Sitka Sedge Tidal Wetland Project (SSTW)

#NEPCWG-21-TillamookEP

Executive Summary

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TILLAMOOK ESTUARIES PARTNERSHIP

Final Report Glossary

CTSI - Confederated Tribes of Siletz Indians
DEQ - OR Department of Environmental Quality
DLCD - Department of Land Conservation & Development
ESA – Environmental Science Associates
ESU - Evolutionarily Significant Units
MOU – Memorandum of Understanding
MTR – Muted Tidal Regulator
NCLC - North Coast Land Conservancy
NNSLWC - Nestucca, Neskowin, and Sand Lake Watersheds Council
NOAA – National Oceanic and Atmospheric Administration
ODFW - OR Department of Fish & Wildlife
OPRD – OR Parks & Recreation Department
OWEB – OR Watershed Enhancement Board
QAPP – Quality Assurance Project Plan
RFP – Request for Proposals
SLE – Sand Lake Estuary
SLR – Sea Level Rise
SSSNA – Sitka Sedge State Natural Area
SSTW – Sitka Sedge Tidal Wetlands
TCPW - Tillamook County Public Works
TDM – Tierra del Mar
TEP – Tillamook Estuaries Partnership
USFS - US Forest Service
USFWS - US Fish & Wildlife

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Where is Sitka Sedge and Why is it Important?

Sand Lake Estuary on the Oregon Coast
Located on the north coast of Oregon between Tillamook and Pacific City, Sitka Sedge State Natural Area (SSSNA) stretches across approximately 357 acres of beaches, tidal flats, emergent salt marshes, and forested wetlands (Figure 1). The park is classified as a state natural area, which is a designation for protecting outstanding, or important portions of Oregon's ecosystems for continued public education, and/or for contributing to larger ecosystem health.

Figure 1 - Sitka Sedge State Natural Area map, Tillamook County, Oregon.

SSSNA includes Whalen Island, the mouth of Sand Lake Estuary (SLE), and an area, previously known as the "Beltz property", which was purchased in 2014 by the Oregon Parks and Recreation Department (OPRD). SLE is Tillamook County's least developed estuary, having lost only 2% of its natural area to commercial, residential, and agricultural conversion between 1870 and 1970. The focus of the Sitka Sedge Tidal Wetland (SSTW) project is on restoring a section of the converted estuarine land that is west of Sand Lake Road and south from Beltz Dike to the adjacent community of Tierra Del Mar (TDM), which is a small underserved, unincorporated community of about 300 residents. This project provides an ideal opportunity to almost fully restore an estuary and its watershed to their natural states (i.e. <1% development).

Importance to Wildlife
The entirety of the SLE, including SSSNA, is located along the Pacific Migratory Flyway, providing indispensable habitat for diverse migratory bird species. The northwestern tip of SSSNA is a Western Snowy Plover Management Area with restrictions on beach access during nesting seasons between March and September each year. SLE supports 17 federal and/or state species of concern, nine of which are Oregon Watershed Enhancement Board's (OWEB) north coast priority species.

Among these species of concern at SSSNA is the Oregon Coast coho salmon (*Oncorhynchus kisutch*), which is listed as "Threatened" under the Endangered Species Act. NOAA's recovery plan states the primary limiting factor for coho recovery is access to intact rearing habitat in

tidal wetlands. Access to such rearing habitat within SSSNA is currently being restricted by Beltz Dike, which this project seeks to remedy. Other native fishes within SSSNA include Chinook salmon, chum salmon, winter and summer steelhead, and sea-run cutthroat trout. Pacific lamprey likely occur in the watershed but are not well-documented.

Tidal wetland access is a critical limiting factor for healthy coastal watersheds. At SSSNA, the only existing tidal flow occurs at Beltz Dike through a single four-foot diameter culvert with a broken tidegate. The Beltz family, who were among a series of families who owned the property prior to OPRD, originally built the dike for agricultural purposes (Figure 2). The tidegate was not designed to provide flood protection from tidal inundation for TDM (because the community did not yet exist) and its design precedes today's fish passage standards as well as any considerations related to sea level rise or other climate change factors. The broken tidegate is now causing erosion on the north and south sides of the levee and high velocity through the culvert making it difficult for fish passage. These ongoing problems put the levee at risk of failure (it is not a matter of "if", but a matter of "when") and give this project a sense of urgency to the project team and to the local community of Tierra del Mar.

