



# Chapter 2 Management Direction

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## Chapter 2. Management Direction

### 2.1 Overview

During development of this CCP, the Service reviewed and considered a variety of local and regional physical and biological resource conditions, as well as social, economic, and organizational aspects important for managing the Refuge. This background information is described more fully in Chapters 3, 4, and 5. As is appropriate for a national wildlife refuge, natural resource considerations were fundamental in designing alternatives. House Report 105-106 accompanying the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57) states "...the fundamental mission of our System is wildlife conservation: wildlife and wildlife conservation must come first." Toward this end, the refuge planning team reviewed scientific reports and studies to better understand ecosystem trends and the latest scientific recommendations for species and habitats.

Public involvement was an important part of the planning process. Local, State, and Federal agencies, Tribes, and elected officials were contacted by the Refuge Complex planning team to ascertain priorities and problems as perceived by others. In addition to holding a public scoping meeting to explain the process and accept comments and suggestions, the team contacted refuge users, nonprofit groups, and community organizations to ensure their comments and ideas were considered during the development of alternatives. The planning team then developed preliminary management concepts and strategies, which they presented to the public in a planning update and at a public meeting in fall 2011. Based on all of the information gathered and feedback from others through the public involvement process, the Service developed three draft alternatives for the Draft Comprehensive Conservation Plan and Environmental Assessment (Draft CCP/EA) for Siletz Bay National Wildlife Refuge (USFWS 2012a), which was released in September 2012. Alternative C was selected as the preferred alternative.

The CCP planning team reviewed and evaluated all of the comments received during the 30-day Draft CCP/EA comment period. Alternative C within the Draft CCP/EA was selected for implementation. In some cases, the management direction has been either clarified or modified based upon public feedback. The details of public participation can be found in Appendix J, Public Involvement, and Table K-2 within Appendix K, Comments Received during Public/Agency Review Period and Service Responses, shows the major changes between the draft and the final CCP.

### 2.2 Management Directions Considered but Not Developed

Early in the alternatives development process, the planning team considered including the following actions in one or more CCP alternatives. These actions were ultimately eliminated from further consideration in this CCP for the reasons provided.

**Development of a Visitor Center.** During the public scoping process the Service received comments from the public and one conservation organization regarding the development of a visitor contact station on a site that is currently serving as a dentist office. Specifically it was requested that the Service purchase the property and convert the dentist office into a visitor contact station. This parcel of land is in private ownership and it is outside of the approved refuge boundary. The Service also believes that this site is extremely vulnerable to sea level rise and storm surge resulting from

climate change and is therefore an inappropriate location for this type of development. For these reasons the Service did not develop this option as an alternative.

**Substantial Participation in a Community-based Visitor Center.** During the public scoping process the Service received comments requesting our extensive participation in a community-based visitor center that is yet to have a determined location. Specifically the comments stated that the Service should build and manage the visitor center and the community would respond by assisting in the staffing of the center. Due to the small size of the Refuge, limited staff, the inadequacy of available locations owned by the Service in the vicinity of Siletz Bay NWR, and the availability of other resource-related material in the local community, the Service made the decision not to develop this as an alternative.

## 2.3 Description of Management Direction

A brief description of the management direction follows. Table 2-1 contains additional details regarding actions associated with the CCP. A map displaying management direction for the Refuge is located at the end of this chapter (Figure 2-1).

**Wildlife and Habitat Management.** Refuge management actions will continue to emphasize protecting and maintaining estuarine, stream-riparian, and forested habitats; however, an increased level of active habitat management and monitoring will also be implemented. If feasible, tidal marsh restoration will occur at Siletz Keys and Alder Island, and on any additional diked lands acquired. Inventory, monitoring, and research programs will be expanded.

**Public Use Management.** Opportunities for wildlife observation and photography will be established throughout the Refuge including the development of a loop trail, a viewing platform, and a parking lot at Alder Island. Unrestricted walking will be allowed on refuge lands west of Highway 101 for the purpose of wildlife observation and photography. Interpreter-led seasonal paddle trips will continue and potentially expand with the development of a non-motorized boat launch near Alder Island.

Waterfowl hunting will be allowed daily in season on 87 acres of refuge lands west of Highway 101, and 3 days per week on 112 acres of refuge lands south of Millport Slough and east of Highway 101. A 100-yard no-hunting zone will be established to prohibit waterfowl hunting on refuge lands that extend westward from the refuge property line on the west side of the housing development of Siletz Keys. A small gravel parking lot and kiosk will be developed to support the Millport Slough waterfowl hunting access. Access to clamming will be allowed through Snag Alley and walk-in bank fishing will be allowed from Alder Island only.

**Adaptive Management.** Adaptive management is a management philosophy and decision process that incorporates flexibility and continual learning. It involves monitoring and evaluation of refuge accomplishments, comparing accomplishments to objectives, and changing management strategies or objectives as necessary to achieve desired results. In the presence of accelerated climate change, adaptive management is an increasingly important management-decision process. The Refuge will employ adaptive management as a standard operating procedure.

**Appropriateness and Compatibility.** Consistent with relevant laws, regulations, and policies, prior to allowing any public use of the Refuge (including commercial use), each use will first need to be found appropriate and determined compatible (16 U.S.C. 668dd-668ee, 50 CFR 25, 26, and 29; and

603 FW 1 and 2). In the Draft CCP/EA, the Service made preliminary findings and determinations regarding the appropriateness and compatibility of each planned use. Appropriateness findings and compatibility determinations have been finalized for each use included in the Service's management direction. Appropriateness and compatibility are further discussed in Appendices A and B.

**Climate Change.** As stated in the Department of the Interior's Secretarial Order 3226 and the Service's Climate Change Strategic Plan (USFWS 2010a), the Service considers and analyzes climate change in its decisions, long-range plans and other activities. Habitat conditions and wildlife populations are directly and indirectly sensitive to climatic conditions, namely precipitation and temperature and changes to hydrologic conditions, sea level rise, and ocean acidification. As described in greater detail in Chapter 3, the Refuge is potentially affected by sea level rise in spite of upward vertical land movement and estimated sediment and vegetative accretion rates. The Refuge may be also be affected by storm surges, increases in extreme precipitation events, higher water temperatures, and ocean acidification.

The combined changes can affect the Refuge's habitats and species directly, such as the timing of arrival of migratory birds and many other phenologic responses, changes in species' ranges and physiology, and indirectly such as added vulnerability to other stressors including increasing invasive species and pathogens. Predicting biological response at the population level, however, requires complex research and information and sophisticated models that can be validated with field studies over time. This highlights the importance of monitoring habitat and species to establish potential correlations and adaptation options.

Knowledge and monitoring of regional and local climate trends on refuge resources will be used to assess potential changes or enhancements to the Refuge's management actions and techniques and/or their timing, using the adaptive management approach described above.

The Refuge Complex staff will participate in and contribute to climate change and sea level rise assessment efforts, including those underway at a landscape scale. Participation in the North Pacific Coast Landscape Conservation Cooperative (LCC) will provide refuge staff with a means to tie in with a larger scale assessment of the impacts of climate change (USFWS 2010a). LCCs are formal science-management partnerships between the Service, Federal agencies, states, tribes, non-government organizations (NGOs), universities, and other entities to address climate change and other biological stressors in an integrated fashion. LCCs provide science support, biological planning, conservation design, research, and design of inventory and monitoring programs.

As needed, objectives and strategies will be adjusted to assist in enhancing the resiliency of refuge resources to climate change. Specific management goals, objectives, and strategies, based on climate change impact projections, will be identified for refuge habitats most vulnerable to climate change and sea level rise.

The Service has developed a Strategic Plan for Responding to Accelerating Climate Change in the 21st Century (USFWS 2010a), and an Action Plan outlining specific actions needed to implement the Strategic Plan. The Action Plan calls for the Service to make its operations carbon-neutral by 2020. The Refuge will work toward this goal by continuing to pursue and engage in mechanisms to conserve energy in refuge operations, including the use of fuel-efficient vehicles and building appropriately sized, energy-efficient facilities, as funding becomes available. The Refuge will also reduce the carbon footprint of land management activities by using energy-efficient techniques,

where feasible and in line with management goals. The Refuge will also explore ways of offsetting any remaining carbon balance, such as carbon sequestration.

**Cultural Resources Protection.** The Service will continue to uphold Federal laws protecting cultural resources, including the National Historic Preservation Act (NHPA), Archaeological Resources Protection Act (ARPA), and Native American Graves Protection and Repatriation Act (NAGPRA). These laws also mandate consultation with Native American tribes, the State Historic Preservation Office (SHPO), and other preservation partners. The NHPA mandates that all projects that use federal funding, permitting, or licensing be reviewed by a cultural resource professional to determine if there is the potential to affect cultural resources. An inventory will be conducted as necessary, and appropriate actions to mitigate effects will be identified prior to implementation of the project. A project-specific determination will be conducted for all undertakings as defined by NHPA, including habitat maintenance and restoration projects as well as new or expanded trails, roads, facilities, and public use areas.

**Fire Management.** The overall objective for fire management on the Complex is to promote a program that provides for firefighter and public safety, reduces the occurrence of human-caused fires, and ensures appropriate suppression response capability to meet expected wildland fire complexity. Fire Management Plans (FMPs) were completed for the entire Complex, including Siletz Bay Refuge, in 2004. The FMP details response to the threat of wildfire and under what circumstances the refuges will use wildland fire as a tool on refuge lands.

**Implementation Subject to Funding Availability.** Actions described in this CCP will be implemented over the life of the plan as funding becomes available. Project priorities and projected staffing/funding needs are included in Appendix C.

**Integrated Pest Management (IPM).** In accordance with 517 Departmental Manual (DM) 1 and 569 Fish and Wildlife Service Manual (FW) 1, an integrated pest management (IPM) approach will be utilized, where practicable, to eradicate, control, or contain pest and invasive species (herein collectively referred to as pests) on refuge lands. IPM will involve using methods based upon effectiveness, cost, and minimal ecological disruption, which considers minimum potential effects to non-target species and the refuge environment. Pesticides may be used where physical, cultural, and biological methods or combinations thereof, are impractical or incapable of providing adequate control, eradication, or containment. If a pesticide is needed on refuge lands, the most specific (selective) chemical available for the target species will be used unless considerations of persistence or other environmental and/or biotic hazards would preclude it. In accordance with 517 DM 1, pesticide usage will be further restricted because only pesticides registered with the US Environmental Protection Agency (USEPA) in full compliance with the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and as provided in regulations, orders, or permits issued by USEPA may be applied on lands and waters under refuge jurisdiction.

