Tillamook County

DEPARTMENT OF COMMUNITY DEVELOPMENT
BUILDING, PLANNING & ON-SITE SANITATION SECTIONS

1510 – B Third Street
Tillamook, Oregon 97141
www.tillamookcounty.gov

Building (503) 842-3407
Planning (503) 842-3408
Sanitation (503) 842-3409
FAX (503) 842-1819
Toll Free 1(800) 488-8280

Land of Cheese, Trees and Ocean Breeze

Estuary/Floodway Development Permit Request #851-26-000111-PLNG: McCoy Marsh Tidal Project

NOTICE TO MORTGAGEE, LIENHOLDER, VENDOR OR SELLER:
ORS 215 REQUIRES THAT IF YOU RECEIVE THIS NOTICE,
IT MUST BE PROMPTLY FORWARDED TO THE PURCHASER

NOTICE OF ADMINISTRATIVE REVIEW
Date of Notice: May 22, 2026

Notice is hereby given that the Tillamook County Department of Community Development is considering the following:

#851-26-000111-PLNG: An Estuary and Floodway Development Permit for the development of McCoy Marsh for tidal reconnection. The project includes a Conditional Use review per the Shoreland Overlay. The project location is off Highway 101 North, a state highway, at the northly boundary of the City of Wheeler Urban Growth Boundary (UGB). The property is zoned Farm (F-1)) and Estuary Conservation 1 (EC1), and designated as Tax Lot 200 in Section 35, Township 3 North, Range 10 West W.M., Tillamook County Oregon. The applicant is Emily Akdedian and property owners are Lower Nehalem Community Trust.

Written comments received by the Department of Community Development prior to 4:00 p.m. on June 5, 2026, will be considered in rendering a decision. Comments should address the standards upon which the Department must base its decision. A decision will be rendered no sooner than the next business day, June 8, 2026.

Notice of the application, a map of the subject area, and the applicable criteria are being mailed to all property owners within 750-feet of the exterior boundaries of the subject parcel for which an application has been made and other appropriate agencies at least 14-days prior to this Department rendering a decision on the request.

A copy of the application, along with a map of the request area and the applicable criteria for review are available for inspection at the Department of Community Development office located at 1510-B Third Street, Tillamook, Oregon 97141, or on the Tillamook County Department of Community Development website: https://www.tillamookcounty.gov/commdev/landuseapps.

If you have any questions about this application, please call the Department of Community Development at 503-842-3408. Comments can be emailed to Sarah Thompson, Office Specialist 2, at Sarah.thompson@tillamookcounty.gov.

Sincerely,

Melissa Jenck, CFM, Senior Planner
Sarah Absher, CFM, Director

Enc. Maps, Applicable Ordinance Standards

Applicable Ordinances & Development Standards

Tillamook County Land Use Ordinance (TCLUO)
https://www.tillamookcounty.gov/commdev/page/land-use-ordinance-luo-zoning-ordinance

- Section 3.106: Estuary Conservation 1 (EC1) Zone
- Section 3.120: Regulated Activities and Impacts Assessments
- Section 3.140: Estuary Development Standards
- Section 3.510: Flood Hazard Overlay (FH)
- Section 3.545: Shoreland Overlay
- Section 4.140: Requirements for Protection of Water Quality and Streambank Stabilization

ARTICLE III – ZONE REGULATIONS

TCLUO SECTION 3.510: FLOOD HAZARD OVERLAY ZONE CRITERIA

(1) The fill is not within a Coastal High Hazard Area.

(2) Fill placed within the Regulatory Floodway shall not result in any increase in flood levels during the occurrence of the base flood discharge.

(3) The fill is necessary for an approved use on the property.

(4) The fill is the minimum amount necessary to achieve the approved use.

(5) No feasible alternative upland locations exist on the property.

(6) The fill does not impede or alter drainage or the flow of floodwaters.

(7) If the proposal is for a new critical facility, no feasible alternative site is available.

(8) For creation of new, and modification of, Flood Refuge Platforms, the following apply, in addition to (14)(a)(1-4) and (b)(1-5):

i. The fill is not within a floodway, wetland, riparian area or other sensitive area regulated by the Tillamook County Land Use Ordinance.

ii. The property is actively used for livestock and/or farm purposes,

iii. Maximum platform size = 10 sq ft of platform surface per acre of pasture in use, or 30 sq ft per animal, with a 10-ft wide buffer around the outside of the platform,

iv. Platform surface shall be at least 1 ft above base flood elevation,

v. Slope of fill shall be no steeper than 1.5 horizontal to 1 vertical,

vi. Slope shall be constructed and/or fenced in a manner so as to prevent and avoid erosion.

Conditions of approval may require that if the fill is found to not meet criterion (5), the fill shall be removed or, where reasonable and practical, appropriate mitigation measures shall be required of the property owner. Such measures shall be verified by a certified engineer or hydrologist that the mitigation measures will not result in a net rise in floodwaters and be in coordination with applicable state, federal and local agencies, including the Oregon Department of Fish and Wildlife.

TCLUO SECTION 6.040: CONDITIONAL USE CRITERIA

A Conditional Use shall be granted if the applicant demonstrates that all of the following applicable criteria are satisfied.

(1) The use is listed as a Conditional Use in the underlying zone, or in an applicable overlying zone.

(2) The use is consistent with the applicable goals and policies of the Comprehensive Plan.

(3) The parcel is suitable for the proposed use considering its size, shape, location, topography, existence of improvements and natural features.

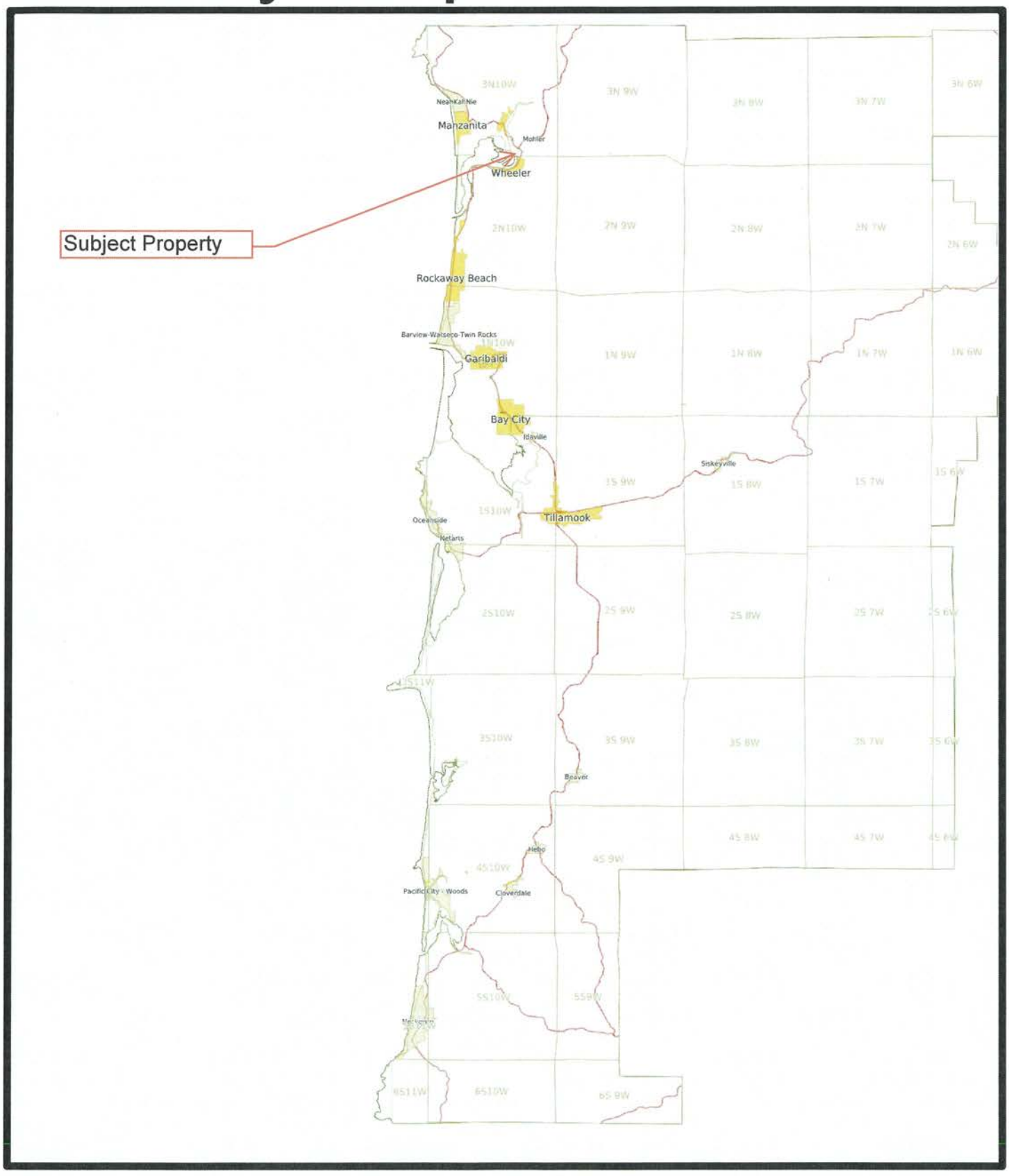
(4) The proposed use will not alter the character of the surrounding area in a manner which substantially limits, impairs or prevents the use of surrounding properties for the permitted uses listed in the underlying zone.

(5) The proposed use will not have detrimental effect on existing solar energy systems, wind energy conversion systems or windmills.

(6) The proposed use is timely, considering the adequacy of public facilities and services existing or planned for the area affected by the use.

