

Final Evaluation Findings

South Slough

National Estuarine Research Reserve

September 2015 to April 2022

Published August 2022



Office for Coastal Management
National Ocean Service
National Oceanic and Atmospheric Administration
United States Department of Commerce

Table of Contents

Summary of Findings.....	1
Program Review Procedures.....	4
Evaluation Findings	6
Program Administration	6
Education Program	9
Stewardship	10
Research and Monitoring	11
Coastal Training Program.....	11
Facilities, Land Management, and Public Access.....	12
Diversity, Equity, and Inclusion.....	15
Partnership with the Friends of South Slough.....	16
Next Generation Climate Scientists	17
Coastal Resiliency and Habitat Restoration Partnerships	19
Partnership for Coastal Watersheds.....	19
Eelgrass Recovery Advisory Committee	19
Coos Watershed Association	20
Evaluation Metrics	21
Evaluation Metrics: 2012-2017.....	21
Evaluation Metrics: 2018-2023.....	24
Conclusion.....	27
Appendix A: Response to Written Comments.....	28

Summary of Findings

The Coastal Zone Management Act requires the National Oceanic and Atmospheric Administration (NOAA) Office for Coastal Management to conduct periodic evaluations of the operation and management of each national estuarine reserve participating in the National Estuarine Research Reserve System. This evaluation examined the operation and management of the South Slough National Estuarine Research Reserve in Oregon by the Oregon Department of State Lands, the designated lead agency, for the period from September 2015 to April 2022. The evaluation focused on climate resilience through the lens of Training, Partnerships, Community Engagement, and Restoration.

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

Accomplishment: The South Slough Reserve worked closely with the Oregon Department of State Lands, tribal partners, and other stakeholders to complete a thorough and comprehensive evaluation of Oregon agencies and organizations that might serve as the reserve's state lead agency. The evaluation found that the Department of State Lands continued to remain the best choice to serve as the lead agency.

Accomplishment: The South Slough Reserve and Oregon Department of State Lands worked closely with the Oregon legislature to obtain approval for two new positions, a GIS specialist and seasonal education position, and the passage of Senate Bill 126. The bill allows the reserve to expand its boundary to include other lands acquired by the department connected to the Coos Bay estuary, including lands acquired with NOAA funding over the past decade.

Accomplishment: The South Slough Reserve has continued to build and expand a strong volunteer program, averaging 4,600 volunteer hours a year! Volunteers shared how meaningful working at the reserve was, with one volunteer stating it "really embellished my life." The reserve provides a welcoming community and an opportunity to learn about the area's resources. The addition of the trail stewards program has allowed a more diverse group of people to volunteer during hours that work with their schedule, while also adding critical capacity of the reserve to protect and manage their lands.

Accomplishment: The South Slough Reserve successfully acquired a key land parcel at the entrance to the Visitor Center and initiated and completed large facilities projects. Facility projects completed include infrastructure investments in trails, the Visitor Center, and storage facilities, and making the reserve facilities more sustainable and inclusive by improving observation decks and initiating a construction project to make bathrooms wheelchair accessible and gender neutral.

Accomplishment: The South Slough Reserve developed and started implementing a Visitor Center Forest Enhancement Plan to help protect facilities from wildfire. Through

implementation they have increased fire resilience; planted native and culturally important plant species; developed a rain garden; and coordinated with the Coquille Indian Tribe and the Confederated Tribes of the Coos, Lower Umpqua, and Siuslaw Indians resulting in the donation of 60 thinned Port Orford cedar logs to tribal members for traditional uses (e.g. plank house repairs, canoe paddles). The plan and associated on-the-ground projects were also used as a powerful outreach tool to educate others on defensible spaces.

Accomplishment: The South Slough Reserve has established strong partnerships with local tribal nations to ensure that management of the reserve is informed by tribal knowledge and expertise. The Reserve and Tribes regularly collaborate on shared priorities across the sectors including research, monitoring, conservation, restoration, outreach and training. For example, working through a relationship of trust and at the request of the tribes, the reserve and tribes are developing an exhibit to display the culturally significant canoe fragment, so that the canoe can remain close to where it was found and accessible to Tribal members and visitors.

Accomplishment: The South Slough Reserve, worked with the Friends of South Slough and Department of State Lands, to develop a process for the Friends group to provide funds to the department to hire interns and provide a higher level of compensation. This supports a more inclusive internship program that can provide valuable career-building opportunities for low-income students.

Accomplishment: The South Slough Reserve is to be commended for its leadership convening groups such as the Partnership for Coastal Watersheds and the Eelgrass Partnership. Through partnerships and collaboration, these groups are addressing critical needs in the region. The Partnership for Coastal Watersheds collaborated on the development of a new hydrodynamic model of Coos Bay and are supporting the update of the 1970s Coos Bay Estuary Management Plan, which will serve as a model for the state. The Eelgrass Partnership is bringing together experts to address the decline in eelgrass from California to Canada and they have identified a shared list of research priorities that are now being addressed.

Recommendation: The NOAA Office for Coastal Management encourages the South Slough Reserve to continue to invest in maintaining the strong connections and collaboration with other divisions and leadership within the Department of State Lands to provide contributions to the strategic direction of the department, promote professional development opportunities for the staff, and build support for reserve initiatives.

Recommendation: The NOAA Office for Coastal Management strongly encourages South Slough Reserve and the Department of State Lands to explore and pursue opportunities to expand management capacity. For example, the reserve could increase the number of positions with supervisory authority so that the management team is not overburdened with supervisory responsibilities. Alternatively, if the reserve is unable to increase the number of positions with supervisory authority, the management team is encouraged to explore opportunities to shift some non-supervisory responsibilities to other department or reserve staff to ensure that the management team has the necessary time to focus on effectively managing staff and interns and leading the reserve in carrying out its mission. Expanding management capacity will

enhance the ability and effectiveness of the reserve to carry out its mission and allow for the expansion of staff to meet any new needs such as managing restoration funding; help build the next generation of coastal managers; and provide support for existing employees.

Recommendation: The NOAA Office for Coastal Management encourages the South Slough Reserve to look for opportunities to expand stewardship capacity to support wetland restoration efforts, management of reserve lands, and implementation of the Fire Resiliency and Management Plan. The reserve might consider looking at funding opportunities through the Infrastructure Investment and Jobs Act funding to support additional positions.

Recommendation: The NOAA Office for Coastal Management encourages the South Slough Reserve to explore opportunities to work across sectors to implement coastal trainings that support cross-reserve initiatives and the Coastal Training Program.

Recommendation: The NOAA Office for Coastal Management encourages the South Slough Reserve to explore and pursue strategies for ongoing challenges of reducing public use impacts and illegal activities. For example, explore the possibility of taking ownership and maintenance responsibility for Hinch Road and Bridge; installing automated gates and surveillance equipment; and continued collaboration and coordination with the law enforcement community.

Recommendation: The NOAA Office for Coastal Management encourages South Slough Reserve to explore investing in replacement housing (for yurts nearing end of life) to increase capacity for visiting researchers and interns, potentially with coordinated planning and cost-sharing with local partners such as the University of Oregon-Oregon Institute of Marine Biology, Oregon State University, or other state agencies like the Oregon Department of Fish and Wildlife.

Recommendation: The NOAA Office for Coastal Management encourages the South Slough Reserve to build on successful programs and continue working towards increasing diversity, equity, and inclusion through staff and manager trainings, outreach efforts to underserved audiences, improving accessibility on reserve trails, and exploring solutions for transportation limitations.