Appendix G contains the Refuge's IPM program documentation to manage pests for this CCP. Along with a more detailed discussion of IPM techniques, this documentation describes the selective use of pesticides for pest management on refuge lands, where necessary. Throughout the life of the CCP, most proposed pesticide uses on refuge lands will be evaluated for potential effects to refuge biological resources and environmental quality. These potential effects will be documented in "Chemical Profiles" (see Appendix G). Pesticide uses with appropriate and practical best management practices (BMPs) for habitat management as well as facilities maintenance will be approved for use on refuge lands where there likely would be only minor, temporary, and localized

effects to species and environmental quality based upon non-exceedance of threshold values in Chemical Profiles. However, pesticides may be used on refuge lands where substantial effects to species and the environment are possible (exceed threshold values) in order to protect human health and safety (e.g., mosquito-borne disease).

Because invasive plants and animals currently represent the greatest threat to the Refuge's wildlife and habitat, control of invasive species will be a high priority management activity. Invasive species such as Scotch broom, Himalayan blackberry, English ivy, and reed canarygrass will continue to be a primary management concern and will be controlled to the degree that funding permits. Invasive species control will be initiated prior to or concurrently with all habitat restoration efforts.

The magnitude of pest problems on the Refuge is beyond the available capital resources to expect control or eradication during any single field season; therefore it is essential to prioritize treatment of infestations. Some non-native species which are pervasive on refuge lands are the subject of long-term control efforts and will continue to be a high priority. Also, the Service will find and verify the identity of new invasive species as early after entry as possible, when eradication and control are still feasible and less costly. Regardless of whether the invasive species is well established or newly introduced, the Refuge will prioritize pre- and post-treatment monitoring, assessment of the successes and failures of treatments and development of new approaches when proposed methods do not achieve desired outcomes.

**Land Protection.** The Service has the authority to acquire land or negotiate agreements on behalf of the National Wildlife Refuge System only within an approved refuge boundary. The Service can make offers to purchase land, purchase conservation easements or enter into management agreements with willing landowners within the approved boundary. Lands or interests therein do not become part of the National Wildlife Refuge System unless they are purchased from or are placed under a management agreement with the individual landowner. Service authority over any use of lands within an approved refuge boundary is limited to lands the Service has acquired in fee title, conservation easement, or entered into an easement or management agreement. Private landowners within an approved refuge boundary retain all of the rights, privileges, and responsibilities of private land ownership and are under no obligation to sell their property to the Service. Service policy for land acquisition is to work on a one-on-one basis with a willing seller/interested landowner. Based on the availability of funds, the Service will continue to negotiate with willing sellers to acquire lands within the existing approved refuge boundary.

**Maintenance of Existing Facilities.** Periodic maintenance of refuge buildings and facilities will be necessary. Periodic maintenance and upgrading of facilities is necessary for safety and accessibility and to support management and visitor needs, and is incorporated in the Service Asset Management System.

**Regulatory Compliance.** Prior to implementation, all planned activities will undergo appropriate reviews and consultations, and permits and clearances will be secured, as necessary, to comply with legal and policy requirements. This includes water quality permits required under Section 401, and dredge and fill permits required under Section 404 of the Federal Water Pollution Control Act of 1982, as amended (33 U.S.C. 1251-1382); appropriate evaluations and documentation under the National Environmental Policy Act; and, as noted above, evaluation and consultation required by Section 7 of the Endangered Species Act, and review and consultation required by Section 106 of the National Historic Preservation Act.

**Response to Mosquito-borne Diseases.** Under draft refuge policy (72 Federal Register 71939), mosquito populations on refuge lands are allowed to fluctuate and function unimpeded unless they pose a threat to wildlife and/or human health. While the Service recognizes that mosquitoes are a natural component of most wetland ecosystems which provide food for some fish and wildlife including migratory birds, we also recognize they can be a nuisance and may represent a threat to human and/or wildlife health. To protect human and wildlife health and safety, the state or a local vector control agency would be allowed to control mosquito populations on refuge lands using pesticide treatments (larvicides, pupacides, or adulticides) only if local, current population monitoring and/or disease surveillance data indicate refuge-based mosquitoes pose a health threat to humans and/or wildlife. As previously described, mosquito treatments would be allowed on refuge lands in accordance with IPM principles applicable to all pests (see Appendix G). Proposed pesticide uses for mosquito control will utilize appropriate and practical BMPs, where possible, given potential effects documented in Chemical Profiles. If mosquitoes are determined to be posing a threat to wildlife and/or human health, a refuge compatibility determination (CD) will be written, which will provide details regarding mosquito population monitoring, disease surveillance, and treatments.

A disease contingency plan (DCP) will be prepared addressing response to mosquito-borne disease outbreaks on and/or adjacent to refuge lands. Much of the information will be evaluated and described in the previously mentioned CD (e.g., IPM treatment options) and will be incorporated with additional specificity, where necessary, into this plan. The DCP also will include other information such as the history of mosquito-borne diseases on and/or adjacent to the Refuge as well as measures to protect refuge visitors, Service-authorized agents, and Service employees when a health threat or emergency is identified by health officials.

**Participation in Regional Planning and Conservation Efforts.** The Refuge Complex staff will actively participate in and contribute to planning and conservation efforts for ongoing and future monitoring and research associated with tidal marsh restoration, invasive species detection and rapid response, and other activities that may affect refuge wildlife resources and habitats. Refuge Complex staff will cultivate working relationships with pertinent local, county, State, and Federal agencies to stay abreast of current and potential developments; and will utilize outreach, education, and information as needed to raise awareness of refuge resources and their dependence on a healthy local environment.

**Partnerships.** Partnerships on the Refuge are critical components in maintaining and continuing efforts to enhance recreation opportunities or implement resource management improvements, such as restoring habitat for threatened and endangered species. These partnerships typically involve joining forces with Federal, state, and local agencies and organizations. The Service will continue to devote time and effort towards maintaining existing and developing new partnerships to enhance collaboration on support of fish and wildlife resources, wildlife-dependent recreational opportunities, and educational programs, and to explore ways to share funding and seek grants on projects of mutual interest. Specifically, the Service will work with local and state agencies to promote mutual understanding, encourage environmentally friendly development, and promote eco-tourism opportunities.

**Refuge Revenue Sharing.** Annual payments to Lincoln County under the Refuge Revenue Sharing Act (16 U.S.C. 715s) will continue according to the established formula and subject to congressional appropriations.

**State Coordination.** The Refuge Complex will continue to coordinate with Oregon State agencies regarding areas of mutual interest. This includes communications with ODFW regarding public recreation, fish passage, and habitat restoration and management priorities identified through the Oregon Conservation Strategy.

**Tribal Coordination.** The Service will coordinate and consult with Native American Tribes on a regular basis regarding issues of shared interest. Currently the Service seeks assistance from Tribes in Native American Graves Protection and Repatriation Act and National Historic Preservation Act and related issues. The Service is also interested in partnering with Tribes to provide cultural resources education and interpretation opportunities.

**Volunteer Opportunities and Partnerships.** Volunteer opportunities and partnerships are recognized as key components of the successful management of public lands and vital to implementation of refuge programs, plans, and projects.

**Wilderness Review.** The Service’s CCP policy requires that a wilderness review be completed for all CCPs. If it is determined that the potential for wilderness designation is found, the process moves on to the wilderness study phase. As part of the process for this CCP, the planning team completed a wilderness review which can be found in Appendix D. This review concluded that the Refuge is not suitable for wilderness designation.

**Table 2-1. Summary of Management Direction**

Key Theme/issue	Future Management
<b>Forested Habitat</b>	
Upland forest	122 acres protected and actively managed. Inventory and assess existing conditions and manage for late-successional forest.
<b>Estuarine Habitat</b>	
Intertidal mudflats	Continue to protect and maintain 0.8 acre, using IPM techniques, plus work with the Oregon Department of State Lands to cooperatively manage intertidal mudflats and to monitor and treat invasive species.
Tidal marsh	Protect and maintain 314 acres of tidal marsh. Work with private landowners and partners to acquire lands within the authorized refuge boundary to facilitate full tidal restoration. Work with ODOT and ODFW to repair or replace culverts to achieve normal tidal function. If feasible, restore tidal flow to Siletz Keys and Alder Island (Schoen Tract) and any additional diked lands acquired. Outplant rare, native species (e.g., Henderson’s checkermallow) to increase native vegetation presence.
<b>Forested Wetlands and Stream-Riparian Habitat</b>	
Forested wetlands and stream-riparian corridor	18 acres protected. Control invasive species with IPM techniques.
<b>Monitoring and Research</b>	
Status monitoring	Continue and expand existing data collection. Collect data on fish, amphibians, small mammals, plants, migratory songbirds.

**Table 2-1. Summary of Management Direction**

<b>Key Theme/issue</b>	<b>Future Management</b>
Effectiveness monitoring	Monitor CCP and other step-down plan objectives.
Research	Continue current research, plus identify priority and long-term research needs and cooperate with partners to accomplish.
<b>Wildlife Observation and Photography</b>	
Wildlife observation and photography	Open Alder Island (Schoen Tract) to observation and photography through development of accessible loop trail. Allow unrestricted walking on refuge lands west of Highway 101. Develop viewing platform off Highway 101.
<b>Interpretation</b>	
Interpretation	Open Alder Island (Schoen Tract) and develop interpretive trail, parking lot, and boat launch, and continue with interpreter-led seasonal paddle trips.
<b>Hunting</b>	
Waterfowl hunting	Allow waterfowl hunting on lands west of Highway 101 (87 acres) 7 days per week. Allow waterfowl hunting 3 days per week on lands south of Millport Slough (112 acres). Establish a 100-yard no-hunting zone to prohibit waterfowl hunting on refuge property that extends westward from the refuge property line on the west side of the housing development of Siletz Keys. Develop gravel parking lot and kiosk.
<b>Fishing</b>	
Fishing	Allow bank fishing from Alder Island—walk in only.
Access for clamming	Allow access to clamming through Snag Alley.
<b>Facilities</b>	
Facilities	Keep current refuge facilities and do not build a visitor center. Utilize habitat-appropriate native plants for landscaping around public use facilities.
<b>Climate Change Adaptation</b>	
Reduce carbon footprint	Replace current vehicles with more fuel-efficient vehicles. Any new or replaced facilities will be appropriately sized and energy-efficient. Use energy-efficient land management techniques where feasible and in line with management goals. Explore ways of offsetting carbon balance, such as carbon sequestration.