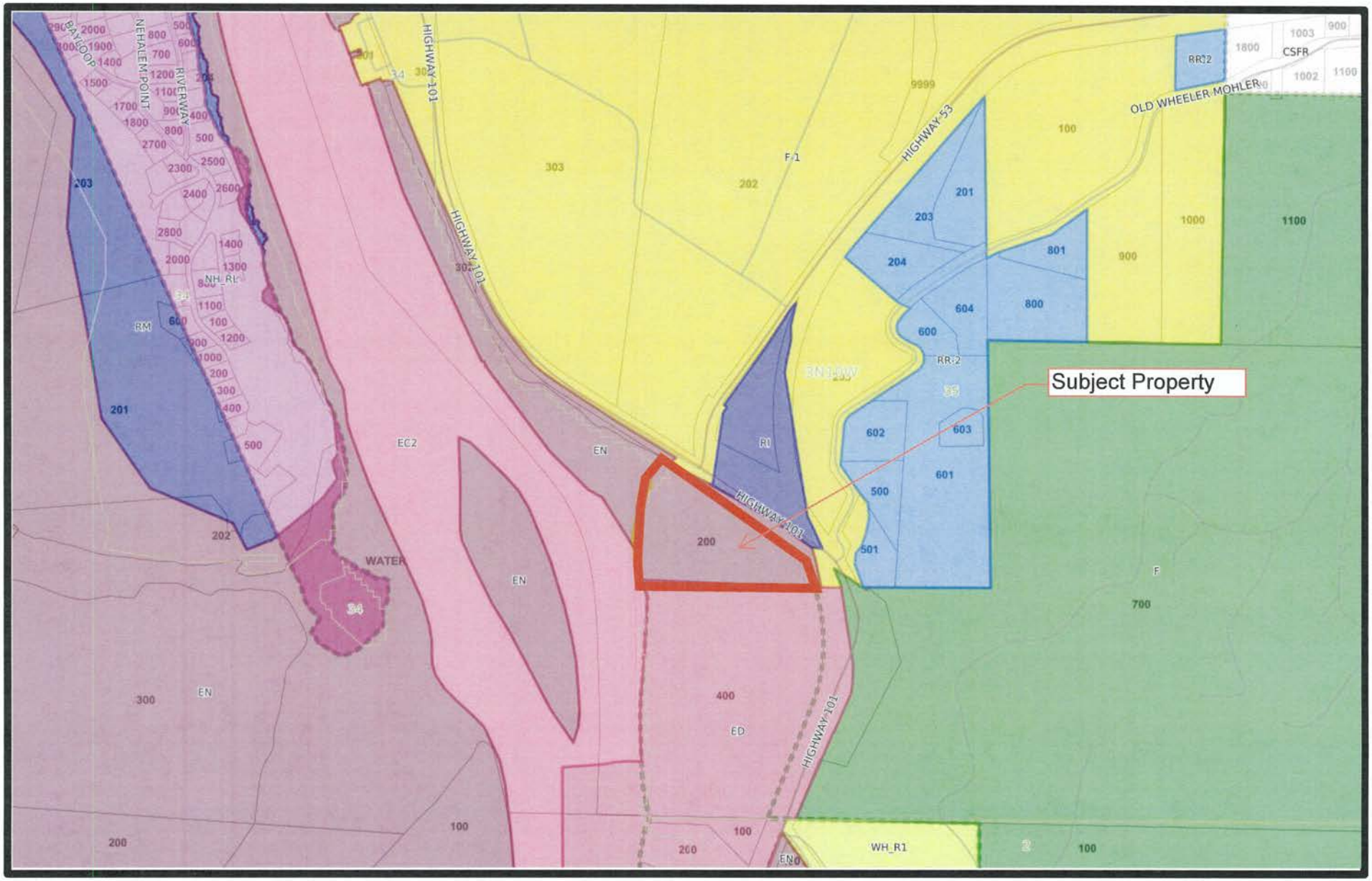
EXHIBIT A

Vicinity Map



Generated with the GeoMOOSE Printing Utilities

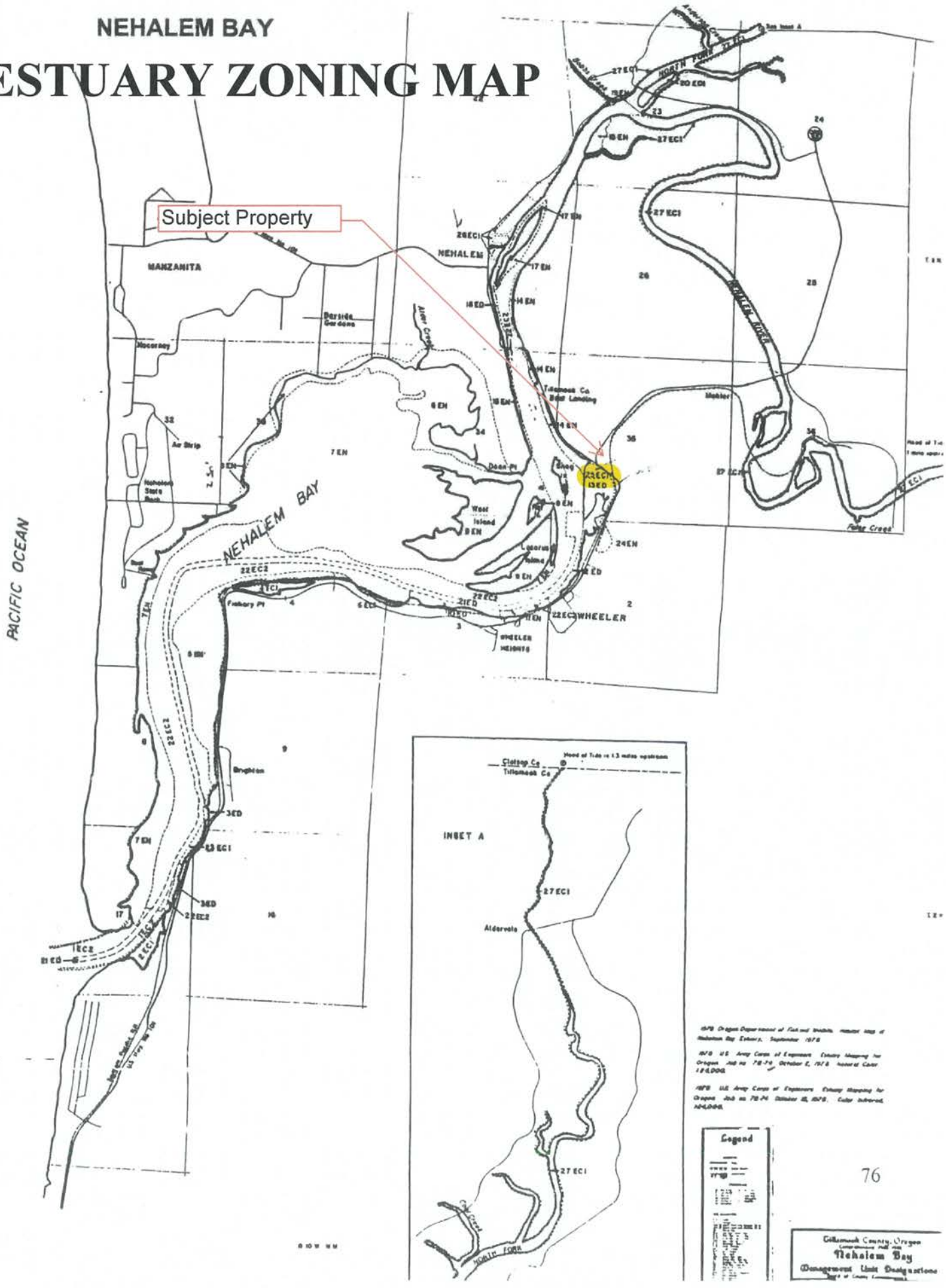
Zoning Map

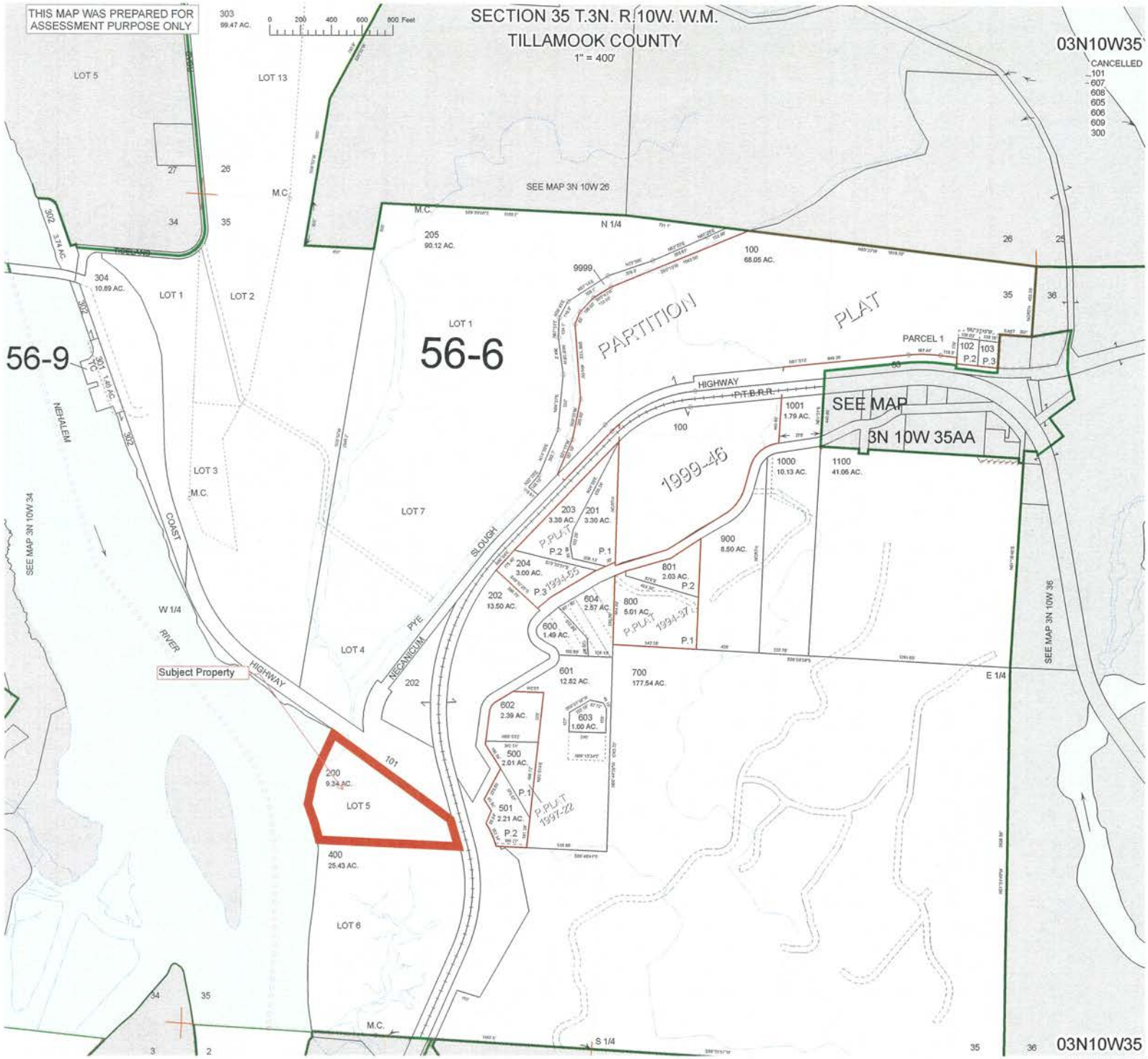


Generated with the GeoMOOSE Printing Utilities

NEHALEM BAY

ESTUARY ZONING MAP




THIS MAP WAS PREPARED FOR ASSESSMENT PURPOSE ONLY
SECTION 35 T.3N. R.10W. W.M.
TILLAMOOK COUNTY
1" = 400'
03N10W35
CANCELLED
101
607
608
605
606
609
300
0 200 400 600 800 Feet
303 99.47 AC.
LOT 5
LOT 13
27
26
M.C.
34
35
SEE MAP 3N 10W 26
N 1/4
205 90.12 AC.
100 68.05 AC.
302 3.74 AC.
304 10.89 AC.
LOT 1
LOT 2
9999
PARTITION PLAT
PARCEL 1
102 P.2
103 P.3
56-9
56-6
LOT 1
HIGHWAY
P.T.B.R.R.
SEE MAP 3N 10W 35AA
1001 1.79 AC.
100
1999-46
1000 10.13 AC.
1100 41.06 AC.
301 1.40 AC.
NEHALEM
COAST
302
LOT 3
M.C.
LOT 7
SLOUGH
203 3.30 AC.
201 3.30 AC.
P.PLAT
P.2
P.1
204 3.00 AC.
P.3 1994-53
900 8.50 AC.
801 2.03 AC.
P.2
202 13.50 AC.
604 2.57 AC.
800 5.01 AC.
P.PLAT 1994-37
P.1
600 1.49 AC.
W 1/4
RIVER
LOT 4
PYE
NECANICUM
Subject Property
HIGHWAY
601 12.82 AC.
700 177.54 AC.
E 1/4
SEE MAP 3N 10W 36
602 2.39 AC.
603 1.00 AC.
500 2.01 AC.
P.1
501 2.21 AC.
P.2
P.PLAT 1997-22
101
200 9.34 AC.
LOT 5
400 25.43 AC.
LOT 6
SEE MAP 3N 10W 34
34
35
M.C.
S 1/4
3
2
35
36
03N10W35
Revised 12/01/22, WS

Tillamook County
2025 Real Property Assessment Report
Account 95266

Map	3N10350000200	**Tax Status**	Non-Assessable
Code - Tax ID	5606 - 95266	**Account Status**	Active
		Subtype	NORMAL
Legal Descr	See Record		
Mailing	LOWER NEHALEM COMMUNITY TRUST PO BOX 496 MANZANITA OR 97130	**Deed Reference #**	2021-3991
		Sales Date/Price	05-05-2021 / $34,000
		Appraiser	KARI FLEISHER

Property Class	980	**MA**	**SA**	**NH**
RMV Class	020	07	TD	101

Site	Situs Address	City

Value Summary

Code Area		RMV	MAV	AV		RMV Exception	CPR %
5606	Land	12,240			Land	0	
	Impr	0			Impr	0	
Code Area Total		12,240	0	0		0	
Grand Total		12,240	0	0		0	

Land Breakdown

Code Area	ID #	RFPD	Ex	Plan Zone	Value Source	Trend %	Size	Land Class	Trended RMV
5606	0	☑		EN	Tidelands	100	9.34 AC		12,240
						Code Area Total	9.34 AC		12,240

Improvement Breakdown

Code Area	ID #	Year Built	Stat Class	Description	Trend %	Total Sqft	Ex%	MS Acct	Trended RMV

Exemptions / Special Assessments / Notations

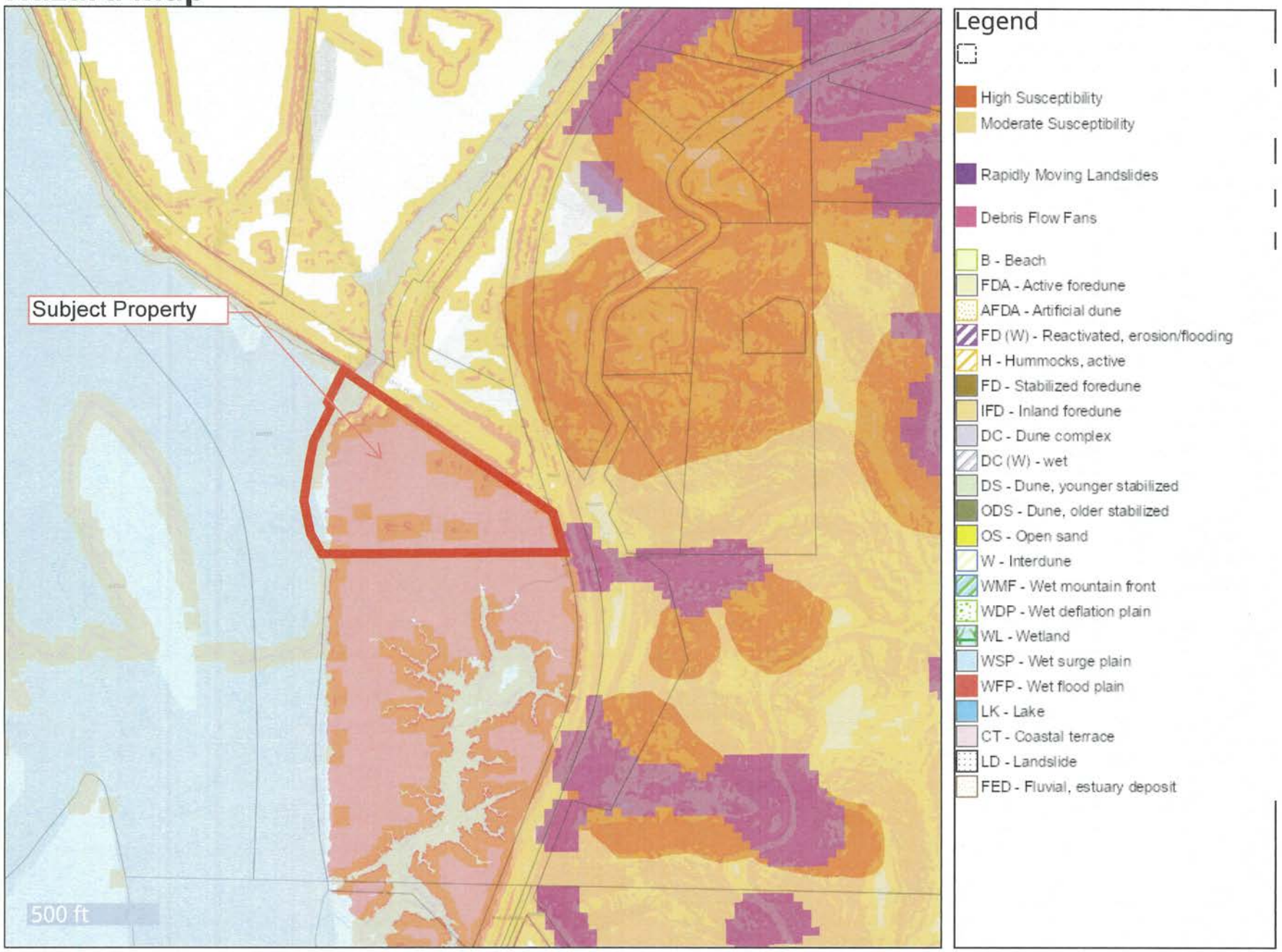
Exemptions (RMV)

- ORS 307.130 - Charitable, Literary, Scientific, Museums and Volunteer Fire Depts.

Comments

01/23/15 Reappraised land; tabled land. Updated size per GIS calculations. RBB 9/1/15 Reappraised RMV for 2015/16. Moved to MA:7 NH 101. KF
3/5/20 Code Change due to Fire Patrol Removal. LM
12/16/21 Due to a property tax exemption approval under ORS 307.130, made account non-assessable and set MAV to $0. KF
0/23/23 Moved exemption to a RMV exemption. KF

Hazard Map



Printed on 5 / 21 / 2026

Statewide Wetlands Inventory

5/21/2026, 4:24:11 PM

1:4,575

0 0.04 0.08 0.16 mi

0 0.05 0.1 0.2 km

Sections

Large Scale

Perennial

Intermittent

Artificial Path

Canal Ditch

NHD Waterbody

USFWS National Wetlands Inventory NWI

Estuarine and Marine Deepwater

Estuarine and Marine Wetland

Freshwater Emergent Wetland

Freshwater Forested/Shrub Wetland

Riverine

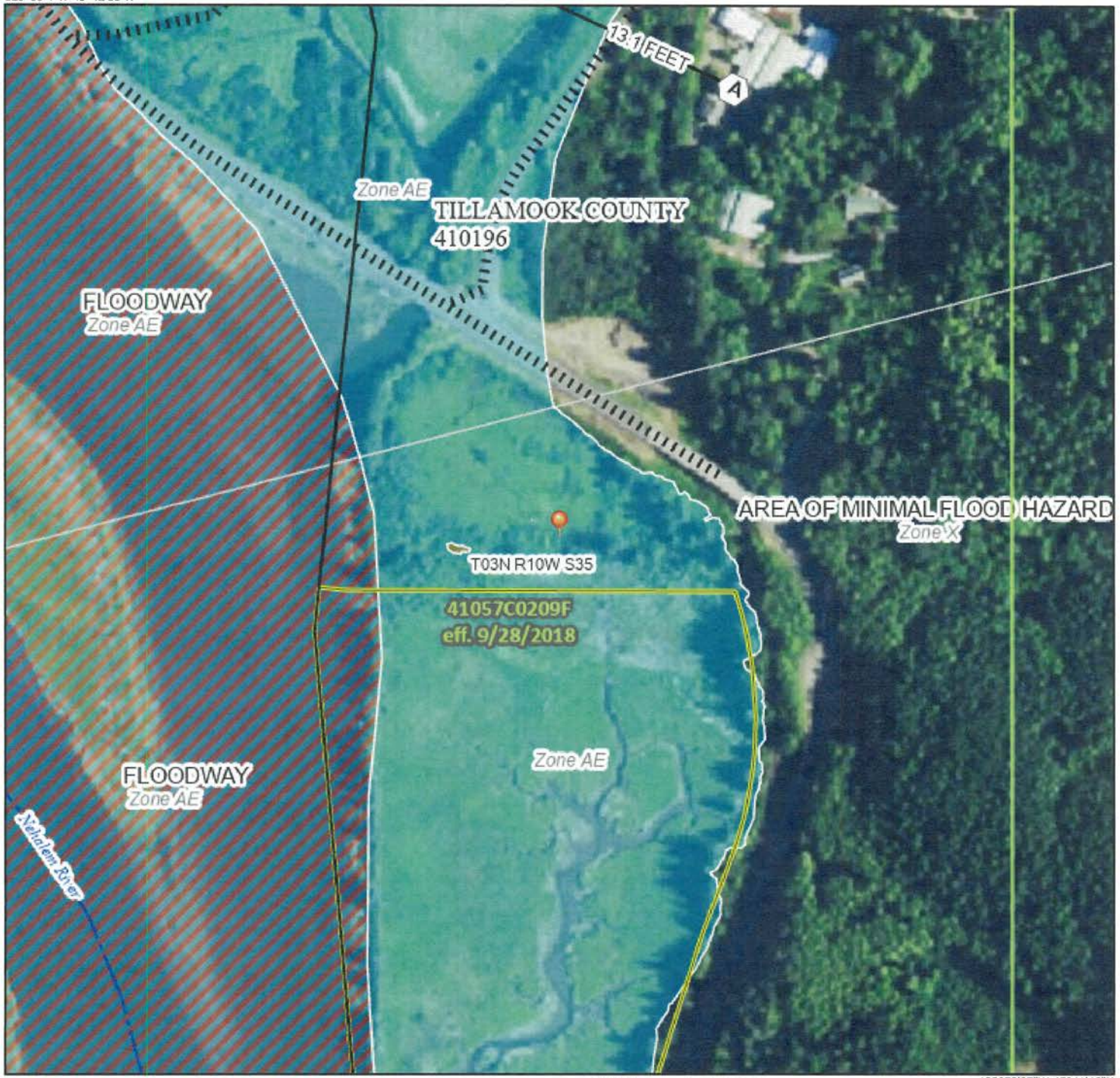
SWI Predominantly Hydric Map Units

Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, USGS TNM – National Hydrography Dataset. Data Refreshed April, 2026., Source: Esri, Vantor, Earthstar Geographics, and the GIS User

National Flood Hazard Layer FIRMette

FEMA

123°53'4"W 45°42'11"N



123°52'27"W 45°41'46"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) Zone A, V, A99
- With BFE or Depth Zone AE, AO, AH, VE, AR
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Area of 1% annual chance flood with average depth less than one foot or with drainag areas of less than one square mile Zone
- Future Conditions 1% Annual Chance Flood Hazard Zone X
- Area with Reduced Flood Risk due to Levee. See Notes. Zone X
- Area with Flood Risk due to Levee Zone D

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard Zone X
- Effective LOMRs
- Area of Undetermined Flood Hazard Zon

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximat point selected by the user and does not represe an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 5/21/2026 at 11:24 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

EXHIBIT B

Tillamook County Department of Community Development
1510-B Third Street. Tillamook, OR 97141 | Tel: 503-842-3408 Fax: 503-842-1819
www.co.tillamook.or.us

PLANNING APPLICATION

OFFICE USE ONLY
Date Stamp
RECEIVED MAR 11 2026
☐Approved ☐Denied
Received by:
Receipt #:
Fees: 1,800 + 90 (tech) = 1890
Permit No: 851-26-000111-PLNG

Applicant ☒ *(Check Box if Same as Property Owner)*

Name: Emily Akdedian Phone: 503-368-3203
Address: 532 Landeda Ave
City: Manzanita State: OR Zip: 97130
Email: emilyakdedian@nehalemtrust.org

Property Owner

Name: LOWER NEHALEM COMMUNITY TRUST Phone: 503.368.3203
Address: PO BOX 496
City: MANZANITA State: OR Zip: 97130
Email: emilyakdedian@nehalemtrust.org

Request: Estuary Developement Permit to allow grading work to breach existing levees/berms at 3 locations, excavate tidal channels and create shallow mounds for planting, and the installation of anchored log structures.

Type II	Type III	Type IV
☐ Farm/Forest Review	☐ Extension of Time	☐ Ordinance Amendment
☐ Conditional Use Review	☐ Detailed Hazard Report	☐ Large-Scale Zoning Map Amendment
☐ Variance	☐ Conditional Use (As deemed by Director)	☐ Plan and/or Code Text Amendment
☐ Exception to Resource or Riparian Setback	☐ Ordinance Amendment	
☐ Nonconforming Review (Major or Minor)	☐ Map Amendment	
☒ Development Permit Review for Estuary Development	☐ Goal Exception	
☐ Non-farm dwelling in Farm Zone		
☐ Foredune Grading Permit Review		
☐ Neskowin Coastal Hazards Area		

Location:

Site Address: South of intersection of Highway 101 and Highway 53

Map Number:	3N	10W	35	200
	Township	Range	Section	Tax Lot(s)

Clerk's Instrument #: _____

Authorization

This permit application does not assure permit approval. The applicant and/or property owner shall be responsible for obtaining any other necessary federal, state, and local permits. The applicant verifies that the information submitted is complete, accurate, and consistent with other information submitted with this application.

Property Owner Signature (Required) — Date: 3/10/26

Applicant Signature — Date: 3/10/26

Tillamook County Department of Community Development
1510-B Third Street. Tillamook, OR 97141 / Tel: 503-842-3408 Fax: 503-842-1819
www.co.tillamook.or.us

DEVELOPMENT PERMIT

OFFICE USE ONLY
Date Stamp: RECEIVED MAR 11 2026 BY:
☐Approved ☐Denied
Received by:
Receipt #:
Fees:
Permit No: 851-26-000111 -PLNG

Applicant ■ *(Check Box if Same as Property Owner)*

Name: Emily Akdedian Phone: 503-368-3203
Address: 532 Laneda Ave.
City: Manzanita State: OR Zip: 97130
Email: emilyakdedian@nehalemtrust.org

Property Owner

Name: LOWER NEHALEM COMMUNITY TRUST Phone: 503-368-3203
Address: 532 LANEDA AVE / PO BOX 496
City: MANZANITA State: OR Zip: 97130
Email: emilyakdedian@nehalemtrst.org

Description of Work: Grading work to breach existing levees at 3 locations, excavate tidal channels and create shallow mounds, install anchored log structures, and revegetation with native species.

