

The Permittee will not implement adaptive management changes that may result in less mitigation than provided for the Covered Species under the original terms of the HCP, unless the Service first provides written approval. The Permittee may propose any such adaptive management changes by notice to the Service, specifying the adaptive management modifications proposed, the basis for them, including supporting data, and the anticipated effects on Covered Species, and other environmental impacts. Within 120 days of receiving such a notice, the Service will approve the proposed adaptive management changes, approve

them as modified by the Service, or notify the Permittee that the proposed changes constitute Permit amendments that must be reviewed under Section 13.2 of this Agreement.

11.4 *No increase in take.*

This section does not authorize any modifications that would result in an increase in the amount and nature of take, or increase the impacts of take, of Covered Species beyond that analyzed under the original HCP and any amendments thereto. Any such modification must be reviewed as a Permit amendment under Section 13.2 of this Agreement.

12.0 *LAND TRANSACTIONS*

12.1 *Acquisition of land by the Permittee.*

Nothing in this Agreement, the HCP, or the Permit limits the Permittee's right to acquire additional lands. Any lands that may be acquired within the Covered Lands will be covered by the Permit, pursuant to, and under the conditions described in the HCP.

12.2 *Disposal of land by the Permittee.*

the Permittee's transfer of ownership or control of covered land will require prior approval by the Service and an amendment of the Permit in accordance with section 13.2 of this Agreement, except that transfers of Covered Lands may be processed as minor modifications in accordance with section 13.1 of this Agreement if:

- (a) The land will be transferred to an agency of the Federal government and, prior to transfer, the Service has determined that transfer will not compromise the effectiveness of the HCP based on adequate commitments by that agency regarding management of such land;
- (b) The land will be transferred to a non-Federal entity that has entered into an agreement acceptable to the Service (e.g., an easement held by the state fish and wildlife agency with the Service as third-party beneficiaries) to ensure that the lands will be managed in such a manner and for such duration so as not to compromise the effectiveness of the HCP;
- (c) The land will be transferred to a non-Federal entity that, prior to completion of the land transaction, has agreed to be bound by the HCP as it applies to the transferred land and has obtained an incidental take Permit following normal Permit procedures covering all species then covered by the Permittee's Permit; or
- (d) The Service determines that the amount of land to be transferred will not have a material impact on the ability of the Permittee to comply with the requirements of the HCP and the terms and conditions of the Permit.

13.0 *MODIFICATIONS AND AMENDMENTS*

13.1 *Minor modifications.*

- (a) Any party may propose minor modifications to the HCP or this Agreement by providing notice to the other parties. Such notice shall include a statement of the

reason for the proposed modification and an analysis of its environmental effects, including its effects on operations under the HCP and on Covered Species. The Parties will use best efforts to respond to proposed modifications within 60 days of receipt of such notice. Proposed modifications will become effective upon all other Parties' written approval. If, for any reason, a receiving party objects to a proposed modification, it must be processed as an amendment of the Permit in accordance with subsection 13.2 of this section. The Service will not propose or approve minor modifications to the HCP or this Agreement if the Service determines that such modifications would result in operations under the HCP that are significantly different from those analyzed in connection with the original HCP, adverse effects on the environment that are new or significantly different from those analyzed in connection with the original HCP, or additional take not analyzed in connection with the original HCP.

- (b) Minor modifications to the HCP and this Agreement processed pursuant to this subsection may include but are not limited to the following:
 - (1) corrections of typographic, grammatical, and similar editing errors that do not change the intended meaning;
 - (2) correction of any maps or exhibits to correct errors in mapping or to reflect previously approved changes in the Permit or HCP;
 - (3) minor changes to survey, monitoring or reporting protocols; and
 - (4) Other types of modifications that are minor in relation to the HCP, that the Service has analyzed and agreed to, and on which the public has had an opportunity to comment.
- (c) Any other modifications to the HCP or IA will be processed as amendments of the Permit in accordance with subsection 13.2 of this section.

13.2 *Amendment of the Permit.*

The Permit may be amended in accordance with all applicable legal requirements, including but not limited to the ESA, the National Environmental Policy Act, and the Services' Permit regulations. The party proposing the amendment shall provide a statement of the reasons for the amendment and an analysis of its environmental effects, including its effects on operations under the HCP and on Covered Species.

14.0 *REMEDIES, ENFORCEMENT, AND DISPUTE RESOLUTION*

14.1 *In general.*

Except as set forth below, each party shall have all remedies otherwise available to enforce the terms of this Agreement, the Permit, and the HCP.

14.2 *No monetary damages.*

No party shall be liable in damages to any other party or other person for any breach of this Agreement, any performance or failure to perform a mandatory or discretionary obligation imposed by this Agreement or any other cause of action arising from this Agreement.

14.3 *Injunctive and temporary relief.*

The Parties acknowledge that the Covered Species are unique and that their loss as species would result in irreparable damage to the environment, and that therefore injunctive and temporary relief may be appropriate to ensure compliance with the terms of this Agreement.

14.4 *Enforcement authority of the United States.*

Nothing contained in this Agreement is intended to limit the authority of the United States government to seek civil or criminal penalties or otherwise fulfill its enforcement responsibilities under the ESA or other applicable law.

14.5 *Dispute resolution.*

The Parties recognize that disputes concerning implementation of, compliance with, or termination of this Agreement, the HCP, and the Permit may arise from time to time. The Parties agree to work together in good faith to resolve such disputes, using the informal dispute resolution procedures set forth in this section, or such other procedures upon which the Parties may later agree. However, if at any time any party determines that circumstances so warrant, it may seek any available remedy without waiting to complete informal dispute resolution.