Recommendation: The NOAA Office for Coastal Management encourages the South Slough Reserve to explore collaborative strategic planning between the Friends group and the reserve to clarify roles and processes that are best done by the Friends group versus the reserve/Department of State Lands. For example, the Friends group and the reserve could work together to develop a process to identify locally relevant issues and projects and recruit interns.

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 and management of the South Slough National Estuarine Research Reserve.

Program Review Procedures

The Coastal Zone Management Act of 1972, as amended,¹ requires that state coastal zone management programs (coastal programs) and national estuarine research reserves (research reserves) that are developed under the act and approved by the secretary of the Department of Commerce be evaluated periodically. Section 315 of the Coastal Zone Management Act and implementing regulations at 15 CFR Part 921, Subpart E, require that a research reserve be periodically evaluated with regard to 1) its operation and management, including education and interpretive activities; 2) the research being conducted within the research reserve; and 3) adherence to the requirements of section 315(b)(2) of the Coastal Zone Management Act.

The National Oceanic and Atmospheric Administration (NOAA) evaluated the South Slough National Estuarine Research Reserve in fiscal year 2022. The evaluation team consisted of Becky Allee, evaluation team lead; Carrie Hall, evaluator; Bree Turner, site liaison; John Rozum, resilience planning specialist; and Jessica McIntosh, Coastal Training Program coordinator, Rookery Bay National Estuarine Research Reserve. The support of reserve staff members 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 Oregon Department of State Lands, published a notice of “Intent to Evaluate” in the *Federal Register* on March 1, 2022, and notified members of Oregon’s congressional delegation. The reserve posted a notice in *The World* on February 27, 2022, of the public meeting and opportunity to comment and also posted on Facebook and Instagram on March 23, April 5, and April 11, 2022.

The evaluation process included a review of relevant documents and a survey of stakeholders, which helped identify climate resilience as a target area through the lens of Training, Partnerships, Community Engagement, and Restoration. 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 virtual public meeting was held on Tuesday, April 12, at 1:00 p.m., to provide an opportunity for members of the public to express their opinions about the implementation of the program. Stakeholders and members of the public were also given the opportunity to provide written comments. A summary of the written comments received and the NOAA Office for Coastal Management’s responses are included in Appendix A. NOAA then developed draft evaluation findings, which were provided to the Oregon Department of State Lands for review, and the department’s comments were considered in drafting the final evaluation findings.

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

¹ [16 U.S.C. 1451 et. seq.](#)

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

Under the current leadership of the South Slough National Estuarine Research Reserve, there has been an expanded scope and effectiveness of the reserve's mission. The reserve manager has forged a path and the means to grow the understanding of the South Slough ecological environment. A customer satisfaction survey for the reserve, with 63 responses, indicated a 98.3% overall satisfaction rating for South Slough.

During the evaluation period, the reserve participated in *The Economic Contribution of the National Estuarine Research Reserves: A Pilot Study*, an economic evaluation of the contributions of four reserves to their respective local economies. The study found that South Slough reserve hosts about 10,000 visitors per year and supports 65 local jobs. The study estimated that visitors spend \$850,000 locally and that the reserve's overall contribution to the local economy is \$6,100,000 annually. A communications person with Oregon Department of State Lands developed a communications plan, identified stakeholders to reach out to, shared presentations, and disseminated the study report broadly. The report has been well received by stakeholders of the reserve.

In 2020, South Slough Reserve's designated lead agency, the Oregon Department of State Lands, was reaffirmed by the State Land Board as the best agency to house the reserve. Several years before, the State Land Board directed the department to evaluate alternative state partners for the reserve due to concerns that supporting reserve operations was inconsistent with the goals of the Common School Fund. The reserve conducted an extensive two-year review. The reserve manager worked closely with potential university partners and stakeholders to explain the reserve's operation and activities and understand potential impacts of moving to a different state partner. Partners played a significant role during the process of state partner reevaluation, including local tribes. The reserve heard from tribes, who expressed concerns about the reserve leaving the department. The tribes believed that the department was best suited to manage the reserve and work with the tribes. This effort also strengthened the reserve's connections and collaboration with other divisions and leadership within the department. In October 2020, a final report that concluded that the reserve should remain within the Department of State Lands was presented to the State Land Board, and there were no objections.

Accomplishment: The South Slough Reserve worked closely with the Oregon Department of State Lands, tribal partners, and other stakeholders to complete a thorough and comprehensive evaluation of Oregon agencies and organizations that might serve as the reserve's state lead agency and found that the Department of State Lands continued to remain the best choice to serve as the lead agency.

Recommendation: The NOAA Office for Coastal Management encourages the South Slough Reserve to continue to invest in maintaining the strong connections and collaboration with other divisions and leadership within the Department of State Lands to provide contributions to the strategic direction of the department, promote professional development opportunities for the staff, and build support for reserve initiatives.

The South Slough Reserve's 2017-2022 Management Plan serves as the primary guiding document for reserve activities. Reserve management is currently working on a management plan update, with an estimated completion date in 2023. Reserve management is meeting with the NOAA liaison monthly to coordinate the work on the plan, as well as the process. Boundary expansion will be a significant part of the new management plan.

The reserve continued to undergo a generational transition during this evaluation period as long-term staff members retired or moved on to new positions, including the manager, operations manager, stewardship coordinator, research coordinator, Coastal Training Program coordinator, and education coordinator. The current manager served as acting reserve manager and research coordinator for one year before being hired permanently as manager in 2018 following the retirement of the previous manager. The operations manager was hired in 2016 following the retirement of the previous operations manager. The facilities manager was hired in 2015 and a maintenance assistant was hired in 2017 following the retirements in these two positions. Two additional positions have been added, a GIS specialist and a seasonal education position.

The reserve manager and operations manager are the only reserve employees with supervisory authority. The reserve has 18 permanent employees, including two managers, and hosts up to 15 interns, and 2 temporary staff annually. The staff and interns cover a wide range of job duties, and interns, in particular, can benefit from high levels of manager involvement. Management of employees and interns takes up a significant amount of the managers' time and limits the reserve's future capacity to add positions and support additional interns. Having additional positions with supervisory authority would allow the management team to provide more support to existing staff and interns and would likely improve employee job satisfaction as well. The current situation also limits the amount of time reserve management has for developing and providing strategic direction for the reserve and building partnerships. Finding opportunities to change the management structure will allow for increased staff capacity.

Recommendation: The NOAA Office for Coastal Management strongly encourages South Slough Reserve and the Department of State Lands to explore and pursue opportunities to expand management capacity. For example, the reserve could increase the number of positions with supervisory authority so that the management team is not overburdened with supervisory responsibilities. Alternatively, if the reserve is unable to increase the number of positions with supervisory authority, the management team is encouraged to explore opportunities to shift some non-supervisory responsibilities to other department or reserve staff to ensure that the management team has the necessary time to focus on effectively managing staff and interns and leading the reserve in carrying out its mission. Expanding management capacity will

enhance the ability and effectiveness of the reserve to carry out its mission and allow for the expansion of staff to meet any new needs such as managing restoration funding; help build the next generation of coastal managers; and provide support for existing employees.

There is good support from the Department of State Lands for all the reserve positions, and salaries are competitive, but the remote location of the reserve continues to be a recruitment challenge. The reserve has run into failed recruitment issues, and people have backed out of commitments due to the remote location of the reserve. Professional development should be considered to aid with staff retention. Some staff have invested in professional development on their own.