Location:

Site Address: South of intersection of Highway 101 and Highway 53

Map Number: 3N	10W	35	200
Township	Range	Section	Tax Lot(s)

Complete all applicable fields:

Regulatory Floodway: ✔	Estuary:	Floodplain: ✔			
New:	Addition:	Replacement:	Remodel:	Demolish:	

Dwelling: N/A	Accessory Structure: N/A
Culvert Diameter: / Length: N/A	Bridge Length: / Width: N/A
Fence Height: N/A	Retaining Wall Height: N/A
Streambank Stabilization: N/A	Other:
Fill/Removal/Grading: 1100 CY	Vegetation Removal: 1100 CY

Structure/Damage $:	5 Year Construction $:
Substantial improvement/damage threshold 50% cost vs. value	

Flood Insurance Rate Map (FIRM) Panel Info

Tillamook County	Panel Number: 41057C	0209F	
Effective Date: 9/28/18	Property Flood Zone(s):	AE	
Floodway: (Y) N	Project Flood Zone(s):	AE	
Stream/Waterbody Name:	Nehalem River		

Elevation Data (NAVD 88)

Base Flood Elevation: 13	First Habitable Floor:
Lowest Floor/Horizontal Member:	
Enclosed Area:	Flood Vent Area:

Other Required Permits

Authorization

This permit application does not assure permit approval. The applicant and/or property owner shall be responsible for obtaining any other necessary federal, state, and local permits. The applicant verifies that the information submitted is complete, accurate, and consistent with other information submitted with this application.

Property Owner Signature (Required) — Date: 2-25-26

Applicant Signature — Date: 2-25-26

Type II Land Use Application

McCoy Marsh Tidal Reconnection Project

Applicant: Lower Nehalem Community Trust

Prepared: March 9, 2026

This application was prepared to support the Lower Nehalem Community Trust (LNCT) in obtaining the required Estuary and Floodplain Development Permits for the proposed McCoy Marsh Tidal Reconnection Project on the Nehalem River. Property details are as follows:

Request: Estuary and Floodplain Development Permit for the proposed McCoy Marsh Tidal Reconnection Project

Location: South side of intersection of HWY 53 and HWY 101. 45.700021, -123.879821

3N 10W Section 35. Tax Lot 3N10-3500-00200 in Tillamook County, Oregon, immediately north of the town of Wheeler (Figures 1).

Zone: EC1- Estuary Conservation Zone. The estuary zone is applied to all estuarine waters, intertidal areas, submerged and submersible lands and tidal wetlands up to the line of non-aquatic vegetation. The entire restoration site is comprised aquatic vegetation.

Staging will occur in the Oregon Department of Transportation Lot zoned as Rural Industrial (RI).

Overlays: Shoreland (SH)

Flood Zone: Special Flood Hazard (AE), Refer to FEMA Firm 41057C0209F

Applicant: Emily Akdedian Lower Nehalem Community Trust 532 Laneda Ave, Suite C Manzanita, OR 97130

Property Owner: same.

Project Description: The Project will restore tidal processes to McCoy Marsh by removing manmade barriers to tidal surface flows and expanding wetland area through breaching levees that no longer serve their function. The project objectives and design elements were identified by a technical advisory team that includes representatives from Lower Nehalem Community Trust, Wild Salmon Center, Oregon Department of Fish and Wildlife, Tillamook Estuary Partnership, and Nehalem Bay Watershed Council. The project design includes restoration of estuarine function by breaching the existing, degraded levees in three locations, grading tidal channels through the breaches and into the marsh interior, installing large wood along the tidal channels and in marsh areas, placement of marsh soils generated through earthwork to create low hummocks capable of supporting high marsh vegetation (Sitka spruce and willows), and installation of native plants across all disturbed areas.

Levees would be breached in three locations to restore full tidal exchange – two between Botts Marsh and McCoy Marsh, and one between McCoy Marsh and the Nehalem Bay. Levee breaching will include earthwork occurring in levee areas, wetlands, and waters. The breaches will include removing the levee material to near the ground surface around 8 to 9 feet elevation to allow tides to enter the McCoy Marsh, and one inset excavated tidal channel graded to tie into the Nehalem River at an elevation of 2 feet. The purpose of the wide breaches is to allow fish and woody debris to more easily enter the McCoy Marsh to provide additional habitat complexity once the construction is completed. Breaches and tidal channels are shown in the attached 60% Design Plans (Attachment 1, Sheet C3). The breaches and channel network will allow tidal access and drainage through McCoy and Botts Marshes to the Nehalem River; the restored features will be graded to provide positive drainage and fish passage.

- Breach 1 is located in the southeast corner of the McCoy Marsh, where a 30-foot opening will be made through the McCoy-Botts Levee, and a channel will be graded to connect to an existing tidal channel that currently drains through a partially buried concrete culvert in the McCoy-Botts Levee. The culvert will be plugged and remain in place.
- Breach 2 is located at the approximate midpoint of the McCoy-Botts Levee and will also be 30-feet wide. The breach will tie into the ground surface elevation of the adjoining Botts Marsh and lower in elevation to the north towards existing tidal wetland areas and converges with the channel at Breach 3.
- Breach 3 is a 50-foot wide opening in the Nehalem Levee and will allow flows from the Nehalem River on the west side of the property connecting it with the Nehalem River. Breach 3 will tie into the Nehalem Bay at an elevation of approximately 2 feet, allowing some inundation during most tidal water levels. The channel bottom will maintain 0.5 % slope for 365 feet towards the site interior.
- Breaches 2 and 3 converge in the marsh interior and join the existing tidal channel to convey tidal flows north and east. The existing tidal channel is an defined channel that connects to Breach 1 and currently terminated in the northwest corner of the site.

Hummocks

A series of "hummocks" will be built from project spoils of levee material excavated to create the breaches and tidal channels. The proposed hummocks are low, oval shaped mounds of soil rising from the marsh surface to a maximum of 2 feet above existing ground surface elevations (max fill at 10-feet elevation to maintain wetland conditions). The hummocks will have side slopes of approximately 5 H: 1 V and will serve multiple purposes: providing topographic diversity, creating more edge habitat, support woody vegetation (Sitka spruce and willows), and catching drift logs in advantageous locations. Floodplain logs and nurse crib structures (discussed below) will be installed on the hummock surfaces to enhance their ability to support Sitka spruce and willow, and to trap drift logs within the project area. These techniques are used by restoration practitioners to "jump start" the development of woody tidal marsh communities. These hummocks will not convert wetland to upland.

The use of hummocks also eliminates the need for riprap to protect the road prism of HWY 101 adjacent to the project site. Oregon Department of Transportation (ODOT) requested that project designs include measures to prevent drift logs and wave energy from impacting and eroding the road prism. Rather than armoring the base of the road with riprap, the design team proposed that the hummocks be developed and arranged in a way that will reduce the possibility of drift logs and waves impacting the road. The arrangement of the hummocks shown in the 60% plan set (Attachment 1, Sheet C3) aims to balance disturbance of wetlands, meeting ODOT's requests, and providing areas where wood will rack close to the tidal channels.

Large Wood

Two types of wood installations are included in the designs: channel logs and nurse crib log structures.

- Channel logs are individual logs with rootwads in tact driven into the channel banks at a 45° angle from the ground surface with at least 10 feet of log to be below ground. Rootwads will be exposed in the channels to provide habitat and encourage local scour and channel formation. A total of 36 channel logs will be installed.
- Crib log structures are comprised of two nurse crib logs without rootwads, laying on the ground surface on either side of two pile logs that are located at each end. The pile logs are driven at least 10 feet below the ground surface and attached to the nurse crib logs using threaded rebar and countersunk nuts. The space between the nurse crib logs will be filled with amended native soil and plated with native vegetation.

Seeding and Planting

All disturbed areas will be seeded and planted with native species that are appropriate to site conditions. The Attachment 2 includes the McCoy Marsh Vegetation Enhancement Plan.

Temporary staging and refueling will occur at an ODOT-owned maintenance lot located on the opposite (north) side of HWY 101. Construction equipment will access the staging and refueling area by crossing overland through vegetated uplands underneath the ODOT bridge that crosses over the Southern Pacific Railroad to access the east side of the refueling and staging area. Vehicles leaving the refueling and staging area will cross HWY 101 to enter the Project site on an existing upland landing.

Applicable Ordinance and Comprehensive Plan Provisions

Per pre-application materials provided by Tillamook County, the proposed development will require an Estuary Development Permit through a Type II application and a Floodplain Development Permit with supporting floodplain materials (hydraulic analysis report). This section details compliance with the Tillamook County Land Use Ordinance (TCLUO); the Floodplain Development Permit, Hydraulic Analysis, and Type II Planning Application are included with this submittal. Sections from the relevant sections of the TCLOU are shown in italics and language demonstrating the project meets the criteria of TCLUO follows.

Section 3.100: ESTUARY ZONES

(1) GENERAL USE PRIORITIES AND AREAS INCLUDED: General priorities, from highest to lowest, for uses within all ESTUARY ZONES shall be:

(a) Uses which maintain the integrity of the estuarine ecosystem.

(b) Water-dependent uses requiring an estuarine location, as consistent with the overall Oregon Estuarine Classification.

(c) Water-related uses which do not degrade or reduce the natural estuarine resources and values.

(d) Non-dependent, non-related uses which do not alter, reduce or degrade the estuarine resources and values.

ESTUARY ZONES shall be applied to all estuarine waters, intertidal areas, submerged and submersible lands and tidal wetlands up to the line of non-aquatic vegetation or the Mean Higher High Water (MHHW) line, whichever is most landward.

The site is zoned as Estuary Conservation 1 (EC1); estuary zones are applied to all estuarine waters, intertidal areas, submerged and submersible lands and tidal wetlands up to the line of non-aquatic vegetation. With the exception of portions of the levees, the site contains tidal wetlands with brackish estuarine vegetation in the existing conditions.

The proposed project is a voluntary estuarine restoration project that will maintain the integrity of the estuarine ecosystem, is a water dependent use, and will not degrade or reduce the natural estuarine resources and values found at the site. It is expected that as a result of the project, there will be significant uplift to the estuarine ecosystem and fish habitat function and values.

Section 3.106: ESTUARY CONSERVATION 1 ZONE (EC1) (1) PURPOSE AND AREAS INCLUDED: The purpose of the EC1 zone is to: (a) Provide for long-term utilization of areas which support, or have the potential to support valuable biological resources. (b) Provide for long-term maintenance and enhancement of biological productivity. (c) Provide for the long-term maintenance of the aesthetic values of estuarine areas, in order to promote or enhance the low intensity recreational use of estuarine areas adjacent to rural or agricultural shorelands. ...

Restoration is a use permitted with standards for Estuary Conservation 1 Zone (EC1) as defined in TCLUO 3.106(2)(i). The project meets the purpose of the EC1 in that is supports valuable biological resources and provides long-term maintenance and enhancement of biological productivity. The project site provides a rare opportunity to provide significant ecological uplift without introducing significant threats to infrastructure or public safety. The property includes existing, degraded levees along the Nehalem River to the west, and the levee separating the site from Bott's Marsh to the south; the property is bounded on the north by HWY 101 and the east by Southern Pacific Railroad. The levees and these built features prevent tidal exchange below 10 feet (NAVD88) other than through a 12-inch concrete culvert in the Botts Levee that allows limited tidal intrusion. Interior of the levees, the land is wetland that has retained much of the estuarine topography with remnant

tidal channel network and a mix of palustrine and estuarine plant communities. The project site is connected to a large functioning marsh (Botts Marsh to the south) and to mature Sitka spruce tidal swamp areas. Restoration of full tidal exchange to the project site interior will use and connect to the existing tidal marsh features. The *Nehalem Basin Strategic Action Plan for Coho Salmon Recovery* (Wild Salmon Center and Coast Coho Partnership, 2023) includes an objective to reconnect 300 acres of tidal wetlands within 20 years, and the proposed project would contribute to achieving that goal.

Further, the project will restore a DSL Aquatic Resource of Special Concern (ARSC) of *Wooded Tidal Wetland.* This design goals and planting strategy will use hummocks, a constructed topographic diverse surface, to restore woody vegetation (willows and Sitka spruce) to the site. The site will meet the DSL description of this type: "a wetland in which trees and shrubs have an aerial cover of 30% or more, and that is inundated at least once annually by tides. The plant species may include Sitka spruce, crabapple, or willows. Because tidal swamps occur at the upper edge of the estuary, they were readily logged and converted to agriculture, and therefore are one of the wetland types most disproportionately lost".

The site will be protected into the future by LNCT and managed as a restored estuarine site.

(2) USES PERMITTED WITH STANDARDS: The following uses are permitted subject to the procedure of Section 3.120 and the standards in Section 3.140:

(i) Active restoration and estuarine enhancement.

The project proposes to complete active restoration by breaching existing levees, both of which are in degraded condition, and excavating tidal channels that will connect to an existing tidal channel. The project purpose is the restore full tidal processes to a levee-protected property that has been isolated from regular tidal influence for 80 years or more. The project will undergo the section 3.120 review and meets the standards in 3.140 as discussed below.

(4) REGULATED ACTIVITIES: The following Regulated Activities are permitted subject to the procedure of Section 3.120 and the standards in Section 3.140.

(f) Regulated Activities in conjunction with an approved active restoration or estuarine enhancement project.

The project will undergo the section 3.120 review and meets the standards in 3.140 as discussed below.

Section 3.120: REVIEW OF REGULATED ACTIVITIES (1) PURPOSE: The purpose of this Section is to provide an assessment process and criteria for local review and comment on State and Federal permit applications which could potentially alter the integrity of the estuarine ecosystem.

(2) REGULATED ACTIVITIES: Regulated activities are those actions which require State and/or Federal permits and include the following: (a) Fill (either fill in excess of 50 c.y. or fill of less than 50 c.y., which requires a Section 10 or Section 404 permit from the U.S. Army Corps of Engineers). (b) Dredging (either dredging in excess of 50 c.y. within a 12 month period, or dredging of less than 50 c.y., which requires a Section 10 permit from the U.S. Army Corps of Engineers).

The applicant has secured funding from OWEB and from the NOAA Restoration Center. As part of the ESA and NEPA compliance, NOAA Restoration Center staff and NMFS fish passage engineer reviewed the project engineering plans. Applications are under review for the 404/401 Permits from the U.S. Army Corps of Engineers and DEQ, and the Oregon Department of State Lands (DSL). The applicant and project engineers have worked with Oregon Department of Fish and Wildlife ODFW and ODOT for technical reviews of the project designs.

(4) ZONE REQUIREMENTS: Uses and activities shall be allowed only if they are allowed in the zones in which they are to be located.

Restoration is an allowed use in EC1.

(5) IMPACT ASSESSMENTS: The Planning Department shall, with the assistance of affected State and Federal agencies, develop impact assessments for regulated activities. Federal Environmental Impact Statements or Assessments may be substituted if made available to the Planning Department. The following considerations must be addressed in the impact assessment. (a) The type and extent of alterations expected. (b) The type of resource(s) affected including, but not limited to aquatic life and habitats, riparian vegetation, water quality and hydraulic characteristics. (c) The expected extent of impacts of the proposed alteration on water quality and other physical characteristics of the estuary, living resources, recreation and aesthetic use, navigation and other existing and potential uses of the estuary. (d) The methods which could be employed to avoid or minimize adverse impacts.

See Attachment 3 (Wetland Delineation) and Attachment 4 (Basis of Design) for analyses made during project planning and design work.

Section 3.140: Sections as applicable:

(5) DREDGING IN ESTUARINE WATERS, INTERTIDAL AREAS AND TIDAL WETLANDS: These standards shall apply only to dredging in excess of 50 c.y. within a 12-month period or dredging of 50 c.y. or less which requires a Section 10 permit from the U. S. Army Corps of Engineers.

(k) Excavation to create new water surface area shall be subject to the standards listed above and to the following standards: ..... (3) Erosion of adjacent shoreland areas and excessive sedimentation and turbidity in adjacent aquatic areas shall be avoided. (4) Excavation shall occur at a time that will minimize its impact on aquatic life. (5) Excavated materials shall not be disposed of in estuarine waters, intertidal areas, or tidal wetlands, except as part of an approved fill project subject to fill standards.

While no dredging is proposed in the main channel of the Nehalem River is proposed, excavation will occur on the interior of the project to extend the existing channel network and to complete the levee breaches on the southern (McCoy/Botts) levee in order to allow tidal water flow into and out of the site. Excavation will also occur to breach Nehalem levee and excavate the exterior part of the tidal channels on the outboard side of the Nehalem Levee.

Excavated materials will not be disposed of in tidal waters, but will be used on the project site to create topographic diversity and the low hummocks for planting of tidal marsh species. Fill will not convert wetland to upland. Excavation work to be performed following all permit requirements

from USACE, DEQ and DSL, and all required Conservation Measures and BMPs will be followed. All excavation will take place while the site is dewatered and isolated from the Nehalem River.

(7) FILL IN ESTUARINE WATERS, INTERTIDAL AREAS AND TIDAL WETLANDS: These standards shall apply only to fill in excess of 50 c.y. or fill of less than 50 c.y. which requires a Section 10 or 404 Permit from the U.S. Army Corps of Engineers. (a) When fill in estuarine waters, intertidal areas or tidal wetlands is proposed, evidence shall be provided by the applicant and findings made by the County that: (1) The fill is necessary for navigation or other water dependent uses that require an estuarine location, or is specifically allowed by the management unit or zone; and (2) A need (i.e. a substantial public benefit) is demonstrated and the use or alteration does not unreasonably interfere with public trust rights; and, (3) If no feasible alternative upland locations exist; and, (4) If adverse impacts are minimized.

Fill will include logs for the habitat structures and "hummocks" built from project spoils of levee material excavated to create the breaches and tidal channels. The hummock placement is critical to restore site topography and allow for woody plant installation. Fill material will not convert wetland to upland.