14.5.1 *Informal dispute resolution process.*

Unless the parties agree upon another dispute resolution process, or unless an aggrieved party has initiated administrative proceedings or suit in Federal court as provided in this section, the parties may use the following process to attempt to resolve disputes:

- (a) The aggrieved party will notify the other parties of the provision that may have been violated, the basis for contending that a violation has occurred, and the remedies it proposes to correct the alleged violation.
- (b) The party alleged to be in violation will have 30 days, or such other time as may be agreed, to respond. During this time it may seek clarification of the information provided in the initial notice. The aggrieved party will use its best efforts to provide any information then available to it that may be responsive to such inquiries.
- (c) Within 30 days after such response was provided or was due, representatives of the parties will meet and negotiate in good faith toward a solution satisfactory to all parties, or will establish a specific process and timetable to seek such a solution.
- (d) If any issues cannot be resolved through such negotiations, the parties will

consider non-binding mediation and other alternative dispute resolution processes and, if a dispute resolution process is agreed upon, will make good faith efforts to resolve all remaining issues through that process.

15.0 MISCELLANEOUS PROVISIONS

15.1 *No partnership.*

Neither this Agreement nor the HCP shall make or be deemed to make any party to this Agreement the agent for or the partner of any other party.

15.2 *Notices.*

Any notice Permitted or required by this Agreement shall be in writing, delivered personally to the persons listed below, or shall be deemed given five (5) days after deposit in the United States mail, certified and postage prepaid, return receipt requested and addressed as follows, or at such other address as any party may from time to time specify to the other Parties in writing. Notices may be delivered by facsimile or other electronic means, provided that they are also delivered personally or by certified mail. Notices shall be transmitted so that they are received within the specified deadlines.

Assistant Regional Director
United States Fish and Wildlife Service
911 N.E. 11th Ave.
Portland, Oregon 97232-4181
Telephone: 503-231-6159
Telefax: 503-231-2019

Director
Oregon Parks and Recreation Department
725 Summer Street NE, Suite C
Salem OR 97301-1271
Telephone: 503-986-0718
Telefax: 503-986-0796

Director
Oregon Department of Fish and Wildlife
3406 Cherry Avenue N.E.
Salem, Oregon 97303
Telephone: 503-947-6044
Telefax: 503-947-6042

15.3 *Entire agreement.*

This Agreement, together with the HCP and the Permit, constitutes the entire agreement among the Parties. It supersedes any and all other agreements, either oral or in writing, among the Parties with respect to the subject matter hereof and contains all of the covenants and agreements among them with respect to said matters, and each party acknowledges that

no representation, inducement, promise or agreement, oral or otherwise, has been made by any other party or anyone acting on behalf of any other party that is not embodied herein.

15.4 *Elected officials not to benefit.*

No member of or delegate to Congress shall be entitled to any share or part of this Agreement, or to any benefit that may arise from it.

15.5 *Availability of funds.*

Implementation of this Agreement and the HCP by the Service is subject to the requirements of the Anti-Deficiency Act and the availability of appropriated funds. Nothing in this Agreement will be construed by the Parties to require the obligation, appropriation, or expenditure of any money from the U.S. Treasury. The Parties acknowledge that the Service will not be required under this Agreement to expend any Federal agency's appropriated funds unless and until an authorized official of that agency affirmatively acts to commit to such expenditures as evidenced in writing.

15.6 *Duplicate originals.*

This Agreement may be executed in any number of duplicate originals. A complete original of this Agreement shall be maintained in the official records of each of the Parties hereto.

15.7 *No third-party beneficiaries.*

Without limiting the applicability of rights granted to the public pursuant to the ESA or other Federal law, this Agreement shall not create any right or interest in the public, or any member thereof, as a third-party beneficiary hereof, nor shall it authorize anyone not a party to this Agreement to maintain a suit for personal injuries or damages pursuant to the provisions of this Agreement. The duties, obligations, and responsibilities of the Parties to this Agreement with respect to third parties shall remain as imposed under existing law.

15.8 *Relationship to the ESA and other authorities.*

The terms of this Agreement shall be governed by and construed in accordance with the ESA and applicable Federal law. In particular, nothing in this Agreement is intended to limit the authority of the Service to seek penalties or otherwise fulfill their responsibilities under the ESA. Moreover, nothing in this Agreement is intended to limit or diminish the legal obligations and responsibilities of the Service as an agency of the Federal government. Nothing in this Agreement will limit the right or obligation of any Federal agency to engage in consultation required under Section 7 of the ESA or other Federal law; however, it is intended that the rights and obligations of the Permittee under the HCP and this Agreement will be considered in any consultation affecting the Permittee's use of the Covered Lands.

15.9 *References to regulations.*

Any reference in this Agreement, the HCP, or the Permit to any regulation or rule of the Service shall be deemed to be a reference to such regulation or rule in existence at the time an action is taken.

15.10 *Applicable laws.*

All activities undertaken pursuant to this Agreement, the HCP, or the Permit must be in compliance with all applicable state and Federal laws and regulations.

15.11 *Successors and assigns.*

This Agreement and each of its covenants and conditions shall be binding on and shall inure to the benefit of the parties and their respective successors and assigns. Assignment or other transfer of the Permit shall be governed by the Service’s regulations in force at the time.

IN WITNESS WHEREOF, THE PARTIES HERETO have executed this Implementing Agreement to be in effect as of the date that the Service issues the Permit.

BY _____ Date _____
David Wesley
Assistant Regional Director
United States Fish and Wildlife Service
Portland, Oregon

BY _____ Date _____
Tim Wood
Director
Oregon Parks and Recreation Department
Salem, Oregon

BY _____ Date _____
Roy Elliker
Director
Oregon Department of Fish and Wildlife
Salem, Oregon