## **2.4 Goals, Objectives, and Strategies**

Goals and objectives are the unifying elements of successful refuge management. They focus and describe management priorities and actions that resolve issues and help bring a refuge closer to its vision. A vision broadly reflects the refuge purposes, the Refuge System mission and goals, other statutory requirements, and larger-scale plans as appropriate. Public use and wildlife/habitat management goals then define general targets in support of the vision, followed by objectives that

direct effort into incremental and measurable steps toward achieving those goals. Finally, strategies identify specific tools and actions to accomplish objectives.

The goals for Siletz Bay NWR over the next 15 years under the CCP are presented on the following pages. The goal order does not imply any priority. Each goal is followed by the objectives that pertain to that goal. Some objectives pertain to multiple goals and have simply been placed in the most appropriate location. Similarly, some strategies pertain to multiple objectives. The timeframe for accomplishing CCP objectives is the 15-year life of the CCP, unless otherwise specified in the objective.

**Readers, please note the following:**

Below each objective statement are the strategies that could be employed in order to accomplish the objectives. Symbols used in the following tables include:

- % percent sign
- > greater than
- < less than

**2.4.1 Goal 1: Protect and maintain upland forests characteristic of the North Pacific Coastal Ecosystem.**

<b>Objective 1.1 Protect and maintain Sitka spruce-western hemlock forest</b>
Protect and maintain 122 acres of Sitka spruce-western hemlock forest on Siletz Bay NWR for the benefit of migratory landbirds (e.g., chestnut-backed chickadee, pileated woodpecker) and a diverse assemblage of other forest-dependent species (e.g., black-tailed deer, bald eagle, Roosevelt elk, bobcat, Pacific giant salamander) throughout the life of the CCP. The desired attributes of this forested habitat are the following: <ul style="list-style-type: none"> <li>• 30-95% (73% average) canopy cover of Sitka spruce and western hemlock with DBH 24-36"</li> <li>• 25-95% (83% average) cover of a mosaic of native shrubs (e.g., salmonberry, huckleberry, salal), ferns, and herbaceous species (e.g., sedges) in understory. Shrub height averages 3 meters (9.84 feet)</li> <li>• 600 square feet/acre density of nurse logs</li> <li>• 6/acre density of snags</li> <li>• &lt;5% cover of invasive plants (e.g., Himalayan blackberry, Scotch broom)</li> <li>• &lt;1% cover English ivy</li> </ul>
<b>Strategies Applied to Achieve Objective</b>
<b>Management Strategies:</b>
a. Use appropriate forest management techniques (e.g., girdling, falling) to thin trees using multiple entry approach, where needed
b. Utilize appropriate IPM techniques including mechanical/physical, chemical, biological, and cultural means (see IPM Appendix)
<b>Monitoring Strategies (see also Objective 5.1 Survey):</b>
c. Monitor migratory landbirds (e.g., chestnut-backed chickadee, pileated woodpecker) and other forest-dependent species (e.g., black-tailed deer, bald eagle, bobcat, Pacific giant salamander) populations to determine distribution and abundance

- d. Estimate canopy cover and DBH of Sitka spruce and western hemlock to determine percent cover by species
- e. Estimate understory cover of a mosaic of native shrubs (e.g., salmonberry, huckleberry, salal), ferns, and herbaceous species (e.g., sedges) to determine percent cover by species
- f. Monitor snags to determine density and location
- g. Monitor invasive plant species (e.g., Himalayan blackberry, Scotch broom, English ivy) to determine percent cover, and location
- h. Monitor tree density and thinning efforts to determine areas that need attention
- i. Monitor bald eagles to determine distribution, population, and reproductive success

**Rationale:** The long-term target is production of late-successional Sitka spruce and western hemlock forest characteristics and restoration of up to 100% of the historic extent of this forest type within the Refuge. Numerous definitions of late-successional or old growth forest exist and vary by location and dominant tree species. However, most definitions indicate four important structural components: number and minimum size of large live trees; canopy conditions; number and minimum size of snags; and number and size of downed large woody debris (LWD). Late-successional Sitka spruce-western hemlock forests provide nesting habitat, forage, and shelter to a variety of wildlife species including the bald eagle. Migratory landbirds (e.g., chestnut-backed chickadee, pileated woodpecker) use the conifer forests because of the presence of other birds and rodents, bark and wood-boring insects, and conifer seeds. This habitat will also benefit a diverse assemblage of other forest-dependent species (e.g., black-tailed deer, bobcat, Pacific giant salamander). Much of this habitat type has been removed from the Oregon coast due to extensive logging and development.

The Refuge currently contains 122 acres of Sitka spruce-western hemlock forest. The forested stands exist within the Schooner Creek Tract, Drift Creek area, Millport Slough North, and Erickson/Schaffer Easement. There are a number of large second-growth trees within these areas, but the presence of several very large and decayed stumps are evidence of past logging.

While this objective emphasizes allowing natural processes (e.g., windfall and natural regeneration in openings) to drive vegetative changes, additional techniques such as thinning, girdling, and falling will also be used to promote the development of late-successional characteristics. Thinning (girdling, falling) trees reduces competition for the resources needed for growth thus promoting larger DBH of late-successional Sitka spruce and western hemlock. Snags are also an important component of a late-successional forest and tree girdling (strip of bark removed from circumference of trunk) can be used to kill trees and create snags.

Maintenance measures, primarily invasive plant control, will be regularly implemented using appropriate IPM techniques including mechanical/physical, chemical, biological, and cultural means. Invasive plants compete with desired tree and shrub species, limit native vegetation production, and cause impacts to food, nesting, and cover for wildlife. Controlling and treating invasive species on a consistent basis will allow the Refuge to continue to provide quality habitat to improve fish and wildlife health and survival.

**2.4.2 Goal 2: Restore, enhance, protect, and maintain estuarine habitats characteristic of the North Pacific Coastal Ecosystem.**

<b>Objective 2.1 Enhance, protect, and maintain salt marsh</b>
Enhance, protect, and maintain 314 acres of salt marsh on Siletz Bay NWR for the benefit of migratory birds (e.g., mallard, American wigeon, bufflehead, green-winged teal, wood duck, Canada geese, savannah sparrow, great blue heron, northern harrier), salmonids (e.g., Chinook, cutthroat, coho), and diverse assemblage of other species (e.g., river otter, black-tailed deer) throughout the life of the CCP. Salt marsh is characterized by the following attributes: <ul style="list-style-type: none"> <li>• Diverse elevations ranging from about 3 feet below mean lower low water (MLLW) to 9 feet above MLLW for tidal flats and tidal marshes. Hydrological flows are affected by high flows in the rivers and tidal cycles</li> <li>• Low elevation areas are a mosaic of native species including salt grass and pickleweed</li> <li>• Upper elevation includes Lyngby’s sedge, slough sedge, tufted hairgrass, Pacific silverweed and occasional Henderson’s checkermallow</li> <li>• Interspersed tidal channels of different orders with LWD component</li> <li>• Lands completely submerged during high seasonal tidal cycles</li> <li>• No cordgrass species</li> </ul>
<b>Strategies Applied to Achieve Objective</b>
<b>Management Strategies:</b>
a. Utilize appropriate IPM techniques including mechanical/physical, chemical, biological, and cultural means (see IPM Appendix)
b. Outplant rare, native species (e.g., Henderson’s checkermallow) to increase native vegetation presence
c. Clean and disinfect clothing and boating equipment before and after entering salt marsh
d. Apply public outreach to inform public about invasive or exotic animal species introductions, transport, and control methods
<b>Monitoring Strategies (see also Objective 5.1 Survey):</b>
e. Monitor migratory birds (e.g., savannah sparrow, great blue heron, northern harrier), and other mammal species (e.g., river otter, black-tailed deer) populations to determine distribution and abundance
f. Monitor waterfowl to determine populations and habitat use
g. Monitor salt marsh to determine stop-over (feeding and loafing) and breeding habitat parameters for waterfowl
h. Monitor hydrological flows and tidal elevations/cycles to understand hydrological influence and parameters
i. Survey native plant species (salt grass, pickleweed, Lyngby’s sedge, slough sedge, tufted hairgrass, Pacific silverweed and Henderson’s checkermallow) to determine distribution and density
j. Monitor LWD to determine location and composition and vegetation response
k. Monitor salmonid and estuary-dependent fish to determine distribution, biological characteristics, and use of LWD installations
l. Monitor water quality to describe water quality parameters
m. Monitor composition and relative abundance of macro invertebrates to determine abundance and distribution

n. Monitor invasive plant (e.g., cordgrass, reed canarygrass, Himalayan blackberry) and animal species to determine distribution and abundance

o. Monitor sedimentation rates and vegetation response within the bay or salt marsh

p. Monitor public use programs (i.e., waterfowl hunting, fishing) to determine fish and wildlife impact and response

q. Work with partners to monitor environmental factors that are climate change related stressors (e.g., changes to hydrology, acidification, storm intensity, floods)

**Rationale:** The salt marshes at Siletz Bay NWR are functionally connected with mudflat habitat and riverine habitats and act as a transition zone between aquatic and terrestrial sites. These marshes provide shoreline stability against wave and wind erosion, reduce flood peaks, trap nutrients, sediment, and pollutants. Salt marshes are also good for sequestering carbon and, unlike freshwater wetlands, do not produce methane. Tidal wetlands are considered essential habitat for many marine and anadromous fish (including threatened coho salmon) and migratory birds. Salt marshes also provide food and nursery areas for numerous young fish, crabs, shrimp, clams, and other invertebrates. Migratory waterfowl such as mallard, American wigeon, northern pintail, bufflehead, and green-winged teal, and Canada geese use the Siletz Bay wetlands. Migratory waterfowl and shorebirds in turn provide an important prey base for the recently delisted bald eagle and the peregrine falcon. Slough sedge, tufted hairgrass, Pacific silverweed, and Henderson’s checkermallow are native salt marsh species and are often associated with unaltered estuarine habitat in Oregon.

The 314 acres of salt marsh at Siletz Bay NWR provide critical ecosystem services, especially considering the status of this habitat type in the state. In Oregon’s seventeen largest estuaries, tidal wetland acreage has declined considerably based on pre-settlement estimates. Fourteen of these estuaries have experienced tidal wetland decreases of 40 percent or more (Good 2000). Based on Scranton (2004) and Hawes et al. (2008), Brophy (2011) estimated 16,173 acres of tidal marsh statewide in the 1850s and by 2005 80% of those acres were no longer tidal marsh. As much as 90 percent of these losses have been for agricultural development and consist of diking and draining of salt marshes to convert them to pastures and crop-growing fields. Within the Siletz Bay estuary, the comparison of 1850s historic vegetation with recent vegetation mapping indicates a 47% loss of tidal marsh (ibid.).

