

# Final Evaluation Findings

South Slough

National Estuarine Research Reserve

July 2007 to September 2015

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## Summary of Findings

The Coastal Zone Management Act requires the National Oceanic and Atmospheric Administration's Office for Coastal Management to conduct periodic evaluations of the performance of state programs participating in the National Estuarine Research Reserve System. This evaluation examined the operation and management of the South Slough National Estuarine Research Reserve by the Oregon Department of State Lands, the designated lead agency, for the period from July 2007 to September 2015. The evaluation focused on three target areas: program administration, coastal resilience and habitat restoration, and public access and land management.

The findings in this evaluation document will be considered by the NOAA Office for Coastal Management in making future financial award decisions concerning the reserve. The evaluation came to these conclusions:

**Accomplishment:** The South Slough National Estuarine Research Reserve has a strong volunteer program to support reserve activities, including 28,000 donated hours over the evaluation period. The public involvement officer manages the volunteer program, and this position has allowed the reserve to expand its engagement and involvement with the community, including serving on the chamber of commerce board and as chair of the tourism committee.

**Accomplishment:** The Friends of South Slough and South Slough National Estuarine Research Reserve created an internship program in 2012 that has provided training opportunities for local university, community college, and high school students, and for adults wishing to gain additional job skills and work experience in science, education, resource management, and tourism.

**Accomplishment:** The South Slough Reserve has taken a leadership role through the Partnership for Coastal Watersheds, bringing together Coos Bay County, Oregon Coastal Management Program, and numerous other partners to gather economic and social data, pilot an approach to updating estuary management plans, and move forward with coastal resilience in the Coos Bay area.

**Accomplishment:** The South Slough Reserve managed a three-year collaborative project to restore native Olympia oysters in Coos Bay and establish self-sustaining populations of Olympia oysters in South Slough. The reserve also collaborated in the development of *A Guide to Olympia Oyster Restoration and Conservation*, which identifies key environmental conditions that affect Olympia oysters and includes a qualitative evaluation of 28 embayments along the west coast to identify areas at risk of losing their oyster population.

**Accomplishment:** The South Slough Reserve has completed several significant habitat restoration projects and is monitoring the results to inform future restoration efforts. For

example, the reserve planted, and is monitoring, the survival of 1,000 cedar trees, varieties thought to be genetically resistant to the fatal Port Orford cedar disease.

**Accomplishment:** The South Slough Reserve developed Teachers on the Estuary workshops, including a climate change module, in collaboration with the Oregon Coast Education Program partners. The education program has strengthened relationships with local school districts and worked to integrate the results of research and monitoring efforts into teacher professional development offerings, such as the course that focused on blue carbon monitoring.

**Accomplishment:** The South Slough Reserve served as one of five national estuarine research reserve reference sites to compare salt marsh vegetation, groundwater, and similar parameters to nearby restoration sites. The project led to the development of protocols and training for restoration practitioners to monitor groundwater as a functional parameter in restoration based on the correlation between hydraulic variability of restoration and reference sites.

**Accomplishment:** The South Slough Reserve brought together seven Northwest Indian tribes and federal and state agencies along the South Coast to participate in a lamprey summit to share the latest scientific information regarding recovery of this endangered species. The summit led to the establishment of a formal relationship for information sharing and dissemination, through the establishment of the Pacific Lamprey Fish Habitat Partnership, formally recognized in 2016.

**Accomplishments:** The South Slough Reserve developed a foundational Upper Watershed Restoration Action Plan that includes the identification of priority restoration areas, provides on-the-ground management suggestions, and identifies potential threats. The plan has served as a foundation for restoration activities within the reserve, including the Wasson Creek Watershed Restoration Project.

**Accomplishment:** The South Slough Reserve enhanced public access through the construction of the North Creek Watershed Trail, which provides interpretive opportunities for the public and K-12 education programs; development of a paddle launch in collaboration with the Port of Coos Bay that provides a safe community-friendly location; and installation of new exhibits in the Interpretive Center, including two aquaria and an aquatic terrarium.

**Necessary Action:** The South Slough National Estuarine Research Reserve must implement a Coastal Training Program that meets the performance requirements in the National Estuarine Research Reserve System's *Coastal Training Program Performance Monitoring Manual*. The reserve must report on this necessary action starting with the period July 2017 to June 2018 until the reserve has met this requirement for three consecutive years.

**Recommendation:** The Office for Coastal Management strongly encourages the South Slough National Estuarine Research Reserve to work with the NOAA Office for Coastal Management to ensure that the needs assessment, market analysis, and final development of the 2018-2022

Coastal Training Program Strategy provide a strong framework for a Coastal Training Program that will meet the Coastal Training Program performance standards.

**Recommendation:** The Office for Coastal Management encourages the reserve to pursue and maintain consistent access to GIS expertise.

**Recommendation:** The Office for Coastal Management strongly encourages the South Slough Reserve to complete and submit its National Estuarine Research Reserve System habitat map.

**Recommendation:** The Office for Coastal Management encourages the South Slough Reserve to continue to build on its efforts to manage undesirable human activities, including illegal dumping, target shooting, and harvesting of native species, through such methods as building on existing partnerships with law enforcement and public outreach.

**Recommendation:** The Office for Coastal Management encourages the reserve to pursue bringing newly acquired properties within the reserve boundary, particularly those acquired with NERRS Procurement Acquisition and Construction or Coastal and Estuarine Land Conservation Program funds.

This evaluation concludes that the Oregon Department of State Lands is adhering to the programmatic requirements of the National Estuarine Research Reserve System in the operation of the South Slough National Estuarine Research Reserve.

## Program Review Procedures

The NOAA Office for Coastal Management evaluated the South Slough National Estuarine Research Reserve in fiscal year 2015. The evaluation team consisted of Carrie Hall, evaluation team lead; Bree Turner, site liaison; and Terry Stevens, manager, Padilla Bay National Estuarine Research Reserve. The support of the reserve staff was crucial in conducting the evaluation, and this support is most gratefully acknowledged.

NOAA sent a notification of the scheduled evaluation to the director of the Department of State Lands, published a notice of “Intent to Evaluate” in the *Federal Register* on August 6, 2015, and notified members of Oregon’s congressional delegation. The reserve posted a notice of the public meeting and opportunity to comment in *The World* on August 3, 2015.

The evaluation process included a review of relevant documents and a survey of stakeholders, which helped identify three target areas for the evaluation: program administration, coastal habitat and climate resilience, and public access and land management. A site visit was conducted, and the evaluation team held meetings with staff members and group discussions with stakeholders and program staff members about the target areas. In addition, a public meeting was held on Wednesday, September 16, 2015, at 5:00 p.m. at the South Slough Reserve located at 61907 Seven Devils Road, Charleston, Oregon, to provide an opportunity for members of the public to express their opinions about the implementation of the reserve.