The reserve was successful in supporting the passage of Senate Bill 126, which was passed by the Oregon legislature and signed by the governor in 2021. The bill amends ORS 273.553 (effective January 1, 2022) to remove language that previously established Valino Island as the northern boundary of the reserve. The bill allows the reserve to expand its boundary to include other lands acquired by the department that are connected to the Coos Bay estuary. During the previous evaluation period, NOAA helped fund the acquisition of over 1,000 acres with \$1.6 million in Coastal Estuarine Land Conservation Program funding and \$600,000 in National Estuarine Research Reserve System procurement, acquisition, and construction funding; some of these lands were north of the current reserve boundary. This amendment now allows lands managed by the reserve that are located north of Valino Island to be included in future expansions of the NOAA-approved reserve boundary.

Accomplishment: The South Slough Reserve and Oregon Department of State Lands worked closely with the Oregon legislature to obtain approval for two new positions, a GIS specialist and seasonal education position, and the passage of Senate Bill 126. The bill allows the reserve to expand its boundary to include other lands acquired by the department connected to the Coos Bay estuary, including lands acquired with NOAA funding over the past decade.

South Slough Reserve has a strong volunteer program that supports all sectors. The public involvement officer manages the volunteer program, which promotes a strong understanding of estuarine ecosystems among the volunteers, allowing them to become ambassadors in the community. Volunteers assist reserve staff members with tasks that include 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. One volunteer described how participating in the volunteer program has “embellished her life.” She was new to the area and reserve staff welcomed her and signed her up for the trail stewardship program. Volunteers donate an average of 4,600 hours per year. Unfortunately, the effect of the pandemic decreased volunteer participation over the past two years. The reserve hopes these numbers will rebound as health concerns lessen, and they have pivoted their volunteer recruitment efforts to reach different age groups. Most current volunteers are retired; there is interest in reaching out to a younger audience for volunteer recruitment.

Accomplishment: The South Slough Reserve has continued to build and expand a strong volunteer program, averaging 4,600 volunteer hours a year! Volunteers shared how meaningful working at the reserve was, with one volunteer stating it “really embellished my life.” The reserve provides a welcoming community and an opportunity to learn about the area’s resources. The addition of the trail stewards program has allowed a more diverse group of people to volunteer during hours that work with their schedule, while also adding critical capacity of the reserve to protect and manage their lands.

The reserve’s 2017-2022 Management Plan includes a strategic plan that outlines common priorities and goals for the reserve. Each program has specific or shared objectives and actions that contribute to achieving the reserve’s goals and addressing priority topics. For example, the research and monitoring programs are collecting data to characterize environmental conditions in the estuary and measure changes and impacts to estuary habitats over time. The education program utilizes these data in teacher trainings and includes information on reserve projects and results in community outreach classes. The stewardship program integrates research questions into restoration and management activities and works with the science and monitoring program to collect pre- and post-monitoring data to measure the effectiveness of stewardship activities. The Coastal Training Program offers trainings and technical support for coastal decision makers to address priority coastal environmental issues.

Education Program

The education coordinator was hired in 2017 following the untimely loss of the previous coordinator. This position was filled by the education specialist for a period before hiring the current coordinator. The reserve is highly valued for the educational opportunities provided, limited only by staff capacity. This sector has seen many challenges during the evaluation period, including the pandemic, which impacted the number of volunteers who assisted with the education program, and the unforeseen loss of institutional program knowledge. Being rural makes accessing the reserve difficult and, as such, teacher workshops are challenging.

The education program is boosting resilience in coastal communities through education and outreach and is a highly sought-after partnership. Audiences include educators, youth, general audiences, and volunteers. Over the last five years the reserve hosted 16 educator workshops on coastal issues and contributed to knowledge transfer from educators to students. In 2019 the reserve hosted about 90 school programs, reaching roughly 3,000 students. School programs at the reserve are K-12, but about 75% are elementary age. The education program fosters appreciation of nature through such activities as interpretive programs and summer science camps. Summer camps have been offered at the reserve since 2004. In 2018 the reserve began offering a week for high school students that aims to provide teenagers with an opportunity to understand the different careers in science, education, and stewardship within the reserve. Responding to a need heard about from local teachers, the reserve updated the education coordinator job description to specify providing in-school teaching. Teachers can have an educator or volunteer from the reserve visit their classroom or schoolyard, or connect virtually to teach a pre- or post-field trip, or other, lesson.

Stewardship

The stewardship coordinator was hired in 2019 following an eight-month vacancy and five-month period where the previous stewardship coordinator was on extended leave. Staff turnover in the stewardship sector has had significant impacts on the program. Despite staff turnover, the program had many significant accomplishments during the evaluation period. Examples include a 2017 habitat restoration at the endangered western lily site, development in 2018 of the Wasson Creek watershed restoration plan, development in 2019 of a Visitor Center forest enhancement plan, a 2020 native shrub planting program, substantial invasive species removal events, and in 2022 development of a trail stewards program. One partner gave a shout-out to a new Saturday stewardship program, stating that this was a great expansion. Partners expressed support for continued expansion of all the great programs that the sector is already doing and emphasized that the offsite programming is great, indicating such programming is really beneficial to expand the audience reach.

Reserve staff convene and work with technical advisory teams to design projects to fulfill information needs of the restoration community. The Wasson Creek Watershed Restoration Plan was completed in 2018, and implementation of this plan was indicated as a high priority for the stewardship coordinator over the next five years. The stewardship coordinator is currently working with a Technical Advisory Team to update the plan with prevailing restoration techniques and information. The Wasson Creek restoration project is a unique opportunity to do whole watershed restoration, inclusive of lowlands and uplands. Tribal partners stated that this watershed approach is appreciated and that it serves as an important model for how to conduct inclusive and holistic restoration. Partners are looking forward to gaining implementation and post-monitoring lessons learned that can be applied to other watersheds.

Moving forward, the stewardship coordinator will be dedicating significant time to implementation of the Wasson Creek restoration. Implementing Wasson Creek restoration will be a huge undertaking and will require maximum capacity from the stewardship coordinator. However, the project implementation requires additional funding and staff. During Wasson Creek implementation, the stewardship program will continue overseeing intern programs, but other responsibilities will require additional support so those tasks are not lost, particularly critical tasks, like permitting. Rather, the coordinator should identify areas where things can be passed off to others; for example, the Coos Bay Watershed Association could take on some of the invasive species work currently undertaken by the stewardship sector. Approval to get another seasonal person to work on trails would be useful. In particular, it would be good to have that person be part of the stewardship team so that the stewardship coordinator could approve and guide the workload.

Recommendation: The NOAA Office for Coastal Management encourages the South Slough Reserve to look for opportunities to expand stewardship capacity to support wetland restoration efforts, management of reserve lands, and implementation of the Fire Resiliency and Management Plan. The reserve might consider looking at funding opportunities through the Infrastructure Investment and Jobs Act funding to support additional positions.

Research and Monitoring

The research coordinator was hired in 2018 following a five-month vacancy after the previous coordinator was hired as reserve manager. During the evaluation period, the reserve had more than 50 research projects and seven peer-reviewed publications. The reserve also established a sentinel site network and completed habitat mapping and change analysis for the entire reserve during the review period. The System Wide Monitoring Program and Sentinel Site Monitoring programs are of great importance for not only monitoring the environmental conditions of the reserve but also for leveraging more research; it's one reason other researchers do so much research in the reserve system. Partners in research include universities, tribes, community groups, and public schools. These partners exclaimed that the reserve is an excellent partner, helping to advance other research needs. Reserve science is a great resource to contribute to the body of knowledge. Long-term data sets are highly utilized by researchers, and this data-rich estuary draws researchers to the reserve. One researcher stated, "The access to these data sets provide valuable resources for graduate students; to have a longer time scale is incredibly valuable."

Coastal Training Program

The previous program evaluation for the South Slough Reserve concluded that a necessary action for the reserve was to implement a Coastal Training Program that meets the performance requirements in the National Estuarine Research Reserve System's Coastal Training Program Performance Monitoring Manual. This necessary action further stated that 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. The reserve is commended for addressing and successfully meeting the requirements of this necessary action.