If unaltered or restored to a more natural hydrologic state (i.e., characterized by sinuous, deeply-incised, and complex tidal channel networks; and the absence of alterations such as ditching, diking, tidegates, restrictive culverts, and roads), salt marsh habitat such as that located at Millport Slough will maintain itself with very little or no input from land managers. Outplanting of rare, native species, such as Henderson’s checkermallow, on refuge lands is needed to reestablish a healthy population since this species is nearly absent at Siletz Bay.

Invasive species degrade habitats that support a diverse community of estuarine organisms including aquatic migratory birds and anadromous fish, and the invertebrate and plant communities that support them. For example, the widespread colonization by cordgrass, which is not currently present on the Refuge, would induce major modifications of physical, hydrological, chemical, and biological estuarine functions. Cordgrass displaces eelgrass on mudflats and native vegetation in salt marshes. This invasive plant must be controlled using IPM techniques including mechanical/physical, chemical, biological, and cultural means.

Introduced native and non-native animal species in salt marshes (New Zealand mudsnail, nutria) are usually in direct competition with native wildlife species for food, shelter, and breeding areas and often cause existing native species populations to decline or become extirpated. Ultimately, animal invasive species can result in considerable impact to native wildlife and the habitat they are dependent upon. Limiting invasive and exotic animal species will provide improved quality habitat and wildlife health and survival. Actions will be taken to reduce competition between native and non-native animal species.

Monitoring sedimentation rates and vegetation response within the bay and salt marsh is important to the understanding of the potential resilience of these habitats to sea level rise, storm surges and flood events.

**Objective 2.2 Protect and maintain intertidal mudflats**

Protect and maintain 0.8 acre of intertidal mudflats on Siletz Bay NWR for the benefit of migratory birds (e.g., American wigeon, mallard, great blue heron, peregrine falcon, salmonids (e.g., Chinook, cutthroat, coho), shellfish (e.g., ghost shrimp, benthic worms, native clams), and a diverse assemblage of intertidal mudflat species (e.g., river otter) throughout the life of the CCP. Shorebirds common in the Pacific Flyway system that utilize mudflats include least and western sandpiper, dunlin, short and long-billed dowitcher, greater yellowlegs, black-bellied plover, red-necked phalarope, whimbrel, long-billed curlew, and black turnstone. Intertidal mudflats are characterized by the following attributes:

- Diverse elevations ranging from about 3 feet below MLLW to about 4 feet MLLW that is completely inundated during two daily tidal cycles
- Sandy/muddy substrate that is sparsely vegetated by widgeon grass and seasonal algae blooms
- Presence of LWD
- Presence of biofilm on muddy substrate
- No Japanese eelgrass
- No cordgrass species

**Strategies Applied to Achieve Objective**

**Management Strategies:**

- a. Utilize appropriate IPM techniques including mechanical/physical, chemical, biological, and cultural means (see IPM Appendix)
- b. Work with Oregon Department of State Lands to cooperatively manage resources, treat/monitor invasive species

**Monitoring Strategies (see also Objective 5.1 Survey):**

- c. Monitor migratory birds (e.g., American wigeon, mallard, great blue heron, peregrine falcon, western sandpiper, short-billed dowitcher), salmonids (e.g., Chinook, cutthroat, coho), shellfish (e.g., sand shrimp, benthic worms, native clams), and mammal species (e.g., river otter) to determine populations, biological characteristics, and use of intertidal mudflats
- d. Monitor invasive plant species (e.g., Japanese eelgrass, cordgrass) to determine percent cover and location
- e. Monitor shorebirds to determine distribution, populations, and habitat use
- f. Monitor habitat parameters to determine stop-over feeding and loafing habitat quality for shorebirds

- g. Monitor composition and relative abundance of macro invertebrates to determine abundance and distribution
- h. Monitor/survey biofilm/algae to determine abundance and composition
- i. Monitor sedimentation rates and vegetation response within the bay or intertidal mudflats
- j. Monitor water quality on the Refuge to ensure contaminant levels are not exceeded and aquatic resources are protected
- k. Monitor LWD to determine rate of deposition
- l. Work with partners to monitor environmental factors that are climate change related stressors (e.g., changes to hydrology and salinity)

**Rationale:** The 0.8 acre of intertidal mudflats are functionally connected with salt marsh and riverine habitats, which contain a rich invertebrate community that supports diversity of native fishes, shorebirds, and waterfowl. Algae and diatoms are the principal plant types; vascular plants are rare or absent. Invertebrates such as snails, shrimp, clams, worms, and crabs are locally common or abundant. The most common and important non-fish species occupying the mudflats include Dungeness crab, softshell clams, and sand shrimp. Waders such as great blue heron and great egret, and shorebirds such as least and western sandpiper, dunlin, short and long-billed dowitcher, greater yellowlegs, black-bellied plover, and whimbrel make extensive use of the mudflats for foraging on macro-invertebrates and in some cases biofilm. Dabbling ducks, diving ducks, gulls, peregrine falcons, and bald eagles also forage there. Harbor seals forage on inundated mudflats at high tide and in the lower bay, or they haul out on the flats and spit to rest. LWD provides perch sites for migratory birds including raptors and waders.

Intertidal mudflats tend to maintain their integrity naturally, and managers typically need to conduct very little active management. As a result, to accomplish this objective, the Refuge primarily needs to pursue invasive species control. Invasive species such as Japanese eelgrass and cordgrass are of primary concern; their impacts are discussed in the rationale section for Objective 2.1.

Actions will be taken to reduce competition between native and non-native vegetation species. These invasive plants must be controlled using IPM techniques including mechanical/physical, chemical, biological, and cultural means. Since land owned by the state is adjacent to refuge lands, we will work cooperatively with the State of Oregon to control invasives. Eradication efforts will be attempted on an annual basis on properties within Siletz Bay to remove and prevent further spread of invasive species.

Sedimentation is a natural event that occurs in bays and estuaries and can alter plant communities and hydrology. The rate of sedimentation should be monitored and the habitat changes due to sedimentation documented. Monitoring sedimentation rates and vegetation response for intertidal mudflats is important to the understanding of the potential resilience of this habitat type to sea level rise, storm surges, and flood events.

**Objective 2.3 Protect and maintain muted tidal marsh until restored to salt marsh**

Protect and maintain 111 acres of muted (restricted) tidal marsh until additional lands are acquired within the approved refuge boundary from willing sellers to facilitate eventual full tidal restoration. Restored tidal marshes will benefit migratory birds (e.g., marsh wren, common yellowthroat, mallard, great blue heron) and salmonids (e.g., coastal cutthroat, coho). Restored

<p>tidal marsh is characterized by the following attributes (see also Objective 2.2):</p> <ul style="list-style-type: none"> <li>• Presence of native plant species such as slough sedge and Pacific silverweed</li> <li>• Non-limited fish passage</li> <li>• &lt;5% cover of invasive/undesirable plants (Himalayan blackberry, reed canarygrass, Scotch broom)</li> <li>• No cordgrass species</li> </ul>
<p><b>Strategies Applied to Achieve Objective</b></p>
<p><b>Management Strategies:</b></p>
<p>a. Work with private landowners and partners to acquire lands within the authorized refuge boundary from willing sellers to facilitate eventual full tidal restoration</p>
<p>b. Work with ODOT and ODFW to repair/replace culverts to achieve normal tidal function</p>
<p>c. Investigate restoration potential of Siletz Keys, Alder Island (Schoen Tract) and any additional diked lands acquired. If feasible, restore tidal flows and tidal marsh function</p>
<p>d. Utilize appropriate IPM techniques including mechanical/physical, chemical, biological, and cultural means (see IPM Appendix)</p>
<p><b>Monitoring Strategies (see also Objective 5.1 Survey):</b></p>
<p>e. Monitor salmonids (e.g., coastal cutthroat, coho) and other fish species to determine presence/absence, distribution, and use of the area</p>
<p>f. Monitor resident and migratory birds (e.g., marsh wren, common yellowthroat, mallard, great blue heron) to determine distribution and abundance</p>
<p>g. Monitor native vegetation (e.g., slough sedge and Pacific silverweed) within the restored area to determine plant growth rates and species composition</p>
<p>h. Monitor invasive plant species (e.g., reed canarygrass, Himalayan blackberry, Scotch broom, <i>Spartina</i>) to determine infestation extent and location</p>
<p><b>Rationale:</b> Muted tidal marshes are areas of diked tidal marsh that receive partial or restricted water flows and are only partially inundated with salt water. Breached dikes and restrictive culverts or failed tidegates allow tidal exchange but flows are reduced and water circulation limited. Even though tidal influence and action is limited, these areas support a diverse plant community characteristic of tidal marsh and have slightly more freshwater-influenced vegetation (Brophy 2002).</p> <p>Our objective is to eventually restore 111 acres of muted or restricted tidal marsh to full tidal action; however, restoration is contingent upon acquiring private lands from willing sellers within the authorized refuge boundary. Full restoration is beyond the scope of the CCP at this time because of ownership issues within the approved refuge boundary.</p> <p>In the interim, native vegetation will be maintained and invasive plant species controlled using appropriate IPM techniques including mechanical/physical, chemical, biological, and cultural means. Salmonids common in the Siletz system including Chinook salmon, coho salmon (a threatened species), steelhead, and cutthroat trout currently utilize the muted tidal wetlands. These species will greatly benefit from full restoration of the tidal flows. In the interim, restrictive culverts will be replaced or removed where possible to improve fish passage. USFWS will work with ODOT and ODFW on replacement projects on and adjacent to the Refuge.</p>

### 2.4.3 Goal 3: Protect and maintain forested wetlands and stream-riparian habitat characteristic of the North Pacific Coastal Ecosystem.

