

# 2020

## Bott's Marsh Management Plan



**OWEB Grant # 217-9901**

**Wheeler, Oregon**

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Lower Nehalem Community Trust

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## Introduction

The Bott's Marsh easement covers an approximately 30 acres of tidal marsh and flats in section 2, Township 2N, Range 10W and section 35, Township 3N, Range 10W. The easement covers the entire property owned by the Lower Nehalem Community Trust. Bott's Marsh is a tidal wetland property on Nehalem Bay adjacent to the City of Wheeler, Oregon. Figure 1 shows the property and the location on the Nehalem estuary.

### Botts Marsh Property Boundary



Figure 1: Bott's Marsh location map



The property is dominantly tidal marsh with remnants of historic dikes along the western edge and near the mouth of the tidal channel. Much of the residual dike has established spruce cover on the uplands. The marsh property and its designation for water dependent development has been the center of estuarine land use controversy since the late 1970's. The intertidal marsh joins the Zimmerman Marsh ownership of the Lower Nehalem Community Trust (LNCT) across state Highway 101 through tidal connection via box culvert. The subject property is entirely tidal marsh and channel with a fringe of residual dike along the Nehalem Bay.

Nehalem Bay is a relatively undeveloped estuary that retains much of the tidal marsh in the lower bay. The bay and fringing marsh has changed only slightly over time (Figures 2, 3, and 4).