(7)*(d) The fill shall be placed at a time that will minimize sedimentation and turbidity. The work periods specified in the Oregon Guidelines for Timing of In-Water Work to Protect Fish and Wildlife Resources (ODFW, 1976) shall be followed unless approval of alternative work periods has been obtained from the ODFW.*

All filling activities will take place when the site is isolated and during the approved In Water Work Windows.

(7)(g) Fills shall be placed so that adjacent or nearby property is not adversely impacted by increased erosion, shoaling or flooding produced by changes in littoral drift or other changes in water circulation patterns. An affidavit from a professional registered engineer or hydrologist may impact assessment required in Section 3.120.

No nearby property will be adversely affected by the placement of fill. Oregon Department of Transportation (ODOT) requested that project designs include measures to prevent drift logs and wave energy from impacting and eroding the road prism. Rather than armoring the base of the road with riprap, the design team proposed that the hummocks be developed and arranged in a way that will reduce the possibility of drift logs and waves impacting the road. The arrangement of the hummocks shown in the 60% plan set (Attachment 1, Sheet C3) aims to balance disturbance of wetlands, meeting ODOT's requests, and providing areas where wood will rack close to the tidal channels.

(7)(i) Fill in estuarine waters, intertidal areas and tidal wetlands shall be subject to the requirements of the State Fill and Removal Law (ORS 541.605 - 541.665), The Rivers and Harbors Act of 1899, the Clean Water Act of 1977 (PL 95-217) and other applicable State and Federal laws. These requirements shall be enforced by State and Federal agencies with regulatory authority over fill projects.

A 404 Permit is being acquired from USACE and a removal fill permit is being acquired from DSL.

(7)(j) An impact assessment shall be conducted during the local, State, and Federal review of permit applications for fill in estuarine waters, intertidal areas, or tidal wetlands according to the provisions outlined in Section 3.120. Identified adverse impacts shall be minimized to be consistent with the resource capabilities and purposes of the area.

See Attachment 3 (Wetland Delineation) and Attachment 4 (Basis of Design), and for analyses made during project planning and design work. NOAA Restoration Center would have completed NEPA for the funding (a federal action).

(12) MITIGATION:

The project is not being completed solely for the purpose of compensatory mitigation for impacts or losses to aquatic or natural resources, but is a voluntary restoration project for the purpose of fish and habitat uplift. Per Goal Section 4.1: *The term mitigation refers to actions which compensate for the adverse impacts to functional characteristics and processes of the estuary which result from dredging or fill in intertidal areas or tidal marshes. The objective of mitigation is to create, restore or enhance an estuarine area in order to replace or compensate for an intertidal area or tidal marsh which is lost or adversely impacted by dredging or fill.*

However, DSL has stated they will require mitigation for the temporary impacts incurred as a result of the project in the form of vegetation success standards and other performance monitoring to ensure the project objectives are met.

(15) RESTORATION AND ENHANCEMENT: Restoration and enhancement projects in estuary zones, Water-Dependent Development (WDD) shoreland zones or other areas within the Shoreland Overlay zone shall be subject to the following standards: (a) Restoration and enhancement policy requirements in the Tillamook County Comprehensive Plan shall be met. (b) Proposals for restoration projects shall present evidence that: (1) The restored area is a shallow subtidal or an intertidal or tidal marsh area after alteration work is performed; and (2) The restored area may not have been a functioning part of the estuarine system when alteration work begins; and (3) The restored area is revitalizing, returning or replacing original attributes and amenities which have been diminished or lost by past alterations, activities or catastrophic events.

(c) Estuarine enhancement project proposals shall identify: (1) The original conditions to be enhanced. (2) The cause of the loss or degradation. (3) The location and extent of actions necessary to achieve the enhancement objective.

(d) Estuarine enhancement project proposals shall present evidence that the project will result in an overall improvement in the cultural, historic, economic or navigation features of an estuary, which will outweigh any adverse impacts.

The project meets the definition and criteria of restoration and enhancement. Per Goal 16 Section 4.1: *The term restoration refers to actions which serve to revitalize, return or replace prior or original attributes within an estuary which have been diminished or lost by past alterations, activities or catastrophic events.*

The project will meet the policy requirements of Tillamook County Comprehensive Plan. The project site is considered "Management Unit: 25". This site is identified as a priority mitigation site. The Management Unit 25 description includes mention of the existing breaches in the McCoy-Botts Levee (the southern dike) which have restored some tidal circulation in the project site. This is limited, as it only occurs at certain elevations and flow through the culvert in the McCoy-Botts Levee is impaired. This site is described in the Goal 16 documents as a priority mitigation site, primarily because past land alterations have reduced tidal circulation. It is an area needed "for enhancement of biological productivity". The project will reverse the effects of the past land alterations to restore tidal circulation. The site is unsuitable for agriculture or building and is unacceptable for dredge placement (Goal 16; 3.4c. 10 Site 12a) due in part to "environmental, engineering or economic constraints which limit their future sue as dredged material disposal sites".

See Attachment 3 (Wetland Delineation) and Attachment 4 (Basis of Design) which provides evidence the site is a tidal marsh area and describes the expected restoration and enhancement objectives. The McCoy Marsh wetland (Wetland 1 in the delineation) includes both tidal and nontidal conditions, including estuarine, intertidal, emergent (E2EM) and riverine palustrine scrub-shrub (PSS)/palustrine forested (PFO) wetland types. The wetland was historically protected from tidal inundation by the McCoy-Botts Levee (the southern dike in the Goal 16 Management Unit 25 description) that has since failed and eroded. E2EM communities are supported inboard of the levees below approximately 9 feet (North American Vertical Datum of 1988 [NAVD88]) elevation; PSS and PFO communities are located near the failed McCoy-Botts Levee, at the east end of the study area, and in a few low mounds above elevations that support E2EM communities.

The failed McCoy-Botts Levee is a partial barrier to tidal inundation and floods; surface waters are able to circumvent the McCoy-Botts Levee through a culvert shown on Figure 2 and around the east end of the levee when water levels are high enough (also shown in Attachment 1). Small drainage channels have formed within the E2EM community, routing surface water toward the culvert as the primary surface water outlet.

(e) When active restoration and enhancement projects are proposed in Estuary Natural (EN) or Estuary Conservation Aquaculture (ECA) zones, evidence shall be provided by the applicant and findings made by the County that the project is consistent with the protection of significant fish and wildlife habitats, biological productivity, and scientific, research and educational needs.

(f) When active restoration or enhancement projects are proposed in Estuary Conservation 1 (EC1) or Estuary Conservation 2 (EC2) zones, evidence shall be provided by the applicant and findings made by the County that the proposed use is consistent with the resource capabilities of the area and the long-term use of renewable resources, and does not cause a major alteration of the estuary. ...

(h) When active restoration projects are proposed in Water-Dependent Development (WDD) shoreland zones, evidence shall be provided by the applicant and findings made by the County that the proposed project does not preclude or conflict with existing or reasonable potential water-dependent use on the site or in the vicinity. Shoreland Development standards shall apply.

See Attachment 3 (Wetland Delineation) and Attachment 4 (Basis of Design) which provide evidence that the project will provide protection of significant fish and wildlife habitats, provide an

increase in biological productivity, and is not a major alteration to the estuary. The project will not conflict with existing or reasonable potential water dependent uses on the site or in the vicinity.

(j) Restoration and enhancement projects in Water-Dependent Development (WDD) shoreland zones or other areas within the Shoreland Overlay zone shall be subject to Shoreland Development standards.

The project is consistent with the Shoreland Development standards as described below under 3.545.

Section 3.510: FLOOD HAZARD OVERLAY ZONE (FH)

A hydraulic analysis report (stamped No Rise) is being submitted for this project that addresses the criteria of 3.510.

ESA compliance for section 3.510: See Attachment 5 for ESA Section 7 compliance documentation completed by NOAA Restoration Center as part of their funding requirements and also used for the Section 7 compliance for the 404 permit authorization.

Section 3.545. SH Shoreland Overlay

(1) PURPOSE: The purpose of the SHORELAND OVERLAY ZONE is to: (a) Provide for development, restoration, conservation of protection of coastal shorelands in a manner which is compatible with the resources and benefits of coastal shorelands and adjacent coastal water bodies. (b) Protect identified priority dredged material disposal and mitigation sites from uses which would prevent their ultimate use for dredged material disposal or mitigation.

The project site is 50 feet of the Nehalem River Estuary and the project is subject to the Shoreland Overlay (SH) criteria. Restoration projects are considered a Conditional Use in this overlay type. Conditional uses under 3.545 (5) include estuarine restoration actions as subject to the estuary development standards in Section 3.140 (15), as discussed previously. The site is identified as a Priority Mitigation Site (MIT-1).

(5) CONDITIONAL USES:

(c) Estuarine restoration actions (as defined in Section 6.12 of the Estuarine Resources Element of the Comprehensive Plan) shall be allowed only at approved sites listed in the Comprehensive Plan, unless the restoration action is approved as part of a mitigation project. Restoration actions are subject to the standards of Section 3.140 (15).

The project meets Section 6.12 of Goal 16, these requirements in particular:

- The project will restore tidal swamps, a habitat type identified as more historically abundant. The project is needed because both high marsh (estuarine emergent) and tidal swamp habitats (tidal scrub-shrub and forested wetlands) have been widely converted through levee construction, vegetation clear and agriculture, and filled for development throughout coastal Oregon. Tidal swamps are characterized by lower-salinity waters and/or higher elevations than tidal marshes, making their conversion to human uses easier. The proximity of tidal swamps to larger rivers attracted logging interests which used the rivers

to transport logs downstream more easily to market. Tidal swamps were logged, cleared, filled, diked, drained, and blocked by tide gates (Brophy, 2019; Diefenderfer, 2007) to allow for agriculture, grazing, and development. Loss of tidal swamp habitat in the PNW began during early European settlement (late 1700s) and continued with little to no documentation until wetland protection laws were enacted in the 1970s. A study by the Columbia River Estuary Study Task Force found that tidal swamp habitat was the most severely impacted estuarine habitat in the Columbia River estuary, with a net loss of 23,000 acres, or 77% of total acreage, since 1870, primarily due to diking (Thomas, 1983). Brophy (2019) also calculated the loss of vegetated tidal wetlands on Oregon's outer coast (not including the Columbia River) and found the loss of tidal swamp was much more severe than the loss of historical tidal marsh (59% loss) and that most of the remaining tidal swamp habitats were small (less than 25 acres), dispersed, and fragmented. The Project supports local watershed needs and priorities and is within a mapped ODFW Oregon Conservation Strategy Conservation Opportunity Area (COA), the Nehalem River Estuary.

- The project will reestablish functional characteristics and processes of the estuary diminished or lot by past alterations, activities or catastrophic events. A restored area must be a shallow subtidal or an intertidal or tidal marsh area after alteration work is performed and may not have been a functioning part of the estuarine system where alteration work begins.
- Priority shall be given to restoration of agriculturally marginal or unused, low-lying diked areas to adjacent estuarine wetland or tideland.
- The project is proposed as a salmon habitat project; it includes breaching dysfunctional levees and removal of a partially buried culvert that limits fish passage.
- The project is a voluntary restoration project, rather than mitigation. DSL has stated they will require mitigation as part of the project for the temporary impacts in the form of vegetation success standards and other performance monitoring.

(6) STANDARDS: Uses within the SHORELAND OVERLAY ZONE are subject to the provisions and standards of the underlying zone and of this section.

(a) Riparian vegetation shall be protected and retained according to the provisions outlined in Section 4.140, REQUIREMENTS FOR PROTECTION OF WATER QUALITY AND STREAMBANK STABILIZATION.
(b) Development in flood hazard areas shall meet the requirements of Section 3.510, FLOOD HAZARD OVERLAY ZONE.

These SH standards will be met. Existing vegetation will be protected during construction and Attachment 1 details the erosion and sediment control measure that will be taken on the site to limit impacts to water quality. The site will be isolated from the Nehalem River during construction.

The flood hazard overlay requirements will be met as described in the Hydraulic Report and 3.510.

Section 6.040: Conditional Use Criteria.

(1) *The use is listed as a Conditional Use in the underlying zone, or in an applicable overlying zone.*

Restoration is listed as a conditional use in the SH zone.

(2) The use is consistent with the applicable goals and policies of the Comprehensive Plan.

The project is consistent with the applicable goals and policies of the Comprehensive Plan, as described above. Oregon Planning Goals 16 (Estuarine Resources) and 17 (Coastal Shorelands), support activities in the Estuary that restore and enhance, rather than degrade, the estuary.

(3) The parcel is suitable for the proposed use considering its size, shape, location, topography, existence of improvements and natural features.

The project site is an ideal candidate for restoration as it occupies former tidal marsh habitat that will have good connectivity to tidal functions of the Nehalem River. The McCoy-Botts Levee and the Nehalem Levee both formerly protected the site but are now in disfunction as a levee and overtopping occurs at 10 NAVD88 events. A culvert is partially buried but does allow some minor flow, and by these events some estuarine characteristics are found on the site. The site contains former tidal channels that will be expanded to connect to the 3 breach areas.

(4) The proposed use will not alter the character of the surrounding area in a manner which substantially limits, impairs or prevents the use of surrounding properties for the permitted uses listed in the underlying zone.

The project will not affect surrounding land uses and is well suited to the character of the surrounding area.

(5) The proposed use will not have detrimental effect on existing solar energy systems, wind energy conversion systems or windmills.

Not applicable.

(6) The proposed use is timely, considering the adequacy of public facilities and services existing or planned for the area affected by the use.

The site is not suitable for agriculture, building, dredge disposal.

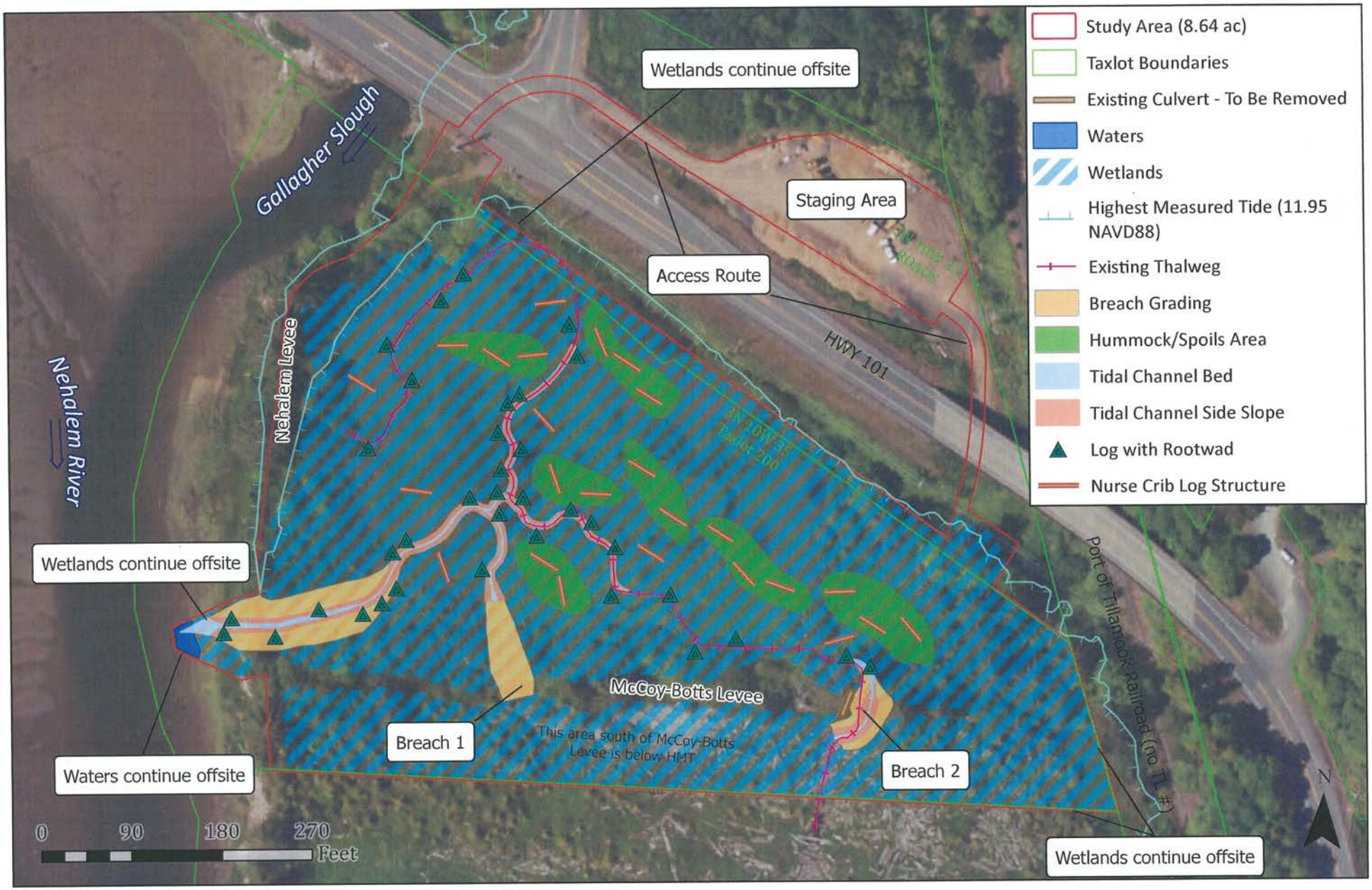
Date: 8/25/2025
Data Source: ESRI, 2025

Figure 1. Location

McCoy Wetland Tidal Reconnection Project - Tillamook County Estuary & Floodplain Development Permit Application

CASCADE ENVIRONMENTAL GROUP

Z:\GIS\336_McCoy\336_McCoy.aprx



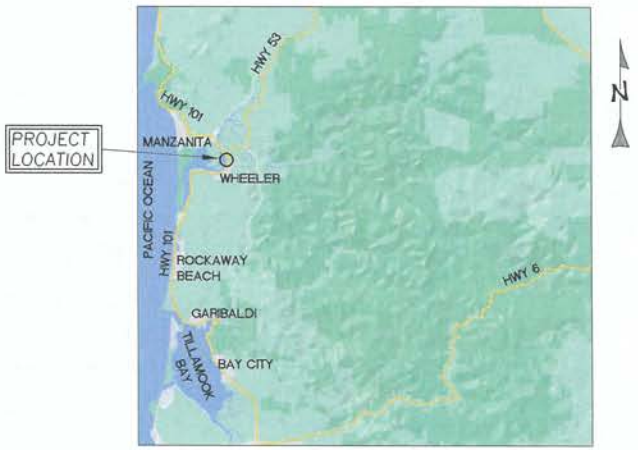
Date: 2/9/2026
Data Source: ESRI, 2025; Tillamook County Assessor

Figure 2. Project Elements

MCCOY WETLAND
TIDAL RECONNECTION PROJECT

60% DRAFT DESIGN SUBMITTAL

VICINITY MAP
N.T.S. (GOOGLE)



REGIONAL MAP
N.T.S. (GOOGLE)

GENERAL NOTES

1. TOPOGRAPHIC MAPPING WAS PERFORMED BY:
   WATERWAYS CONSULTING, INC.
   1020 SW TAYLOR STREET, SUITE 380
   PORTLAND, OR 97205
   SURVEY DATE: JULY 24, 2024 & JANUARY 8, 2025.
2. LIDAR CONTOURS OUTSIDE OF TOPOGRAPHIC MAPPING AREA WERE PROVIDED BY DOGAMI, 2009.
3. AERIAL PHOTO SOURCE: AUTOCAD CIVIL3D GEOLOCATION MAP, 2024.
4. CONTOUR INTERVAL IS ONE FOOT. ELEVATIONS AND DISTANCES SHOWN ARE IN DECIMAL FEET.
5. THIS IS NOT A BOUNDARY SURVEY. PROPERTY LINES ARE NOT SHOWN HEREON.
6. ALL CONSTRUCTION AND MATERIALS SHALL CONFORM TO THE LATEST EDITION OF THE STATE OF OREGON STANDARD SPECIFICATIONS, ISSUED BY THE DEPARTMENT OF TRANSPORTATION (HEREAFTER REFERRED TO AS "STANDARD SPECIFICATIONS").
7. THESE DESIGNS ARE INCOMPLETE WITHOUT THE FINAL STAMPED TECHNICAL SPECIFICATIONS PREPARED BY WATERWAYS CONSULTING, INC. REFER TO TECHNICAL SPECIFICATIONS FOR DETAILS NOT SHOWN HEREON.