Stakeholders and members of the public were given the opportunity to provide written comment via email or U.S. mail through Friday, September 25, 2015. No written comments were received. The NOAA Office for Coastal Management then developed draft evaluation findings, which were provided to the reserve for review, and the reserve’s comments were considered in drafting the final evaluation findings.

Final evaluation findings for the national estuarine research reserves highlight each reserve’s accomplishments in the target areas and include recommendations, which are of two types:

**Necessary Actions** address programmatic requirements of implementing regulations of the Coastal Zone Management Act. These must be carried out by the dates specified. Failure to address necessary actions may result in a future finding of non-adherence and the invoking of interim sanctions, as specified in the Coastal Zone Management Act §312(c).

**Recommendations** are actions that the office believes would improve the program, but which are not mandatory. The state is expected to have considered the recommendations by the time of the next evaluation or dates specified.

## Evaluation Findings

### Program Administration

The South Slough Reserve is administered through the Oregon Department of State Lands. The reserve and Department of State Lands staff are knowledgeable in the administration of federal financial assistance awards and competently manage their federal cooperative agreements under the Coastal Zone Management Act.

### *Staffing*

The South Slough Reserve underwent a generational transition during the evaluation period as long-term staff members retired or moved on to new positions, including the manager, operations manager, stewardship coordinator, research coordinator, and education coordinator. The stewardship coordinator position was eliminated because of state budget cuts, but the reserve was able to have the position reinstated and hire a stewardship coordinator in the summer of 2014. Many stewardship projects were placed on hold during that time. At the time of the site visit, the reserve had key staff positions filled, and the new stewardship, education, and research coordinators were executing high-performing programs. The reserve also has very robust internship programs and hosted 41 interns between 2012 and 2015.

The previous evaluation had a finding that the reserve should consider additional positions or staffing capacity for information technology, GIS, and education functions. Since the evaluation, the reserve made permanent a chief technologist position that was formerly temporary. The chief technology officer led an effort to develop a system of wireless devices to provide internet connectivity throughout the reserve using an intranet at the interpretive center and at the ECOS lab, via the Oregon Institute of Marine Biology network. The reserve successfully addressed a recommendation in the previous evaluation findings that the reserve should complete implementation of its wireless connectivity plan.

The chief technologist also oversees the reserve's GIS activities. The reserve has been able to obtain part-time GIS assistance through temporary funding during parts of the evaluation period, although not at the time of the site visit. The reserve would benefit from having GIS capacity. The reserve manages a large natural area, and GIS can serve as an important management tool for mapping, tracking, and understanding habitat changes. GIS is also an important tool in tracking invasive species and restoration planning and implementation. The reserve is currently in the process of developing and finalizing its habitat maps for submission to the Centralized Data Management Office. The NOAA Office for Coastal Management encourages the reserve to continue to pursue having in-house GIS capacity.

The reserve has been able to obtain temporary educators through the AmeriCorps program, and this has substantially added to the reserve's capacity to deliver direct educational activities to implement the education program. However, inconsistent funding does present challenges

in meeting demand when staffing is lower. Additional support could also expand reserve capacity to provide professional development activities for teachers.

### ***Coastal Training Program***

The Coastal Training Program coordinator provides coastal trainings, technical assistance, adult education opportunities, and support for general reserve efforts such as assisting with developing the recent management plan, and made significant contributions to the national Coastal Training Program. The South Slough Coastal Training Program is constrained, since the reserve is located in a remote area and the potential pool of trainees within driving distance is smaller than for many other reserves.

During the evaluation period, the reserve has often not met the national performance measure of five training workshops per year. In addition, the reserve appears to have been using a broader interpretation of “training” and “coastal decision maker” than the definitions set and laid out by the National Estuarine Reserve Research System in the *Coastal Training Program Performance Monitoring Manual* (2012). The manual defines training events in this way: “Are provided to coastal decision makers in order to support and contribute to the outcome(s) and goal of the Coastal Training Program.” Coastal Decision Makers are defined as those “who regularly make decisions about coastal resources in a professional or volunteer capacity. Examples – local government staff and officials, developers, land use planners, contractors.” The Office for Coastal Management recognizes that after the evaluation site visit, the reserve has made significant progress to ensure that the Coastal Training Program meets national standards.

During the evaluation site visit, the evaluation team heard from stakeholders that they would have an interest in coastal training on such topics as effective ways to treat invasive species, research and data to inform forestry management practices, and disasters and climate adaptation. In addition, although it is highly encouraged that the reserve focus training events near or on the reserve, coastal training programs can travel to other locations on the coast that would be more accessible to stakeholders.

The reserve is in the process of refining a needs assessment to guide the final development of the 2018-2022 Coastal Training Program Strategy. Currently, the reserve is not planning to update its market analysis. It is key that the reserve implement a well-designed needs assessment to provide a strong foundation to guide the development of a Coastal Training Program that best serves the needs of the region’s coastal decision makers and meets National Estuarine Research Reserve System requirements. In addition, the reserve could benefit from updating its market analysis to determine its most effective role in the state.

The NOAA Office for Coastal Management finds that it is necessary that the Coastal Training Program meet the national minimum standards for a Coastal Training Program. The office encourages the reserve to continue to hold monthly calls, as needed, with the office’s Coastal Training Program lead to ensure that the needs assessment, market analysis, and final development of the 2018-2022 Coastal Training Program Strategy provide a strong framework

for a Coastal Training Program that will meet the Coastal Training Program performance standards.

### ***Management Plan***

All national estuarine research reserves are required by the Coastal Zone Management Act to have five-year management plans. At the time of the site visit, the 2006-2011 management plan was out-of-date. Since the evaluation site visit, the program has completed an updated 2017-2022 management plan, which was posted as final by NOAA in the *Federal Register* on August 24, 2017.

### ***Disaster Response and Resilience Plan***

The reserve developed its Disaster Response and Resiliency Plan in 2015 to guide internal response actions and coordinate response actions with partner agencies during disaster response operations. In March 2015, the reserve coordinated an earthquake drill, practicing its response. The reserve also participated in the development of spill prevention and contingency response plans by the Coos estuary subcommittee of the Oregon Coast Oil Spill and Marine Safety Committee.

The reserve hosts numerous visitors during the day and has extensive infrastructure, including monitoring equipment, and faces diverse hazards such as wildfires, earthquakes, tsunamis, and oil and chemical spills from commercial shipping activity in Coos Bay. The plan lays out how the reserve staff will respond to a disaster and its resources for assisting partner agencies. The plan also lays out the reserve infrastructure at risk, describes the reserve's natural resources and related information so that responders can better minimize impacts to priority habitats, and describes the data the reserve can provide responders to assist their efforts, such as water quality, tides, water depth, appropriate safe areas for staging activities, and access routes.