<p><b>Objective 3.1 Protect and maintain wet-mesic Sitka spruce-western hemlock forest</b></p> <p>Protect and maintain 18 acres of wet-mesic Sitka spruce-western hemlock forest on Siletz Bay NWR and adjacent riparian habitat throughout the life of the CCP for the benefit of migratory landbird (e.g., chestnut-backed chickadee, pileated woodpecker, Wilson’s warbler) and a diverse assemblage of other forest-dependent species (e.g., black-tailed deer, bobcat, northwestern salamander). The desired attributes of wet-mesic Sitka spruce-western hemlock forest are the following (based on Brophy 2009, Brophy et al. 2011, Brophy and van de Wetering 2012, NatureServe 2012):</p> <ul style="list-style-type: none"> <li>• Periodic freshwater tidal and/or seasonal riparian flooding</li> <li>• Flat topography with local microrelief caused by logs, stumps, and buttressed roots of spruce trees</li> <li>• High organic content of soils (&gt;20% organic matter)</li> <li>• Woody vegetation dominated by native trees and shrubs (e.g., Sitka spruce, red alder, Hooker willow, Sitka willow, twinberry, Pacific crabapple). Dominant herbaceous species include slough sedge and skunk cabbage with non-wetland species (e.g., salal, huckleberry) growing on fallen logs or spruce root platforms</li> <li>• &lt;5% cover of invasive plants (e.g., blackberry, gorse, Scotch broom)</li> <li>• No English ivy</li> </ul>
<p><b>Strategies Applied to Achieve Objective</b></p>
<p><b>Management Strategies:</b></p> <p>a. Utilize appropriate IPM techniques including mechanical/physical, chemical, biological, and cultural means (see IPM Appendix)</p>
<p><b>Monitoring Strategies (see also Objective 5.1 Survey):</b></p> <p>b. Monitor migratory landbird (e.g., chestnut-backed chickadee, pileated woodpecker, Wilson’s warbler) and other forest-dependent species (e.g., black-tailed deer, bobcat, northwestern salamander) population and use</p> <p>c. Monitor plant community composition (i.e., percent cover of trees, shrubs, ferns, and herbaceous species)</p> <p>d. Determine woody species stem density and basal area</p> <p>e. Monitor salmonids and other fish to determine use and distribution</p> <p>f. Monitor invasive plant species (e.g., Himalayan blackberry, Scotch broom, reed canarygrass, English ivy) to determine abundance and distribution</p> <p>g. Monitor hydrology to determine beaver effects on water flow</p>
<p><b>Rationale:</b> For the purposes of this CCP, wet-mesic Sitka spruce-western hemlock forests are defined as woody habitats that consist of valley forested wetlands and riparian forest along rivers, salt marsh, or mudflats (e.g., National Vegetation Classification Standard <i>Tsuga heterophylla</i> - <i>Picea sitchensis</i>/<i>Lysichiton americanus</i> Hardwood-Conifer Rich Swamp Group, NatureServe 2012). Riparian and wetland forests are highly variable in their composition, size, and structure. Periodic freshwater tidal and/or seasonal riparian flooding are the major natural processes that drive this system. Soils are perennially wet, usually with high organic content. Historically, many of the areas located in the lower brackish (mesohaline to oligohaline) and freshwater tidal zones of Oregon’s estuaries were likely Sitka spruce and/or shrub tidal swamp. Tidal swamps were also found on the margins of the marine salinity zone where freshwater dilutes ocean water, such as</p>

along tributary streams, on high natural levees, and in hillslope seepage zones.

Sitka spruce is the dominant tree species of this forest type. Early seral stage deciduous trees, such as red alder, typically make up younger forests or frequently disturbed areas along stream bottom lands. Most riparian forests have been impacted directly and indirectly by adjacent timber harvests and road construction. Harvest of large-diameter trees, and removal of adjacent forests, have created increases in sediment input and loss of LWD. Dike construction, land clearing for agricultural purposes, and urbanization has reduced the amount of coastal forested wetlands.

The 18 acres of wet-mesic Sitka spruce-western hemlock (lowland riparian) forest are found on the Refuge adjacent to the Millport Slough tidal marshes, around the perimeter of Alder Island, and by Siletz Keys. Migratory landbirds (e.g., chestnut-backed chickadee, pileated woodpecker, Wilson's warbler) and a diverse assemblage of other forest-dependent species are present and use the surrounding habitat for hunting, foraging, and resting. This area also provides off-river habitat for salmonids during high waters, including the threatened coho salmon.

Invasive plant species such as Himalayan blackberry and English ivy present challenges. Himalayan blackberry readily invades riparian areas, forest edges, oak woodlands, meadows, roadsides, clear-cuts, and any other relatively open area, including all open forest types. Once it becomes well established, it out competes low stature native vegetation and can prevent establishment of shade intolerant trees, leading to the formation of apparently permanent blackberry thickets with little other vegetation present. Invasive species treatment has been initiated on the Himalayan blackberry that infests much of the refuge uplands, roadsides, and trail edges. English ivy is a vigorous growing vine that impacts all levels of disturbed and undisturbed forested areas, growing both as a ground cover and a climbing vine. As the ivy climbs in search of increased light, it engulfs and kills branches by blocking light from reaching the host tree's leaves. Due to lack of funding and staff, efforts to date have been sporadic and not sufficient to halt the spread of these species on the Refuge.

#### **2.4.4 Goal 4: Enhance, protect, and maintain instream aquatic habitat for all dependent species including anadromous and estuary-dependent fish.**

##### **Objective 4.1 Enhance, protect, and maintain instream aquatic habitat**

Enhance, protect, and maintain instream aquatic habitat within the Refuge throughout the life of the CCP for anadromous fish and other estuary-dependent fish common in the Siletz River estuary and refuge tributaries including fall Chinook salmon, chum salmon, coho salmon, summer and winter steelhead, and cutthroat trout. Instream aquatic habitat is characterized by the following attributes:

- Instream and estuary channel presence of woody and organic debris
- Meandering estuary channels and fresh water creeks (e.g., complex and braided) with unimpeded fish access
- Water quality that will meet life-history needs for salmonids (e.g., water temperature 12.8°-17.8°C, dissolved oxygen levels >7.0 mg/l)
- Instream substrate (spawning gravel), <5% cover, pool/riffle ratio suitable for cutthroat trout
- <1% non-native or invasive fish (e.g., smallmouth bass, bluegill) and plants

<b>Strategies Applied to Achieve Objective</b>
<b>Management Strategies:</b>
a. Installation of LWD (i.e., logs and root wads) in stream channels to promote diverse hydrological and physical structure
b. Provide spawning (cutthroat trout) and rearing habitat (salmon)
c. Plant and maintain stream side vegetative cover to reduce water temperatures
d. Work cooperatively with ODFW and adjacent landowners to address fish passage and water quality issues
e. Coordinate with ODFW, USFS, and other partners to implement Siletz Bay component of ODFW coho and multi-species conservation plans, particularly the physical habitat restoration actions listed in the Oregon Coast Coho Conservation Plan ( <a href="http://www.dfw.state.or.us/fish/CRP/docs/coastal_coho/final/Coho_Plan.pdf">http://www.dfw.state.or.us/fish/CRP/docs/coastal_coho/final/Coho_Plan.pdf</a> )
f. Work cooperatively with ODFW and USFWS Fisheries Program to understand, monitor, and control non-native invasive fish (e.g., smallmouth bass, bluegill, bullhead) that are competitive with native fishes
g. Work cooperatively with researchers to inventory, monitor, determine species composition and richness of estuary and instream invertebrate community
<b>Monitoring Strategies (see also Objective 5.1 Survey):</b>
h. Monitor salmonids to determine distribution, biological characteristics, and use of LWD installations
i. Monitor water quality (e.g., temperature, turbidity, dissolve oxygen, pH, toxins, nutrients, organic loading, dissolved and suspended solids) to detect presence of off-site contaminants (point and non-point sources)
j. Monitor estuary and instream benthic invertebrates to determine species composition, diversity and abundance
k. Monitor riparian and estuary invasive plant and animal species to determine infestation, abundance, and distribution
<p><b>Rationale:</b> Protection and enhancement of aquatic habitat is important to anadromous and estuary-dependent fish species. The Siletz River watershed is a productive fishery resource for the state of Oregon. Salmonids common in the Siletz system include spring and fall Chinook salmon, chum salmon, coho salmon (threatened species), summer and winter steelhead, and coastal cutthroat trout.</p> <p>Threats currently facing salmonids and other estuary-dependent fish include the present or threatened destruction, modification, or curtailment of habitat or range. In many Oregon coastal streams, past human activities (e.g., logging, agriculture, gravel mining, urbanization) have resulted in impediments to fish passage, degradation of stream complexity, increased sedimentation, reduced water quality and quantity, loss and degradation of riparian habitats, and loss and degradation of lowland, estuarine, and wetland salmonid rearing habitats. Most anadromous fish species in the Pacific Northwest have been in decline for decades. Spring Chinook salmon, coho salmon, chum salmon, and coastal cutthroat trout all have depressed populations. Coho salmon on the Oregon Coast are listed as “Threatened” on the federal Threatened and Endangered Species List.</p> <p>Conserving and restoring salmonid populations is an important goal, not only for their own sake,</p>

but also because of their cultural, historical, and ecological value. Salmonids are an important food source for numerous other wildlife species. Sixty-seven wildlife species of the Pacific Northwest, including many known to inhabit the Refuge, have been known to have a “strong” or “recurrent” relationship with salmon (Cederholm et al. 2000). For a full list of benefitting species, see Appendix E, Biological Resources of Concern.

For successful production, juvenile salmonids that live at the edges of streams or in backwater areas depend on the presence of streambank vegetation and abundant instream structure created by logs and root wads, as well as adequate water quality. LWD has been placed at the Millport Slough restoration and reference sites to provide cover and to increase channel diversity quality, which improves health and survival of estuary-dependent and juvenile salmonids.

To control invasive non-native fish (e.g., largemouth bass, bluegill) the Refuge will work cooperatively with ODFW and other fisheries biologists to detect the presence of and remove and control these species to reduce competition between native and non-native fish species. Invasive plant species have been noted on the Refuge; however, very limited control efforts have been conducted and these species may be continuing to invade and spread through refuge aquatic habitat. Limiting invasive species will provide quality forage to improve fish health and survival. Invasive species will be controlled using appropriate IPM techniques including mechanical/physical, chemical, biological, and cultural means to prevent them from competing with desired native species.