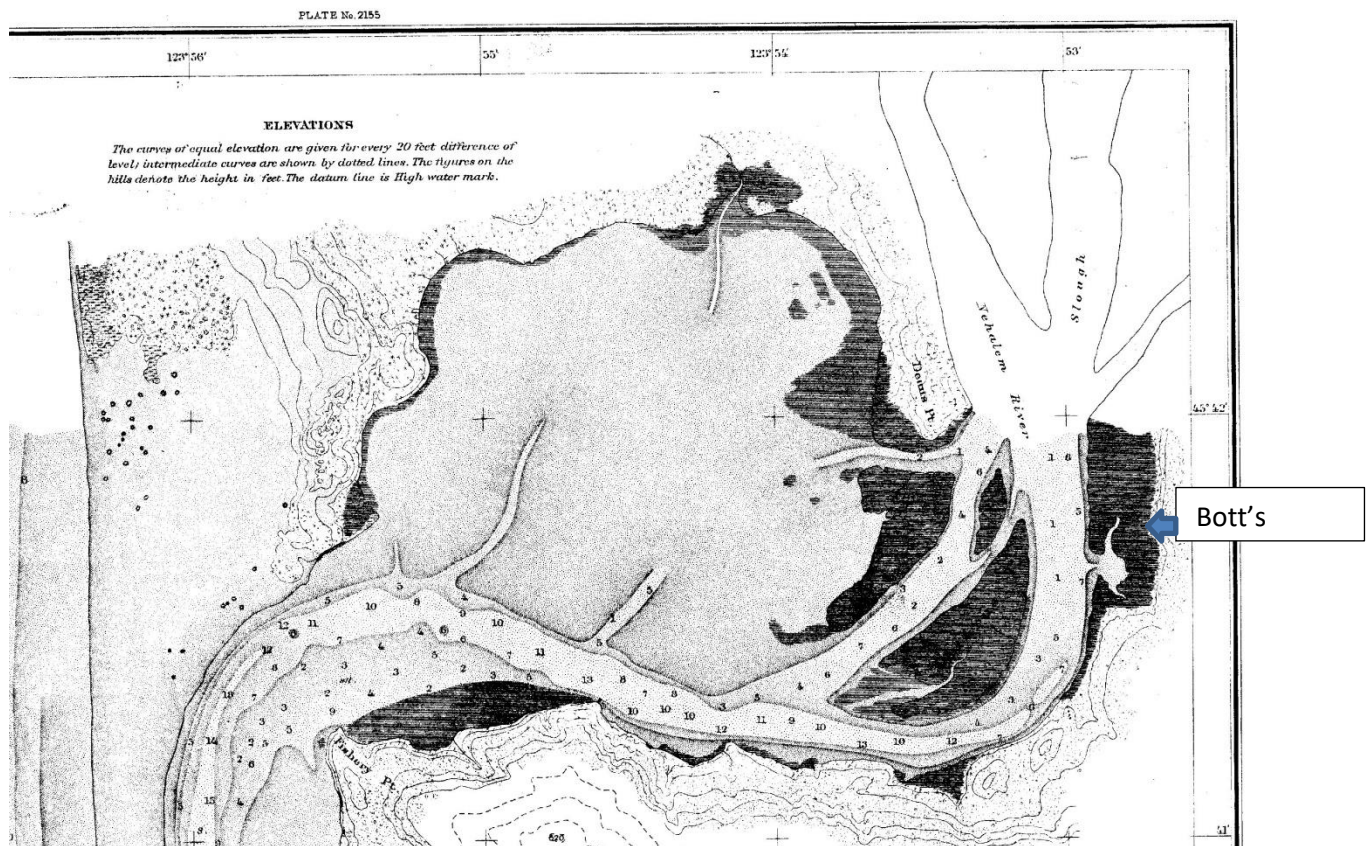


Figure 2: Nehalem Bay 1891

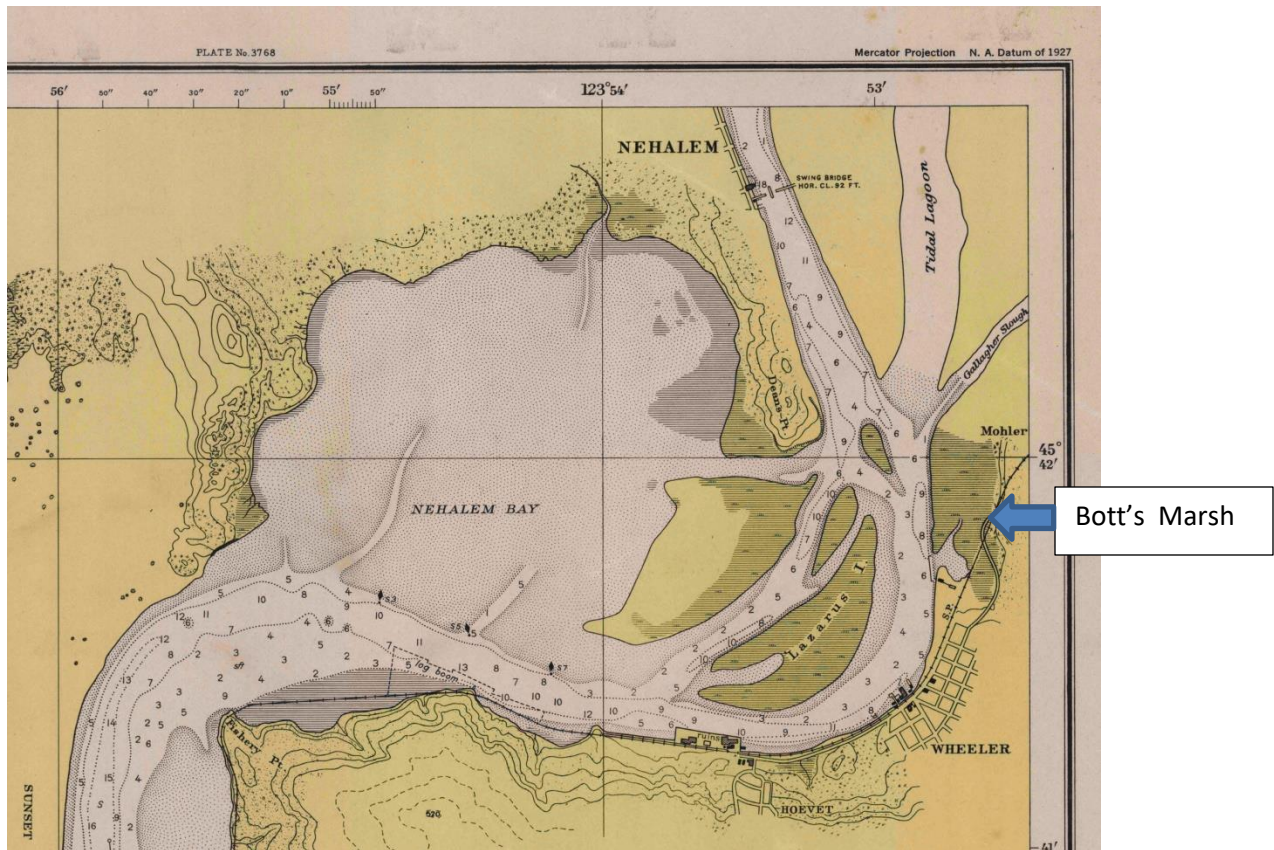


Figure 3: Nehalem Bay 1947

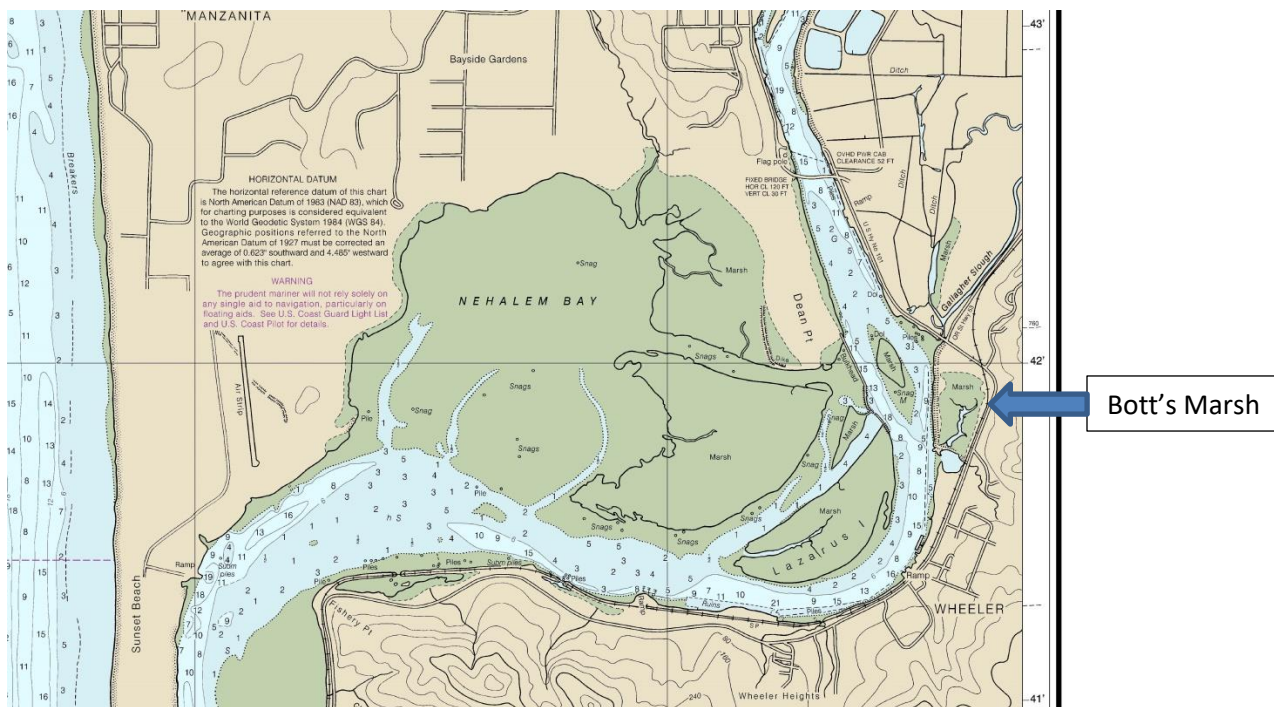


Figure 4: Nehalem Bay 2014



As the area developed the fringe marsh was altered by highway and railroad construction on the east and by development of the town of Wheeler to the south. The changes in the marsh area can be seen by comparing the Bott's Marsh area through time (Figures 2, 3, and 4). Early road development (Figure 5) on fill and piling supported roads which were eventually placed on fill.

Nehalem Bay is classified as a shallow draft development estuary with extensive areas designated for conservation. The communities that surround the Bay support a tourism and retirement community. From its



**Figure 5: Plank road and railroad on fill near Bott's Marsh (taken from City of Wheeler website)**

website: "Wheeler was born in the early 1900's when a railroad link was completed connecting Portland to the timber-rich area surrounding the bay. The train delivered lumber as well as seafood to eager markets to the east. The lumber mills and fish packing plants of Wheeler's early decades are gone now....leaving a village of charming, historic buildings strung together on the edge of that beautiful bay as if they were displayed on a holiday mantle." It continues: "Wheeler has been called "the little town with the million-dollar view!" It is a coastal refuge where people come to relax, refresh, and enjoy the scenic splendor of Oregon's north coast."

In order to facilitate the purchase, the North Coast Land Conservancy purchased the property on March 12, 2019 with a loan from Craft3. LNCT using grant funds from the Oregon Watershed Enhancement Board (Grant # 217-9901), U.S. Fish and Wildlife Service, and donations from the local community has acquired title from NCLC. The LNCT will maintain the property for the benefit of the ecological values of the estuarine marsh under a conservation easement held by Oregon Watershed Enhancement Board. The LNCT will protect the property from encroachment and future development in perpetuity. The primary purpose for the conservation acquisition is to protect the estuarine dependent species of invertebrates, fish, birds and mammals that use the marsh and the greater Nehalem Bay. The entire property owned by LNCT will be encumbered by a conservation easement held by OWEB. The date of the easement will be at the time of transfer of property from NCLC to LNCT. There are no encumbrances or structures on the subject property.

This management plan has been developed by Ken Bierly, consultant; with assistance from Casey Storey, Fisheries Biologist, David Evans & Assoc. Inc.; Shane Sjogren, LNCT Stewardship Lead. Other members of the trust board, especially Doug Firstbrook have provided important input.



## Property Information

### History

The Nehalem Valley and the tidal marshes of the Nehalem estuary have been used by the Tillamook people for centuries. The name "Tillamook" is a Chinook language term meaning "people of Nekelim (or Nehalem)." Byram (2002) describes these coastal people as having their largest communities along estuary shores and having a more settled lifestyle with relatively permanent village sites. He suggests they had a "commuter economy" where the seasonal travels both by canoe and inland to hunt and gather food using "work stations" as temporary occupation sites with more permanent village sites near the estuary where food resources were abundant. The skilled use of canoes allowed rapid travel to traditional use sites throughout the lower river system and nearshore environments. The Tillamook were skilled basket-weavers (Crawford, 1982) and adapted to different traditions when they met with other weavers on reservations.

A fishing weir site has been documented in Nehalem Bay (Byrum, 2002) but there is little information on such sites due to the significant alteration and sedimentation of the bay from historic forest fires. Typical estuarine resources utilized by the Tillamook people included a wide variety of estuarine fishes, shellfish, and high marsh plants; silverweed (*Argentina egedii*), springbank clover (*Trifolium wormskjoldii*), and northern rice root lily (*Fritillaria camschatcensis*). Deur (2005) describes cultivation of high marsh vegetation; while not documented in Nehalem Bay, use of the plants from marshes like Bott's Marsh is quite likely.

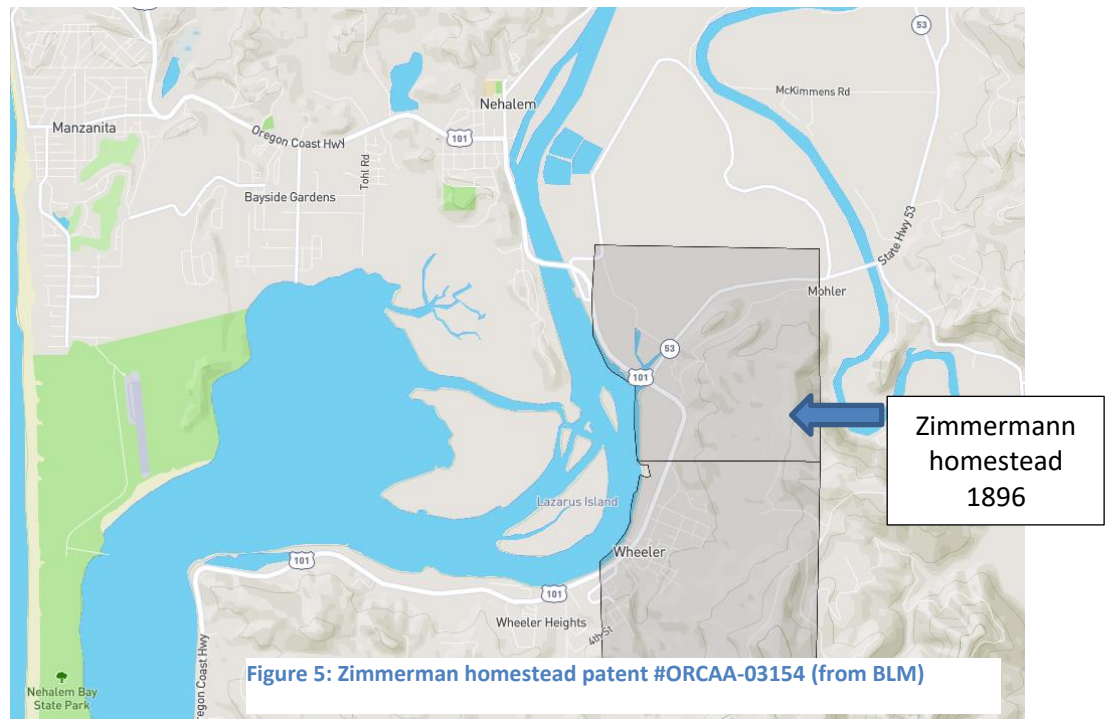
The Tillamooks had a detailed mythology with links to existing events; the Story of the Thunderbird and Whale, for example, reflects the large subduction zone earthquake in 1700. The Tillamook divided their mythology into three categories; the earliest was the Myth Age, followed by the Age of Transformation, when the "South Wind" remade the land. The third age is the "period of true happenings", or events that happened in what the Tillamook considered recent history. Despite this, stories from the third age were considered just as much of a myth as those from the first or second.