The NOAA Office for Coastal Management encourages the reserve to keep the Disaster Response and Resiliency Plan up to date and to engage regularly with emergency responders in the region, for example, in conducting drills.

### ***Facilities Planning***

The previous evaluation findings contained a recommendation encouraging the reserve to complete its master facilities plan update. Although the master facilities plan has not been updated since 1991, the reserve has completed a Facilities Development and Improvement Plan, after the evaluation site visit, that is included in the draft 2017-2022 management plan.

### ***Education Program***

In 2012, the reserve conducted a statewide coastal education market analysis, going above and beyond a market analysis of its immediate region. A needs assessment study that covered six coastal counties was also conducted to define its educational priorities going forward. In addition to standard questions, the needs assessment included additional questions on coastal resilience. The reserve identified climate change impacts and coastal ecology as strong areas of

interest. Other areas of interest included coastal hazards, marine and estuarine biology and ecology, data analysis, climate change and sea level rise, best management practices, and interdisciplinary research. The needs assessment also found that teachers identified a sustained long-term professional development relationship as key to successful training and that field experiences with a multi-day component and distance learning opportunities were the best delivery methods. The reserve's Teachers on the Estuary program, discussed further in the section "Coastal Resilience and Habitat Restoration," is a program designed to build long-term professional relationships and to provide multi-day field experiences. In addition, the reserve's leadership in the Oregon Coast Education Program, also discussed further in the section "Coastal Resilience and Habitat Restoration," helps support long-term professional relationships and information sharing.

The completion of the two reports successfully addressed a recommendation in the previous evaluation findings to complete the analysis and study as part the National Estuarine Research Reserve System's K-12 Estuarine Education Program. The effort was conducted in partnership with the U.S. Bureau of Land Management and the Coos Watershed Association.

The South Slough National Estuarine Research Reserve education program's strong partnership with the Coos County School District includes the TIDES curriculum, which was field tested with grades 6-8 and focuses on the investigation and discovery of estuaries and their connection to watersheds and the ocean. The curriculum can also easily be used at other estuaries in the bioregion, and TIDES Explorer student kits and Estuary Study backpacks can be easily refined and reproduced for loan, while PowerPoint presentations and publications can be accessed via the Internet.

In the spring of 2014, South Slough initiated an afterschool program for students at Madison Elementary and Sunset schools in the Empire area of Coos Bay. The Estuary Explorers program began at the reserve several years ago as an effort to enhance student understanding of estuaries and their watersheds through structured, inquiry-based activities held at South Slough on Saturdays. In 2013, Estuary Explorers was offered on Friday afternoons to provide opportunities for students after Coos Bay schools modified their schedule to accommodate budget cuts.

The after-school program enhances learning through hands-on, field-based activities near the school by bringing activities, resources, and science to the campus. Supported by AmeriCorps members, the program is offered in several multi-week blocks to local schools for three different grade bands, K-2, 3-4, and 5-7. In addition to the after-school program, a monthly visit to South Slough is offered for students and their families on a Friday at the culmination of the program. Saturday activities are also advertised for Estuary Explorers participation in order to increase attendance and strengthen the connection between the reserve and the community.

### ***Friends of Sough Slough and Volunteer Program***

The Friends of the South Slough is an enthusiastic volunteer group that helps support reserve programs through fundraising and bookstore and gift shop sales at the Interpretive Center. The Friends group is able to apply for and manage grant funds to support reserve activities.

An outstanding program of the Friends group is the local internship program. The internship program began in 2012; since then an average of 10 interns a year have graduated from the program. The program provides opportunities for university, community college, and high school students, and adults wishing to gain additional job skills and work experience. The internships cover science, education, resource management, and tourism, one of the major economic growth areas for coastal Oregon, and the internships help the local workforce develop skills applicable to newly developing coastal industries. The Friends group provides the interns with stipends, and reserve staff members mentor the interns. The interns have been able to provide the reserve with increased capacity across sectors to further the reserve's work.

The reserve also has a very active volunteer program supported by the public involvement coordinator. The public involvement officer manages the volunteer program, and this position has allowed the reserve to expand its engagement and involvement with the community, including serving on the chamber of commerce board and as chair of the tourism committee. Volunteers assist reserve staff members with tasks that include long-term fish seining program and System-wide Monitoring Program data collection; field and lab work for research, monitoring, and stewardship projects; trail work; outreach at festivals and community events; program marketing; visitor services; interpretive programs; formal education programs; and administrative support at the Interpretive Center. The reserve also set as an evaluation metric, "providing six opportunities annually for volunteers, interns, and community members to participate in stewardship and restoration activities that involve invasive species removal." Volunteer groups from the Friends, local high schools, Coos Forest Protective Association, and other groups have assisted the reserve with removing invasives such as scotch broom, purple loosestrife, and gorse. The reserve met or exceeded its evaluation metric target for providing opportunities for restoration activities for years three and four. The reserve did not provide data for years one and two as the reserve did not have a stewardship coordinator on staff during those years to coordinate activities related to this metric. During the evaluation period, volunteers donated over 28,000 hours in support of the reserve.

### ***Findings for Program Administration***

**Accomplishment:** The South Slough National Estuarine Research Reserve has a strong volunteer program to support reserve activities, including 28,000 donated hours over the evaluation period. The public involvement officer manages the volunteer program, and this position has allowed the reserve to expand its engagement and involvement with the community, including serving on the chamber of commerce board and as chair of the tourism committee.

**Accomplishment:** The Friends of South Slough and South Slough National Estuarine Research Reserve created an internship program in 2012 that has provided training opportunities for

local university, community college, and high school students, and for adults wishing to gain additional job skills and work experience in science, education, resource management, and tourism.

**Necessary Action:** The South Slough National Estuarine Research Reserve must implement a Coastal Training Program that meets the performance requirements in the National Estuarine Research Reserve System’s *Coastal Training Program Performance Monitoring Manual*. The reserve must report on this necessary action starting with the period June 2017 to June 2018 until the reserve has met this requirement for three consecutive years.

**Recommendation:** The Office for Coastal Management strongly encourages the South Slough National Estuarine Research Reserve to work with the NOAA Office for Coastal Management to ensure that the needs assessment, market analysis, and final development of the 2018-2022 Coastal Training Program Strategy provide a strong framework for a Coastal Training Program that will meet the Coastal Training Program performance standards.

**Recommendation:** The Office for Coastal Management encourages the reserve to pursue and maintain consistent access to GIS expertise.