**2.4.5 Goal 5: Research and monitoring. Gather scientific information (surveys, research, and assessments) to support adaptive management decisions.**

**Objective 5.1 Conduct inventory and monitoring surveys**

Throughout the life of the CCP, conduct high-priority inventory and monitoring (survey) activities that evaluate resource management and public-use activities to facilitate adaptive management. These surveys contribute to the enhancement, protection, use, preservation, and management of wildlife populations and their habitats on- and off-refuge lands. Specifically, they can be used to evaluate achievement of resource management objectives identified under Goals 1 through 4 in CCP. These surveys have the following attributes:

- Data collection techniques will have minimal animal mortality or disturbance and minimal habitat destruction
- Minimum number of samples (e.g., water, soils, vegetative litter, plants, macroinvertebrates, vertebrates) to meet statistical analysis requirements will be collected for identification and/or experimentation in order to minimize long-term or cumulative impacts
- Proper cleaning of investigator equipment and clothing as well as quarantine methods, where necessary, will minimize the potential spread or introduction of invasive species
- Projects will adhere to scientifically defensible protocols for data collection, where available and applicable

**Strategies Applied to Achieve Objective**

a. Prepare inventory and monitoring plan

b. Early detection and rapid response monitoring to identify new or spreading invasive plant and

animal problems
c. Collect data and samples of fish, wildlife, and habitat parameters to determine overall health of the Refuge
d. Utilize scientific survey protocols for data collection to ensure quality results
e. Utilize most recent and up-to-date survey equipment to ensure reliable data are collected
f. Implement management strategies as needed as identified by survey data to maintain biological integrity, diversity, and environmental health
g. Monitor invasive/nuisance plant and animal species in mudflats, salt marsh, freshwater wetlands, uplands, and forested habitats to determine distribution and infestation
h. Monitor forest diseases and pests to determine presence and extent
i. Monitor salmonids to determine distribution, biological characteristics, and use of LWD
j. Monitor mammals, migratory landbirds, shorebirds, waterfowl, insects, and amphibians to determine populations, distributions, and habitat use
k. Conduct long-term hydrological, biological, and physical monitoring to determine effectiveness of salt marsh restoration projects
l. Monitor water quality returning to river and bay to determine pollution levels
m. Conduct periodic soil testing to maintain optimal pH levels and soil condition
n. Monitor habitat parameters including vegetation associated with respective habitat types to determine health of ecosystem
o. Monitor sedimentation rates and vegetation response within the bay or salt marsh
p. Monitor public use programs (i.e., waterfowl hunting) to determine waterfowl impact and response
q. Monitor Sitka spruce and western hemlock to determine growth rate, density, canopy cover and DBH
r. Monitor a mosaic of native shrubs (e.g., salmonberry, huckleberry, salal, wax myrtle), ferns, and herbaceous species (e.g., sedges) to determine understory cover
s. Monitor snags to determine density
t. Monitor existing and planted trees and shrubs to determine survival rate
u. Monitor tree density and thinning efforts to determine areas that need attention
v. Monitor/survey biofilm/algae to determine abundance and composition
w. Monitor hydrological parameters (e.g., flow regime—timing and magnitude) and associated physical attributes (e.g., water temperature, dissolved oxygen levels) to determine if parameters are within water quality standards
x. Monitor hydrology to determine beaver effects on water flow
y. Monitor hydrological flows and tidal elevations/cycles to understand hydrological influence and parameters
z. Monitor wetland native vegetation to determine species composition
aa. Monitor vegetation and wildlife to determine response to IPM techniques
<b>Rationale:</b> National Wildlife Refuge System Administration Act of 1966, as amended (16 U.S.C. 668dd-ee) set a requirement to "... monitor the status and trends of fish, wildlife, and plants in each refuge." Surveys will be used primarily to evaluate resource response to assess progress toward achieving refuge management objectives (under Goals 1 through 4 in this CCP) derived from the NWRs Mission, refuge purpose(s), and maintenance of biological integrity, diversity, and

environmental health (601 FW 3).

Determining resource status and evaluating progress toward achieving objectives is essential to implementing adaptive management on Department of Interior lands as required by policy (522 DM 1). Specifically, results of surveys will be used to refine management strategies, where necessary, over time in order to achieve resource objectives. Surveys will provide the best available scientific information to promote transparent decision-making processes for resource management over time on refuge lands.

The Service will provide staff to adequately address biological complexity of the Refuge with the goal of hiring an additional Permanent Full Time (PFT) Wildlife Biologist. Currently, the Complex has only one PFT Wildlife Biologist. The Wildlife Biologist will design and implement scientific studies.

**Objective 5.2 Conduct research**

Throughout the life of the CCP, conduct high-priority research projects that provide the best science for habitat and wildlife management on- and off-Refuge. Scientific findings gained through these projects will expand knowledge regarding life-history needs of species and species groups as well as identify or refine habitat and wildlife management actions. Wildlife and habitat responses to refuge management actions will be monitored through research projects, and as a result, resource management objectives and adaptive management will be facilitated to achieve desired outcomes. These research projects have the following attributes:

- Adhere to scientifically defensible protocols for data collection, where available and applicable, in order to develop the best science for resource management
- Data collection techniques will have minimal animal mortality or disturbance and minimal habitat destruction
- Collect the minimum number of samples (e.g., water, soils, vegetative litter, plants, macroinvertebrates, vertebrates) to meet statistical analysis requirements for identification and/or experimentation in order to minimize long-term or cumulative impacts
- Utilize proper cleaning of investigator equipment and clothing as well as quarantine methods, where necessary, to minimize the potential spread or introduction of invasive species
- Often result in peer reviewed articles in scientific journals and publications and/or symposiums

**Strategies Applied to Achieve Objective**

a. Identify and articulate priority management-oriented research needs to a wide scientific audience

b. Collect data and samples of fish, wildlife, and habitat parameters to meet statistical analysis requirements

c. Utilize scientific survey protocols for data collection to ensure quality results

d. Utilize most recent and up-to-date survey equipment to ensure reliable data are collected

e. Quarantine or clean investigator equipment and clothing to prevent spread of invasive plant and animals

f. Conduct research on salt marshes to determine accretion and subsidence rates

g. Conduct research on the potential effects of climate change and sea level rise on salt marshes

**Rationale:** Like monitoring, results of research projects will expand the best available scientific

information and potentially reduce uncertainties to promote transparent decision-making processes for resource management over time on refuge lands. In combination with results of surveys, research will promote adaptive management on refuge lands. Scientific publications resulting from research on refuge lands will help increase the visibility of the NWRS as a leader in the development of the best science for resource conservation and management.

Research projects on refuge lands will address a wide range of natural and cultural resource as well as public-use management issues. Examples of management-oriented research projects include habitat use and life-history requirements for specific species/species groups, practical methods for habitat management and restoration, extent and severity of environmental contaminants, techniques to control or eradicate pest species, effects of climate change on environmental conditions and associated habitat/wildlife response, identification and analyses of paleontological specimens, modeling of wildlife populations, and assessing response of habitat/wildlife to disturbance from public uses. Projects may be species-specific, refuge-specific, or may evaluate the relative contribution of the Refuge to larger landscape (e.g., ecoregion, region, flyway, national, international) issues and trends.

The findings from two ongoing projects may elicit new fields of inquiry and research, and influence priorities for inventory and monitoring on the Refuge. The Refuge will monitor the results of coastal and marine species climate sensitivity analyses (in progress, Dr. Deborah Reusser, USGS, lead researcher, funded by the North Pacific Landscape Conservation Cooperative) and a North Pacific birds sensitivity analysis (in progress, PRBO-Conservation Science, funded by the North Pacific Landscape Conservation Cooperative).

**Objective 5.3 Conduct scientific assessments**

Throughout the life of the CCP, conduct scientific assessments to provide baseline information that will expand our knowledge regarding the status of refuge resources and better inform resource management decisions. The scientific assessments will contribute to the development of refuge resource objectives and they will also be used to facilitate habitat restoration through selection of appropriate habitat management strategies based upon site-specific conditions.

- Utilize accepted standards, where available, for completion of assessments
- Scale and accuracy of assessments will appropriate for development and implementation of refuge habitat and wildlife management actions

**Strategies Applied to Achieve Objective**

- a. Utilize scientific assessment results to implement management strategies to benefit ecosystems
- b. Complete water resource assessment for the Refuge – Division of Engineering, Water Resources Branch
- c. Develop a National Vegetation Classification Standard vegetation data layer for use in GIS
- d. Conduct baseline assessment of water chemistry and monitor changes over time to determine acidification rate

**Rationale:** In accordance with the Service policy for implementing adaptive management on refuge lands (522 DM 1), appropriate and applicable environmental assessments are necessary to determine resource status, promote learning, and evaluate progress toward achieving objectives whenever using adaptive management. These assessments will provide fundamental information about biotic (e.g., vegetation data layer) as well as abiotic processes and conditions (e.g., soils, topography, hydrology) that are necessary to ensure that implementation of on-the-ground resource management achieve resource management objectives identified under Goals 1 through 4. For example, a baseline estuary water chemistry analysis is lacking and needed to monitor the long-term potential effects of ocean acidification, a high risk to refuge resources.

**2.4.6 Goal 6: Provide opportunities for people of all ages to observe, photograph, and learn about waterfowl, waterbirds, and other estuarine wildlife of the Pacific Coast and increase their interest in and connection with nature.**

**Objective 6.1 Provide high quality wildlife observation and wildlife/nature photography opportunities at Siletz Bay NWR**

Throughout the life of the CCP, provide visitors of all ages and different abilities with a variety of safe and accessible opportunities at Siletz Bay to successfully observe or photograph wildlife while limiting the impacts of wildlife and habitat disturbance. Quality wildlife observation and wildlife/nature photography programs at Siletz Bay are defined by several elements including:

- Focus on major wildlife species and groups of wildlife species, including estuarine birds and fish.
- Emphasize activities on a year-round basis
- Satisfy a range of skill sets, from casual and beginning observers/photographers to more advanced observers/photographers.

**Strategies Applied to Achieve Objective**

- a. Allow wildlife observation and photography on Alder Island by creating an Architectural Barriers Act (ABA) accessible loop trail
- b. Develop a parking lot on the old Highway 101 spur road to provide visitors with walk-in access to Alder Island
- c. Work with refuge volunteers and other partners e.g., Lincoln City Audubon Society and Oregon Youth Authority to improve and maintain trail on Alder Island
- d. Work with refuge volunteers and other partners to offer guided wildlife observation and photography hikes and programs
- e. Provide signs and brochures that promote appropriate self-guided use of Alder Island trail
- f. Develop a bird checklist for the Siletz Bay
- g. Build a viewing platform off of the old Highway 101 spur road in conjunction with parking lot and non-motorized boat launch
- h. Allow unrestricted walking on refuge lands west of Highway 101 for the purpose of observing and photographing wildlife

**Rationale:** Wildlife and nature photography promote public understanding and appreciation for the Refuge’s natural resources. The Service will allow wildlife observation and photography on or from Alder Island and on refuge lands west of Highway 101. To facilitate wildlife observation and photography on Alder Island, the Service will provide infrastructure including development of a

non-motorized boat launch, a parking lot, and a trail that is accessible for people of all abilities. The parking lot will be located along the former Highway 101 spur road and will be designed to provide safe access to Alder Island from Highway 101. This location has been selected to be enhanced for wildlife observation, photography, and interpretation based on a variety of factors including the ability for the Refuge to provide safe access from Highway 101 and the topography of the island, which lends itself to designs that minimize wildlife disturbance. The island contains habitat that is used by an assortment of birds and mammals and will provide a reliable wildlife observation and photography opportunity for visitors.