The Tillamook tribe consists of several divisions and dialects, including: Nehalem, Tillamook Bay, Nestucca/Salmon River, and Siletz Bands of the overall Tillamook Group. Estimated to have 2200 people at the beginning of the 18th century, the Tillamook lost population in the 19th century to infectious disease and effects of encroachment by European Americans. In 1849 they were estimated to have 200 members. In 1856 they were forced to live on the Siletz Reservation with many other Tribes and Bands, the southern bands (Nestucca, Salmon River and Siletz River peoples') territory being largely within the 1855 boundaries of the Siletz Reservation. The federal government reduced and eventually eliminated the Siletz Reservation through a series of executive orders and allotment between 1865 and 1892.

In 1898 the northern Tillamook (Nehalem and Tillamook Bay) and the Clatsop, (another Tribe abutting their territory to the north), were the first tribes to sue the United States government for compensation for aboriginal title to land it had taken from them without a ratified treaty or compensation. They were paid a settlement in 1907. Their descendants are now considered part of the Confederated Tribes of Siletz. The Siletz Tribe was recognized by the U.S. government in 1977 by an act of Congress, becoming

the second tribe in the U.S. to have its federal status restored. The people of the Nehalem have been scattered and are affiliated with the Siletz, Grand Ronde, the federally unrecognized Clatsop-Nehalem and Clatsop among others. The largest number of verifiable descendants are enrolled at Quinault Indian Nation.

The Nehalem valley was described by J.M. Alley in Nesbit (1885) as: “In Nehalem Valley is near 1,000 acres of alluvial marsh; elevation above low water, 6 feet; rise and fall of common tides, 6 feet; storm tides, 3 feet higher. Country, new; no marshes reclaimed. Settlers are dairymen, scarce of means, who take up only such lands as can be used with least expense. The Nehalem Valley is



small, the land exceedingly rich, and climate mild. Above tide land the county is generally heavily timbered with spruce, hemlock, fir, cedar, alder, and smaller growth. The Nehalem River, with its two forks, its Bay and sloughs, affords fine facilities for rafting and booming logs. Two or three mill companies are trying to get the entrance to Nehalem Bay surveyed and buoyed, that they may establish extensive lumber mills. Access at present is very difficult.”

The property was patented by a homestead entry in 1896 by Wilhelm Zimmermann (Birth 1846, Death 1912), who patented 163 acres of land approximating a portion of Section 2 T2NR10W and Section 35 T3N R10W (Figure 5).

The Wheeler area was settled by Europeans in the 1860’s and the town of Wheeler was established in 1868. The southwestern portion of the property was eventually parceled into the town site of Wheeler and divided into smaller parcels.

A sawmill was established at Wheeler adjacent to and south of the marsh property in 1902 and operated until 1930. A dike was constructed to direct river flow (and logs) towards the Wheeler sawmill in the 1920’s. The Pacific Railway and Navigation Company constructed a rail line along Bott’s Marsh between 1906 and 1911. The line became the Tillamook Branch Line of the Southern Pacific Railroad in

1916. The Oregon Coast Highway was approved by the Oregon Legislature in 1917. And on October 29, 1924, the City of Wheeler dedicated Front Street through Wheeler as the route for Highway 101. Construction of the railroad and highway separated Bott's Marsh from the adjacent Zimmerman Marsh property before any aerial photographs were available.



Figure 6: Aerial photograph 1939



Figure 7: Aerial photograph 1962

In 1939 Bott's Marsh appears not to be diked (Figure 6). By 1962 a dike is observable in an aerial photograph (Figure 7). The tidal connection to Zimmerman Creek and Fisher Creek appears not to have been severed, however the 1962 image shows a cross dike that was an attempt to block the tidal connection. The cross dike has since eroded and tidal connection appears clear and free. Since that time the property has been relatively undisturbed.

Through time, Bott's Marsh wetlands were parceled into three tax lots along Nehalem Bay. These three tax lots of intertidal marsh became the center of land use controversy as Tillamook County was completing their comprehensive plan in the late 1970's. The Estuarine Planning Goal (Goal 16) of Oregon's Statewide Planning Program requires intact salt marsh tracts to be designated as Natural or Conservation management units. However, the owner and community had other desires for the property at the time and it was designated as a Development Management Unit and an exception to Goal 16 was developed and approved by Tillamook County. This action was key to the Tillamook County Comprehensive Plan being acknowledged by the Land Conservation and Development Commission. The acknowledgement and goal exception were contested in court and upheld by the Oregon Supreme Court in 1987.

Since that time, the previous owner had proposed a number of development proposals for a marina at the marsh location, none of which have been successful. The demand for marina space has declined

and the community vision for the area has changed. As reported in the Tillamook Headlight Herald: “Wheeler’s Vision Plan, with input from its citizens, makes clear the kind of low-key development most want to see for the Bott’s Marsh area. Previous plans for a marina and large-scale condominiums have met with considerable resistance from members of the small coastal community. The idea of purchasing the seven acres “uplands” for the creation of a waterfront park and possible interpretive center, coupled with a land conservatory acquiring the saltwater marsh next to it, was appealing.”

While the ownership has changed, the physical nature of the property has not changed over the last few decades. The remaining dike along the west edge of the property is eroding in some locations. The marsh is relatively undisturbed.

### **Location and Adjacent Properties**

Bott’s Marsh is located on the north edge of the City of Wheeler in the city urban growth boundary and outside the City limits. The property is bordered on the east by Tillamook County Railroad and Highway 101. The property to the north is separated from Bott’s Marsh by a dike and the upland to the south is old fill. Nehalem Bay abuts the entire west side of Bott’s marsh. The physical features of the marsh are shown on Figure 8. The important features are the dikes on the west and north sides of the marsh and the tidal connection to Zimmerman and Fisher Creeks across the highway and railroad berm. Bott’s Marsh is part of a larger wetland complex that extends to the east side of the railroad and Highway 101 causeways. A four-foot concrete box culvert allows tidal water to pass under the railroad and highway. The Zimmerman Marsh ownership of LNCT lies on the south east side of the railroad/highway berm from Bott’s Marsh (Figure 9). The railroad right of way along the eastern property boundary has the greatest potential effect on the property.

The Easement property is 30 acres of tidal marsh and flats with the remnant of a dike along the western edge of the property.

### **Property Description**

The property is two separate tax lots created in 2019 (tax lot 100 section 2, T2N, R10W and tax lot 400 section 35, T3N, R10W). Tax lot 100 is 1.37 acres and tax lot 400 is 27.20 acres. The total site area is 28.57 acres according to the Tillamook County Assessor’s records. The conservation easement covers the entire property.