## Coastal Resilience and Habitat Restoration

### *Partnership for Coastal Watersheds*

The reserve, in collaboration with the Coos Watershed Association and other local partners, initiated the Partnership for Coastal Watersheds to develop locally driven approaches to responsible watershed planning and development. The reserve and other conveners of the partnership hoped that having a new approach to managing the watershed would help the local communities anticipate and respond to the local effects of climate and land use changes. Project team members received the Oregon Land Board’s Partnership Award in 2013 in recognition of the benefits of this effort.

Phase I of the project began with members of the partnership defining a 20-year community vision that describes economic, environmental, and community goals and an action plan to chart a course to fulfill the vision. One of the partnership’s first projects was the development of *State of the South Slough and Coastal Frontal Watersheds (2012)*, a status and trends assessment, which establishes a shared understanding of the current environmental and socio-economic conditions facing the Charleston and South Slough community. The assessment resulted in updated biological, physical, social, and economic data that help the Coos Bay community understand the potential effects of climate change, monitor the estuary for environmental change, and consider and plan management alternatives. A companion *Action Plan (2012)* describes voluntary actions the community can take to address the environmental and socio-economic conditions that impede progress towards the community vision. Phase one of the project was funded in part with Coastal Zone Management Act funding from the Cooperative Institute for Coastal and Estuarine Environmental Technology. Reserve staff

members had key roles in obtaining funding, facilitating this effort, and researching and writing the assessment and plan.

The reserve next took a lead role in developing phase II of the project and obtaining funding through a National Estuarine Research Reserve System (NERRS) Science Collaborative grant. The partnership was working on developing a set of monitoring tools to track and model estuary conditions over time, including a circulation model for the Coos estuary, at the time of the evaluation site visit. The circulation model was being designed to answer user questions such as helping coastal managers better understand the sources and movement of nutrients and bacteria in estuarine waters.

The reserve has also taken a lead role in the partnership's work to expand the water quality monitoring network in Coos estuary from 5 to 12 stations. In 2015, the partnership published *Community, Lands and Waterways Data Source*, an encyclopedic compilation of existing status and trends that characterize environmental and socioeconomic conditions in the Coos estuary and surrounding communities, and identifies data gaps. The data source also describes the anticipated effects of climate change in the Coos estuary and surrounding area. A local planner who the evaluation team met during the Oregon Coastal Management Program evaluation in 2016 noted that the information provided has been helpful in ensuring that local elected officials are able to make informed coastal management decisions based on facts.

The partnership's *Action Plan* recommended updating the Coos Bay Estuary Management Plan, and the partnership worked with the Oregon Coastal Management Program to support this pilot effort. Oregon's statewide planning law provides for the development of estuary management plans for each of the state's 22 major estuaries. The initial plans were developed over 30 years ago in the 1980s and in many cases are in need of updating. The Coos Bay Estuary Management Plan update process is piloting new techniques to improve the plan's usefulness for decision makers, including the first large effort in the U.S. to use the new Coastal and Marine Ecological Classification Standard, Version 4, for habitat mapping. The reserve hosted two workshops of the technical committee charged with this effort.

As part of the effort to update the estuary management plan, the Oregon Coastal Management Program developed a new method to determine the extent of tidal influence in areas where tidal flow has ceased because of diking or alteration. The Coastal Training Program coordinator worked with staff members at NOAA and the coastal program to make the methodology available to other reserves. The methodology was presented by webinar to the National Estuarine Research Reserve System, and this method is now being applied in both Washington and California.

### ***Sentinel Site Development***

The South Slough Reserve is developing an exceptional Sentinel Site Program that exceeds national requirements and is informing coastal resilience efforts for the Coos Bay area and greater West Coast region. Reserve staff members were designing a program that not only met

national requirements but one that also fits the marsh habitat of the reserve, which is different than Gulf or East Coast marshes. The program will enable the reserve to increase understanding of local impacts to sea level rise and impacts of ocean acidification.

Implementation of the Sentinel Site Program at the South Slough Reserve began in 2010 with the establishment of six long-term biological monitoring sites, including four paired marsh and eelgrass sites and a pair of marsh island sites. Plant community and marsh elevation data were collected from vegetation transects in permanent sampling plots located along the estuarine salinity gradient. Rod surface elevation tables and feldspar horizon markers were installed to track changes in marsh surface elevation and vertical sediment accretion rates. The biological monitoring sites are located near System-wide Monitoring Program stations to couple long-term water quality, including water level and meteorological data, with the vegetation community, marsh elevation data, and sediment and water table dynamics. The reserve has slowly implemented a vertical control network and installed benchmarks that are tied to local tidal datums, the national vertical datum, and existing geodetic and tidal datums. In 2015, the reserve is prioritizing completion of all sentinel site elements at Hidden Creek with the addition of groundwater wells and a high precision water level logger to understand inundation patterns.

The ocean waters off the shore of Oregon have seen increased levels of carbon dioxide, affecting the survival rates of species such as oysters. The reserve has taken a leadership role within the National Estuarine Research Reserve System in the area of ocean acidification and studying pH dynamics in estuaries. The reserve has installed high-resolution pH and pCO<sub>2</sub> sensors in South Slough and will be analyzing the data along with data collected at the System-wide Monitoring Program water quality stations. Reserve staff members are also engaged in efforts by the West Coast Ocean Acidification and Hypoxia Panel to develop a West Coast acidification monitoring network.

### ***Monitoring Partnerships***

The reserve has worked with a number of partners to improve monitoring and understanding of the Oregon coast. The reserve participated in an Oregon Department of Geology and Mineral Industries-led consortium to collect Oregon coast LiDAR data in 2011. The reserve is part of SeagrassNet and international seagrass monitoring and conducts quarterly eelgrass monitoring at Valino Island.

The reserve is part of the Northwest Association of Networked Ocean Observing Systems, a partnership of over 40 entities, including industry, state agencies, local governments, tribes, nongovernment organizations, and educational institutions, that provides an integrated picture of what is going on in the Pacific Northwest oceans and estuaries. Through the Northwest Association of Networked Ocean Observing Systems, the reserve is a participant in a partnership project that has provided real-time water quality data for shellfish growers in Oregon, Washington, and Alaska since 2005.

The reserve has a cooperative agreement with the Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians to provide telemetry equipment for their North Spit U.S. Bureau of Land Management boat launch sonde station in lower Coos Bay. The data were recently made available to end users through the Northwest Association of Networked Ocean Observing Systems Visualization System. In addition, the agreement provides for jointly developing research and stewardship proposals and managing projects, and protecting and preserving important archaeological physical history and artifacts.