The Coastal Training Program coordinator was hired in 2019 following a four-month vacancy after the retirement of the previous coordinator. The new coordinator came on board halfway through the review period just prior to the beginning of the pandemic. During the evaluation period, there were 31 training programs offered, reaching 39 partnering organizations and 799 participants. In spring 2017, the Coastal Training Program hosted a data fair so people from different state agencies could exchange their data. The program also participated in a reserve system science collaborative project on marsh restoration that consisted of a series of focus groups, evaluating three locations, and a Coastal Training Program trained facilitation team. The coordinator is also on an estuarine-resilience watershed planning working group.

The previous coordinator focused the program on bringing GIS tools to the South Coast GIS User's Group and hosting networking events for the diverse group of GIS users and

practitioners. This was done through workshops, summits like the annual Symposium by the Sea (held 2017-2019), and networking events that brought together coastal managers, planners, modelers, scientists, and GIS data service and online tool users from small, rural, and remote communities along Oregon's coast to collaborate and connect with their coastal neighbors.

Reserve staff indicated that the protection of cultural resources became a growing area of interest in the natural resources management community during the reporting period, and the Coastal Training Program responded by collaborating with local tribes to offer trainings that covered: a) identification of cultural resources; b) protection of the resources; and c) policies/laws already protecting these resources and how to write updated policies to reflect best practices. Three cultural resource trainings have been offered since 2019; the audience has largely centered on reserve staff, other field staff from Oregon Department of State Lands, and the Unclaimed Properties Division within the Department of State Lands. This has been an important relationship-building program with the tribes, who provide instructors for the courses. The first workshop had instructors from a single tribe, the next workshop expanded the instructor pool to three tribes, and the latest workshop incorporated material from six tribes on the coast and along the Columbia River.

The Coastal Training Program is considering workshop fees to enhance participation. A recent trial run using fees resulted in a 75% retention rate compared to 50% without fees. Fees are needed to pay for speakers and establish a travel scholarship program. A willingness-to-pay survey to help structure fees would be useful. The Coastal Training Program is also exploring professional development opportunities for students. Interns are currently underutilized by the program, so an examination of ways they could use interns would be useful. There have been some conversations to explore working with the Oregon Coastal Program. Having the Coastal Training Program coordinator establish a working relationship with Oregon Coastal Program staff could provide a nexus to the Oregon coastal management community, giving the coordinator an opportunity to expand the audience and training offerings. A meet and greet between the two programs would be a great idea.

Recommendation: The NOAA Office for Coastal Management encourages the South Slough Reserve to explore opportunities to work across sectors to implement coastal trainings that support cross-reserve initiatives and the Coastal Training Program.

Facilities, Land Management, and Public Access

The reserve's current boundary extends over 5,000 acres and supports several remote public access points. There are only two staff designated to survey the entirety of the reserve. Dumping of trash, theft of forestry products, and illegal camping continue to be issues the reserve must address. Reserve management adjusted the staff schedule to ensure that they have someone on site six days of the week to monitor for these illegal activities. They have also put out game cameras to try to track dumping. The reserve has an established and good working relationship with the county sheriff, but the sheriff's office likewise does not have the staff to regularly monitor the area. State police and tribal officers also aid with enforcement

when able. One potential improvement would be to work with Coos County to explore obtaining ownership of the bridge at Hinch Road, which could then be gated off. The office encourages the reserve to continue to be creative and implement actions to reduce human impacts to reserve resources.

Recommendation: The NOAA Office for Coastal Management encourages the South Slough Reserve to explore and pursue strategies for ongoing challenges of reducing public use impacts and illegal activities. For example, explore the possibility of taking ownership and maintenance responsibility for Hinch Road and Bridge; installing automated gates and surveillance equipment; and continued collaboration and coordination with the law enforcement community.

Successful procurement, acquisition, and construction funding requests have led to several updates and improvements. For example, the reserve was able to expand the science lab; overhaul Spruce Ranch visitor housing; complete Visitor Center renovations; and complete improvements to the trail system and an observation platform. The reserve was also able to improve parking at the ECOS laboratory, and initiate making the reserve facilities more sustainable and inclusive through construction on a project to make bathrooms wheelchair accessible and gender neutral. Some additional facility updates during the evaluation period include:

- Expansion and remodel of ECOS laboratory and parking area – 2018
- Renovated Spruce Ranch housing kitchen – 2018/2019
- Replaced Visitor Center observation decks – 2018/2019
- Updated and replaced Visitor Center gutters – 2019
- Replaced maintenance building roof – 2019
- Replaced Visitor Center HVAC system – 2018
- Replaced maintenance building siding – 2020
- Replaced Spruce Ranch HVAC – 2018
- Painted/waterproofed Spruce Ranch housing – 2019
- Replaced education platform on trail system – 2018
- Updated Visitor Center landscaping with rain garden – 2019
- Added new HVAC/AC unit for server room at Visitor Center – 2019
- Updated new access gate at Big Cedar Trailhead – 2019
- Expanded maintenance compound with new pole barn storage – 2019-2021 (continuing)
- Added wind generator to Joe Ney communications building for backup power – 2019

A 1.14-acre parcel at the entrance to the Visitor Center was acquired in 2021 from Coos County. The property was purchased for \$85,000 with NOAA procurement, acquisition, and construction funds and a donation by the Friends group. The property was a recent foreclosure, and the previous owner retains ownership of an adjacent 0.56-acre unimproved parcel. The Friends group is working with the reserve to secure funds to purchase the remaining 0.56-acre lot through a recently signed purchase option agreement with the owner.

Accomplishment: The South Slough Reserve successfully acquired a key land parcel at the entrance to the Visitor Center and initiated and completed large facilities projects. Facility projects completed include infrastructure investments in trails, the Visitor Center, and storage facilities, and making the reserve facilities more sustainable and inclusive by improving observation decks and initiating a construction project to make bathrooms wheelchair accessible and gender neutral.

Additional facility needs include boardwalks for the public trail as well as interpretive signage and updated housing. Housing at the reserve is greatly appreciated by the many partners. The current capacity supports 11, with septic being the limiting factor. This is rustic field housing and it reaches capacity every year. The reserve prioritizes housing for interns and visiting researchers working on reserve projects, often on a first-come, first-served basis. Housing may also be used to support teacher and Coastal Training Program trainings if available. The housing is located in the maintenance compound, so there is a limitation on who can be included in the intern program if transportation is an issue. The Oregon Institute of Marine Biology has dorms, but they are usually packed. Housing is definitely a need on the coast, and what is available at the reserve is an amazing resource. The reserve is considering the housing situation as it develops its new management plan. The current structures (yurts) are nearing the end of life expectancy. The reserve will need to explore options for improving the housing.

Recommendation: The NOAA Office for Coastal Management encourages South Slough Reserve to explore investing in replacement housing (for yurts nearing end of life) to increase capacity for visiting researchers and interns, potentially with coordinated planning and cost-sharing with local partners such as the University of Oregon-Oregon Institute of Marine Biology, Oregon State University, or other state agencies like the Oregon Department of Fish and Wildlife.

Reserve staff reported that there are many logging roads throughout the reserve, and staff are currently creating an inventory of these roads as part of a fire resiliency and management plan that was developed and implemented to help protect facilities from wildfires. Portions of several of the logging roads have been replanted with disease-resistant Port-Orford-cedar saplings as part of a long-term study being conducted with the assistance of the U.S. Department of Agriculture and Forest Service. The reserve coordinated with tribes to donate cedar that was cleared when the fire resiliency and management plan was implemented. “Cedar, much like salmon, is the lifeblood of our culture; it provides us with medicine, clothing, housing, and transportation,” wrote Doc Slyter, chairman of the Confederated Tribes at the time, in a letter of appreciation for the donation. Slyter values the ability of tribal members to “gather and manage culturally significant resources on these lands for our cultural and ceremonial purposes.”