ABBREVIATIONS

AVG.	AVERAGE
CC	CONCRETE
CY	CUBIC YARDS
DIA.	DIAMETER
E	EXISTING
EG	EXISTING GROUND
ELEV.	ELEVATION
DI	DRAINAGE INLET
FG	FINISHED GRADE
FT	FEET
INV	INVERT
MIN	MINIMUM
N	NEW
NIC	NOT IN CONTRACT
N.T.S.	NOT TO SCALE
O.C.	ON CENTER
RC	RELATIVE COMPACTION
RSP	ROCK SLOPE PROTECTION
SPK	SPIKE
SQ.FT.	SQUARE FOOT
T	TREE
T.B.D.	TO BE DETERMINED
TYP	TYPICAL
UNK	UNKNOWN
WSE	WATER SURFACE ELEVATION
YR	YEAR

TREE SPECIES

A	ALDER
BM	BIGLEAF MAPLE
C	COTTONWOOD
CYP	CYPRESS
DF	DOUGLAS FIR
EUC	EUCALYPTUS
M	MAPLE
MAD	MADRONE
O	OAK
R	REDWOOD
RC	RED CEDAR
SPR	SPRUCE
T	TREE (SPECIES UNKNOWN)
W	WILLOW
WF	WHITE FIR

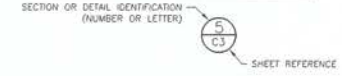
PROJECT DESCRIPTION

THESE DRAWINGS PROVIDE DESIGN DETAILS FOR THREE (3) LEVEE BREACHES AND TIDAL CHANNELS TO ENHANCE HABITAT WITHIN MCCOY WETLAND IN TILLAMOOK COUNTY, OREGON.

WORK SHALL CONSIST OF EARTHWORK ASSOCIATED WITH THE THREE BREACHES AND TIDAL CHANNEL, AND INSTALLATION OF LOG STRUCTURES FOR HABITAT COMPLEXITY.

SHEET INDEX

SECTION AND DETAIL CONVENTION



* CALL BEFORE YOU DIG *
CONTACT UNDERGROUND SERVICE ALERT (USA) PRIOR TO ANY CONSTRUCTION WORK 1-800-332-2344

WATERWAYS CONSULTING INC.
1020 SW TAYLOR ST.
SUITE 380
PORTLAND, OR 97205
PH: (503) 412-2700
WWW.WATERWAYS.COM

DRAFT
NOT FOR CONSTRUCTION

PREPARED AT THE REQUEST OF:
LOWER NEHALEM COMMUNITY TRUST

COVER

MCCOY WETLAND TIDAL RECONNECTION PROJECT
60% DRAFT DESIGN SUBMITTAL

DESIGNED BY: J.H./D.M.
DRAWN BY: C.B.
CHECKED BY: J.H.
DATE: 10/30/2025
JOB NO.: 21-049

BAR IS ONE INCH ON ORIGINAL DRAWING. ADJUST SCALES FOR REDUCED PLOTS
0 1"

C1

LEGEND

	EXISTING 1-FT LIDAR CONTOURS
	EXISTING 1-FT SURVEY CONTOURS
	EXISTING CULVERT
	(E) THALWEG
	(E) TILLAMOOK COUNTY GIS TAXLOTS
	(E) MEAN HIGH WATER (8.45')
	(E) HIGH TIDE LINE (11.48')
	(E) HIGHEST MEASURED TIDE (11.95')
	(E) OVERHEAD ELECTRIC LINE
	(E) DELINEATED WETLAND
	(E) POWER POLE
48"A	(E) TREE
Δ^2	(E) SURVEY CONTROL POINT

EXISTING CONDITIONS PLAN

SCALE: 1" = 40'

CONTROL POINTS

POINT	NORTHING	EASTING	ELEV.	DESC.
1	759716.77	7338745.66	15.67	MAG NAIL
2	760029.95	7338308.70	14.68	MAG NAIL
3	759613.29	7338907.58	22.34	MAG NAIL

WATERWAYS CONSULTING INC.
509A SWIFT ST.
SANTA CRUZ, CA 95060
PH:(831)421-9291 // FAX:(888)819-6617
WWW.WATWAYS.COM

DRAFT

NOT FOR CONSTRUCTION

PREPARED AT THE REQUEST OF:

LOWER NEHALEM COMMUNITY TRUST

EXISTING CONDITIONS PLAN

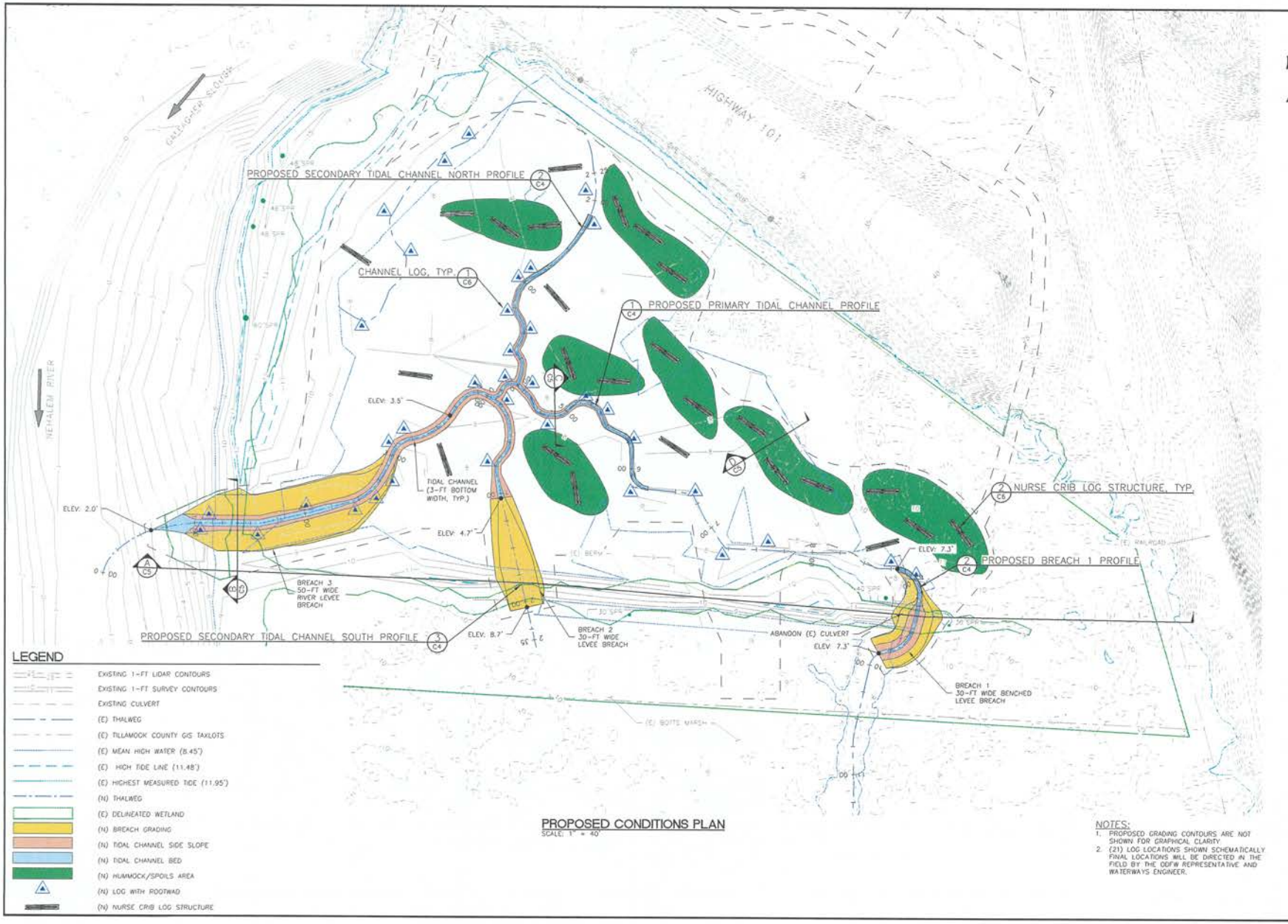
MCCOY WETLAND TIDAL RECONNECTION PROJECT
60% DRAFT DESIGN SUBMITTAL

DESIGNED BY: J.H./D.M.
DRAWN BY: C.B.
CHECKED BY: J.H.
DATE: 10/30/2025
JOB NO.: 21-049

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS

0 1"

C2



PROPOSED CONDITIONS PLAN

SCALE: 1" = 40'

NOTES:
1. PROPOSED GRADING CONTOURS ARE NOT SHOWN FOR GRAPHICAL CLARITY
2. (21) LOG LOCATIONS SHOWN SCHEMATICALLY FINAL LOCATIONS WILL BE DIRECTED IN THE FIELD BY THE ODFW REPRESENTATIVE AND WATERWAYS ENGINEER.

WATERWAYS CONSULTING INC.
5004 SWIFT ST.
SANTA CRUZ, CA 95060
PH: (831) 421-9291 // FAX: (888) 819-4841
WWW.WATWAYS.COM

DRAFT
NOT FOR CONSTRUCTION

PREPARED AT THE REQUEST OF:
LOWER NEHALEM COMMUNITY TRUST

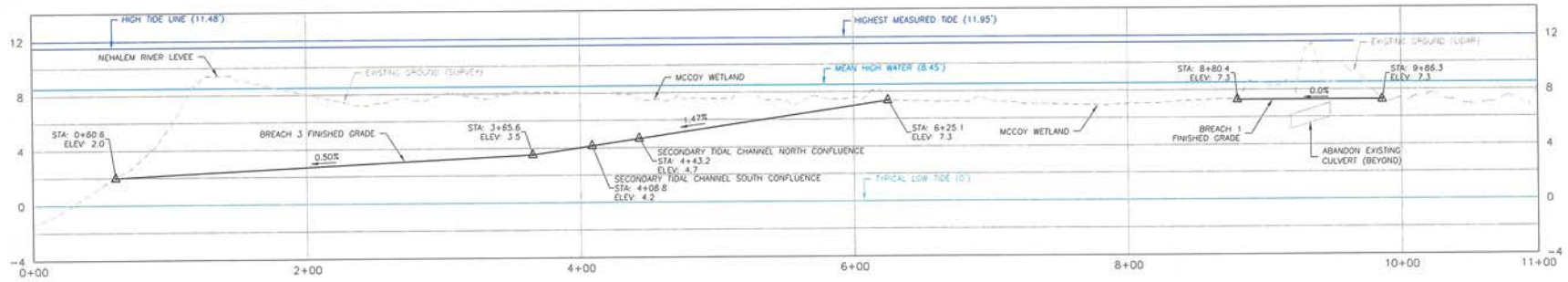
PROPOSED CONDITIONS PLAN

MCCOY WETLAND TIDAL RECONNECTION PROJECT
60% DRAFT DESIGN SUBMITTAL

DESIGNED BY: J.H./D.M.
DRAWN BY: C.B.
CHECKED BY: J.H.
DATE: 10/30/2025
JOB NO.: 21-049

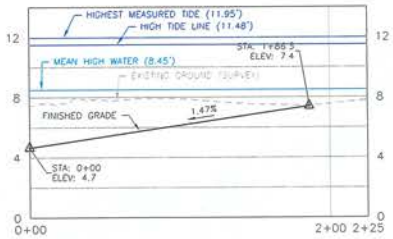
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

C3



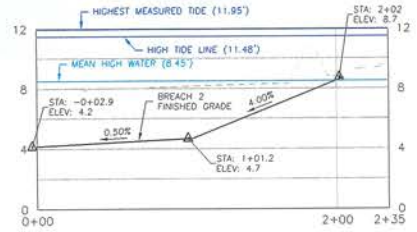
PROPOSED PRIMARY TIDAL CHANNEL PROFILE (1/C3)

SCALE: HORIZ: 1" = 40', VERT: 1" = 4'



SECONDARY TIDAL CHANNEL NORTH PROFILE (2/C3)

SCALE: HORIZ: 1" = 40'



SECONDARY TIDAL CHANNEL SOUTH PROFILE (3/C3)

SCALE: HORIZ: 1" = 40', VERT: 1" = 4'

WATERWAYS CONSULTING INC.
5094 SWIFT ST.
SANTA CRUZ, CA 95060
PH: (831) 427-4291 / FAX: (831) 419-6811
WWW.WATERWAYSCONSULT.COM

DRAFT

NOT FOR CONSTRUCTION

PREPARED AT THE REQUEST OF:

LOWER NEHALEM COMMUNITY TRUST

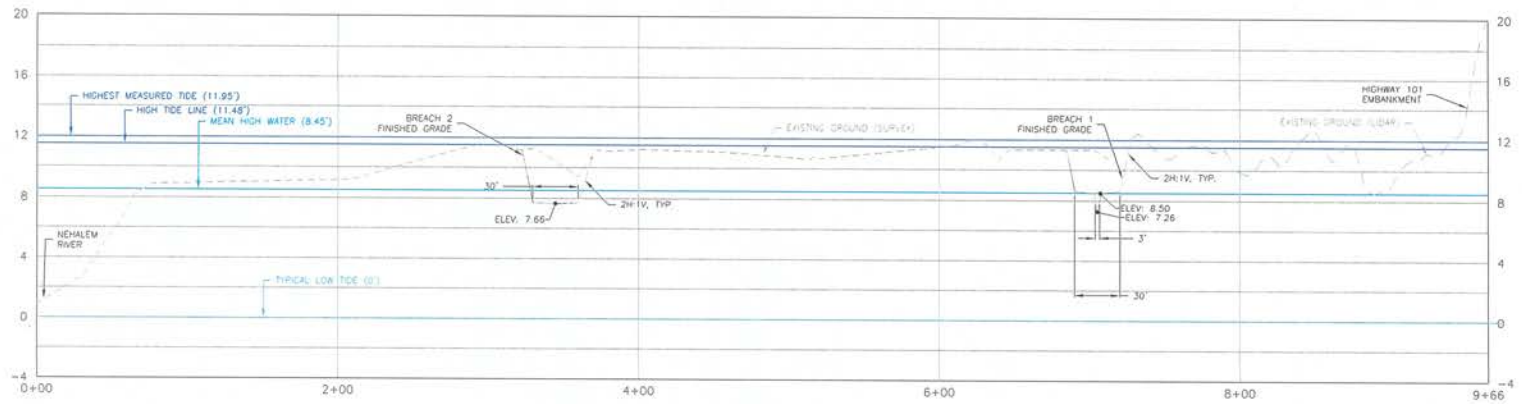
CHANNEL PROFILES

MCCOY WETLAND TIDAL RECONNECTION PROJECT
60% DRAFT DESIGN SUBMITTAL

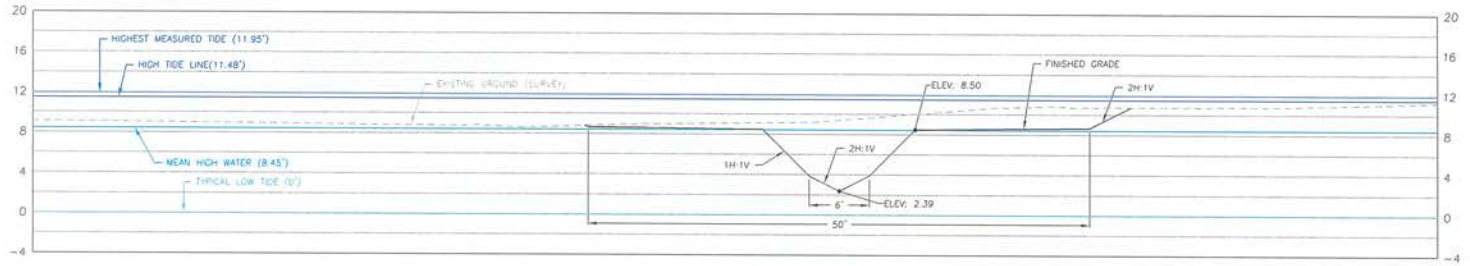
DESIGNED BY: J.H./D.M.
DRAWN BY: C.B.
CHECKED BY: J.H.
DATE: 10/30/2025
JOB NO.: 21-049

BAR IS ONE INCH ON ORIGINAL DRAWING. ADJUST SCALES FOR REDUCED PLOTS
0 1"