### ***NERRS Science Collaborative Blue Carbon***

The reserve received a small technology transfer grant from the NERRS Science Collaborative in 2013 to improve understanding of the “blue carbon” potential of the region’s salt marshes and the potential markets to generate funds to support wetland restoration and conservation. The grant supported a one-day workshop in January 2014, based on a curriculum first developed by Waquoit Bay Reserve. The workshop provided coastal wetland managers with technical information to increase their understanding of carbon sequestration and carbon markets and of the potential role of coastal blue carbon in estuarine habitat restoration.

The coordinator of monitoring programs and the Coastal Training Program coordinator built on the workshop and organized the Pacific Northwest Coastal Blue Carbon Working Group. The group of Northwest wetland researchers, policy makers, and land managers met in December 2014 to develop and adopt a framework to guide research on the carbon sequestration potential of Oregon salt marshes and to develop a proposal for a NERRS Science Collaborative grant. Unfortunately, the first proposal was not selected, but the working group continued its work on blue carbon. In March 2015, the Coastal Training Program coordinator organized and facilitated a meeting of human dimensions specialists to consider socio-economic aspects of carbon sequestration in estuaries. The working group expanded to include decision makers from Washington, California, and Oregon to inform the development of state and regional carbon management policies that could be responsive to the needs of both coastal blue carbon researchers and coastal community stakeholders. Since the evaluation site visit, the partners submitted another successful NERRS Science Collaboration proposal to quantify carbon stocks in estuarine wetlands across the Pacific Northwest, and South Slough Reserve is a study site for the project, with reserve staff members providing logistical support and coordination of local fieldwork.

As part of the larger National Estuarine Research Reserve System Blue Carbon initiative, the education program staff partnered with the Waquoit Bay Reserve and a consultant to develop a blue carbon curriculum aligned with the next generation science standards. The reserve, along with Waquoit Bay Reserve, also held two Teachers on the Estuary trainings, one in South Slough and one in Waquoit Bay, in 2013 focused on blue carbon. The teachers then piloted the blue carbon curriculum with their students and provided feedback that was used to improve the curriculum. The curriculum engages students in learning about the carbon cycle, ecosystem functions, the process of science, the engineering and technology design process, and calculating economic value for natural resources, and provides for student field studies and stewardship projects.

### ***Monitoring Restoration Sites***

The reserve served as one of five national estuarine research reserve reference sites to compare salt marsh vegetation, groundwater, and similar parameters to nearby restoration sites funded by the NOAA Restoration Center. A report, *Measuring Tidal Wetland Response to Restoration Using Performance Benchmarks from Local Reference Sites*, was published in 2012. The project concluded that reserve tidal wetland sites can provide appropriate long-term reference sites for local tidal wetland restoration projects and that the recently formalized Restoration Performance Index which compares change in user-selected indicator variables over time between reference and restoration sites offers promise as a tool for measuring restoration status. The project also led to the development of protocols and training for restoration practitioners to monitor groundwater as a functional parameter in restoration based on the correlation between hydraulic variability of restoration and reference sites.

### ***Olympia Oyster Restoration***

The reserve has engaged in a decade-long effort to better understand the native Olympia oyster's habitat requirements and life cycle and restore oysters to Coos Bay. The reserve's efforts also help aquaculture practice in the Coos Estuary, a major local industry. The native oyster project has also supported a number of internship learning experiences at the reserve.

#### *NERRS Science Collaborative Restoring Olympia Oysters in Coos Bay Project*

Building on a NOAA Restoration Center Community-Based Restoration Program project, Restoration of Native Olympia Oysters within the Sough Slough Estuary (2006-2009), the reserve received funding through a NERRS Science Collaborative project (2010-2013), to restore native Olympia oysters in Coos Bay and establish self-sustaining populations of Olympia oysters in the South Slough. Reserve staff members studied the timing of reproduction, fecundity, and larval supplies; dispersal; and settlement of oysters in Coos Bay and the South Slough. Other partners included the University of Oregon and the Oregon State University Extension Program and Oregon Sea Grant. Friends of Sough Slough was able to provide stipends for a native oyster monitoring intern and two additional research interns, and they, along with assistance from an AmeriCorps volunteer, completed a monitoring project on the growth, survival, and recruitment of native oysters in 2014.

#### *NERRS Science Collaborative Native Oyster Transfer Project*

The reserve partnered with the Elkhorn and San Francisco Bay Reserves on a collaborative project, Transferring Native Oyster Restoration Recommendations from Central California to Oregon and Southern California. A guidance document, *A Guide to Olympia Oyster Restoration and Conservation*, identifies key environmental conditions that affect Olympia oysters. The guide includes a qualitative evaluation of 28 embayments along much of the range of the species, which identifies the areas at risk due to low population sizes or unreliable recruitment, and characterizes patterns of exposure to stressors. An online site evaluation tool was developed that could be applied by a user to assess other sites in a similar manner. The document was designed to help guide the successful siting of new restoration projects. The project was supported by a National Estuarine Research Reserve Graduate Research Fellow.

### *Teachers on the Estuary (TOTE) Program*

Reserve staff members have also worked with the Oregon Coast Education Program to build statewide capacity for estuarine education. The Oregon Coast Education Program is a partnership of institutions including South Slough, the Oregon Coast Aquarium, the Hatfield Marine Science Center, the Oregon Institute of Marine Biology, Portland State University, and the High Desert Museum. The South Slough Education Coordinator has served as the principal investigator for the program since its inception. The education coordinator has participated in the Oregon Environmental Literacy Council, and through the council helped develop the 2010 Oregon Environmental Literacy Plan for schools. The reserve is actively engaged in the Oregon Coast STEM (science, technology, engineering, and math) education hub.

Through the Oregon Coast Education Program, the reserve provided two professional development trainings, one in Charleston and one in Newport, for 24 educators during the summer of 2014. At the Charleston workshop, the research coordinator presented a summary of oyster research in South Slough, while a former Oregon Coast Education Program teacher shared ways in which he incorporated research on oysters he conducted while working at the reserve into his classroom. The workshops combine field-based experiences with training on the use of modules and resources to support enhanced meaningful watershed education for students. The teachers will continue to work with Oregon Coast Education Program coordinators throughout the school year implementing coastal education plans in the classroom and field that incorporate the techniques and activities from the workshops. NOAA's Bay Watershed Education and Training (B-WET) program provided funding. Since the evaluation site visit, the education program has also developed a TOTE program around its sentinel site program.

### ***U.S. Geological Survey Climate Change Project***

The South Slough Reserve collaborated with the U.S. Geological Survey on the Northwest Climate Science Center Sea-Level Rise Project: Marshes to Mudflats: Climate Change Effects along a Latitudinal Gradient in the Pacific Northwest. The overall project goals are to develop baseline data, models, and tools to improve predictions regarding the impacts of regional climate change on Pacific Northwest estuaries. Coos Bay is one of eight study sites. As part of the project, staff members are facilitating a marsh plant leaf litter decomposition study to assess rates of marsh plant litter decomposition across the Pacific coast climatic gradient; test for differences in decomposition rates between high and low tidal marsh; determine if there are species-level differences in decomposition rates at select sites in the Pacific Northwest; test whether litter size affects decomposition rates; and evaluate the duration of litter decay over the growing season at two sites.