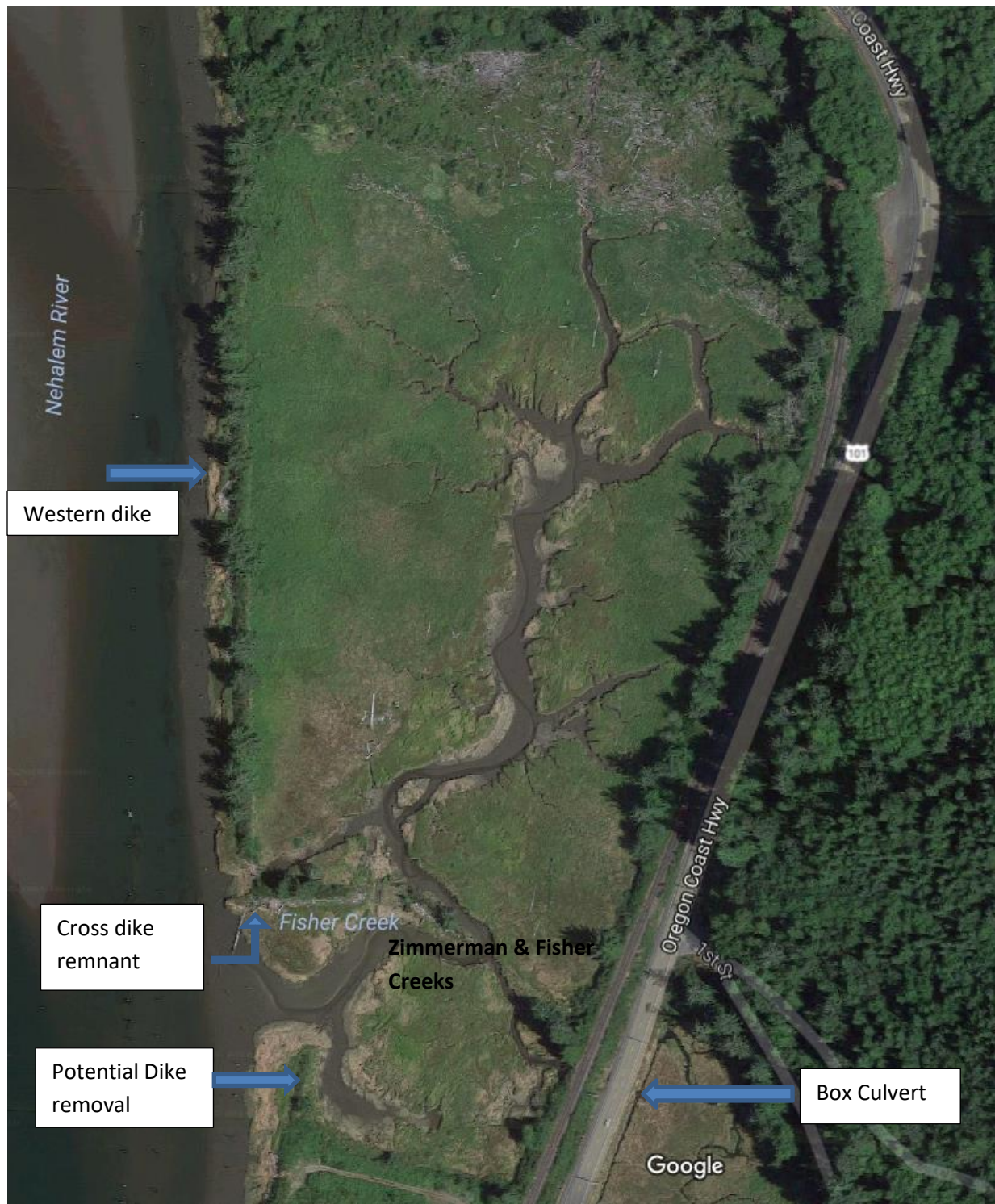


Figure 8: Bott's Marsh features (2015 Google image)



**Figure 9: Bott's Marsh showing connection to Zimmerman Marsh**



## Legal Property Description:

### BAYSIDE SURVEYING

11765 HWY 101 South  
Tillamook, Oregon 97141

Terry L. Jones  
503-842-5551  
Fax 503-842-5552

DECEMBER 12, 2018

#### LEGAL DESCRIPTION BOTT'S MARSH TO LOWER NEHALEM COMMUNITY TRUST

A TRACT LOCATED IN SECTION 2, TOWNSHIP 2 NORTH, RANGE 10 WEST, AND SECTION 35, TOWNSHIP 3 NORTH, RANGE 10 WEST OF THE WILLAMETTE MERIDIAN, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE INITIAL POINT OF ROWS ADDITION TO WHEELER; THENCE SOUTH 85°01'06" WEST 111.67 FEET; THENCE NORTH 21°37'00" EAST 578.97 FEET TO A 5/8 INCH REBAR ON THE WESTERLY RIGHT-OF-WAY OF THE RAILROAD AND THE TRUE POINT OF BEGINNING;

THENCE NORTH 21°37'00" EAST 440 FEET, MORE OR LESS, TO THE NORTH LINE OF SAID SECTION 2;

THENCE WESTERLY, ALONG SAID NORTH LINE, TO THE MEAN LOW WATER LINE OF THE NEHALEM RIVER/BAY;

THENCE SOUTHERLY ALONG THE MEAN LOW WATER LINE OF THE NEHALEM RIVER/BAY TO A POINT NORTH 65°47'47" WEST FROM THE POINT OF BEGINNING;

THENCE SOUTH 65°47'47" EAST 430 FEET, MORE OR LESS, TO THE POINT OF BEGINNING.

TOGETHER WITH: GOVERNMENT LOT 6 OF SECTION 35 WITH THE TIDELANDS FRONTING AND ABUTTING THEREON; AND THE SOUTHEAST QUARTER OF THE SOUTHWEST QUARTER OF SECTION 35 LYING WEST OF THE CENTERLINE OF US HIGHWAY 101 AND EXCLUDING THAT PORTION WITHIN THE PORT OF TILLAMOOK BAY RAIL ROAD RIGHT-OF-WAY.

TOGETHER WITH A 30.00 FOOT WIDE ACCESS AND UTILITY EASEMENT, THE EASTERLY LINE OF WHICH IS DESCRIBED AS FOLLOWS;

BEGINNING AT A POINT ON THE WESTERLY RIGHT-OF-WAY OF THE RAILROAD SAID POINT BEING SOUTH 85°01'06" WEST 111.67 FEET FROM THE INITIAL POINT OF ROWS ADDITION TO WHEELER; THENCE NORTH 21°37'00" EAST 578.97 FEET.

THIS DESCRIPTION IS BASED ON MAP BY THIS FIRM DATED NOVEMBER 6, 2018, AND ON FILE AT THE TILLAMOOK COUNTY SURVEYOR'S OFFICE.

C:\BSSLGL\BOTTSMARSH-BLA22.DOC

## Property Use and Structures

The property is nearly entirely tidal marsh and channels. The only upland is a residual dike along the western side of part of the property and a small remnant of the cross dike seen in the 1962 image (Figure 7). The dike is not within a diking district and is not maintained. There are no properties

protected by the residual dike. There are no structures on the property. All utilities are located in adjacent public road right of ways. There is an access easement to reach the property from Hemlock Street.

## Adjacent Uses and Plans

The adjacent property to the north is proposed for development adjacent to the marsh with an open space buffer between the proposed development and the marsh. Towards town (south) the property will contain commercial development. The property has been annexed into Wheeler and rezoned for the development. Planning approval has not been completed. The earlier conceptual design (Figure 10) shows a “Natural Area/Native Species Parkland” buffer between the cluster development and the marsh. The owner is currently considering a motel/commercial development for the adjacent property.

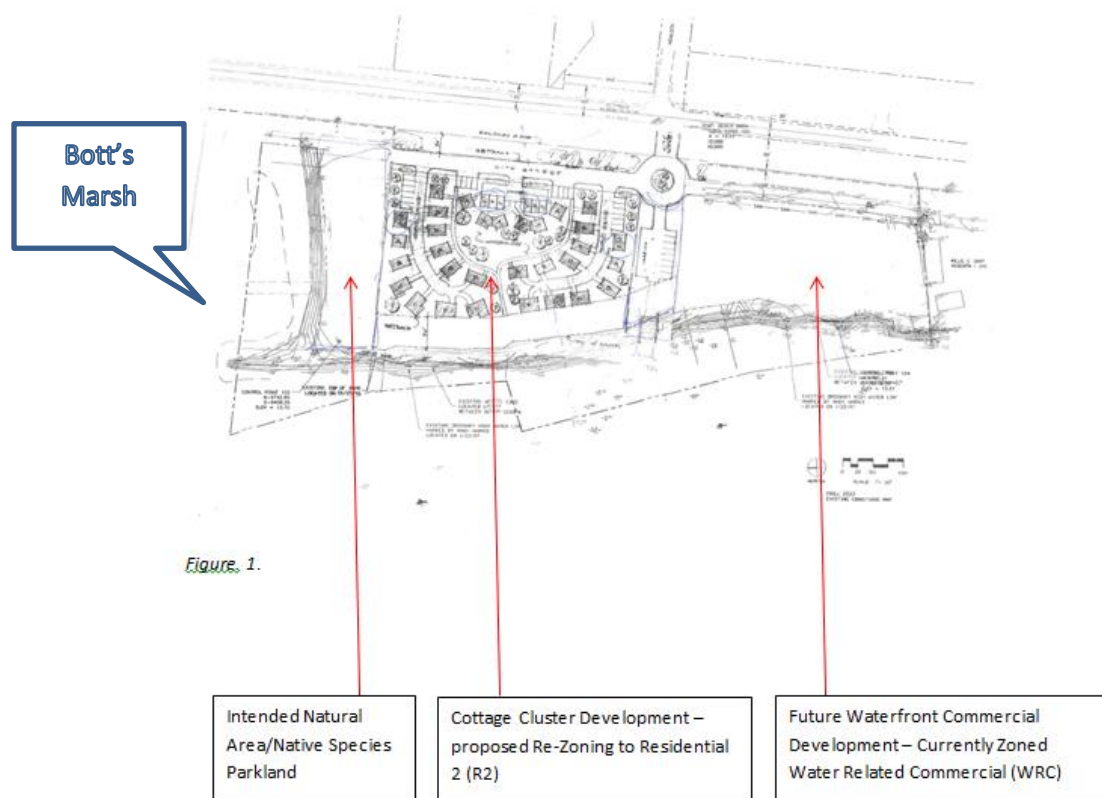


Figure 10: Conceptual design for Bott's Marsh LLC property.