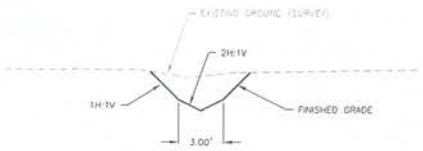
C4



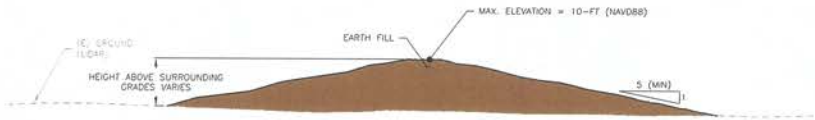
SECTION - MCCOY-BOTTS LEVEE (A/C5)
SCALE: HORIZ: 1" = 40', VERT: 1" = 4'



SECTION - NEHALEM RIVER LEVEE (B/C5)
SCALE: 1" = 8'



TYPICAL SECTION - TIDAL CHANNEL (C/C5)
SCALE: 1" = 4'



TYPICAL SECTION - FLOODPLAIN HUMMOCK (C/C5)
SCALE: 1" = 4'

WATERWAYS CONSULTING INC.
509A SWIFT ST.
SANTA CRUZ, CA 95060
PH:(831)421-9291 // FAX:(888)819-6841
WWW.WATWAYS.COM

DRAFT
NOT FOR CONSTRUCTION

PREPARED AT THE REQUEST OF:
LOWER NEHALEM COMMUNITY TRUST

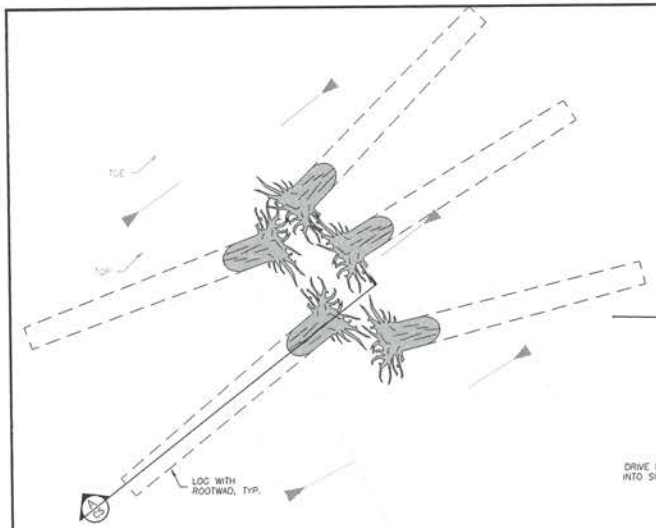
SECTIONS

MCCOY WETLAND TIDAL RECONNECTION PROJECT
60% DRAFT DESIGN SUBMITTAL

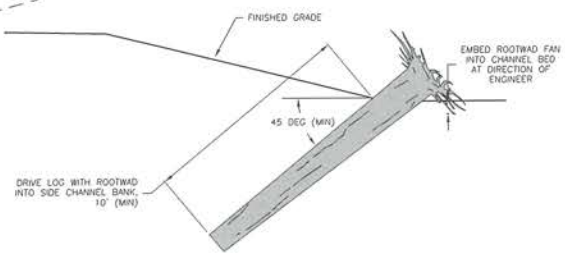
DESIGNED BY:	J.H./D.M.
DRAWN BY:	C.B.
CHECKED BY:	J.H.
DATE:	10/30/2025
JOB NO.:	21-049

BAR IS ONE INCH ON ORIGINAL DRAWING. ADJUST SCALES FOR REDUCED PLOTS
0 1"

C5 | 5 OF 10

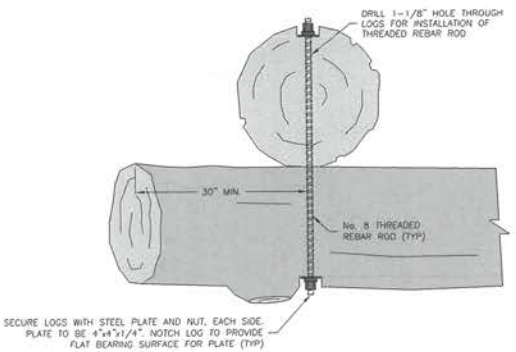


CHANNEL LOG PLAN VIEW
SCALE: 1" = 4'

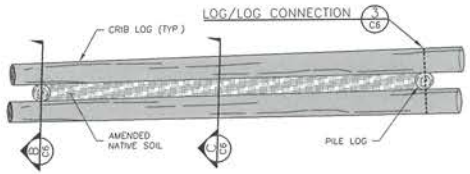


CHANNEL LOG SECTION A C6|C5
SCALE: 1" = 4'

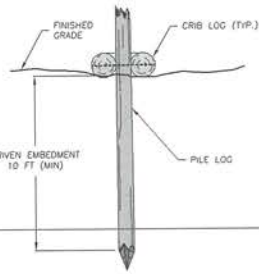
CHANNEL LOG DETAILS 1 C1
SCALE: 1" = 4'



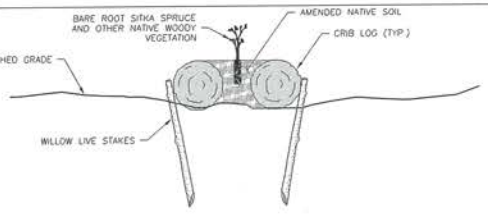
LOG/LOG CONNECTION 3 C6|C5
SCALE: 1" = 1'



PLAN VIEW



PILE LOG SECTION B C6|C5
SCALE: 1" = 4'



PLANTING SECTION C C6|C5
SCALE: 1" = 2'

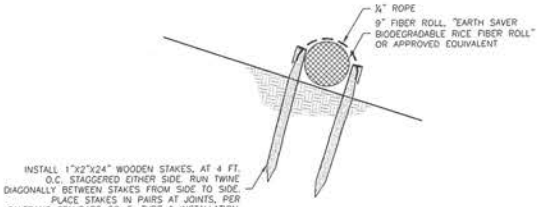
NURSE CRIB LOG STRUCTURE DETAILS 2 C1
SCALE: 1" = 4'

LOG STRUCTURE NOTES

1. PLACEMENT LOCATIONS: LOG STRUCTURE LOCATIONS AND DESIGNS ARE SHOWN CONCEPTUALLY DUE TO THE INHERENT VARIABILITY OF THE MATERIAL PROPERTIES. THE DESIGN REQUIRES THAT THE ENGINEER WILL OBSERVE CONSTRUCTION OF THE LOG STRUCTURES TO ENSURE THE INTENT OF THE DESIGN IS MET. OBSERVATIONS MUST INCLUDE LOG SELECTION, PLACEMENT, AND BACKFILLING. ANY LOG STRUCTURES CONSTRUCTED WITHOUT THE ENGINEER PRESENT ON-SITE MAY RESULT IN REJECTION OF THE WORK BY THE ENGINEER.

2. LOGS: ALL LOGS SHALL BE SALVAGED ON SITE. MATERIALS FOR USE IN THE STRUCTURES SHALL MEET THE FOLLOWING SIZE CRITERIA:

ITEM	DIAMETER	LENGTH	TOTAL COUNT
CHANNEL LOG	18"	15'	36
NURSE CRIB LOG	18-36"	20-40'	100
PILE LOGS	12"	15'	100



FIBER ROLL 4 C7
SCALE: 1" = 1'

WATERWAYS CONSULTING INC.
509A SWIFT ST.
SANTA CRUZ, CA 95060
PH: (831) 421-9291 / FAX: (831) 421-9292
WWW.WATERWAYS.COM

DRAFT
NOT FOR CONSTRUCTION

PREPARED AT THE REQUEST OF:
LOWER NEHALEM COMMUNITY TRUST

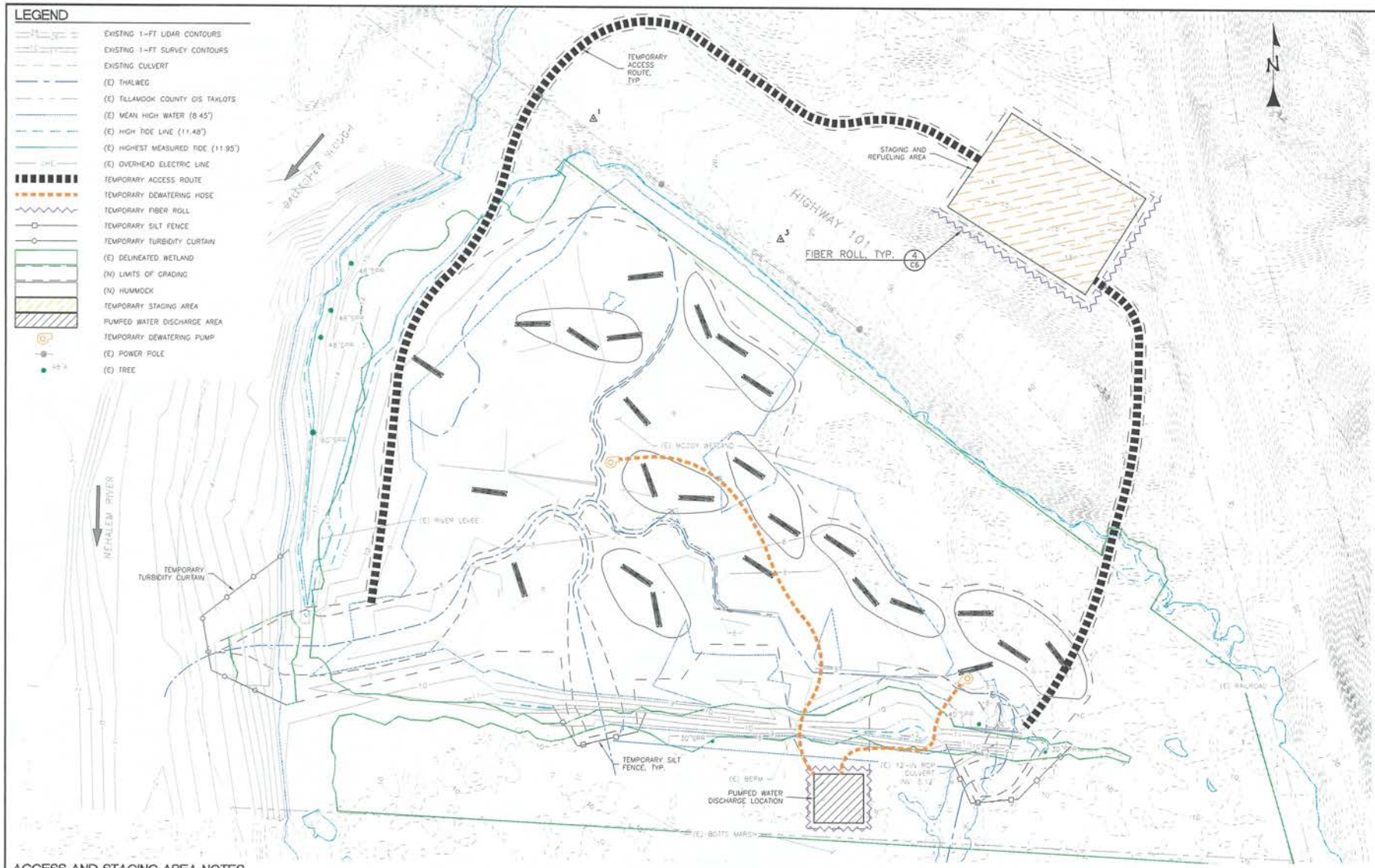
DETAILS

MCCOY WETLAND TIDAL RECONNECTION PROJECT
60% DRAFT DESIGN SUBMITTAL

DESIGNED BY: J.H./D.M.
DRAWN BY: C.B.
CHECKED BY: J.H.
DATE: 10/30/2025
JOB NO.: 21-049

BAR IS ONE INCH ON ORIGINAL DRAWING. ADJUST SCALES FOR REDUCED PLOTS
0 1"

C6



ACCESS AND STAGING AREA NOTES

1. USE ONLY THE APPROVED ACCESS POINTS, AS SHOWN ON THE DRAWINGS. STOCKPILE MATERIALS WITHIN AN EXISTING FLAT AND PREVIOUSLY DISTURBED AREA.
2. THE ACCESS PLAN SHOWN ON THE DRAWINGS IS SCHEMATIC. SUBMIT A SITE ACCESS PLAN FOR APPROVAL BY THE ENGINEER, PRIOR TO MOBILIZATION.
3. CONTAIN THE DOWNSLOPE PERIMETER OF STAGING OR STOCKPILE AREAS WITH SILT FENCE.
4. STORE, MAINTAIN AND REFUEL ALL EQUIPMENT AND MATERIALS IN A DESIGNATED PORTION OF THE STAGING AREA.

DEWATERING, ACCESS, AND EROSION CONTROL PLAN

SCALE: 1" = 40'

WATERWAYS CONSULTING INC.
5094 SWIFT ST.
SANTA CRUZ, CA 95060
PH: (831) 421-9291 / FAX: (888) 819-6841
WWW.WATERWAYS.COM

DRAFT

NOT FOR CONSTRUCTION

PREPARED AT THE REQUEST OF:

LOWER NEHALEM COMMUNITY TRUST

DEWATERING, ACCESS, AND EROSION CONTROL PLAN

MCCOY WETLAND TIDAL RECONNECTION PROJECT
60% DRAFT DESIGN SUBMITTAL

DESIGNED BY: J.H./D.M.
DRAWN BY: C.B.
CHECKED BY: J.H.
DATE: 10/30/2025
JOB NO.: 21-049

BAR IS ONE INCH ON ORIGINAL DRAWING. ADJUST SCALES FOR REDUCED PLOTS.
0 1"

C7

GENERAL NOTES

1. PREPARED AT THE REQUEST OF:
   LOWER NEHALEM COMMUNITY TRUST
   532 LANEDA AVE
   MANZANITA, OREGON 97130
   TELEPHONE: (503)368-3203

2. NOTIFY THE ENGINEER AT LEAST 48 HOURS PRIOR TO CONSTRUCTION. THE ENGINEER OR A DESIGNATED REPRESENTATIVE SHALL OBSERVE THE CONSTRUCTION PROCESS, AS NECESSARY TO ENSURE PROPER INSTALLATION PROCEDURES.

3. EXISTING UNDERGROUND UTILITY LOCATIONS:

   A. CALL UNDERGROUND SERVICE ALERT (1-800-642-2444) TO LOCATE ALL UNDERGROUND UTILITY LINES PRIOR TO COMMENCING CONSTRUCTION.

   B. PRIOR TO BEGINNING WORK, CONTACT ALL UTILITIES COMPANIES WITH REGARD TO WORKING OVER, UNDER, OR AROUND EXISTING FACILITIES AND TO OBTAIN INFORMATION REGARDING RESTRICTIONS THAT ARE REQUIRED TO PREVENT DAMAGE TO THE FACILITIES.

   C. EXISTING UTILITY LOCATIONS SHOWN ARE COMPILED FROM INFORMATION SUPPLIED BY THE APPROPRIATE UTILITY AGENCIES AND FROM FIELD MEASUREMENTS TO ABOVE GROUND FEATURES READILY VISIBLE AT THE TIME OF SURVEY. LOCATIONS SHOWN ARE APPROXIMATE. THE CONTRACTOR IS CAUTIONED THAT ONLY ACTUAL EXCAVATION WILL REVEAL THE DIMENSIONS, SIZES, MATERIALS, LOCATIONS, AND DEPTH OF UNDERGROUND UTILITIES.

   D. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE LOCATION AND/OR PROTECTION OF ALL EXISTING AND PROPOSED PIPING, UTILITIES, TRAFFIC SIGNAL EQUIPMENT (BOTH ABOVE GROUND AND BELOW GROUND), STRUCTURES, AND ALL OTHER EXISTING IMPROVEMENTS THROUGHOUT CONSTRUCTION.

   E. PRIOR TO COMMENCING FABRICATION OR CONSTRUCTION, DISCOVER OR VERIFY THE ACTUAL DIMENSIONS, SIZES, MATERIALS, LOCATIONS, AND ELEVATIONS OF ALL EXISTING UTILITIES AND POTHOLE THOSE AREAS WHERE POTENTIAL CONFLICTS ARE LIKELY OR DATA IS OTHERWISE INCOMPLETE.

   F. TAKE APPROPRIATE MEASURES TO PROTECT EXISTING UTILITIES DURING CONSTRUCTION OPERATIONS. CONTRACTOR IS SOLELY RESPONSIBLE FOR THE COST OF REPAIR/REPLACEMENT OF ANY EXISTING UTILITIES DAMAGED DURING CONSTRUCTION.

   G. UPON LEARNING OF THE EXISTENCE AND/OR LOCATIONS OF ANY UNDERGROUND FACILITIES NOT SHOWN OR SHOWN INACCURATELY ON THE PLANS OR NOT PROPERLY MARKED BY THE UTILITY OWNER, IMMEDIATELY NOTIFY THE UTILITY OWNER AND THE CITY BY TELEPHONE AND IN WRITING.

   H. UTILITY RELOCATIONS REQUIRED FOR THE CONSTRUCTION OF THE PROJECT FACILITIES WILL BE PERFORMED BY THE UTILITY COMPANY, UNLESS OTHERWISE NOTED.

12. IF DISCREPANCIES ARE DISCOVERED BETWEEN THE CONDITIONS EXISTING IN THE FIELD AND THE INFORMATION SHOWN ON THESE DRAWINGS, NOTIFY THE ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.

13. ALL TESTS, INSPECTIONS, SPECIAL OR OTHERWISE, THAT ARE REQUIRED BY THE BUILDING CODES, LOCAL BUILDING DEPARTMENTS, OR THESE PLANS, SHALL BE DONE BY AN INDEPENDENT INSPECTION COMPANY. JOB SITE VISITS BY THE ENGINEER DO NOT CONSTITUTE AN OFFICIAL INSPECTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT THE REQUIRED TESTS AND INSPECTIONS ARE PERFORMED.

14. PROJECT SCHEDULE: PRIOR TO COMMENCEMENT OF WORK, SUBMIT TO THE ENGINEER FOR REVIEW AND APPROVAL A DETAILED CONSTRUCTION SCHEDULE. DO NOT BEGIN ANY CONSTRUCTION WORK UNTIL THE PROJECT SCHEDULE AND WORK PLAN IS APPROVED BY THE ENGINEER. ALL CONSTRUCTION SHALL BE CLOSELY COORDINATED WITH THE ENGINEER SO THAT THE QUALITY OF WORK CAN BE CHECKED FOR APPROVAL. PURSUE WORK IN A CONTINUOUS AND DILIGENT MANNER TO ENSURE A TIMELY COMPLETION OF THE PROJECT.