Accomplishment: The South Slough Reserve developed and started implementing a Visitor Center Forest Enhancement Plan to help protect facilities from wildfire. Through implementation they have increased fire resilience; planted native and culturally important plant species; developed a rain garden; and coordinated with the Coquille Indian Tribe and the Confederated Tribes of the Coos, Lower Umpqua, and Siuslaw Indians resulting in the donation

of 60 thinned Port Orford cedar logs to tribal members for traditional uses (e.g. plank house repairs, canoe paddles). The plan and associated on-the-ground projects were also used as a powerful outreach tool to educate others on defensible spaces.

Diversity, Equity, and Inclusion

The reserve convened a Diversity, Equity, and Inclusion Committee in early 2019, and the Coastal Training Program coordinator was named chair in fall 2019. Activities have included education of reserve staff, consulting nearby tribes in writing a Land Acknowledgement policy, and brainstorming policies and practices for better serving a greater portion of the public in reserve programs, events, and facilities. The reserve has identified a need to make internship opportunities more equitable by providing larger stipends and transportation. There is also a need to increase accessibility of trails for individuals with mobility challenges. The reserve continues to explore ways to expand learning opportunities to make things more equitable, accessible, and inclusive across all sectors and programs. For example, the reserve is considering ways that outreach efforts can better reach underserved populations and exploring solutions to transportation limitations. At the current time, a lack of personal transportation prevents some from having access to the reserve and limits opportunities for interns.

Recommendation: The NOAA Office for Coastal Management encourages the South Slough Reserve to build on successful programs and continue working towards increasing diversity, equity, and inclusion through staff and manager trainings, outreach efforts to underserved audiences, improving accessibility on reserve trails, and exploring solutions for transportation limitations.

One culturally significant action the reserve took was to house a canoe fragment at the reserve's Interpretive Center. The canoe fragment was found at Sunset Bay State Park. Because it was found on state land, per state law, the fragment would have been transferred to the University of the Oregon's Museum of Natural and Cultural History. The three coastal tribes felt strongly that the canoe fragment should remain close to its home location, and they worked with Oregon Parks and Recreation Department to identify South Slough as the best location to house the canoe. The local tribal nations were supportive of the reserve displaying the canoe fragment at the reserve's Interpretive Center in a manner that protects the canoe from humidity. The reserve and the tribes are interested in using this fragment as an anchor for other cultural exhibits in the future.

Accomplishment: The South Slough Reserve has established strong partnerships with local tribal nations to ensure that management of the reserve is informed by tribal knowledge and expertise. The Reserve and Tribes regularly collaborate on shared priorities across the sectors including research, monitoring, conservation, restoration, outreach and training. For example, working through a relationship of trust and at the request of the tribes, the reserve and tribes are developing an exhibit to display the culturally significant canoe fragment, so that the canoe can remain close to where it was found and accessible to Tribal members and visitors.

Partnership with the Friends of South Slough

The Friends of the South Slough (Friends group) 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, which the Friends group helps fund. A representative from the Friends group discussed with the evaluation team that the goal of funding the program is to focus on how the program moves the needle on the next generation of climate scientists. The program provides opportunities for university, community college, and high school students, and adults wishing to gain additional job skills and work experience. The program has individuals addressing different aspects of climate change. 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 Friends group, the reserve, and the Department of State Lands worked closely together to develop a new process that allows the Friends group to provide the department with a lump sum payment to support internships, and the department hires the interns as state employees. This improved compensation allows interns to earn a living wage. The Friends group received a legacy grant that is being used to fund this effort. The Friends group is interested in identifying locally relevant coastal management issues that interns can help address during their internship. This is a new direction for the Friends group and will require new processes to choose the locally relevant issues and recruit interns. The Friends group and reserve are encouraged to work together to develop a process to identify locally relevant issues and projects and recruit interns.

In 2017, the Friends group donated two large native-style canoes to the reserve. The reserve kept one and had some modifications completed to ensure that it was safe and comfortable for students. The canoe can hold about 18 people, which makes it much more feasible to provide an estuary paddle trip for a group of students. The second canoe was donated to the Anishinaabe Pacific Northwest group.

Accomplishment: The South Slough Reserve, worked with the Friends of South Slough and Department of State Lands, to develop a process for the Friends group to provide funds to the department to hire interns and provide a higher level of compensation. This supports a more inclusive internship program that can provide valuable career-building opportunities for low-income students.

Recommendation: The NOAA Office for Coastal Management encourages the South Slough Reserve to explore collaborative strategic planning between the Friends group and the reserve to clarify roles and processes that are best done by the Friends group versus the reserve/Department of State Lands. For example, the Friends group and the reserve could work together to develop a process to identify locally relevant issues and projects and recruit interns.

Next Generation Climate Scientists

The reserve has a robust program that provides valuable training and experiences to the next generation of climate scientists through internships and fellowships, such as the Margaret A. Davidson fellowship program. Partnerships enable the reserve to host a variety of students from local and regional areas. There have been 61 interns since the beginning of this evaluation period in 2015. One partner mentioned that the reserve program is the most incredible learning and training program she's ever seen, noting that interns have opportunities to participate in research programs and educational activities. One intern mentioned that she gained invaluable experience in both the field and the lab and had opportunities to participate in additional field work during the internship. She stated that she learned practical skills of doing research and that her experience has helped her to design a new senior project and has laid the foundations for her career path. One of the science and education interns taught k-12 students of the importance of the estuary. He noted that informing the public is an ongoing challenge, but the reserve makes positive impacts. Another intern learned about how nutrient levels impact types and amount of plankton and described her time as an intern as a "truly amazing opportunity." The fellowship provided her with resources for research, training, and access to estuarine scientists, as well as System Wide Monitoring Program access, which has been helpful with research. She emphasized the importance of professional development aspects, such as presenting and facilitation skills, and noted the fellowship has allowed her to become a more well-rounded scientist.

One suggestion the evaluation team heard from the reserve's partners regarding the internships and fellowships was to make the program more formalized through a new strategic plan for an internship program that would lay out how the various intern and fellow opportunities could be integrated. This could provide the underpinnings to make a stronger cohort. Interns gain a lot from interacting with other interns.

Interns and fellows are always invited to join in summer camps and given other opportunities to highlight their work and expand their experiences. For example, the reserve will often swap interns with other programs for a few days, allowing interns and fellows to work with the U.S. Fish and Wildlife Service to conduct sampling to expand the scope of their experience. The reserve might consider engaging interns in more community outreach events so the public could get to know about the interns and fellows and local research science.

Professional development opportunities could also further enhance the intern/fellow program. The reserve could consider offering coastal trainings during the summer that would be of interest to interns. For example, the reserve could host the Office for Coastal Management's facilitation training.

Sea Grant is a state-serving entity, with interest in continuing coastal efforts. The reserve regularly hosts interns through the Oregon Sea Grant Summer Scholars Program and has assisted the program by providing housing for interns stationed on the South Coast. The reserve's partnership with Oregon Sea Grant benefits the interns through workforce

development and increased environmental literacy. This partnership also gives interns hands-on experience in invasive species work and seagrass restoration. Having interns at the reserve provides an important touch point on the south coast for Sea Grant. Sea Grant uses the reserve as space to foster and facilitate collaborations with the academic community, as there is an “amazing facility at reserve” and availability of short-term housing for interns. The partnership allows Sea Grant to extend its reach to the coastal community.