In February 2017 the Coastal segment of the Salmonberry Trail Plan was completed. The plan shows the trail along the east side of Bott's Marsh (Figure 11).

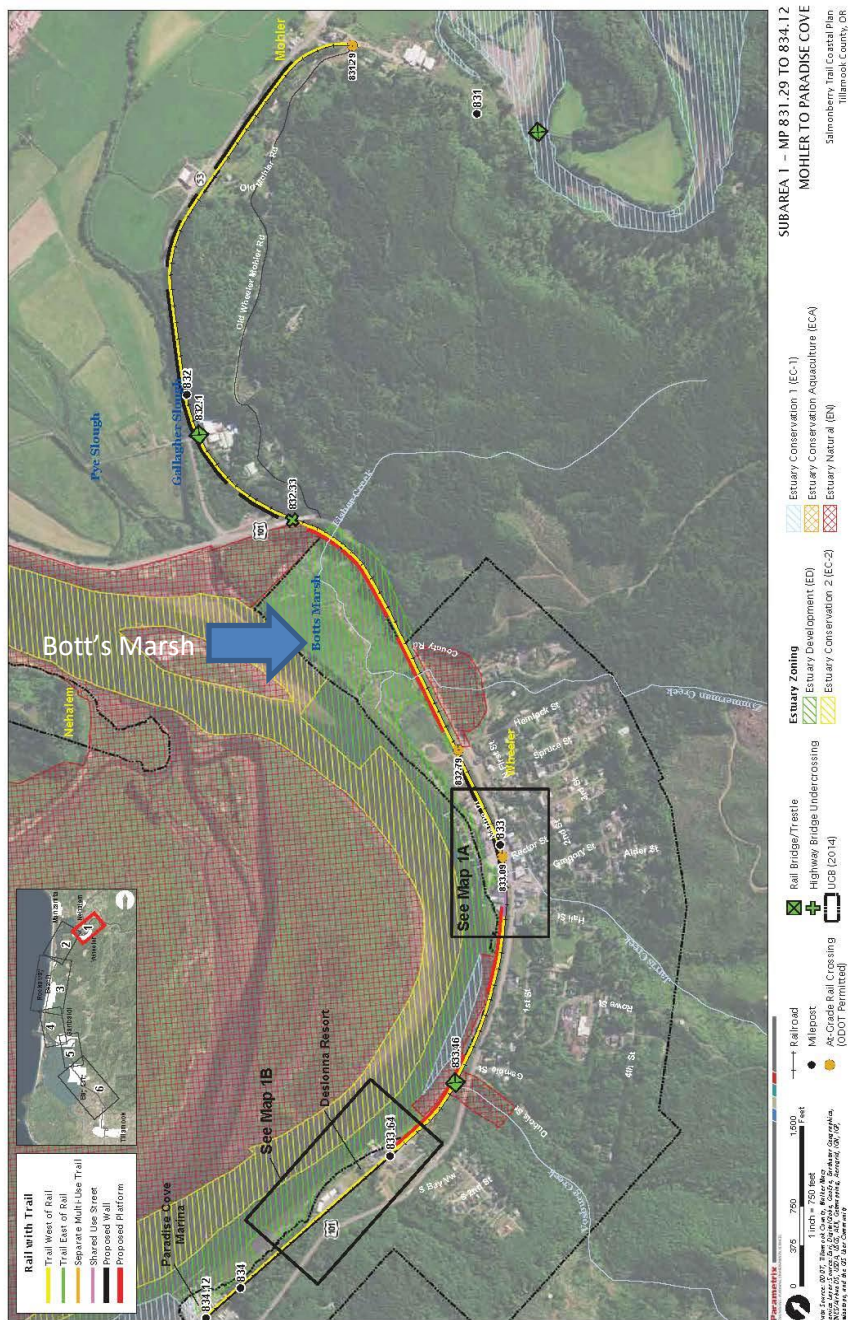


Figure 11: Salmonberry Trail Concept (from Salmonberry Trail Coast Segment Planning Study Final Plan Report, 2017)

The final plan identified that no fill would be placed in estuarine lands. The plan includes the following language: “Most of Subarea 1 is zoned ED (primarily Bott’s Marsh). Vosburg Creek and north end of Bott’s Marsh zoned EC or EN; no fill allowed in any estuary zone.”

Development on the upland property to the south of the marsh will be protected by a 50-foot setback from the marsh. The current owner plans to develop low intensity residential uses on the property and provide trail access to the waterfront on the adjacent property. The dike along the west side of the property is failing and will be allowed to erode through time. A potential short-term active restoration project would be to remove the western dike along the southern portion of the property (Figure 8) in association with development of the adjacent property.

## **Purpose and Goals**

The primary purpose for the fee acquisition is to protect the salt marsh and tidal channels from the threat of development allowed by the zoning. Approximately 55% of the tidal marshes of Nehalem Bay have been blocked from tidal inundation (Brophy et al., 2019). In an evaluation of tidal wetland prioritization for Nehalem Bay (Brophy and So, 2009) the site was identified as medium-high for protection. The goal for the property is to assure the tidal marsh remains as a functioning part of the Nehalem Bay estuary. The goal of maximizing the ecological values of the site includes exploring the future potential for expanding the marsh by selective and limited dike removal. Most restoration will be passive, allowing the western dike to erode with tides and waves. The management plan will guide directions for LNCT for the next 25 years with review and reevaluation at least every 5-10 years.

## **Conservation Easement Values**

OWEB has provided partial funding for fee acquisition of the property known as Bott's Marsh. As a condition of the funding, a conservation easement for the protection of the ecological assets of the property is being granted to OWEB. The easement over Bott's Marsh includes the entire property of approximately 30 acres of estuarine marsh and tide flats. The site includes low marsh, high marsh and tidal channels. The management of the property is directed to assure the tidal marsh habitats persist through time.

The easement identifies the following Priority Ecological Systems:

Intertidal mudflats

Intertidal salt marsh

The property provides rearing habitat for North Coast Basin Priority Species of juvenile Chinook, and coho salmon.

## **Goals That Focus on Protecting Existing Marsh Conditions**

### **Objective 1) Document existing conditions and monitor changes**

#### **Action 1. Complete site condition documentation for baseline condition**

This action would include detailed vegetation mapping, tidal channel mapping and fishery sampling to document current conditions. This action was completed in 2018 and documented in the baseline report.

### **Action 2. Establish monitoring procedures and periods**

This action would include the development of partners and procedures for monitoring to ensure that marsh vegetation, fisheries, and other biota are evaluated on a schedule that is meaningful. Too frequent monitoring of a fully functioning site is not likely warranted, however monitoring at a sufficient frequency to evaluate change and reasons for change is critical.

Monitoring for trespass will be weekly during the summer season to ensure no trespass occurs or if observed is addressed.

Site visit monitoring to inspect for exotic species will occur on an annual basis during the summer season when plants are most identifiable.

### **Action 3. Rezone the protected property**

This action would include requesting Tillamook County to amend the Tillamook County Estuary Management Plan to designate the property as “Estuarine Natural” rather than “Estuarine Development”.

## **Objective 2) Partner with adjoining landowners to limit off-site negative impacts to the ecological functions of the marsh and tidal channels**

### **Action 1. Maintain relationship with upland owner to the south as development plans are put together.**

The current conversation with the landowner of the adjacent uplands (Bott’s Marsh LLC) has been very receptive to assuring adjacent development is buffered from and protective of the adjacent marsh. The LNCT will remain in contact and review development proposals for potential adverse effects of adjacent development.

### **Action 2. Review Phase 2 Environmental Site Assessment of the adjacent uplands (south of the marsh)**

This action will be important to evaluate the potential for contamination and what remedial measures, if any, are necessary to protect the marsh property from historic uses of the adjacent property. This report has been reviewed and has not shown an environmental threat from the adjacent property.

### **Action 3. Participate in the Salmonberry Trail Implementation Effort**

The final plan for the Salmonberry Trail has identified that protection of the integrity of the marsh will be necessary for any trail development. As the trail is implemented LNCT should look for the opportunity to interpret the ecological importance of intertidal salt marshes and small tidal systems and creeks for the public users of the trail when built.