15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DESIGN, PERMITTING, INSTALLATION, AND MAINTENANCE OF ANY AND ALL TRAFFIC CONTROL MEASURES DEEMED NECESSARY.

16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR GENERAL SAFETY DURING CONSTRUCTION. ALL WORK SHALL CONFORM TO PERTINENT SAFETY REGULATIONS AND CODES. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR FURNISHING, INSTALLING, AND MAINTAINING ALL WARNING SIGNS AND DEVICES NECESSARY TO SAFEGUARD THE GENERAL PUBLIC AND THE WORK, AND PROVIDE FOR THE PROPER AND SAFE ROUTING OF VEHICULAR AND PEDESTRIAN TRAFFIC DURING THE PERFORMANCE OF THE WORK. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR COMPLIANCE WITH ALL APPLICABLE PROVISIONS OF OSHA IN THE CONSTRUCTION PRACTICES FOR ALL EMPLOYEES DIRECTLY ENGAGED IN THE CONSTRUCTION OF THIS PROJECT.

17. CONSTRUCTION CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS, AND CONSTRUCTION CONTRACTOR FURTHER AGREES TO DEFEND, INDEMNIFY AND HOLD DESIGN PROFESSIONAL HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTION LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF DESIGN PROFESSIONAL. NEITHER THE PROFESSIONAL ACTIVITIES OF CONSULTANT NOR THE PRESENCE OF CONSULTANT OR THEIR OR HER EMPLOYEES OR SUB-CONSULTANTS AT A CONSTRUCTION SITE SHALL RELIEVE THE CONTRACTOR AND ITS SUBCONTRACTORS OF THEIR RESPONSIBILITIES INCLUDING, BUT NOT LIMITED TO, CONSTRUCTION MEANS, METHODS, SEQUENCE, TECHNIQUES OR PROCEDURES NECESSARY FOR PERFORMING, SUPERINTENDING OR COORDINATING ALL PORTIONS OF THE WORK OF CONSTRUCTION IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND APPLICABLE HEALTH OR SAFETY REQUIREMENTS OF ANY REGULATORY AGENCY OR OF STATE LAW.

18. MAINTAIN A CURRENT, COMPLETE, AND ACCURATE RECORD OF ALL AS-BUILT DEVIATIONS FROM THE CONSTRUCTION AS SHOWN ON THESE DRAWINGS AND SPECIFICATIONS, FOR THE PURPOSE OF PROVIDING THE ENGINEER OF RECORD WITH A BASIS FOR THE PREPARATION OF RECORD DRAWINGS.

19. MAINTAIN THE SITE IN A NEAT AND ORDERLY MANNER THROUGHOUT THE CONSTRUCTION PROCESS. STORE ALL MATERIALS WITHIN APPROVED STAGING AREAS.

20. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO BE FULLY INFORMED OF AND TO COMPLY WITH ALL PERMIT CONDITIONS, LAWS, ORDINANCES, CODES, REQUIREMENTS AND STANDARDS, WHICH IN ANY MANNER AFFECT THE COURSE OF CONSTRUCTION OF THIS PROJECT, THOSE ENGAGED OR EMPLOYED IN THE CONSTRUCTION AND THE MATERIALS USED IN THE CONSTRUCTION.

21. PROVIDE, AT CONTRACTOR'S SOLE EXPENSE, ALL MATERIALS, LABOR AND EQUIPMENT REQUIRED TO COMPLY WITH ALL APPLICABLE PERMIT CONDITIONS AND REQUIREMENTS.

22. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION STAKING AND LAYOUT, UNLESS OTHERWISE SPECIFIED.

23. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION AND PRESERVATION OF ALL SURVEY MONUMENTS OR PROPERTY CORNERS. DISTURBED MONUMENTS SHALL BE RESTORED BACK TO THEIR ORIGINAL LOCATION AND SHALL BE CERTIFIED BY A REGISTERED CIVIL ENGINEER OR LAND SURVEYOR AT THE SOLE EXPENSE OF THE CONTRACTOR.

24. THE OWNER SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION OF ALL PROPERTY LINES AND EASEMENTS AND CONFIRMING THAT PROPOSED PROJECT ELEMENTS ARE LOCATED ON DISTRICT OWNED LANDS OR ARE COORDINATED WITH OWNERS AND APPROPRIATE PERMISSIONS ARE GRANTED FOR THE WORK.

25. TREE DIMENSIONS: TRUNK DIAMETERS SHOWN REPRESENT DIAMETER AT BREAST HEIGHT (DBH), MEASURED IN INCHES. DBH IS MEASURED 4.5 FT ABOVE GROUND FOR SINGLE TRUNKS AND TRUNKS THAT SPLIT INTO SEVERAL STEMS CLOSE TO THE GROUND. THE DBH FOR TREES THAT SPLIT INTO SEVERAL STEMS CLOSE TO THE GROUND MAY BE CONSOLIDATED INTO A SINGLE DBH BY TAKING THE SQUARE ROOT OF THE SUM OF ALL SQUARED STEM DBH'S, UNLESS OTHERWISE NOTED. WHERE TREES FORK NEAR BREAST HEIGHT, TRUNK DIAMETER IS MEASURED AT THE NARROWEST PART OF THE MAIN STEM BELOW THE FORK. FOR TREES ON A SLOPE, BREAST HEIGHT IS REFERENCED FROM THE UPPER SIDE OF THE SLOPE. FOR LEANING TREES, BREAST HEIGHT IS MEASURED ON THE SIDE THAT THE TREE LEANS TOWARD. TREES WITH DBH LESS THAN 8" ARE TYPICALLY NOT SHOWN.

    12"P = 12" DBH PINE

26. TREE SPECIES ARE IDENTIFIED WHEN KNOWN. HOWEVER, FINAL DETERMINATION SHOULD BE MADE BY A QUALIFIED BOTANIST. REFER TO THE LEGEND FOR TREE SPECIES SYMBOLS.

27. TREE TRUNK DIMENSIONS MAY BE SHOWN OUT-OF-SCALE FOR PLOTTING CLARITY. CAUTION SHOULD BE USED IN DESIGNING NEAR TREE TRUNKS. THERE ARE LIMITATIONS ON FIELD ACCURACY, DRAFTING ACCURACY, MEDIUM STRETCH AS WELL AS THE "SPREAD" OR "LEANING" OF TREES. REQUEST ADDITIONAL TOPOGRAPHIC DETAIL WHERE CLOSE TOLERANCES ARE ANTICIPATED. INDIVIDUAL TREES ARE NOT TYPICALLY LOCATED WITHIN DRIPLINE CANOPY AREAS SHOWN.

28. WILLOWS TO BE REMOVED SHALL BE TRIMMED, TRANSPLANTED, AND UTILIZED IN THE REVEGETATION PLAN.

29. CONTRACTOR IS REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.

30. CULTURAL RESOURCES: IN THE EVENT THAT HUMAN REMAINS AND/OR CULTURAL MATERIALS ARE FOUND, ALL PROJECT-RELATED CONSTRUCTION SHALL CEASE WITHIN A 100-FOOT RADIUS. THE CONTRACTOR SHALL, PURSUANT TO SECTION 7050.5 OF THE HEALTH AND SAFETY CODE, AND SECTION 5097.94 OF THE PUBLIC RESOURCES CODE OF THE STATE OF OREGON, NOTIFY TILLAMOOK COUNTY CORONER IMMEDIATELY.

EARTHWORK NOTES

1. GRADING SUMMARY:

TOTAL CUT VOLUME =	1100 CY
TOTAL FILL VOLUME (HUMMOCKS) =	900 CY
NET (CUT) =	200 CY

   THE ABOVE QUANTITIES ARE APPROXIMATE IN-PLACE VOLUMES CALCULATED AS THE DIFFERENCE BETWEEN EXISTING GROUND AND THE PROPOSED FINISH GRADE, PREPARED FOR PERMITTING PURPOSES ONLY. EXISTING GROUND IS DEFINED BY THE TOPOGRAPHIC CONTOURS AND/OR SPOT ELEVATIONS ON THE PLAN. PROPOSED FINISH GRADE IS DEFINED AS THE DESIGN SURFACE ELEVATION OF WORK TO BE CONSTRUCTED. THE QUANTITIES HAVE NOT BEEN FACTORED TO INCLUDE ALLOWANCES FOR BULKING, CLEARING AND GRUBBING, SUBSIDENCE, SHRINKAGE, OVER EXCAVATION, AND RECOMPACTION, UNDERGROUND UTILITY AND SUBSTRUCTURE SPOILS AND CONSTRUCTION METHODS.

   THE CONTRACTOR SHALL PERFORM AN INDEPENDENT EARTHWORK ESTIMATE FOR THE PURPOSE OF PREPARING BID PRICES FOR EARTHWORK. THE BID PRICE SHALL INCLUDE COSTS FOR ANY NECESSARY IMPORT AND PLACEMENT OF EARTH MATERIALS OR THE EXPORT AND PROPER DISPOSAL OF EXCESS OR UNSUITABLE EARTH MATERIALS.

2. PRIOR TO COMMENCING WORK, PROTECT ALL SENSITIVE AREAS TO REMAIN UNDISTURBED WITH TEMPORARY FENCING, AS SHOWN ON THE DRAWINGS, AS SPECIFIED, OR AS DIRECTED BY THE ENGINEER.

3. DO NOT DISTURB AREAS OUTSIDE OF THE DESIGNATED LIMITS OF DISTURBANCE, UNLESS AUTHORIZED IN WRITING BY THE ENGINEER. THE COST OF ALL ADDITIONAL WORK ASSOCIATED WITH RESTORATION AND REVEGETATION OF DISTURBED AREAS OUTSIDE THE DESIGNATED LIMITS OF DISTURBANCE, AS SHOWN ON THE DRAWINGS, SHALL BE BORNE SOLELY BY THE CONTRACTOR.

4. REMOVE ALL EXCESS SOILS TO AN APPROVED DUMP SITE OR DISPOSE OF ON SITE AT A LOCATION TO BE APPROVED BY THE ENGINEER, IN A MANNER THAT WILL NOT CAUSE EROSION.

5. PRIOR TO STARTING WORK ON THE PROJECT, SUBMIT FOR ACCEPTANCE BY THE ENGINEER A HAZARDOUS MATERIALS CONTROLS AND SPILL PREVENTION PLAN. INCLUDE PROVISIONS FOR PREVENTING HAZARDOUS MATERIALS FROM CONTAMINATING SOIL OR ENTERING WATER COURSES, AND ESTABLISH A SPILL PREVENTION AND COUNTERMEASURE PLAN.

6. FINE GRADING ELEVATIONS, CONFORMS, AND SLOPES NOT CLEARLY SHOWN ON THE DRAWINGS SHALL BE DETERMINED BY THE CONTRACTOR IN THE FIELD TO DIRECT DRAINAGE TO PROTECTED DRAINAGE CONTROL STRUCTURES OR NATURAL WATERWAYS IN A MANNER THAT SUPPORTS THE INTENT OF THE DESIGN. ALL FINAL GRADING SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.

STREAM/WETLAND CONSTRUCTION BEST MANAGEMENT PRACTICES

1. ALL WORK WITHIN THE WETTED CHANNEL SHALL BE COMPLETED WITHIN THE IN-WATER WORK WINDOW AS LISTED IN THE PERMITS.

2. FISH RELOCATION

   2.1. SHALL BE PERFORMED BY THE CONTRACTOR (UNLESS STATED OTHERWISE IN THE CONTRACT DOCUMENTS) PRIOR TO PERFORMING ANY CONSTRUCTION WITHIN THE WETTED CHANNEL. ALL FISH RELOCATION WORK SHALL BE SUPERVISED BY A QUALIFIED FISHERIES BIOLOGIST WITH EXPERIENCE IN WORK AREA ISOLATION, AND A VALID ODFW SCIENTIFIC TAKE PERMIT. PERFORM THE FOLLOWING STEPS IN THE ORDER LISTED FOR FISH RELOCATION:

   2.2. CONDUCT FISH RELOCATION ACTIVITIES DURING PERIODS OF THE DAY WITH THE COOLEST AIR AND WATER TEMPERATURES POSSIBLE.

   2.3 ISOLATE THE WETTED STREAM CHANNEL AT THE UPSTREAM END OF THE LIMITS OF DISTURBANCE WITH BLOCK NETS. CLOSELY MONITOR ALL BLOCK NETS THROUGHOUT CONSTRUCTION TO ENSURE THEY STAY SECURED TO THE BANKS AND FREE OF ORGANIC ACCUMULATION.

   2.4 CONDUCT AN INITIAL SWEEP OF THE WETTED CHANNEL WITH SEIN NETS WITHIN THE WORK ZONE FROM UPSTREAM TO DOWNSTREAM.

   2.5 ISOLATE THE DOWNSTREAM END OF THE WETTED CHANNEL WITH BLOCK NETS.

   2.6 INSTALL DEWATERING EQUIPMENT AND BEGIN SLOWLY DEWATERING WHILE CONTINUING FISH RELOCATION ACTIVITIES.

   2.7 ELECTROFISHING SHALL FOLLOW NMFS (2000) GUIDELINES.

   2.8 FISH TRANSPORT

   2.8.1. MINIMIZE THE TIME FISH ARE IN TRANSPORT CONTAINERS.

   2.8.2. KEEP TRANSPORT CONTAINERS IN SHADED AREA.

   2.8.3. LIMIT THE NUMBER OF FISH WITHIN CONTAINERS AND ONLY KEEP FISH OF RELATIVELY COMPARABLE SIZE WITHIN A GIVEN CONTAINER.

   2.8.4. USE AERATORS OR REPLACE THE WATER IN THE CONTAINERS AT LEAST EVERY 15 MINUTES WITH COLD CLEAR WATER.

   2.8.5. RELEASE FISH IN AN AREA UPSTREAM OF THE CONSTRUCTION AREA WITH ADEQUATE COVER AND FLOW REFUGE. DOWNSTREAM IS ACCEPTABLE PROVIDED THE RELEASE SITE IS BELOW THE INFLUENCE OF CONSTRUCTION.

   2.8.6. MONITOR AND RECORD FISH PRESENCE, HANDLING, AND INJURY/MORTALITY DURING ALL PHASES OF FISH RELOCATION AND SUBMIT A FISH SALVAGE REPORT AS REQUIRED BY PERMITS WITHIN 60 DAYS.

3. DEWATERING/BYPASS FLOWS

   3.1. PUMPS: WHENEVER A PUMP IS USED TO DEWATER THE ISOLATION AREA AND ESA-LISTED FISH MAY BE PRESENT, A FISH SCREEN WILL BE USED THAT MEETS THE MOST CURRENT VERSION OF NMFS'S FISH SCREEN CRITERIA (NMFS 2011A). NMFS APPROVAL IS REQUIRED FOR PUMPING AT A RATE THAT EXCEEDS 3 CFS.

   3.2. TREAT ALL DISCHARGE WATER FROM DEWATERING ACTIVITIES WITHIN THE CONSTRUCTION AREA USING BEST MANAGEMENT PRACTICES TO REMOVE DEBRIS, SEDIMENT, PETROLEUM PRODUCTS, AND ANY OTHER POLLUTANTS LIKELY TO BE PRESENT. DEWATER THE SHORTEST LINEAR EXTENT OF WORK AREA PRACTICABLE.

   3.3. FLOW BYPASS SHALL BE PERFORMED AS SHOWN ON THE DRAWINGS, OR AS DIRECTED BY THE ENGINEER IN THE FIELD.

   3.4. RE-WATERING OF THE WORK AREA FOLLOWING CONSTRUCTION SHALL BE PERFORMED SLOWLY TO PREVENT LOSS OF SURFACE FLOW DOWNSTREAM AND ANY SUDDEN INCREASE IN STREAM TURBIDITY.

EROSION CONTROL NOTES

1. THE ESCP MEASURES SHOWN ON THIS PLAN ARE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, UPGRADE THESE MEASURES AS NEEDED TO COMPLY WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL EROSION AND SEDIMENT CONTROL REGULATIONS.

2. PHASE CLEARING AND GRADING TO THE MAXIMUM EXTENT PRACTICAL TO PREVENT EXPOSED INACTIVE AREAS FROM BECOMING A SOURCE OF EROSION.

3. IDENTIFY, MARK, AND PROTECT (BY FENCING OFF OR OTHER MEANS) CRITICAL RIPARIAN AREAS AND VEGETATION AND ADJOINING WETLAND ASSOCIATED ROOTING ZONES, AND VEGETATION AREAS TO BE PRESERVED. IDENTIFY VEGETATIVE BUFFER ZONES BETWEEN THE SITE AND SENSITIVE AREAS (E.G., WETLANDS), AND OTHER AREAS TO BE PRESERVED, ESPECIALLY IN PERIMETER AREAS.

4. PRESERVE EXISTING VEGETATION WHEN PRACTICAL AND RE-VEGETATE OPEN AREAS. RE-VEGETATE OPEN AREAS WHEN PRACTICABLE BEFORE AND AFTER GRADING OR CONSTRUCTION. IDENTIFY THE TYPE OF VEGETATIVE SEED MIX USED.

5. EROSION AND SEDIMENT CONTROL MEASURES INCLUDING PERIMETER SEDIMENT CONTROL MUST BE IN PLACE BEFORE VEGETATION IS DISTURBED AND MUST REMAIN IN PLACE AND BE MAINTAINED, REPAIRED, AND PROMPTLY IMPLEMENTED FOLLOWING PROCEDURES ESTABLISHED FOR THE DURATION OF CONSTRUCTION, INCLUDING PROTECTION FOR ACTIVE STORM DRAIN INLETS AND CATCH BASINS AND APPROPRIATE NON-STORMWATER POLLUTION CONTROLS.

6. APPLY TEMPORARY AND/OR PERMANENT SOIL STABILIZATION MEASURES IMMEDIATELY ON ALL DISTURBED AREAS AS GRADING PROGRESSES AND FOR ALL ROADWAYS INCLUDING GRAVEL ROADWAYS.