Getting the word out about internships is primarily through direct contact with local and regional universities. Several of the interns indicated they learned about internship opportunities through classmates or email chain announcements. It is recommended that the reserve continue to focus on communication with local universities to get the word out about these opportunities, but also consider recruitment through professional societies. Using previous interns to make the public aware of internship opportunities and recruit new interns by talking about their experiences is also a viable way to get the word out.

Coastal Resiliency and Habitat Restoration Partnerships

The reserve leverages many partnerships in the work it does to advance coastal resiliency and habitat restoration. Several sessions throughout the evaluation highlighted the various strong partnerships that contribute to the accomplishments of the reserve.

Partnership for Coastal Watersheds

The Partnership for Coastal Watersheds is a group of civic-minded community members representing divergent perspectives and collaborating to develop locally driven approaches to responsible development, and to help prepare for climate-related changes on Oregon's south coast. The partnership collaborates as a community and serves as a state model for estuary management plan updates. For example, System Wide Monitoring Program data are incorporated into several projects, including a hydrodynamic model developed by University of Oregon researchers and the Lands and Waterways: Data Source, which lays a vital foundation for revision of the Coos Bay Estuary Management Plan.

The partnership works to promote research and science coming out of collaboration and is supporting additional work in the region. Reserve staff coordinate the partnership and facilitate the leveraging of funding and technical capacity to develop projects related to the partnership's mission. The reserve's leadership of the partnership was noted by many partners and stakeholders as an important, significant contribution. Lessons learned from the partnership's work are being utilized by other communities such as Yaquina Bay and Tillamook. One local government official described working with the partnership as "amazing" and as helping the county tap into broader knowledge, bringing science to planning decisions. Another partner stated that the partnership "is awesome" and the perfect venue to get feedback from the community. The partnership is considered a "really important group" and the reserve's leadership is critical to the success of the group. Some examples of achievements with this partnership include:

- Development of a new hydrodynamic model of Coos Bay
- Updated Coos Bay Estuary management plan (funded by the reserve) that included a map atlas, science findings, and management recommendations
- Development of a vulnerability analysis and adaptation plan
- Sounding board for research projects to ascertain local knowledge, help develop useful products, and help to refine models.

Eelgrass Recovery Advisory Committee

Reserve staff formed a regional Eelgrass Recovery Advisory Committee and collaborated with multiple partners on projects to understand eelgrass population declines and estuarine areas best suited to support native species restoration and enhancement, including eelgrass and native oyster beds. The reserve has the lead role in bringing together this advisory group of 20 organizations that form the committee. In 2018, a mentored student analyzed eelgrass

abundance in lower Coos Bay and documented decline in South Slough. The following year, the reserve used this analysis to put together a workshop of eelgrass experts from British Columbia to California to share technical expertise and identify top research and education priorities on eelgrass. Coming out of the workshop, the committee was formed with five subgroups: abiotic stressors, biotic stressors, mapping, restoration, and ecology. There are currently three graduate students working on data modeling to understand the decline and another student hosted to characterize sediments in eelgrass habitats in South Slough and Coos Bay. In 2020, the committee began a pilot eelgrass transplant experiment looking at the impact of elevation and season of planting. Finally, the committee benefits from reserve monitoring data. The reserve has quarterly monitoring of eelgrass, which was cited as rare. This monitoring allows researchers to document seasonal changes. Some highlights for the partnership include:

- Received 2018 Reserve System Science Collaborative Grant to help support this effort
- Held a workshop that gave an overview of the issues with eelgrass, the causes of its declining status, research, monitoring, and the identification of data gaps and research ideas
- Integrated the work of three Margaret A. Davidson fellows to refine ecological models and look at other abiotic and biotic factors influencing eelgrass distribution

Coos Watershed Association

Another important organization that reserve staff support is the Coos Watershed Association. The association uses the reserve's research and monitoring to inform its restoration work. Staff have been serving on planning committees for the association for over five years. Staff provide organizational support, serve as active members of the board, and are members of the outreach committee. Representatives from the association stated that the reserve enhances their mission and programs in a very direct way and that the reserve provides a welcoming place to go. One example of a joint project is the rain garden at the Visitor Center, developed by the association along with reserve staff.

Accomplishment: The South Slough Reserve is to be commended for its leadership convening groups such as the Partnership for Coastal Watersheds and the Eelgrass Partnership. Through partnerships and collaboration, these groups are addressing critical needs in the region. The Partnership for Coastal Watersheds collaborated on the development of a new hydrodynamic model of Coos Bay and are supporting the update of the 1970s Coos Bay Estuary Management Plan, which will serve as a model for the state. The Eelgrass Partnership is bringing together experts to address the decline in eelgrass from California to Canada and they have identified a shared list of research priorities that are now being addressed.

Evaluation Metrics

Beginning in 2012, 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. In 2017, reserves began a new five-year period and set targets specific to their programs based on measures from existing National Estuarine Research Reserve System performance measures.

Evaluation Metrics: 2012-2017

Metric 1: Education

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 promotes 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-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.

Results:

- Year 1 = 21,858
- Year 2 = 9,668
- Year 3 = 10,243
- Year 4 = 7,608
- Year 5 = 7,870

Total: 1 of 5 years the reserve met its annual target of 12,500 contact hours for a total of 57,247 contact hours.

Discussion: The reserve met its target for only one of five years. The reserve’s education program was heavily impacted by the untimely loss of the education coordinator, but the reserve still managed to average 11,449 contact hours over the 5-year period.

Metric 2: Research and Monitoring

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 Reserve 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 reserve staff, visiting researchers, graduate students, and through collaborations with partners and other interested groups. 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 to 2017, 8 scientific research and monitoring projects implemented annually will contribute to our understanding of coastal management issues.

Results:

- Year 1 = 9
- Year 2 = 8
- Year 3 = 8
- Year 4 = 12
- Year 5 = 15

Total = 5 of 5 years the reserve met its annual target of 8 scientific research and monitoring projects.

Discussion: The reserve is applauded for successfully implementing and achieving or exceeding its target for scientific research and monitoring projects every year.

Metric 3: Restoration and Stewardship

Goal: Improve the long-term conservation and restoration of native biodiversity and ecosystem processes within the South Slough Reserve, 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 Reserve 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 Reserve by developing projects that focus on invasive species removal.

Performance Measure: By 2017, the South Slough 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 South Slough Reserve will provide 6 opportunities annually for volunteers, interns, and community members to participate in stewardship and restoration activities that involve invasive species removal.

Results:

- Year 1 = 0 opportunities for invasive species removal
- Year 2 = 0 opportunities for invasive species removal
- Year 3 = 7 opportunities for invasive species removal
- Year 4 = 6 opportunities for invasive species removal
- Year 5 = 8 opportunities for invasive species removal

Total = The reserve exceeded its final year target of 6 opportunities for invasive species removal.

Discussion: The reserve did not provide any opportunities for invasive species removal in years 1 and 2 as there was no stewardship coordinator. Once a stewardship coordinator was on board, the reserve was able to begin building a program to use volunteers to address invasive species removal, and by year 5 had built its program up to offer 8 opportunities annually, exceeding its target of 6 opportunities.

Evaluation Metrics: 2018-2023

Metric 1: Education

Goal: Management Plan Priority 2, Goal 3, Increase public awareness of reserve stewardship practices, habitat-related research, and habitat protection.

Objective: Management Plan Priority 2, Goal 3, Objective 2, More fully incorporate the use of local data into at least two formal education pathways, to help illustrate connectivity of estuarine and marine habitats.