## **Goals That Focus on Protection by Passive Ecological Enhancement**

### **Objective 1) Allow natural recovery processes to remove the western dike**

#### **Action 1. Remove noxious weeds from the dike**

Scotch Broom and Himalayan Blackberries are found along the dike abutting Bott's Marsh. Volunteer events will be scheduled to remove blackberry, scotch broom and other exotic species from the dikes where it is safe for volunteer access. Hand removal will occur on an annual basis as needed following the initial treatment.

#### **Action 2. Monitor dike erosion and failure**

By allowing wave and tidal erosion of the dike, observations will be made each summer following winter freshet and storm tides to ensure the erosive forces do not adversely impact the marsh or tidal channels.

## **Goals that Focus on Active Restoration Actions**

### **Objective 1) Evaluate the potential for active restoration**

#### **Action 1. Conduct an analysis of active restoration potential**

The most obvious opportunities for active restoration are the removal of dikes to the marsh surface. Three areas of the marsh property are potential active restoration sites; the south west dike, the western dike and the remnant cross dike. An analysis of the costs, feasibility and potential benefits of each restoration action could be evaluated. Working with fish and wildlife management agencies and others, the options could be evaluated and prioritized for action or no action.

#### **Action 2. Develop funding and schedule to implement projects based on evaluation**

If active restoration is warranted and affordable, the LNCT will develop funding and schedule appropriate action.

#### **Action 3. Cooperate with Fish Passage Improvement**

The Culvert Assessment and Fish Passage Prioritization Report for the Lower Nehalem Watershed Council (Clearway Environmental, 2016) show three culverts that could affect fish passage to Nehalem River through the property. Two ODOT culverts (Culverts #175, and #457) were identified as "Medium" and "Low" priority for the Lower Nehalem, primarily because of the relatively short length of habitat blocked by the culverts. Culvert #175 is the box culvert between Bott's Marsh and Zimmerman Marsh owned by Oregon Department of Transportation. Culvert #457 is a 3-foot concrete culvert under Highway 101. Culvert #332 is just upstream of Zimmerman Marsh, is owned by Tillamook County and also identified as a "Medium" priority for replacement in the Lower Nehalem.

As the Lower Nehalem Watershed Council and ODOT work to address fish passage, the LNCT should cooperate to encourage consideration of addressing these culverts.



## Inventory

### Climate

The northern Oregon coast is a wet place. Wheeler gets 95 inches of rain, on average, per year with some kind of precipitation, on average, 187 days per year. November is the wettest month in Wheeler with 15.2 inches of rain, and the driest month is July with 1.5 inches. The wettest season is Spring with 41% of yearly precipitation and 7% occurs in Autumn, which is the driest season.

July high temperature is around 67 degrees and the January low is 38 degrees. The climate is maritime, moist and cool. August is the hottest month for Wheeler with an average high temperature of 68.0°, which ranks it as one of the coolest places in Oregon. December has the coldest nighttime temperatures for Wheeler with an average of 37.1°. This is one of the warmest places in Oregon. The moderating effect of the Pacific Ocean is felt throughout the year.

### Geology

Bott's Marsh is a part of the alluvial deposits of the Nehalem watershed. The deposits consist of sand, gravel, and silt forming flood plains with soils containing abundant organic material, and thin peat beds. The recent USGS study of Channel Stability and Bed-Material Transport (Jones et al., 2012) while focused on riverine transport of coarse material, characterize the Nehalem estuary as the site of deposition of fine material.

### Soils

The soils are Fluvaquents-Histosols complex, 0 to 1 percent slopes. This soil type can be found throughout the tidal wetland marsh. It consists of estuarine deposit material, commonly found in tidal marshes and swamps. Typical soil profiles have a mucky peat at the surface and mucky silt loams at the sub-surface. Regular inundation of tidal water produces anaerobic conditions that keep plant material from decaying and maintains the high organic content throughout the soil profile.

### Vegetation

The vegetation is salt marsh with Lyngbyei sedge (*Carex lyngbyei*), Tufted hairgrass (*Deschampsia caespitosa*), and other typical salt marsh species. A small area of accumulated large wood is surrounded by high marsh with the bulk of the site sedge marsh. The marsh surface is laced with tidal channels.

Mapping of the Bott's Marsh Site by the National Wetlands Inventory and Fishman Environmental Services (Figures 12 and 13) show similar pattern of tidal marsh ranging from low marsh near the tidal channels to high marsh on the periphery of the site). A site visit to Bott's Marsh on September 6, 2018 documented only minor changes to the marsh habitat types mapped by Fishman Environmental Services. *Carex Lyngbyei* dominates nearly all the site. High marsh species (*Deschampsia caespitosa*, *Aster chilensis*, *Potentilla pacifica*, etc.) were observed on areas of slightly higher elevation.



Figure 12: National Wetlands Inventory Wetland Mapping of Bott's Marsh

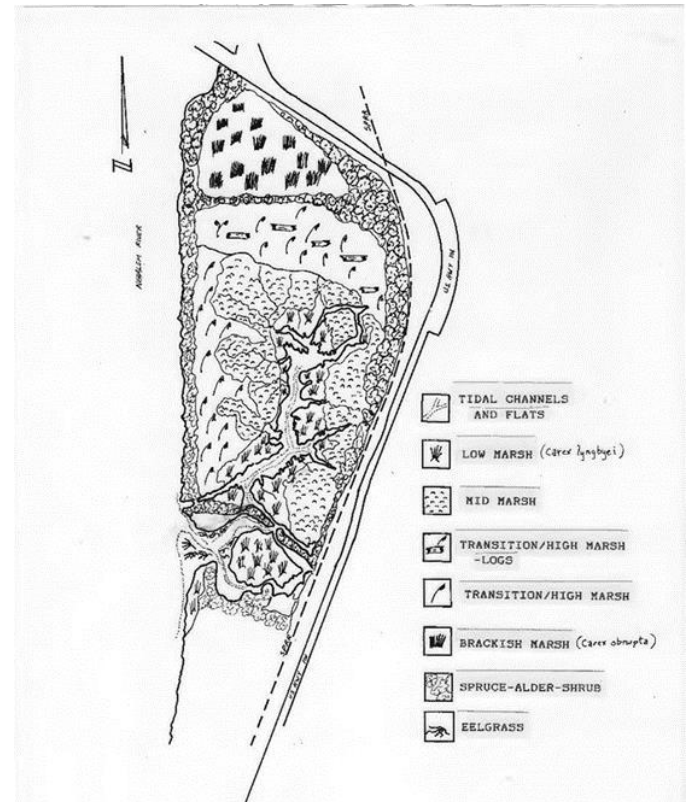


Figure 13: Fishman Environmental Services. Mapping of Bott's Marsh Vegetation

## Aquatic Species

Fish species that use the marsh include; Chinook Salmon (spring run), Chum Salmon, Coho Salmon (federally threatened), Sea-run coastal cutthroat trout (Oregon Coast ESU), and Steelhead. Pacific lamprey are found in Nehalem Bay and likely spawn in Zimmerman and Fisher Creeks.

The following estuarine fish are found in the Bott's Marsh area and are likely found on site: Pacific herring (*Clupea pallasii*), Northern anchovy (*Engraulis mordax*), Surf smelt (*Hypomesus pretiosus*), Threespine stickleback (*Gasterosteus aculeatus*), Shiner perch (*Cymatogaster aggregata*), English sole (*Pleuronectes vetulus*), Starry flounder (*Platichthys stellatus*), Pacific sand lance (*Ammodytes hexapterus*), Pacific staghorn sculpin (*Leptocottus armatus*), Lingcod (*Ophiodon elongatus*), Pacific tomcod (*Microgadus proximus*), and White sturgeon (*Acipenser transmontanus*).

On Friday September 28, 2018 observations of fish use was conducted by snorkel survey of tidal channels. Findings from the site survey include “Aquatic habitat in Bott’s Marsh is dominated by deep dendritic tidal channels within an herbaceous – dominated marsh. Upper channel banks are steep with nearly sheer faces and channel bottoms are flat to gently sloping. Channel sediment is dominated by clay and silt with very little sand. “

Biota observations were: “Numerous small diameter burrows were noted within the banks and bed of the Bott’s Marsh channels. Several pits were dug amongst these burrows to determine the general composition of benthic fauna. No clams, crabs, or shrimp were observed in these pits, but segmented marine worms of undetermined species were abundant. Snorkel observations of Bott’s Marsh yielded few individual fish during the period of outgoing tide and low slack. One unidentified juvenile sculpin (Cottidae) was noted in the main channel. In addition, three-spine stickleback (*Gasterosteus aculeatus*), a juvenile salmonid (*Oncorhynchus* sp.), and numerous sculpin of unknown species were noted at the confluence of Zimmerman Creek and Bott’s Marsh where the culvert met the marsh.”