The loop trail will traverse along the existing dike that surrounds Alder Island. It will provide visitors with a designated route of travel, which will provide protection for sensitive resources through proper routing and construction techniques. The trail will be open to these wildlife-dependent recreational activities year-round during daylight hours only. Wildlife observation and photography will largely be self-guided and will be restricted to the Alder Island Nature Trail and the parking lot.

The Service will also open refuge lands west of Highway 101 unstructured wildlife observation and photography year-round (Figure 2-1). These lands consist of 97 acres of salt marsh where the Siletz River empties into the bay near the development of Siletz Keys and near the mouth of Drift Creek. The Service will not provide infrastructure on these lands to enhance these public uses, and visitors using the area will be advised to use caution since no parking on the west side of Highway 101 will be provided.

**Objective 6.2 Provide high-quality interpretive opportunities at Siletz Bay NWR.**

Throughout the life of the CCP, provide visitors with opportunities for self-guided and refuge-led interpretation at Siletz Bay NWR. A high-quality interpretive program should:

- Engage people of all ages and abilities
- Emphasize learning about estuarine wildlife, tidal marsh restoration, and invasive species
- Emphasize non-guided activities but also periodic guided programs

**Strategies Applied to Achieve Objective**

- a. Offer a minimum of 10 interpretive led paddle trips annually
- b. Provide interpretive panels with an estuarine habitat based theme along the Alder Island Trail
- c. Build a non-motorized boat launch along the old Highway 101 spur road to provide visitors with safe access to Millport Slough
- d. Hire a permanent, full-time refuge volunteer coordinator
- e. Hire a permanent, full-time north coast refuge manager

**Rationale:** Opening the Refuge to public use will allow the Service to offer interpretive programs and opportunities to a varied and interested audience. Siletz Bay NWR is close to Lincoln City, a coastal city that is popular with tourists in the spring and summer. Development of an ABA-accessible interpretive loop trail surrounding Alder Island will provide the public with an opportunity to learn about wildlife, especially salmonids, that use and in many cases depend on estuaries. In addition it will provide the Service with an opportunity to teach people about invasive species that threaten wildlife and habitat. Once visitors learn about wildlife and the threats they face, visitors will be able to act with greater understanding to maximize their role in preventing the spread of invasive species.

Because so much of Siletz Bay NWR is tidally influenced, one of the best ways for visitors to

experience refuge resources is via the navigable waters that flow through or adjacent to the Refuge including Millport Slough, the Siletz River, and No Name Slough. Although these waters are not refuge-owned and can be accessed by anyone at any time, the Refuge has offered seasonal, guided interpretive trips on these waterways via canoe/kayak since 2005. The Refuge will continue to offer this program during the 15-year timeframe of the CCP.

Currently, along the Siletz River a private moorage is used to launch both motorized and non-motorized boats to access the Siletz River, the open bay or Millport Slough for the purpose of fishing, wildlife observation, and relaxation. To provide visitors with a different perspective and/or refuge-related recreation, the Service will develop a non-motorized boat launch along the old Highway 101 spur road on the east side of U.S. Highway 101. The Refuge will also provide information on paddle routes as well as wildlife and habitat viewing that can be experienced during the trip. The availability of this new boat launch and the associated interpretive materials will allow visitors who do not own a motorized boat to more readily access these waters and come to a greater understanding about the use of the area by wildlife. The launch will be open during daylight hours on a year-round basis. Use is expected to be heaviest from May through September when the weather is more conducive to non-motorized boat use (e.g., calmer winds, warmer air temperatures, less water chop).

**2.4.7 Goal 7: Provide and manage safe, enjoyable, and quality waterfowl hunting and fishing opportunities in Siletz Bay for people of varying ages and resources that further the tradition of wildlife conservation and stewardship.**

**Objective 7.1 Provide opportunities for quality waterfowl hunting at Siletz Bay NWR**

Throughout the life of the CCP, provide an opportunity for waterfowl hunters of all ages and abilities to hunt geese, coots, and a variety of dabbling and diving ducks on 199 acres while minimizing impacts to other wildlife, and other recreational users. Provide a quality, safe waterfowl hunt program that:

- Place a priority on safety
- Include clear and concise regulations and makes them readily available
- Pose minimal conflict with wildlife and habitat objectives
- Pose minimal conflict with other priority public use activities
- Pose minimal conflict with neighboring lands

**Strategies Applied to Achieve Objective**

- a. Prepare waterfowl hunt plan and opening package
- b. Allow hunting on refuge lands west of Highway 101 in Siletz Bay seven days a week according to ODFW regulations
- c. Allow hunters to access refuge lands open to hunting via boat or foot
- d. Establish a 100-yard no-hunting zone to prohibit waterfowl hunting on refuge property that extends westward from the refuge property line on the west side of the housing development of Siletz Keys
- e. Allow hunting on refuge lands south of Millport Slough three days per week
- f. Develop an informational tear sheet on the rules and regulations of waterfowl hunting in Siletz Bay
- g. Improve the graveled parking lot along Millport Slough road to provide hunters with walk-in

access

h. Develop an informational kiosk and place at Millport Slough parking lot to convey refuge rules and regulations regarding waterfowl hunting

i. Conduct law enforcement patrols on a regular basis to ensure compliance with state and federal waterfowl hunting regulations

**Rationale:** Hunting is identified as a priority public use by the NWRS Improvement Act because it promotes appreciation for and conservation of natural resources. The Service will allow the hunting of waterfowl, defined here as ducks, geese, and coots on portions of Siletz Bay NWR. Hunting will be permitted in accordance with State and Federal regulations and seasons.

There is a demand for public hunting around Siletz Bay, especially in areas that have walk-in access and do not require the use of a boat. During the public scoping process there were many requests to allow waterfowl hunting on refuge lands both west and east of Highway 101. Opening the Refuge to waterfowl hunting and providing walk-in opportunities, at both Millport Slough and on refuge lands west of Highway 101, will enhance and slightly increase waterfowl hunting opportunities in the area. Lands west of Highway 101 get the most use by waterfowl, and since the state tidelands adjacent to the Refuge are already hunted, opening the Refuge will effectively expand this hunting area and therefore will likely provide the highest quality waterfowl hunting opportunity on the Refuge.

The Service will allow waterfowl hunting seven days per week on 87 acres of refuge-owned lands that are west of Highway 101 (Figure 2-1). These lands consist of salt marsh where the Siletz River empties into the bay near the development of Siletz Keys and uplands and wetlands at the mouth of Drift Creek. Waterfowl hunting has occurred on the state-owned tidelands of Siletz Bay west of U.S. Highway 101 for many decades. The tidelands are managed by the Department of State Lands and are legally open to hunting so long as the hunter remains 200 yards or more from the shoreline/road. However, refuge-owned lands west of U.S. Highway 101 in Siletz Bay have been closed to waterfowl hunting since the Refuge was established in 1991. Though it has been surveyed, the seaward boundary of the tidal marsh near Siletz Keys has not been posted with official refuge boundary signs due to the difficulty in keeping posts upright and intact in the marsh where tides inundate the site twice daily. Consequently, there is often confusion among hunters as to where the refuge boundary ends and the state-owned tidelands begin. The Refuge has maintained that as long as hunters were in the mudflats and not east of the vegetation line they were most likely on state tidelands; however, this boundary has been difficult to legally enforce. Opening refuge lands west of U.S. Highway 101 will not only enhance waterfowl hunting in Siletz Bay but it will also decrease the uncertainty of legal hunt boundaries and eliminate the issue of hunters trespassing over refuge lands to access the state hunting area.

The Service will establish a 100-yard no-hunting zone to prohibit waterfowl hunting on refuge property that extends westward from the refuge property line on the west side of the housing development of Siletz Keys. Access to the Refuge will be allowed for hunting from one hour before sunrise to one hour after sunset. Hunters accessing lands west of U.S. Highway 101 will be directed to use caution since no parking would be provided by the Refuge.

The Service will also allow waterfowl hunting three days per week on 112 acres of refuge lands that are east of Highway 101 and south of Millport Slough (Figure 2-1). Specifically, hunters will

be allowed to hunt ducks, geese, and coots on Wednesday, Saturday, and Sunday during the ODFW established hunt season. Hunters accessing lands east of U.S. Highway 101 and south of Millport Slough will access the site by using a short trail and a small gravel parking lot located on South Millport Slough Road or by boat. The parking lot and trail will be constructed by the Service to support this planned use. To minimize potential conflict between refuge users, reduce associated safety issues, and to provide sanctuary to waterfowl on non-hunt days the refuge lands south of Millport Slough that are open to waterfowl hunting will remain closed to wildlife observation, photography, and interpretation. For boat access, hunters can reach refuge lands on both the east and west side of Highway 101 during high tides from a private boat launch on the Siletz River.

**Objective 7.2 Provide opportunities for quality fishing and clamming at Siletz Bay NWR**

Throughout the life of the CCP, provide opportunities for visitors to dig for clams and fish from refuge lands in accordance with state fishing regulations, while minimizing impacts to other resources. Provide a quality fishing program that:

- Includes clear and concise regulations that are readily available
- Poses minimal conflict with wildlife and habitat objectives
- Poses minimal conflict with other priority public use activities

**Strategies Applied to Achieve Objective**

a. Prepare fishing plan and opening package

b. Allow anglers to bank fish from Alder Island nature trail and develop dedicated locations along the trail for this activity

c. Allow clammers access through refuge-owned Snag Alley to reach clamming beds on state-owned tidelands

d. Develop an informational kiosk to share information on fishing access and regulations

e. Provide containers for anglers to discard their used monofilament line

**Rationale:** Fishing is identified as a priority public use and it is a popular visitor activity that occurs at many locations along the Oregon coast. Currently, there is no fishing program on the Refuge. The Service will open recreational bank fishing from Alder Island and allow clamming access to state-managed tidelands near Drift Creek. All recreational fishing and clamming will be permitted in accordance with State, Federal, and refuge-specific regulations and seasons to ensure that it will not interfere with the conservation of fish and wildlife and their habitats, or conflict with other wildlife-dependent recreational activities.