### ***Port Orford Cedar Restoration***

The Port Orford cedar, one of several species forming a unique forest assemblage endemic to the Southern Oregon coast, is threatened by *Phytophthora lateralis*, a waterborne pathogen that is transported into areas via logging machinery, vehicles, shoes, and livestock. In partnership with the U.S. Department of Agriculture Forest Service and Oregon State University Extension Service, state and private timber organizations, and Americorps, the reserve planted over 1,000 Port Orford cedar saplings in 2011 and 2012 to explore genetic resistance by the species to *P. lateralis*. The cedar trees represent different varieties that are thought to be genetically resistant to the fatal Port Orford cedar disease and are monitored annually for growth and survival. Monitoring, testing for the disease, and outreach will continue in order to identify genetically resistant tree lineages as part of an ongoing effort to find a solution to this regional issue. The study results will help guide future restoration of cedar groves. The reserve and the Oregon Department of Forestry are discussing the potential for planting resistant cedars on the site of a future timber sale, adjacent to the reserve, and monitoring their growth.

### ***Invasive species***

The reserve has an active program to address invasive species through removal and restoration, and mapping and monitoring, to better understand the impact of the invasive species and reserve efforts to manage them. The reserve collaborates with a multitude of groups in order to identify and remove invasive species within and surrounding the reserve, most commonly cordgrass, reed canary grass, purple loosestrife, *Cotoneaster sp.*, and gorse. For example, reserve staff members have worked with the Kilkich Youth Corps and various university student groups to remove cotoneaster; the Oregon Youth Conservation Corps works to remove reed canary grass and cordgrass; and the Coos Forest Protective Agency inmate crew has worked on removing scotch broom on Indian Point. The reserve and Coos Watershed Association partnered on an Oregon State Weed Board grant to do early detection and rapid response of noxious weeds on reserve property.

The reserve is also involved in a number of partnerships to address invasive species. In 2014, the reserve joined the Gorse Action Group, a two-county task force focused on mapping and removing gorse, a thorny shrub which chokes out native plants and contributes to ecosystem flammability. The stewardship coordinator has also been involved in a community-wide working group coordinating a regional effort to control nutria. The reserve worked with U.S. Department of Agriculture Wildlife Services contractors to treat invasive nutria within and around South Slough.

The reserve and partners are mapping the presence and extent of high priority invasive species affecting the reserve. The distribution of reed canary grass and Himalayan blackberry were mapped at the Wasson restoration site to provide baseline information. The area will be monitored and remapped after restoration work is conducted. Maps were also developed showing the spatial distribution of European green crabs in Coos estuary, including South Slough, based on a 2016 survey.

### ***Fish Habitat Partnerships***

### *Pacific Marine and Estuarine Fish Habitat Partnership*

In 2010, the reserve joined a collaboration of tribal, public, and nonprofit organizations in Oregon, Washington, and California to establish the Pacific Marine and Estuarine Fish Habitat Partnership. The partnership supports restoration and research to conserve healthy native fish populations in estuaries and nearshore waters of the West Coast. The Coastal Training Program coordinator has served as chair and vice chair, and the research coordinator has served on the science and data committee.

The partnership conducted research and published the results in two reports: “Nursery Functions of U.S. West Coast Estuaries: The State of Knowledge for Juveniles of Focal Invertebrate and Fish Species” (2014) and “Nursery Functions of West Coast Estuaries: Data Assessment for Juveniles of 15 Focal Fish and Crustacean Species” (2015). The data assessment describes the state of knowledge of juvenile fish and their habitat needs in West Coast estuaries and classifies these estuaries using the Coastal Marine Ecological Classification Standard (CMECS). The assessments will be used to develop a prioritization scheme to guide the work of restoration planners. The partnership involved more than 100 researchers and dozens of fisheries management and scientific agencies and organizations that provided data about specific fishes and their habitat, including the Tijuana River, Elkhorn Slough, San Francisco, and Padilla Bay reserves. The data being acquired is also contributing to two other nationally significant fish habitat studies that are in progress, including one of recreationally important fishes, sponsored by the National Fish Habitat Board, and a study sponsored by NOAA of the habitat requirements of several species of so-called forage fish in the nearshore Pacific Ocean.

Furthering this effort, the reserve recently received a Pacific Marine and Estuarine Fish Habitat Partnership grant from the U.S. Fish and Wildlife service to examine fish assemblages in South Slough and the Coos estuary beginning in 2015. The project involves monthly seining at seven locations in South Slough, five of which were last sampled in the 1980s. In addition, the project will include fyke netting at the Kunz Marsh restoration project site (last sampled in the 1990s). Data from this project will be used to examine long-term changes in fish assemblages in South Slough. The Friends of South Slough will administer the grant for the reserve.

### *Pacific Lamprey Fish Habitat Partnership*

In 2012, the reserve and the Coquille Indian Tribe hosted representatives of seven northwest tribes and state and federal resource agencies at the South Coast Lamprey Summit, a three-day exploration of recovery efforts for Pacific lamprey and other species of cultural importance to Indian tribes. The summit was the first gathering of tribal and non-tribal scientists on the southern Oregon coast to discuss the species recovery. The summit led to the creation of the Pacific Lamprey Fish Partnership, formally recognized in 2016. The partnership’s goal is to conserve Pacific lamprey throughout its range in California, Oregon, Washington, Idaho, and Alaska.

### ***Findings for Habitat Restoration and Coastal Resilience***

**Accomplishment:** The South Slough Reserve has taken a leadership role through the Partnership for Coastal Watersheds, bringing together Coos Bay County, Oregon Coastal

Management Program, and numerous other partners to gather economic and social data, pilot an approach to updating estuary management plans, and move forward with coastal resilience in the Coos Bay area.

**Accomplishment:** The South Slough Reserve managed a three-year collaborative project to restore native Olympia oysters in Coos Bay and establish self-sustaining populations of Olympia oysters in South Slough. The reserve also collaborated in the development of *A Guide to Olympia Oyster Restoration and Conservation*, which identifies key environmental conditions that affect Olympia oysters and includes a qualitative evaluation of 28 embayments along the west coast to identify areas at risk of losing their oyster population.

**Accomplishment:** The South Slough Reserve has completed several significant habitat restoration projects and is monitoring the results to inform future restoration efforts. For example, the reserve planted, and is monitoring, the survival of 1,000 cedar trees, varieties thought to be genetically resistant to the fatal Port Orford cedar disease.