The survey concludes: “Bott’s Marsh contains intact tidal marsh that is limited in the Nehalem Estuary. The site provides shelter and foraging opportunities for numerous fish species during various life stages and provides links between other important aquatic habitats in the estuary. Opportunities for habitat enhancement and improvements are present on the property, but in its current state is a high quality habitat with important ecosystem function within the watershed and estuary.”

Invertebrates are important food sources for the scores of shorebirds that use Nehalem Bay. Invertebrates likely found in Bott’s Marsh include; Bay shrimp (*Crangon franciscorum*), Blue mussel (*Mytilus edulis*), Pacific littleneck clam (*Protothaca staminea*), and Dungeness crab (*Cancer magister*). The bay shrimp is the dominant decapod in most Pacific coast estuaries. It is an important prey item for many Pacific coast fish and crab species.

## Bird Species

Focal bird species include Purple martin that nest on pilings in the marsh area, Bald eagles that nest in the area and feed in the marsh, Brown pelican (federally endangered), dunlin, western sandpiper and other shorebirds.

## Hydrology

The site is inundated by the diurnal tides of Nehalem Bay. Freshwater input to the marsh system comes from Zimmerman Creek and Fisher Creek. These streams have small catchments and are channeled to Bott’s Marsh through a 4 foot box culvert under Highway 101 and the railroad. The site will be managed in conjunction with the Zimmerman Marsh Preserve site on the east side of the highway.

## Invasive Species

A site visit observed the common disturbed site assortment of invasive species on the western dike that included Armenian Blackberry (*Rubus armeniacus*) and Scotch Broom (*Cytisus scoparius*). While not pervasive, these species could be eradicated by a focused volunteer effort.

The greater threat to the estuarine system is invasion by Cordgrass (*Spartina* sp.). Cordgrass has been found in only two estuarine sites along the Oregon coast (Siuslaw Estuary and Lower Columbia River Estuary) it continues as a threat. The Oregon Department of Agriculture determined *Spartina* to be a category “A” rated noxious weed (Oregon Department of Agriculture, 2011). The primary management approach is to become aware of the plant by LNCT staff and conduct annual observations of the marsh to determine if it occurs. Early detection can lead to effective eradication (Issacson et al., 2003; Howard et al., 2007).

The purple varnish clam or purple mahogany clam (*Nuttallia obscurata*) is an invasive species from Japan or Korea. It is found in sediment ranging from cobble to muddy sand in the upper mid-intertidal zone, just above the range of the native littleneck clam. *Nuttallia obscurata* is currently found in Coos, Alsea, Yaquina, Nestucca, Netarts, and Nehalem estuaries. There is no effective way to eliminate the purple varnish clam.

The European green crab (*Carcinus maenas*) and the Chinese mitten crab (*Eriocheir sinensis*) are both estuarine invasive species that could potentially be found in the Nehalem estuary. Early detection and notification of the Oregon Department of Agriculture, Oregon Department of Fish and Wildlife would be important steps to address the potential threat.

## Public and Educational Use

Bott’s Marsh is identified in the Tillamook County Water Trail for Nehalem as “Bott’s Marsh is on the left, just before you enter the town of Wheeler. At high tide this is an extraordinary salt marsh used by school as an on-the-water classroom.” The close proximity of the marsh to the Wheeler City boat ramp makes it a popular canoe and kayak stop.

## Analysis

### Ecological Features of Concern

The North Coast priority ecological system provided by Bott’s Marsh acquisition is intertidal salt marsh and tidal channels. The site provides off channel habitat for Chinook Salmon, Chum Salmon, Coho Salmon, and Steelhead which are priority species for the North Coast Basin. The site also provides habitat for estuarine dependent fish and invertebrates. A wide variety of water birds use the site and it is a popular duck hunting location. The values of the site are threatened by the designation of the property as Estuarine Development in the Tillamook County Estuary Plan.

Bott’s Marsh is within the Oregon Department of Fish & Wildlife designated Conservation Opportunity Area 009 that has estuaries and wetlands as strategy habitats. Protection of Bott’s Marsh from development is the primary conservation action by the acquisition.

The current conditions indicate the site provides the ecological system benefits proposed in the acquisition proposal. The priority conservation issues are to assure tidal hydrology is maintained and invasive species are monitored and eliminated to the extent possible. Invasive species on the western dike are of less concern than the potential of *Spartina* infestation of the tidal marsh area.



## Conservation Issues

The primary conservation issue facing Bott's Marsh will be interaction with the local community as development proposals on adjacent properties are finalized. Coordination with the Salmonberry Trail Coastal Segment implementation to ensure encroachment on the marsh does not occur.

Ongoing dialog with the current landowner as development proposals for the upland property south of the marsh go forward. The current good relationship will be necessary to develop understandings and agreements on how development proceeds to protect the Bott's Marsh site.

Management of the site will involve annual inspection for invasive species, seasonal inspections for trespass and biannual bayside clean-up of marine debris.

## Management Action

### Conservation Approach

The management approach is a passive restoration approach to the dike and active conservation education approach to protection of the marsh. Bott's Marsh will be managed in alignment with the missions and goals for LNCT and the property will be preserved in perpetuity for its conservation values.

The property will be managed for the conservation of priority species and with the objective of building conservation awareness of the ecological value and importance of tidal marsh systems. Since the property is in excellent ecological condition, active restoration is not anticipated.

### Management Actions

The management actions anticipated will be to remove human debris and flotsam on a regular basis (at least biennially with the Nehalem Bay Clean Up event). The dike will be inspected on a regular schedule to observe passive reclamation by tidal and wave action. The perimeter of the property will be regularly walked to determine if there is trespass or invasive species issues.

The LNCT will work with the current landowner as they develop the adjacent upland to assist in the interpretation of Bott's Marsh and its resources from the bayside trail they are contemplating. The LNCT does not anticipate any trail or public access other than water access to the marsh.

## Desired Future Conditions

The management objective for Bott's Marsh is to maintain the tidal marsh and flat ecological systems of the site. Since the site is in a relatively good condition and the threats are limited, management will focus on maintenance of habitat conditions of the tidal marsh and flats.

## Priority Management Strategies and Actions

Management of an intact tidal marsh will focus on developing relationships with neighbors and regular observation to assure that encroachment does not occur. The property is not well suited for access

because of the railroad that abuts the east side and Nehalem Bay that abuts the west side of the property.

The priority management actions will be invasive species detection and property observation for trespass. The threat of aquatic invasive species (green crab, mitten crab, and others) occur at the system level (estuary wide) and are best treated by early detection, rapid response in accord with the Aquatic Nuisance Task Force recommendations.

The same concern for the detection of *Spartina* as a potential salt marsh invader will be observed and addressed according to the Oregon *Spartina* Response Plan.

Volunteer crews will be used to remove upland non-native species such as Scotch Broom and Armenian Blackberry.

Since the property has no upland access and is tidally inundated, the floating litter from Nehalem Bay can be deposited in the marsh. The Lower Nehalem Community Trust participates in a biennial Bay Cleanup that included Bott's Marsh.

The conditions of the residual dike along the western edge of the marsh will be inspected annually after winter storms and high tides. The purpose of the inspection is to determine areas of potential failure and evaluate potential effects on the marsh.

## Implementation Plan and Schedule

The schedule for management will be a part of the stewardship responsibility of the Lower Nehalem Community Trust Stewardship Lead. The following table identifies the management actions and schedule for those actions.

Action	Frequency	Schedule
Invasive weed removal from the dike	Annual volunteer event until eradication	Summer event
<i>Spartina</i> inspection	Annually	Summer at low tide
Invasive invertebrate (Green Crab, Mitten Crab) inspection	Annually	Summer at low tide
Dike condition review	Annually	Spring after high water events
Trespass inspection	Annually	Weekly during the Summer

## Monitoring, Maintenance and Adaptive Management

Monitoring the marsh and channels will be dominantly by photo documentation. Photo points established with the baseline report will be repeated every five years. Surface features and tidal channels will be mapped and changes documented through time on at least a five-year basis. If dike breaches occur, changes of the marsh will be documented and changes to the dike conditions will be observed on an annual basis.

## **Plan Review and Update**

LNCT staff will review this management plan every five years. LNCT will make any revisions needed to reflect the changing management and restoration needs of the Bott's Marsh property in consultation with the Oregon Watershed Enhancement Board staff.

## **Community Involvement and Educational Opportunities**

Every year the Trust holds walking events on some of its properties for members and the general public. These events are led by someone well-grounded in the ecological significance of the habitat being preserved. Some of these events result from partnerships with other organizations such as the Tillamook Estuary Partnership, North Coast Land Conservancy and the Cape Falcon Marine Reserve.