Recreational fishing is a very popular sport on the navigable waters of the Siletz River and takes place mainly from boats. The Service will allow bank fishing for fish such as salmonids, surfperch, and sturgeon along the south bank of the Siletz River from Alder Island. The Service will develop one or more dedicated sites along the trail where anglers can access the Siletz River. The designated sites along the trail will concentrate anglers and potentially generate trash including monofilament line, which can entangle wildlife and is therefore a hazard. The Service will provide containers for anglers to discard their used monofilament line. Anglers will access the island itself by using the paved public parking lot and trailhead that will be developed by the Service and located on the east side of Highway 101 along the abandoned Highway 101 spur. Access to bank fishing will require users to access the riverbank from the Alder Island Nature Trail. The Alder Island Nature Trail will be open for anglers to access during daylight hours only. Camping, overnight use, and fires will be prohibited. Pets will be prohibited on the Alder Island trail to prevent wildlife disturbance. Pets will be required to remain inside vehicles at all times.

Clamming is currently allowed in Siletz Bay on state-owned tidelands on the west side of U.S. Highway 101. Clamming provides a recreational experience to harvest softshell clams by digging with a hand shovel or using a clam gun (i.e., aluminum or PVC piped suction device). In addition to the harvest of clams, the harvest of shrimp other marine invertebrates for bait is included within the term clamming.

The Service will allow clambers to cross refuge lands on foot to access state-owned tidelands where clamming beds occur. This access will eliminate refuge trespass issues associated with clamming in this location and provide clambers with an easier route to clamming beds. Clamming access to state-managed tidelands will require users to observe daily tide cycles and walk across mudflats and/or small tidal channels. The Service will not provide infrastructure on these lands to enhance clamming or any other public use. Visitors using the area will be advised to use caution since no parking on the west side of Highway 101 will be provided.

The Service will develop a fishing information tear sheet and an informational kiosk, and will share information about fishing and other available wildlife-dependent recreational uses with refuge visitors through the internet via a refuge website and/or social media site. These forms of interpretive material will help educate the public on refuge regulations and how they can minimize wildlife and habitat disturbance.

**2.4.8 Goal 8: Provide facilities and materials and conduct outreach that welcomes and orients children and adults to Siletz Bay National Wildlife Refuge so they can easily and safely learn about its abundant fish and wildlife resources.**

**Objective 8.1 Provide facilities that welcome and orient visitors to Siletz Bay NWR.**

Throughout the life of the CCP, provide an integrated set of welcome and orientation facilities for visitors to:

- Feel welcomed
- Easily find accurate, timely, and appropriate orientation materials and information
- Be aware of their options (available activities and experiences, where and when to go, how to get there, etc.)
- Safely pursue self-guided activities

**Strategies Applied to Achieve Objective**

a. Develop a welcome and orientation panel at Alder Island

b. Maintain bunkhouse along Drift Creek to house refuge interns and volunteers

c. Utilize habitat-appropriate native plants for landscaping around public use facilities

**Rationale:** As described in the Oregon State Parks Regional Interpretive Framework (OPRD 2005), the Oregon Coast is considered one of the world’s most stunning landscapes. It features dramatic rocky shoreline, historic lighthouses, endless beaches, quaint seaside towns, and scenic bridges. The U.S. Highway 101 National Scenic Byway follows the shoreline and is the main route used by visitors who come to the coast from Portland and other inland population centers including Corvallis, Eugene, Roseburg, Medford, and Grants Pass.

According to OPRD, bird watching, walking and day hiking will be the most popular recreation activities over the next ten years (OPRD 2008). Visitors to the Oregon Coast NWR Complex will likely stop for a couple of reasons: a short 20-minute stop made to look at a view and take a picture, or a longer, one- to three-hour, stop allowing visitors to leave the car and stretch their legs. Interpretive signs and spotting scopes may enhance observation, interpretation, and education during short stops. Visitors making longer stops may be more interested in learning about the site and the Refuge will develop the Alder Loop trail and associated interpretive panels to capitalize on this interest.

The Service will develop a welcome and orientation panel located in the parking lot at Alder Island, which will serve to orient visitors and provide them with information about how to safely enjoy the Refuge.

**Objective 8.2 Conduct public outreach**

Throughout the life of the CCP, conduct outreach to the public in an effort to:

- Describe the Refuge and its place as part of the National Wildlife Refuge System
- Provide current information about refuge management, biology, volunteer opportunities, public use events, and rules and regulations

**Strategies Applied to Achieve Objective**

a. Maintain an up-to-date brochure on the Refuge Complex

b. Partner with media outlets in Oregon to market public use opportunities on the Refuge

c. Participate in social media outreach

d. Maintain a refuge website

e. Maintain online photo sharing database

f. Partner with non-profit conservation organizations and appropriate media outlets in Oregon to disseminate information about refuge management, fish, wildlife and habitats

g. Maintain a refuge presence at community events that have high potential to deliver refuge messages to key audiences

**Rationale:** Outreach is critical in educating the public, volunteers, and partners about how refuges protect and conserve natural resources and what we are doing to provide economic benefits to communities. When people know and understand about the mission of the Service and the NWRS they are more likely to support the Refuge. Outreach can also improve visitors’ awareness of regulations and policies and the reasons behind them.

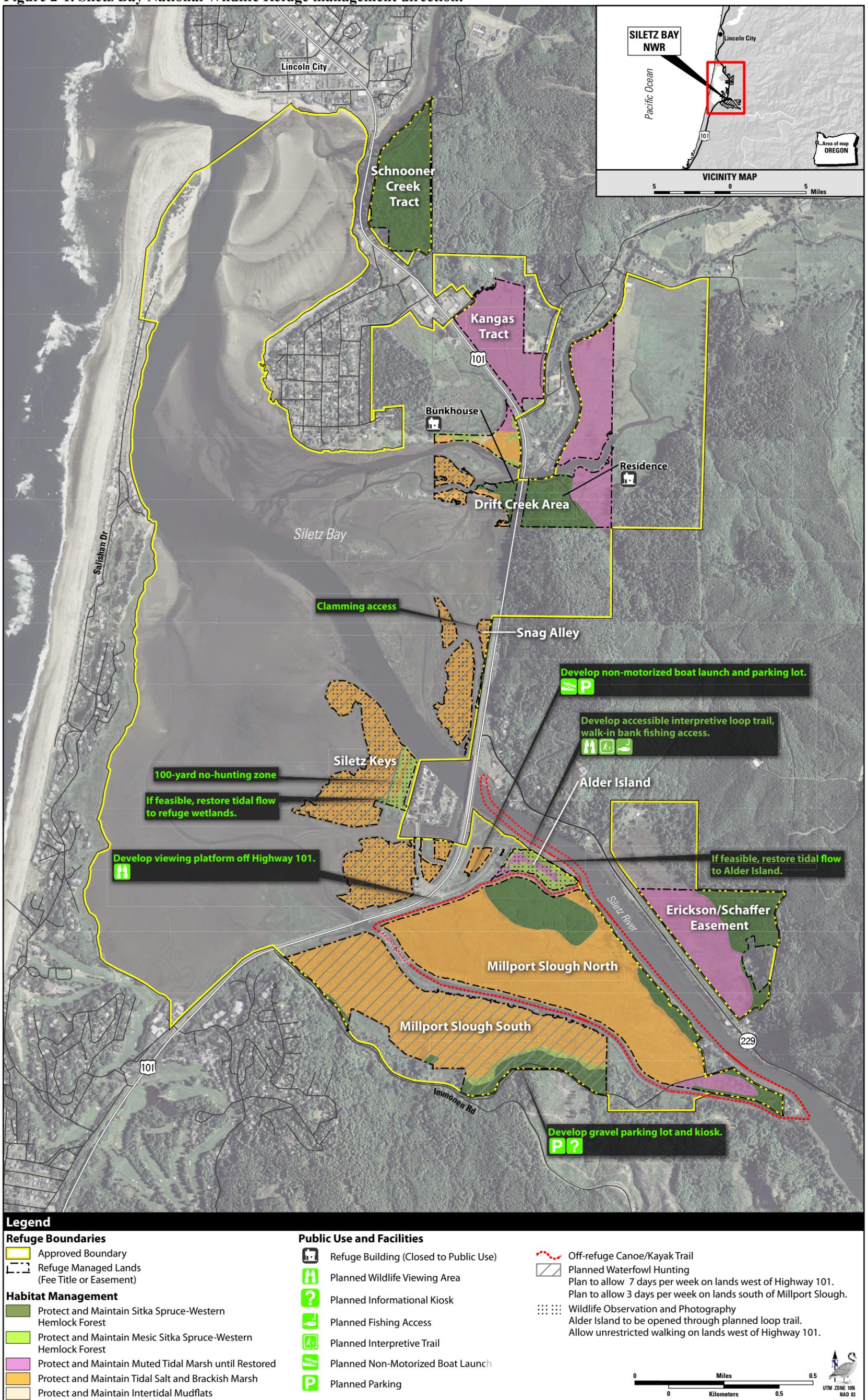
Our outreach efforts will focus on providing specific information about Siletz Bay NWR including important news and events and it will be used as a means of building an online community of support for the Oregon coast refuges. Specific examples of outreach involve maintaining a refuge website and utilizing social media to advertise volunteer opportunities, announce interpretative and environmental education events, relate news releases, share photos and videos, and provide an engaging view of what employees and volunteers do for the Service’s Oregon Coast NWR Complex.

**Objective 8.3 Work with the community and volunteers**

Throughout the life of the CCP, increase the volunteer program to assist with public use programs, monitoring, research, and maintenance on the Refuge throughout the life of the CCP.

<b>Strategies Applied to Achieve Objective</b>
a. Solicit for volunteers
b. Develop public use and habitat-related projects that support refuge needs
c. Hire a full-time Volunteer Coordinator
d. Work with volunteers to have them assist with maintenance of public use facilities and trails
e. Work with volunteers to have them assist with invasive species monitoring and removal
<b>Rationale:</b> Volunteers are recognized as key components in the successful management of public lands and are vital to implementation of refuge wildlife, habitat, and public use programs. During these times of declining budgets the National Wildlife Refuge System faces a growing shortage of staff, and in many cases funding for key conservation programs has been reduced. The Service will recruit volunteers to assist in refuge management and these volunteers will in turn play a critical role in providing support for the Refuge and serve as an advocate for protecting refuge wildlife and habitat.

Figure 2-1. Siletz Bay National Wildlife Refuge management direction.



Data Sources: Refuge Boundaries from USFWS/R1; Roads from ESRI; Imagery from 2009 NAIP

**The back sides of maps are blank to improve readability.**