**Accomplishment:** The South Slough Reserve developed Teachers on the Estuary workshops, including a climate change module, in collaboration with the Oregon Coast Education Program partners. The education program has strengthened relationships with local school districts and worked to integrate the results of research and monitoring efforts into teacher professional development offerings, such as the course that focused on Blue Carbon monitoring.

**Accomplishment:** The South Slough Reserve served as one of five national estuarine research reserve reference sites to compare salt marsh vegetation, groundwater, and similar parameters to nearby restoration sites. The project led to the development of protocols and training for restoration practitioners to monitor groundwater as a functional parameter in restoration based on the correlation between hydraulic variability of restoration and reference sites.

**Accomplishment:** The South Slough Reserve brought together seven Northwest Indian tribes and federal and state agencies along the South Coast to participate in a lamprey summit to share the latest scientific information regarding recovery of this endangered species. The summit led to the establishment of a formal relationship for information sharing and dissemination, through the establishment of the Pacific Lamprey Fish Habitat Partnership, formally recognized in 2016.

## **Public Access and Land Management**

The previous section, “Habitat Restoration and Climate Resilience,” also covers topics related to land management. This section covers those topics not previously discussed in the above section.

### ***Upper Watershed Restoration Action Plan***

The reserve completed the Upper Watershed Restoration Action Plan (2009) with funding from an Oregon Watershed Enhancement Board grant. The action plan inventories and classifies

reserve uplands and identifies management areas within the reserve. It also identifies priority areas for restoration, includes on-the-ground management suggestions, and identifies potential threats for management areas. The reserve has been a leader in tidal marsh restoration and is now extending this work into riparian and upland habitats. The action plan serves as the foundation for upcoming restoration endeavors in the reserve, including the Wasson Creek Watershed Restoration Project. The Wasson Creek drainage was identified as the highest priority for habitat improvement and protection.

### ***Habitat Mapping***

The reserve completed and submitted reserve and watershed boundaries and a habitat map to the Centralized Data Management Office in 2011 but did not complete field verification of randomly selected habitat points. In 2014, the reserve began a project to refine and validate Oregon's Coastal and Marine Ecological Classification Standard (CMECS) habitat classification for the Coos estuary. As part of this effort, reserve staff members began updating the 2011 habitat map using the *Standard Operating Procedures for Mapping Land Use and Change in the National Estuarine Research Reserve System* (May 2015). The reserve plans to validate the habitat classifications and convert them to the Coastal and Marine Ecological Classification Standards by 2019. The habitat map will provide valuable baseline information as the reserve continues to move forward with its priorities of invasive removal and habitat restoration. The maps will facilitate the analysis of habitat change within the reserve and across the national system. Since the site visit, the office has provided additional technical assistance to move this effort forward. The NOAA Office for Coastal Management encourages the reserve in its efforts to complete the National Estuarine Research Reserve System habitat map and submit it for approval.

### ***Resource Protection Challenges***

The reserve faces ongoing issues related to dumping, target shooting, illegal harvesting, damage from ATV use, vandalism, burglary, camping, and campfires. The reserve does not have a staff member with law enforcement authority. The reserve relies primarily on the Coos County Sheriff's Department to address most concerns. The county sheriff has a limited staff and patrols are irregular. The U.S. Bureau of Land Management also has an enforcement officer in the region who has assisted the reserve. The Oregon State Police enforce hunting and fishing regulations, and the U.S. Coast Guard provides protection within waterways.

Reserve staff members do informal patrolling as they conduct fieldwork, and maintenance staff members are frequently in the field and able to keep an eye on the most publically trafficked areas of the reserve. Maintenance staff members most commonly enforce reserve rules by informing those they encounter of the rules related to reserve use. The science team also provides some capacity for enforcement by reporting debris or events observed in the reserve. Education staff members assist by educating visitors and students during program orientations.

In 2015, the reserve posted boundary signs that outline the reserve rules along its boundary, particularly in high use and problem areas. In addition, with the new stewardship coordinator,

the reserve has increased its capacity to do public outreach and provide reserve visitors with information. The NOAA Office for Coastal Management encourages the reserve to continue to build on its efforts to manage undesirable human activities, including illegal dumping, target shooting, and harvesting of native species, through such methods as building on existing partnerships with law enforcement and public outreach.

### ***Expanded Public Access***

The reserve provides visitors with learning opportunities and access to the public to enjoy the South Slough area. The reserve is located in a smaller community but still hosts approximately 25,000 people each year. The reserve is accessible by road, trail, or watercraft. The Interpretive Center has new exhibits to engage the public and visitors in learning more about the area, including two aquaria and an aquatic terrarium. The reserve constructed the North Creek Watershed Trail, which provides additional interpretive opportunities for the public and K-12 education programs; and developed a paddle launch in collaboration with the Port of Coos Bay that provides a safe community-friendly location. The NOAA Office for Coastal Management commends the reserve for continuing to improve its public access amenities and expanding public access through land acquisition, as discussed below.

### ***Land Acquisition***

The reserve acquired 1,659 acres within the evaluation period, including tidal estuarine wetlands, forested uplands, and forested fresh water wetlands, helping to ensure that the estuary maintains its natural dynamic processes. The Department of State Lands is responsible for managing the properties.

Property	Acreage	Year	Funding Source
North Creek Headwaters (Salal Log Cabin)	1.4	2008	NERRS Procurement Acquisition and Construction funds and Gustafson Estate funds
Hidden Creek Headwaters	1.6	2008	NERRS Procurement Acquisition and Construction funds and Gustafson Estate funds
Wasson Creek Headwaters	670	2011	Coastal and Estuarine Land Conservation Program and Gustafson Estate funds
Salal Lane Uplands	435	2011	Coastal and Estuarine Land Conservation Program and Gustafson Estate funds
Common School Fund Tracts	312	2012	NERRS Procurement Acquisition and Construction funds, Coastal and Estuarine Land Conservation Program and Gustafson Estate funds
Indian Point	239	2014	U.S. Fish and Wildlife's National Coastal Wetlands Conservation Grant Program and Gustafson Estate funds

The Office for Coastal Management commends the reserve for its successful land acquisitions that help protect the estuary and provide public access. The office encourages the reserve to pursue bringing these properties within the reserve boundary, particularly those acquired with

NERRS Procurement Acquisition and Construction or Coastal and Estuarine Land Conservation Program funds.