LNCT anticipates kayaking events into the marsh, as well as walking tours along the adjacent rail line (Salmonberry Trail) that give opportunities for birding, observation of flora and conversation to further the comprehension of the major marsh contributions to the aquatic health of the estuary. Bott's Marsh is identified on the Nehalem Water Trail as "an extraordinary salt marsh" and "used by school groups as an on-water classroom".

LNCT also holds title to Zimmerman Marsh across HYW 101 from Bott's Marsh. This presents the opportunity for discussion of the hydrological connectivity that now exists between the two areas dissected by highway and rail line infrastructure and could further understanding of the importance of not filling wetlands for expediency only to later have to consider significant and expensive mitigation or restoration at a later time.

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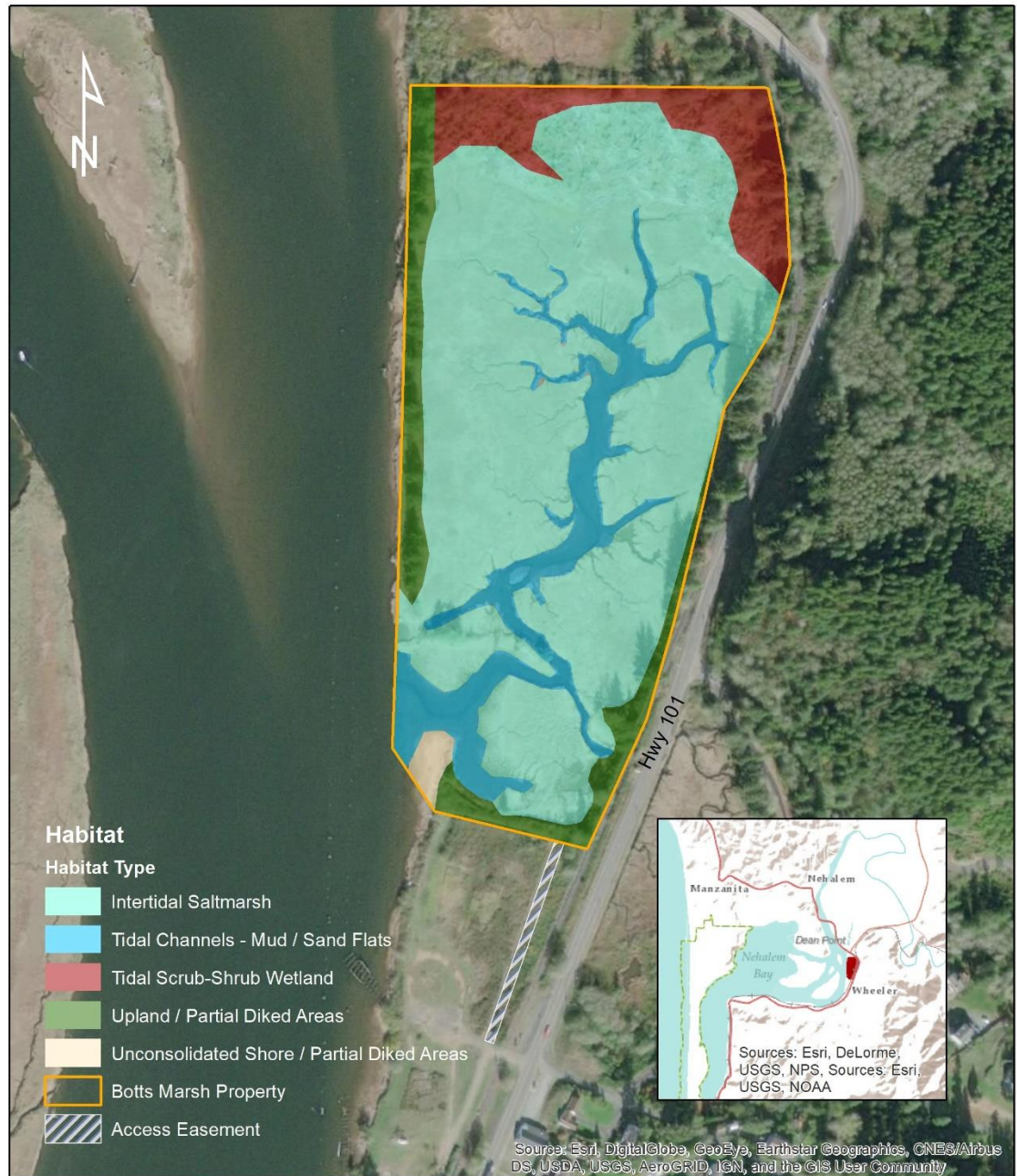
## Attachments

- Location and Access Map
- Existing Habitat Map
- Invasive Species Monitoring Map

## Botts Marsh Property Boundary



## Botts Marsh Existing Habitat Types



Feet

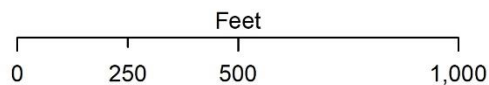
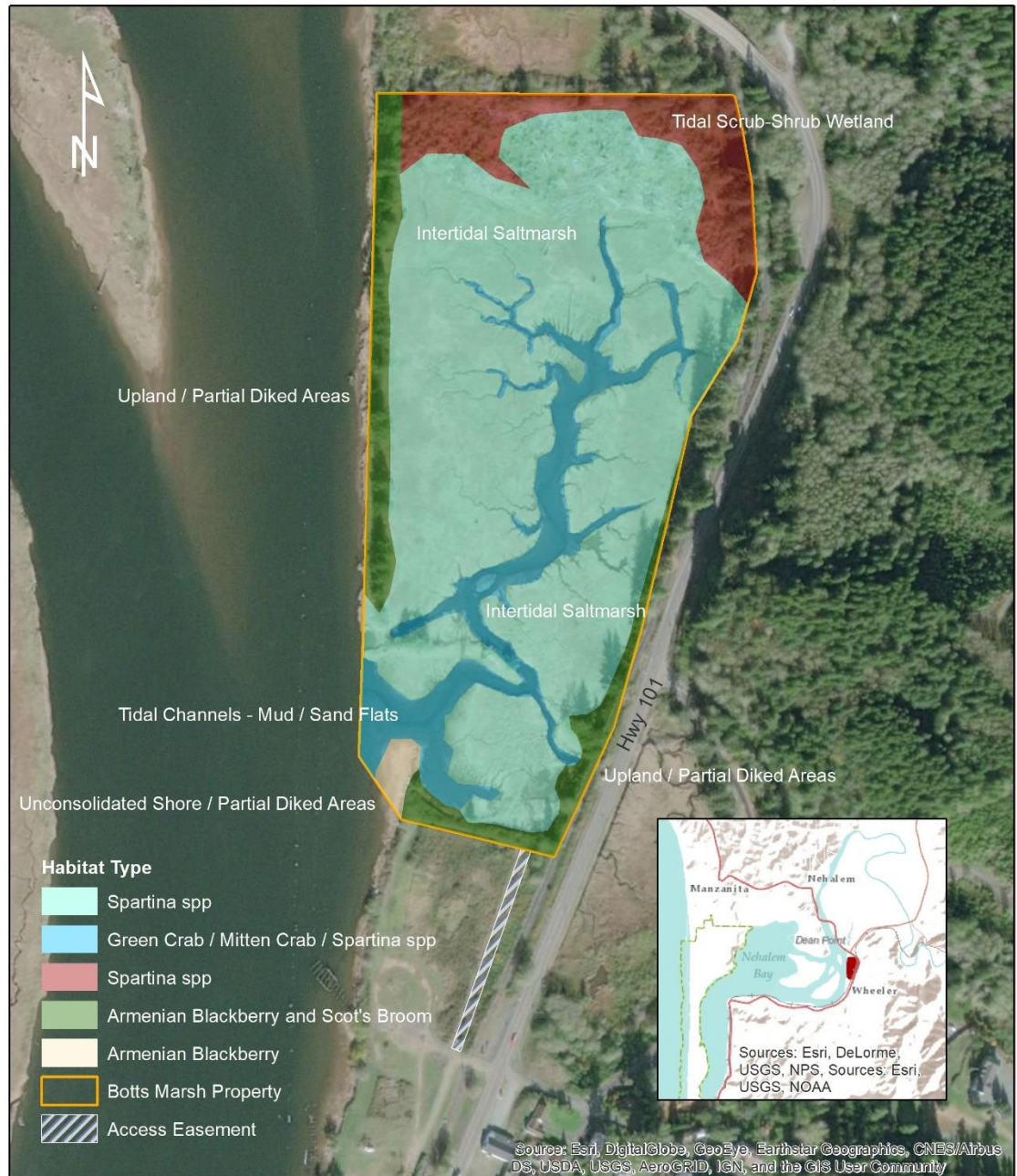
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Map Date: January 19, 2020  
Data Source: Bierly Associates LLC

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# Botts Marsh Invasive Species Monitoring



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