Strategy: Increase the use of reserve data in K-12 formal education programming.

Strategy: Continue to improve the engagement of students and citizen scientists in data collection and monitoring.

Performance Measure: From 2017 to 2022, the total number of P-12 student contact hours through the reserve’s formal education programs.

Target: From 2017 to 2022, the reserve’s formal education programs will result in 20,000 P-12 student contact hours.

Results: Year 1 = 7,890 P-12 student contact hours
Year 2 = 7,035 P-12 student contact hours
Year 3 = 2,936 P-12 student contact hours
Year 4 = 895 P-12 student contact hours

Total to Date = 18,756 student contact hours

Discussion: The decline in contact hours noted for years 3 and 4 reflect the impacts of the COVID-19 national pandemic. The reserve still has a good chance of meeting the five-year target.

Metric 2: Research

Goal: Improve the scientific understanding of estuaries and their watersheds through the development and application of reserve research, data, and tools.

Objective: Reserves and coastal researchers will increase their collaborative research to address the needs of decision-makers and stakeholders.

Strategy: Conduct collaborative research projects that engage natural resource managers across multiple sectors to address decision-makers’ and stakeholders’ needs.

Strategy: Engage undergraduate and graduate students in collaborative research opportunities. Maintain and strengthen partnerships with research institutions to advance estuarine science at reserves.

Performance Measure: From 2018 to 2022, the average number of research projects being carried out annually within the reserve.

Target: From 2018 to 2022, an average of 12 research projects per year will be carried out within the reserve.

Results:

- Year 1 = 21 research projects
- Year 2 = 21 research projects
- Year 3 = 17 research projects
- Year 4 = 18 research projects

Average to Date = 19 research projects per year

Discussion: The reserve is to be commended for exceeding the target for research projects for the first four years. The reserve is on track to continue to exceed its target.

Metric 3: Volunteer Performance

Goal: Enhance and inspire stewardship, protection, and management of estuaries and their watersheds in coastal communities through place-based approaches.

Objective: Communities and individuals will have an enhanced connection to estuaries and coastal ecosystems to promote stewardship and care of the resource.

Strategy: Create and enhance volunteer programs that contribute to reserve goals, facilitate outreach, and inspire connection to estuaries in their communities.

Performance Measure: From 2017 to 2022, the number of volunteer hours contributed to reserve programs as measured by the total Volunteer Hours Index.

Target: From 2017 to 2022, volunteers will contribute 20,000 volunteer hours to reserve programs.

Results:

- Year 1 = 6,452 volunteer hours
- Year 2 = 3,861 volunteer hours
- Year 3 = 2,875 volunteer hours
- Year 4 = 1,739 volunteer hours

Total to Date = 14,927 volunteer hours

Discussion: The decline in volunteer hours noted for years 3 and 4 reflect the COVID-19 national pandemic. As discussed in the findings, the reserve has recently developed several new programs and is attracting new volunteers. Due to the impacts of the pandemic, the reserve will most likely not meet its five-year target.

Conclusion

For the reasons stated herein, I find that the State of Oregon's operation and management of the South Slough National Estuarine Research Reserve, including education, research, and interpretative activities, is adhering to the terms of the reserve's financial assistance awards and the programmatic requirements of the Coastal Zone Management Act and its implementing regulations.

These evaluation findings contain eight recommendations that must be considered before the next regularly scheduled program evaluation but that are not mandatory at this time. Recommendations that must be repeated in subsequent evaluations may be elevated to necessary actions.

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



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

August 30, 2022

Date

Appendix A: Response to Written Comments

Reagan Thomas

I'm a senior at Portland State University majoring in Environmental Science and minoring in Geography and GIS. I was an intern for South Slough during the summer of 2021 as part of an REU program hosted by the Oregon Institute of Marine Biology. I was mentored by Ali Helms, the estuarine monitoring coordinator.

My research for the internship was focused on the sediment characteristics of eelgrass beds in the estuary to help inform site suitability for the Reserve's pilot eelgrass restoration project. It was my first time conducting research and I took full advantage of the opportunity to absorb everything I could from the research staff. I learned about the many ecosystem services provided by eelgrass beds, including carbon sequestration, wave attenuation, and substrate stabilization, and the provision of habitat for species that are culturally and economically valuable to Oregon's coastal communities. I also learned about the environmental and anthropogenic threats estuaries face, as well as estuarine ecosystem functions that protect communities from sea level rise, coastal eutrophication, and shoreline erosion. Through my research project and discussions with South Slough scientists, I gained a more thorough appreciation for estuaries and the importance of coastal restoration to enhance climate resilience.

During my time at South Slough, I got invaluable experience conducting research in the field and in the lab. A substantial portion of my college education prior to the internship had been remote as a response to the pandemic, so I was unable to fully develop those research skills that require in-person learning. The internship helped me overcome those learning gaps. In addition to my eelgrass research, I participated in field work for other research, including assessing vulnerability to wildfire, assessing salt marsh restoration success, collecting data on invasive green crabs, and taking water quality data throughout the estuary. The direct mentorship from Ali, as well as the supportive and welcoming nature of the rest of the staff allowed me to learn many of the practical skills necessary for conducting research.

They also generously answered my many questions about what it is like to be an environmental researcher. Without exception, the South Slough research staff welcomed my questions and spoke candidly about their work and how important it is to them. Those discussions are a key part of why I have become so driven toward a career in research.

I am now in the beginning stages of a new research project for a senior thesis that is in many ways a thematic continuation of what I learned at South Slough. I'm studying salt marsh restoration projects along the Pacific Northwest coast to determine how different restoration techniques have led to different outcomes. The knowledge, practice, and inspiration I gained through my internship at South Slough were motivators for this new research and will help inform my process.

There were several other undergraduate interns at South Slough who I became good friends with. I can say with certainty that their sentiments about their internships largely mirror mine in terms of how quickly they developed as scientists and how impactful the overall experience was for them. Some of them have taken inspiration from their internships to orient themselves toward research and restoration, others toward environmental policy and management. This speaks to the strength of the Reserve to inspire and equip students for careers in applied research and environmental protection, which will contribute to the global effort to increase climate resilience and awareness.

To summarize, my internship had a galvanizing effect on me. The experiences I had working alongside the researchers there laid the foundation for the professional skills required for a career in environmental research, and the relationships I made with the staff made way for conversations that validated and intensified my desire to become an environmental scientist. My summer at South Slough was a formative experience for me and one for which I will always be grateful.

NOAA Office for Coastal Management Response: The Office for Coastal Management thanks Mr. Thomas for his comments.

Christine M. Moffitt

The reserve interns have many focus areas, and the intern program does not appear to have a theme. The individual interns are not specifically addressing climate science as a theme, although several of the internships have had highly relevant focus areas.

Our organization (Friends of South Slough) has a mission “To support protection and stewardship of estuaries by being a trusted voice on estuary policy and by enhancing the work of South Slough Reserve.”

In the past two years, due to several factors including COVID sequestration, our organization has focused more to nudge the leadership of the Reserve into a more coordinated interaction with our organization’s leadership. We have worked to prioritize activities and our volunteer engagement to essential functions that link to policy and engagement. We are interested in enhancing and highlighting research activities that provide a more regional impact and outcome. We are concerned that there are serious gaps in knowledge within the public, its policy makers, and leaders regarding estuary function. There have been recent proposals by local and regional leaders that have proposed major alterations to the estuary to accommodate shipping and industrial development. We see an immediate need for more targeted focus within the community and in the region to enhance the understanding of protection and restoration of essential habitat such as eelgrass, providing an understanding of the complexities of estuary hydrology affected by upwelling, dredging, and other physical factors. We also see an emerging need to understand the capacity of estuaries to store and expand blue carbon.