### ***Findings for Public Access and Land Management***

**Accomplishments:** The South Slough Reserve developed a foundational Upper Watershed Restoration Action Plan that includes the identification of priority restoration areas, provides on-the-ground management suggestions, and identifies potential threats. The plan has served as a foundation for restoration activities within the reserve, including the Wasson Creek Watershed Restoration Project

**Accomplishment:** The South Slough Reserve enhanced public access through the construction of the North Creek Watershed Trail, which provides interpretive opportunities for the public and K-12 education programs; development of a paddle launch in collaboration with the Port of Coos Bay that provides a safe community friendly location; and installation of new exhibits in the Interpretive Center, including two aquaria and an aquatic terrarium.

**Recommendation:** The Office for Coastal Management strongly encourages the South Slough Reserve to complete and submit its National Estuarine Research Reserve System habitat map.

**Recommendation:** The Office for Coastal Management encourages the South Slough Reserve to continue to build on its efforts to manage undesirable human activities, including illegal dumping, target shooting, and harvesting of native species, through such methods as building on existing partnerships with law enforcement and public outreach.

## **Evaluation Metrics**

Beginning in 2012, national estuarine research reserves began tracking their success in addressing three evaluation metrics specific to their programs. The evaluation metrics include a five-year target and provide a quantitative reference for each program about how well it is meeting the goals and objectives it has identified as important to the program.

Goals and Objectives from the South Slough NERR Management Plan dated 2006-2011:

### **METRIC 1**

**Goal:** Implement a comprehensive program of education and outreach that expands and strengthens the awareness, understanding, appreciation, and stewardship of estuaries and coastal habitats, and promote the use of science in coastal management decision making.

**Objective:** Increase the awareness and understanding of the value of the South Slough estuary and estuarine systems by the public living in the Coos Bay watershed.

**Strategy:** Maintain capacity to offer more formal education programs for pre-K to 20 learners through the use of volunteers and student interns that address ecological functions, values, and services “so that” Oregon citizens are able to make informed decisions that affect estuaries and coastal communities. This measure is strategically aligned with the NERRS Strategic Plan for Education.

**Performance Measure:** From 2012 to 2017, number of contact hours achieved annually through formal education programs.

**Target:** From 2012 to 2017, 12,500 contact hours will be achieved annually through formal education programs.

<u>First Year Results:</u>	21,858
<u>Second Year Results:</u>	9,668
<u>Third Year Results:</u>	10,243
<u>Fourth Year Results:</u>	7,608

#### **Cumulative Results:**

**Discussion:** When setting the target and during year one, the reserve had a misunderstanding regarding how the data were to be calculated. The reserve has a robust education program that reaches students throughout the region through both formal and informal education programs. In addition, the reserve has helped develop formal curriculums around key issues such as blue carbon.

#### **METRIC 2**

**Goal:** To enhance, develop, and implement research and monitoring projects that expand the scientific knowledge of estuarine processes in Pacific Northwest estuaries and provide technical information to coastal managers in the Lower Columbia biogeographic region.

**Objective:** Maintain and develop research and monitoring projects that promote the understanding of coastal issues for dissemination to the concerned public, private, and governmental entities, and decision makers tasked with managing coastal habitats.

**Strategy:** Research and monitoring activities at the South Slough NERR will address an interdisciplinary array of estuarine and watershed science questions and management issues defined by national priorities and regional needs. Research and monitoring projects will be conducted by the reserve staff, visiting researchers, and graduate students, and through collaborations with partners and other interested groups. The reserve staff will promote research and monitoring projects that are related to coastal management issues and provide relevant information to coastal managers. A project will be counted and applied towards the target every year that it is actively being conducted.

**Performance Measure:** From 2012 to 2017, number of scientific research and monitoring projects implemented annually that will contribute to our understanding of coastal management issues

**Target:** From 2012 through 2017, eight scientific research and monitoring projects implemented annually will contribute to our understanding of coastal management issues.

First Year Results: 9  
Second Year Results: 8  
Third Year Results: 10  
Fourth Year Results: 12

**Discussion:** The reserve has either met or exceeded (three of four years) the target every year. As discussed in the findings, the reserve’s research and monitoring projects are contributing to the understanding of coastal resilience and restoration and helping inform decision makers.

**METRIC 3**

**Goal:** Improve the long-term conservation and restoration of native biodiversity and ecosystem processes within the South Slough NERR, with particular focus on the reserve’s upland forests and riparian areas.

**Objective:** Develop projects that promote habitat restoration and native plant communities in the South Slough NERR and Coos Bay Watershed.

**Strategy:** In 2014, a new stewardship coordinator was hired after the position was eliminated in 2010. With the position now filled, the reserve will work with partners, stakeholders, and community volunteers to build restoration activities in the drainages of South Slough NERR by developing projects that focus on invasive species removal.

**Performance Measure:** By 2017, the reserve will provide opportunities annually for volunteers, interns, and community members to participate in stewardship and restoration activities that involve invasive species removal.

**Target:** By 2017, the reserve will provide six opportunities annually for volunteers, interns, and community members to participate in stewardship and restoration activities that involve invasive species removal.

First Year Results: 0  
Second Year Results: 0  
Third Year Results: 7 opportunities provided  
Fourth Year Results: 6 opportunities provided

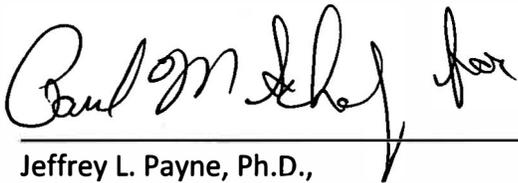
**Discussion:** During the first two years, the reserve did not have a stewardship coordinator. Since the hiring of a stewardship coordinator in 2014, the reserve has developed a robust volunteer program that is able to utilize groups and members of the public to expand its restoration capacity. The reserve met its target by year three and continued to meet the target in year four.

## Conclusion

For the reasons stated herein, I find that the State of Oregon is adhering to the programmatic requirements of the Coastal Zone Management Act and its implementing regulations in the operation of its South Slough National Estuarine Research Reserve.

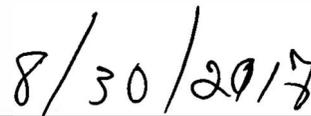
These evaluation findings contain one necessary action and four recommendations. The necessary action is mandatory. Recommendations must be considered before the next regularly scheduled program evaluation. Recommendations that must be repeated in subsequent evaluations may be elevated to necessary actions.

This is a programmatic evaluation of the South Slough Reserve and may have implications regarding the state's financial assistance awards. However, it does not make any judgment about or replace any financial audits.



Handwritten signature of Jeffrey L. Payne, Ph.D., in cursive script, followed by a horizontal line.

Jeffrey L. Payne, Ph.D.,  
Director, NOAA Office for Coastal Management



Handwritten date 8/30/2017, followed by a horizontal line.

Date

## **Appendix A: Response to Written Comments**

No written comments were received.