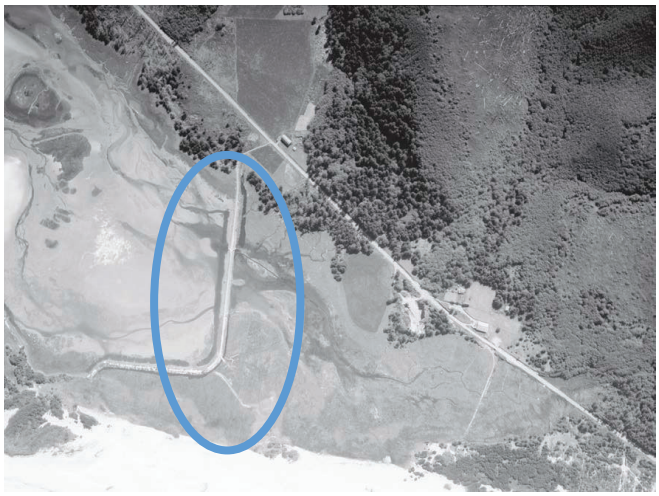

Figure 2 - 1939 Aerial of Sitka Sedge State Natural Area with Beltz Dike circled in blue. Tillamook, Oregon.

Importance to People

Tidal wetlands provide invaluable ecosystem services to coastal communities that are negatively impacted by tidal wetland loss. These services include water purification, water quantity/storage, sediment storage and routing, buffering of floodwater, food provisions, and natural aesthetic.

Tribal Importance[1]: Sitka Sedge is in the traditional territory of the Nestucca group of Tillamook Indians, an area that was originally included within the Siletz Reservation boundaries from 1855-75. The Nestucca Tillamooks are now part of the Confederated Tribes of Siletz Indians. In addition, the Confederated Tribes of the Grand Ronde claim cultural affiliation to the area.

Community of Tierra del Mar: The dike restricts waterflow in both directions and can cause rain, snowmelt, and other freshwater sources to back up within Beltz Marsh rather than flow into SLE. Lack of wetland drainage due to the undersized culvert potentially contributes to

[1] Excerpt from the Sitka Sedge State Natural Area website; https://stateparks.oregon.gov/index.cfm?do=park.profile&parkId=208

chronic localized flooding problems in TDM (Figure 3). The main connection road, Sand Lake Road, is frequently closed due to flooding and has been identified by Tillamook County Public Works as being at risk of total failure.

Figure 2 - Flooding in Tierra del Mar (photo courtesy of ESA)

Visitors to Sitka Sedge State Natural Area: Beltz Dike now serves as an unmaintained, half-mile long walking trailhead that leads from the parking area to 3.5 miles of looping hiking trails through SLE and coniferous forested dunes to the beach and the Pacific Ocean. The day use area includes picnic tables, ADA accessible bathrooms, bicycle repair stations, and an information kiosk.

How Will this Project Positively Impact Coastal Ecosystems and Communities?

The goal of this project is the evaluation of dike (re)location and design alternatives that will enable future tidal reconnection of 68-acres of the Beltz Marsh wetlands (located south of the existing Beltz Dike), restoration of hydrologic function, further habitat complexity, increase species diversity, and improve water quality. Comparisons between dike (re)location alternatives include (1) extent of restoration/reconnection of Beltz Marsh to tidal and estuarine processes in the adjacent Sand Lake Estuary, (2) improvement of fish passage conditions into Beltz Marsh and the three creeks east of Sand Lake Road (Reneke, Beltz, and No Name/East Marsh) to address limiting factors preventing recovery of ESA-listed Oregon Coast coho salmon and benefit other native fish species, (3) the goal of no negative impacts to neighboring properties in Tierra Del Mar (TDM) and, to the extent feasible, improve TDM's flood protection, stormwater management, and resilience to climate change and sea-level rise, (4) to maintain or improve recreational access to the Sitka Sedge Natural Area (SSNA) trail network, and (5) costs. An example of a dike relocation and estuarine restoration concept planning map that is part of the alternative analysis is shown in Figure 4.