The reserve is a National Estuarine Research Reserve. We wish to emphasize the research capacity and help direct the outcomes of this research into the outreach and training of interns, community members, local leadership, and regional, state and other policy makers.

We suggest that more cohesive programs would be helpful so that the internship program would be more focused and coordinated program. We have already taken steps to help provide this program more consistent funding, and also to provide competitive wages for the interns to improve equity of opportunity for these positions. At this time, it has been more of a program that is stochastic and takes opportunities as available. We think strategic planning would be important to set goals for the program and regularly evaluate the success with exit interviews, outside reviews and other tools.

NOAA Office for Coastal Management Response: The Office for Coastal Management thanks Ms. Moffitt for her comments.

Alexa Carleton

Hello! I'm the Outreach Coordinator for the Coos Watershed Association. I've been in this role for 9 years, and from the very beginning, I knew that I wanted to work with the South Slough Reserve as much as possible. Luckily, there is a lot of overlap between what our organizations do and care about, so it's been easy to work together! Between 2015 and 2021, I have had the pleasure of working closely with at least 13 South Slough staff and AmeriCorps members on a variety of projects.

This work falls into four main categories that I will touch on today: youth programs, invasive species, community education, and organizational support.

First, youth programs. We lead a few different types of watershed stewardship and leadership programs for local teens, and South Slough staff have been involved with all of them—whether it's letting us use the South Slough classroom and Interpretive Center as a home base for activities; connecting us to visiting researchers who teach our students how to conduct eelgrass feeding trials; teaching our students how to survey beaver dams, measure trees, or monitor restoration plantings; or training our high school crews to mentor younger students in the Estuary Explorers program. These activities have significantly enhanced our youth programs and enriched the student learning experience year after year, especially for the youth who had never been to South Slough and can now take their families there.

Second, invasive species: South Slough Reserve is one of our most active partners when it comes to control and education efforts: they have helped out at our annual weed pull events, invited us to participate in their Stewardship Saturday events as well as their virtual "stay at home stewardship" series, helped us produce educational Scotch broom and biddy-biddy videos on South Slough property, and are members of our regional weeds partnerships such as the Gorse Action Group.

Third, community education:

- South Slough staff have been instrumental to the Coos Watershed Mayfly Festival, which is an event our organization leads each year that's focused on making watershed stewardship fun and accessible to the general public. For five years, South Slough staff have served on the planning committee and developed/led an activity, whether it's in person or virtual.
- They also invited us to help develop a rain garden at the Interpretive Center, which features 15 native species—more than any other local project of this type—and is a stellar example that both of our organizations can use for showing people how to do this type of landscaping using only the plants that are native to our region. This is one of the most fun projects I've worked on, and one that I feel really proud of—and I know they could have done it on their own but chose to welcome us in as their main collaborator.

Lastly: organizational support. South Slough has been an active member of our board for many years (often in leadership roles) and, more recently, our newly formed Outreach and Education Committee. Because of everything they do and represent in the community, they bring a lot to the table and we really appreciate having them in these more formal roles in addition to all the informal ways we work together. They have also helped elevate and advertise all our programs within their newsletters, email lists, etc., and we try to do the same in return

OVERALL – South Slough Reserve enhances the Coos Watershed Association's mission and programs in a very direct way, both by sharing their passionate and knowledgeable staff with us and all of our audiences, and by welcoming us into the South Slough landscapes—for instance, giving us the perfect place for a rain garden demonstration and THE perfect place to learn about watersheds. When it comes to making science and nature engaging and accessible for our community, South Slough is often one of our main partners—and usually our first phone call. I can honestly say that working with this group of people is one of the absolute best parts of my job.

NOAA Office for Coastal Management Response: The Office for Coastal Management thanks Ms. Carleton for her comments.

Lonne Mays

The South Slough National Estuarine Research Reserve, under Bree Yednock's leadership and expertise, has expanded both the *scope* and *effectiveness* of its mission. The SSNERR is providing scientifically validated guidance to decision makers at local, state, and national levels regarding the key roles that estuaries play in maintaining Earth as a habitable planet for current and future generations. In addition, the SSNERR's Community Outreach programs and educational programs bring to all generations an understanding of the importance of estuaries, as well as an appreciation of their beauty and wonder. As the very first National Estuarine Research Reserve created, the South Slough NERR has forged a path and means for the

scientific community, as well as the world at large, to grow in its understanding of the myriad interdependent ecosystems comprising the meeting of the fresh water and marine environments, and how the Anthropocene epoch will ultimately determine their collective fate.

NOAA Office for Coastal Management Response: The Office for Coastal Management thanks Mr. Mays for his comments.

Dave Stone

Last time I visited, I wanted to photograph sundew, which I had seen there years before. I asked for a map and was told its location was no longer on the map because this rare plant was being poached. It's too bad that is happening and the law-abiding public can't be told where it is, but good on them for protecting it. That should be their priority. I'm ok looking for it on my own if that is what it takes to protect it.

NOAA Office for Coastal Management Response: The Office for Coastal Management thanks Mr. Stone for his comments.

Madeleine Vander Heyden

I will not be able to attend the virtual public meeting so instead I am writing to express my support and appreciation for the staff at SSNERR. I manage the Oregon Coastal Program for the USFWS and have worked with the Reserve on a number of projects to improve habitat for coastal species of concern. The Reserve is one of my most reliable partners. I can count on stewardship and monitoring staff to work collaboratively, responsibly manage financial assistance agreements, and effectively communicate project issues and results. They exhibit a high degree of professionalism, competency, and enthusiasm. I consider myself fortunate to have the Reserve in my community. I also appreciate the hiking trails and interpretive programs, and consider the Reserve to be a great asset to Oregon coastal conservation and science.

NOAA Office for Coastal Management Response: The Office for Coastal Management thanks Ms. Vander Heyden for her comments.

Barbara Taylor

If I recall correctly, South Slough National Research Reserve was the first NRR to be designated in the U.S.A. I have lived on the coast of Oregon (less than a 30-minute drive from South Slough NRR) all my life – 69 years. SSNERR offers educational and scientific opportunities for students and researchers alike, as well as providing critical habitat protection for wetland flora and fauna. The Reserve is popular with local nature enthusiasts, as well as being a destination for nonresident hikers, birders, artists, photographers, kayakers, and canoeists. Some trails on the Reserve are open for folks to walk their dogs. The staff and volunteers at SSNERR are

knowledgeable and helpful, helping to provide a unique and enriching experience for all visitors, whether their purpose is recreational or professional. SSNERR is a gem on Oregon's south coast.

NOAA Office for Coastal Management Response: The Office for Coastal Management thanks Ms. Taylor for her comments.

Kenneth F. Bierly

As a multigenerational Oregonian I would like to provide my sincere appreciation for the work of the SSNERR staff and the programs they support. For some 30 years I have worked in natural resource management in Oregon as Wetland Program Manager of the Division of State Lands (now Department of State Lands) and as Governor Kitzhaber's Manager for the Governor's Watershed Enhancement Board and as Deputy Director of the Oregon Watershed Enhancement Board until my retirement in 2013. During that time, the staff and programs of the SSNERR provided the state with a model of science applied to place and community that both helped in the administration of programs I was involved with and to Oregonians across the state.

The program has attracted very talented staff that have either completed their careers at the reserve or have gone on to contribute in other roles. The program provides a model for community learning and the practice of using science to build tools for improved management of our coastal resources. It is with great regard that I recommend the continued support and assistance to the SSNERR.

NOAA Office for Coastal Management Response: The Office for Coastal Management thanks Mr. Bierly for his comments.