Evaluation of dike (re)location alternatives that provide optimal tidal connectivity to Beltz Marsh, including comprehensive tidal wetland designs, is the just first step in a much larger watershed-scale restoration effort within SSSNA. Final designs and restoration of Beltz Marsh will be next, followed by the restoration of the SSSNA property east of Sand Lake Road including (i) upstream fish passage improvements on all the three salmon-bearing creeks, (ii) floodplain wetland restoration, and (iii) large wood placement on Beltz and Reneke Creeks. Together, these restoration efforts will not only improve habitat for the fish and wildlife that depend upon SSSNA, the birds that stopover in SSSNA while migrating along the Pacific Flyway, and the 17 federal and/or state species of concern; it will also protect the community of Tierra del Mar (TDM) from flooding and will remove transportation barriers along a lifeline road

system for the isolated, rural communities and for commercial vehicles that rely on Sand Lake Road. The changes made to Beltz Dike, stemming from the alternative analyses conducted during this project, will change the hydrology within Beltz Marsh. The designs for later phases of the larger restoration project will be based on the new hydrology. Therefore, the goal of this Sitka Sedge Tidal Wetland project is quite literally "foundational".

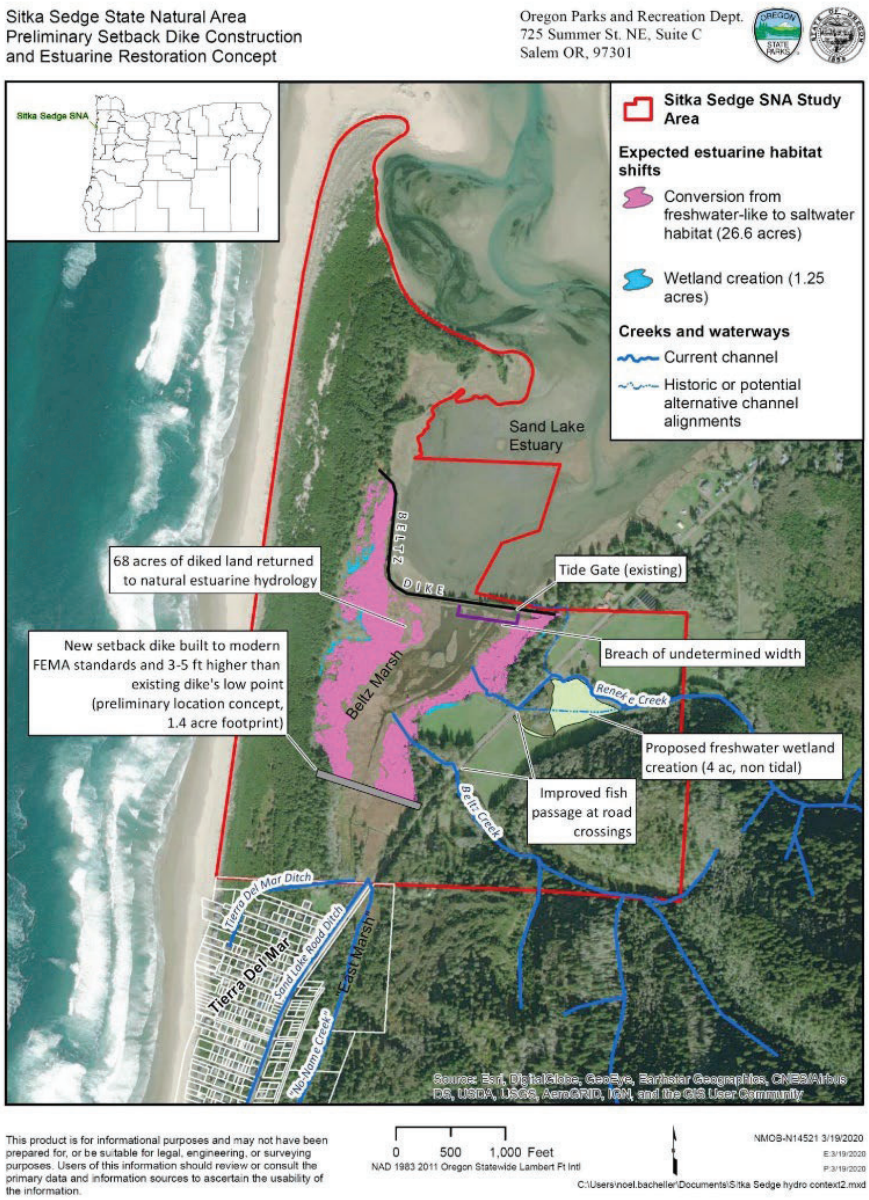

Figure 4 – Sitka Sedge Tidal Wetland Preliminary Setback Dike Construction, Breach of Existing Dike, and Estuarine Restoration Concept Map (courtesy of ESA)

What are the Project Highlights and Next Steps?

Engineering consultant deliverables for this project include the data collection, model generation, and analyses necessary to inform 30% designs for the preferred dike (re)location and estuarine restoration alternative to be chosen by OPRD. Project highlights include:

- Detailed bathymetry map created using
  - LiDAR imaging and high resolution PhoDAR imaging for surface level data
  - Side-scanning sonar imagery for subtidal zones and
  - Land surveys
- 2D hydrodynamic model of SSSNA generated and validated
- Assessment of the TDM drainage system performed
- Geotechnical analysis data collected

- Alternatives analysis developed including variations on the location and dimensions of dike breaching, four setback dike locations, and other restoration elements.

OPRD announced its preferred restoration option remains a setback dike, with a 100-150 foot breach in the original dike to remove the failed tide gate. However, no decision has yet been made between the four setback dike locations.

Further geotechnical analysis of the unconsolidated soils in Beltz Marsh is necessary to refine the cost estimates and certain preliminary design assumptions. For example, without additional data, it is uncertain whether installation of a setback dike requires one or two seasons to complete: the estuarine soils may require extra settling time to allow for compaction from the weight of the construction materials. This type of information will be necessary for OPRD to choose between the four setback dike location alternatives.

External grant funding for the additional geotech work was attempted but could not be secured before the expiration of this RAE grant. Therefore, the engineering consultant was instructed to complete its Basis of Design Report with general information for each of the four possible setback dike locations rather than specific details for a preferred alternative:

- Rationale and applicable design criteria/assumptions
- Potential phasing/sequencing considerations
- Preliminary construction quantities and cost estimates
- Anticipated design challenges and recommendations for additional data collection
- Anticipated construction challenges, depending on geotechnical results
- Potential timelines for implementation
- Critical permitting considerations
- Contingencies depending on results from further geotechnical data

Who are the Partners on this Project?

Oregon Parks & Recreation Department are the landowners and final decision makers. Tillamook Estuaries Partnership is leading the restoration project management of the Sitka Sedge Tidal Wetland project. Environmental Science Associates was hired as the engineering consultant to provide the deliverable for this project. The technical advisory team (Figure 5) consisted of representatives from TEP, OPRD, ODFW, TCPW, USFWS, NNSLWC, USFS, DEQ, CTSI, DLCD, NCLC, and members of the Tierra del Mar community. (See Glossary for acronyms.)

Figure 5 - OPRD, TEP, TCPW, NNSLWC on site at Sitka Sedge State Natural Area discussing restoration options (photo courtesy of TEP)

Where Can You Learn More?

The Basis of Design Report (30% design) will be completed by the engineering consultant, ESA, by the end of April 2024 and will be posted on TEP's Sitka Sedge project webpage. https://www.tbnep.org/project/sitka-sedge/

The slides from the 04/15/2023 and 06/17/2023 Town Hall meetings can be found on OPRD's Sitka Sedge project page (https://www.oregon.gov/oprd/prp/pages/pla-sitka-sedge-hydro.aspx).

The recorded technical team meetings and town hall sessions can be found on TEP's YouTube Channel. Look for the Sitka Sedge playlist. (https://www.youtube.com/playlist?list=PLGN4i9FD7nRC9cQVXv1cdniCz3uhNnIdf)

What did this Project Cost?

The project costs included a contracted services agreement with ESA, worth $270k. This RAE grant covered $99k of those costs. Match was provided in the form of a $35k grant from The Nature Conservancy and Portland General Electric. Additional funding for the Sitka Sedge Tidal Wetland project was provided by an OWEB Technical Assistance Grant (#222-1010-19860), which is not recorded as match or leverage for this RAE grant.

Sand Lake Estuary Photo courtesy of Tamara Enz, TEP