7. ESTABLISH MATERIAL AND WASTE STORAGE AREAS, AND OTHER NON-STORMWATER CONTROLS.

8. PREVENT TRACKING OF SEDIMENT ONTO PUBLIC OR PRIVATE ROADS USING BMPS SUCH AS GRAVELED (OR PAVED) EXITS AND PARKING AREAS, GRAVEL ALL UNPAVED ROADS LOCATED ONSITE, OR USE AN EXIT TIRE WASH. THESE BMPS MUST BE IN PLACE PRIOR TO LAND-DISTURBING ACTIVITIES.

9. WHEN TRUCKING SATURATED SOILS FROM THE SITE, EITHER USE WATER-TIGHT TRUCKS OR DRAIN LOADS ON SITE.

10. USE BMPS TO PREVENT OR MINIMIZE STORMWATER EXPOSURE TO POLLUTANTS FROM SPILLS, VEHICLE AND EQUIPMENT FUELING, MAINTENANCE, AND STORAGE; OTHER CLEANING AND MAINTENANCE ACTIVITIES, AND WASTE HANDLING ACTIVITIES. THESE POLLUTANTS INCLUDE FUEL, HYDRAULIC FLUID, AND OTHER OILS FROM VEHICLES AND MACHINERY, AS WELL AS DEBRIS, LEFTOVER PAINTS, SOLVENTS, AND GLUES FROM CONSTRUCTION OPERATIONS.

11. FUELING ACTIVITIES MUST BE LOCATED A MINIMUM OF 150 FEET FROM ORDINARY HIGH WATER AND SENSITIVE WATERS, INCLUDING WETLANDS.

12. IMPLEMENT THE FOLLOWING BMPS WHEN APPLICABLE: WRITTEN SPILL PREVENTION AND RESPONSE PROCEDURES, EMPLOYEE TRAINING ON SPILL PREVENTION AND PROPER DISPOSAL PROCEDURES, SPILL KITS IN ALL VEHICLES, REGULAR MAINTENANCE SCHEDULE FOR VEHICLES AND MACHINERY, MATERIAL DELIVERY AND STORAGE CONTROLS, TRAINING AND SIGNAGE, AND COVERED STORAGE AREAS FOR WASTE AND SUPPLIES.

13. USE WATER, SOIL-BINDING AGENT OR OTHER DUST CONTROL TECHNIQUE AS NEEDED TO AVOID WIND-BLOWN SOIL.

14. ONSITE VEHICLE SPEED ON UPAVED SURFACES SHALL BE LIMITED TO 15 MPH.

15. THE APPLICATION RATE OF FERTILIZERS USED TO REESTABLISH VEGETATION MUST FOLLOW MANUFACTURER'S RECOMMENDATIONS TO MINIMIZE NUTRIENT RELEASES TO SURFACE WATERS. EXERCISE CAUTION WHEN USING TIME-RELEASE FERTILIZERS WITHIN ANY WATERWAY RIPARIAN ZONE.

16. IF A STORMWATER TREATMENT SYSTEM (FOR EXAMPLE, ELECTRO-COAGULATION, FLOCCULATION, FILTRATION, ETC.) FOR SEDIMENT OR OTHER POLLUTANT REMOVAL IS EMPLOYED, SUBMIT AN OPERATION AND MAINTENANCE PLAN (INCLUDING SYSTEM SCHEMATIC, LOCATION OF SYSTEM, LOCATION OF INLET, LOCATION OF DISCHARGE, DISCHARGE DISPERSION DEVICE DESIGN, AND A SAMPLING PLAN AND FREQUENCY) BEFORE OPERATING THE TREATMENT SYSTEM. OBTAIN PLAN APPROVAL BEFORE OPERATING THE TREATMENT SYSTEM. OPERATE AND MAINTAIN THE TREATMENT SYSTEM ACCORDING TO MANUFACTURER'S SPECIFICATIONS.

17. TEMPORARILY STABILIZE SOILS AT THE END OF THE SHIFT BEFORE HOLIDAYS AND WEEKENDS, IF NEEDED. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT SOILS ARE STABLE DURING RAIN EVENTS AT ALL TIMES OF THE YEAR.

18. AT THE END OF EACH WORKDAY SOIL STOCKPILES MUST BE STABILIZED OR COVERED, OR OTHER BMPS MUST BE IMPLEMENTED TO PREVENT DISCHARGES TO SURFACE WATERS OR CONVEYANCE SYSTEMS LEADING TO SURFACE WATERS.

19. CONSTRUCTION ACTIVITIES MUST AVOID OR MINIMIZE EXCAVATION AND CREATION OF BARE GROUND DURING WET WEATHER.

20. SEDIMENT FENCE: REMOVE TRAPPED SEDIMENT BEFORE IT REACHES ONE THIRD OF THE ABOVE GROUND FENCE HEIGHT AND BEFORE FENCE REMOVAL.

21. WITHIN 24 HOURS, SIGNIFICANT SEDIMENT THAT HAS LEFT THE CONSTRUCTION SITE, MUST BE REMEDIATED. INVESTIGATE THE CAUSE OF THE SEDIMENT RELEASE AND IMPLEMENT STEPS TO PREVENT A RECURRENCE OF THE DISCHARGE WITHIN THE SAME 24 HOURS. ANY IN-STREAM CLEAN UP OF SEDIMENT SHALL BE PERFORMED ACCORDING TO THE OREGON DIVISION OF STATE LANDS REQUIRED TIMEFRAME.

22. THE INTENTIONAL WASHING OF SEDIMENT INTO STORM SEWERS, DRAINAGE WAYS, OR WETLANDS MUST NOT OCCUR. VACUUMING OR DRY SWEEPING AND MATERIAL PICKUP MUST BE USED TO CLEANUP RELEASED SEDIMENTS.

23. THE ENTIRE SITE MUST BE TEMPORARILY STABILIZED USING VEGETATION OR A HEAVY MULCH LAYER, TEMPORARY SEEDING, OR OTHER METHOD SHOULD ALL CONSTRUCTION ACTIVITIES CEASE FOR 30 DAYS OR MORE.

24. PROVIDE TEMPORARY STABILIZATION FOR THAT PORTION OF THE SITE WHERE CONSTRUCTION ACTIVITIES CEASE FOR 14 DAYS OR MORE WITH A COVERING OF BLOWN STRAW AND A TACKIFIER, LOOSE STRAW, OR AN ADEQUATE COVERING OF COMPOST MULCH UNTIL WORK RESUMES ON THAT PORTION OF THE SITE.

25. PROVIDE PERMANENT EROSION CONTROL MEASURES ON ALL EXPOSED AREAS AS THEY ARE COMPLETED. DO NOT REMOVE TEMPORARY SEDIMENT CONTROL PRACTICES UNTIL PERMANENT VEGETATION OR OTHER COVER OF EXPOSED AREAS IS ESTABLISHED. HOWEVER, DO REMOVE ALL TEMPORARY EROSION CONTROL MEASURES AS EXPOSED AREAS BECOME STABILIZED, UNLESS DOING SO CONFLICTS WITH LOCAL REQUIREMENTS. PROPERLY DISPOSE OF CONSTRUCTION MATERIALS AND WASTE, INCLUDING SEDIMENT RETAINED BY TEMPORARY BMPS.

WATERWAYS CONSULTING INC.
509A SWIFT ST.
SANTA CRUZ, CA 95060
PH: (831) 421-9291 / FAX: (888) 819-6841
WWW.WATERWAYSCONSULTING.COM

DRAFT
NOT FOR CONSTRUCTION

PREPARED AT THE REQUEST OF:
LOWER NEHALEM COMMUNITY TRUST

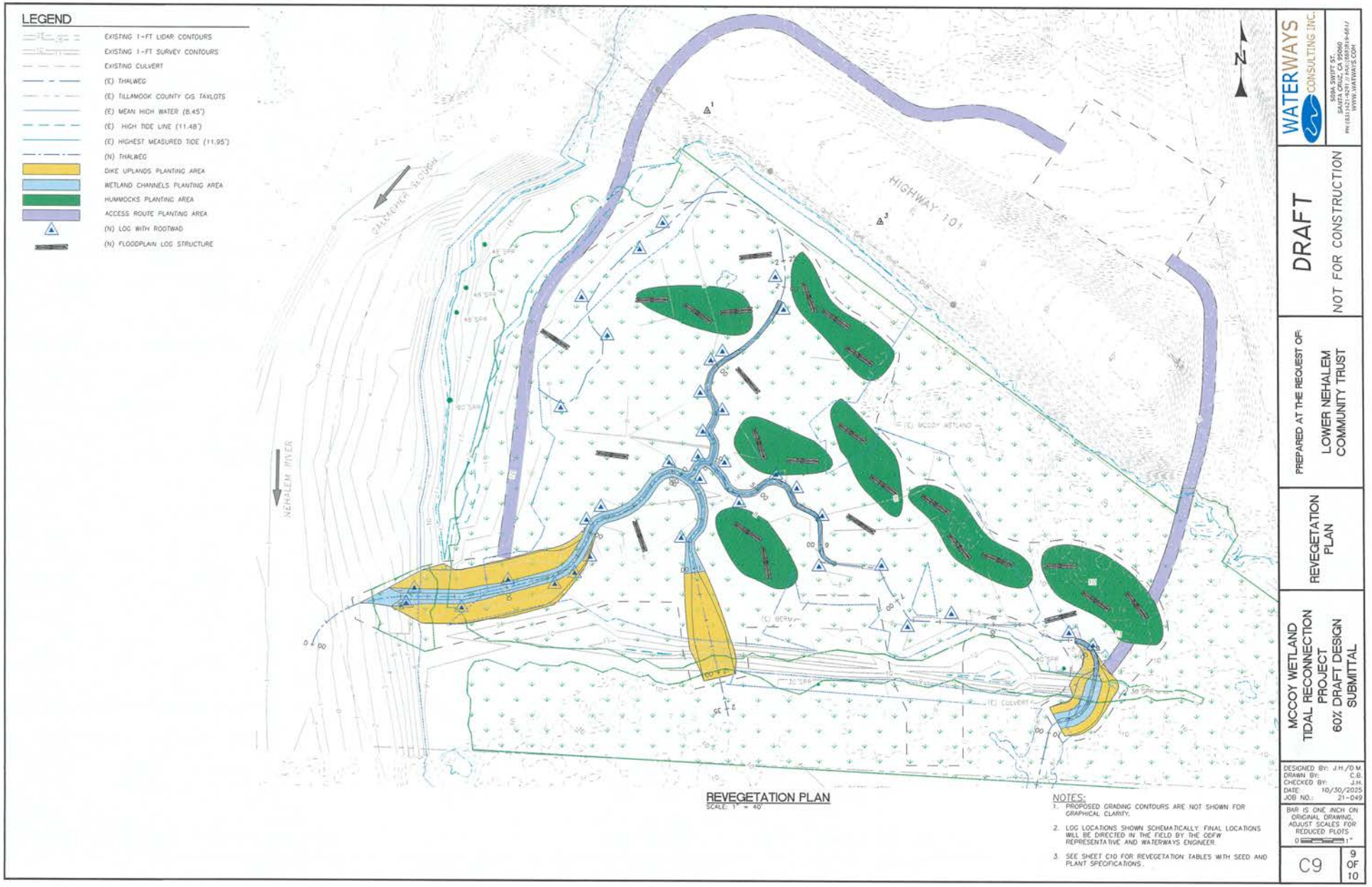
NOTES

MCCOY WETLAND TIDAL RECONNECTION PROJECT
60% DRAFT DESIGN SUBMITTAL

DESIGNED BY: J.H./D.M.
DRAWN BY: C.B.
CHECKED BY: J.H.
DATE: 10/30/2025
JOB NO.: 21-049

BAR IS ONE INCH ON ORIGINAL DRAWING. ADJUST SCALES FOR REDUCED PLOTS
0 1"

C8



REVEGETATION PLAN
SCALE: 1" = 40'

NOTES:
1. PROPOSED GRADING CONTOURS ARE NOT SHOWN FOR GRAPHICAL CLARITY.
2. LOG LOCATIONS SHOWN SCHEMATICALLY. FINAL LOCATIONS WILL BE DIRECTED IN THE FIELD BY THE ODFW REPRESENTATIVE AND WATERWAYS ENGINEER.
3. SEE SHEET C10 FOR REVEGETATION TABLES WITH SEED AND PLANT SPECIFICATIONS.

WATERWAYS CONSULTING INC.
5084 SWIFT ST.
SANTA CRUZ, CA 95060
PH: (831) 421-9291 / FAX: (888) 919-6517
WWW.WATWAYS.COM

DRAFT
NOT FOR CONSTRUCTION

PREPARED AT THE REQUEST OF:
LOWER NEHALEM COMMUNITY TRUST

REVEGETATION PLAN

MCCOY WETLAND TIDAL RECONNECTION PROJECT
60% DRAFT DESIGN SUBMITTAL

DESIGNED BY: J.H./D.M.
DRAWN BY: C.B.
CHECKED BY: J.H.
DATE: 10/30/2025
JOB NO.: 21-049

BAR IS ONE INCH ON ORIGINAL DRAWING. ADJUST SCALES FOR REDUCED PLOTS
0 1"

C9 | 9 OF 10

PLANTING TABLE 1 - WETLAND CHANNELS (19,640 SQ FT)

HERBACEOUS (PLUGS - CLUSTERS OF 10, EACH CLUSTER SPACED 5' APART)			
SPECIES	COMMON NAME	SIZE	SPACING
CAREX DEWEYANA	DEWEY'S SEDGE	PLUG	6"
CAREX OBNUPTA	SLOUGH SEDGE	PLUG	6"
ELEOCHARIS PALUSTRIS	CREEPING SPIKE-RUSH	PLUG	6"
JUNCUS BOLANDERI	BOLANDER'S RUSH	PLUG	6"
SCIRPUS MARITIMUS	SEACOAST BULRUSH	PLUG	6"
SCIRPUS MICROCARPUS	SMALL-FLOWERED BULRUSH	PLUG	6"

PLANTING TABLE 2 - HUMMOCKS (29,451 SQ FT)

TREES				
SPECIES	COMMON NAME	SIZE	NUMBER	SPACING
PICEA SITCHENSIS	SITKA SPRUCE	PLUGS	18	3 PER HUMMOCK LOG STRUCTURE PLANTED INTO LOGS
SALIX PIPERI	PIPER WILLOW	4' CUTTINGS	1289	4'
SHRUBS				
SPECIES	COMMON NAME	SIZE	NUMBER	SPACING
LONICERA INVOLUCRATA	BLACK TWINBERRY	1 GALLON	184	4'
ROSA PISOCARPA	SWAMP ROSE	1 GALLON	184	4'
SPIRAEA DOUGLASII	DOUGLAS SPIRAEA	1 GALLON	184	4'
HERBACEOUS				
SPECIES	COMMON NAME	SIZE	NUMBER	SPACING
ACHILLEA MILLEFOLIUM	COMMON YARROW	PLUGS	1767	6" IN CLUSTERS OF 6, EACH CLUSTER SPACED 5' APART
AGROSTIS EXARATA	SPIKE BENTGRASS	PLUGS	1767	6" IN CLUSTERS OF 6, EACH CLUSTER SPACED 5' APART
CAREX OBNUPTA	SLOUGH SEDGE	PLUGS	1767	6" IN CLUSTERS OF 6, EACH CLUSTER SPACED 5' APART
DESCHAMPSIA CESPITOSA	TUFTED HAIRGRASS	PLUGS	1767	6" IN CLUSTERS OF 6, EACH CLUSTER SPACED 5' APART

PLANTING TABLE 3 - HUMMOCK AND CHANNEL GRADING AREA SEED (49,091 SQ FT)

HERBACEOUS (SEEDED 25 LBS / ACRE)			
SPECIES	COMMON NAME	SIZE	PERCENT
ACHILLEA MILLEFOLIUM	COMMON YARROW	SEED	10.00%
AGROSTIS EXARATA	SPIKE BENTGRASS	SEED	40.00%
CAREX OBNUPTA	SLOUGH SEDGE	SEED	10.00%
DESCHAMPSIA CESPITOSA	TUFTED HAIRGRASS	SEED	40.00%

PLANTING TABLE 4 - DIKE UPLAND SEED (67,458 SQ FT)

HERBACEOUS (SEEDED 25 LBS / ACRE)			
SPECIES	COMMON NAME	SIZE	PERCENT
ACHILLEA MILLEFOLIUM	COMMON YARROW	SEED	20.00%
AGROSTIS EXARATA	SPIKE BENTGRASS	SEED	40.00%
DESCHAMPSIA CESPITOSA	TUFTED HAIRGRASS	SEED	40.00%

PLANTING TABLE 5 - DIKE UPLAND (67,458 SQ FT)

TREES				
SPECIES	COMMON NAME	SIZE		SPACING
ALNUS RUBRA	RED ALDER	2 GALLON	50	8'
PICEA SITCHENSIS	SITKA SPRUCE	2 GALLON	50	8'
SALIX PIPERI	PIPER WILLOW	4" POLE CUTTING	2,000	4'
THUJA PLICATA	WESTERN RED CEDAR	2 GALLON	50	8'
SHRUBS				
SPECIES	COMMON NAME	SIZE		SPACING
CONUS STOLONIFERA	RED OSIER DOGWOOD	1 GALLON	413	4'
GAULTHERIA SHALLON	SALAL	1 GALLON	413	4'
LONICERA INVOLUCRATA	BLACK TWINBERRY	1 GALLON	413	4'
ROSA PISOCARPA	SWAMP ROSE	1 GALLON	413	4'
SYMPHORICARPOS ALBUS	SNOWBERRY	1 GALLON	414	4'
HERBACEOUS (PLUGS - CLUSTERS OF 5 EACH SPACED 6" APART IN CLUSTER. CLUSTERS SPACED 10' APART)				
SPECIES	COMMON NAME	SIZE		PERCENT
FRAGARIA VESCA	WOOD'S STRABERRY	PLUG	675	20.00%
GEUM MACROPHYLLUM	LARGE-LEAVED AVENS	PLUG	675	20.00%
LUPINUS POLYPHYLLUS	LARGE-LEAVED LUPINE	PLUG	675	20.00%
TELLIMA GRANDIFLORA	FRINGECUP	PLUG	675	20.00%
TOLMIEA MENZIESII	PIGGY-BACK PLANT	PLUG	675	20.00%

PLANTING TABLE 6 - ACCESS AREA UPLANDS SEED (16,897 SQ FT)

HERBACEOUS (SEEDED 25 LBS / ACRE)			
SPECIES	COMMON NAME	SIZE	PERCENT
ACHILLEA MILLEFOLIUM	COMMON YARROW	SEED	10.00%
AGROSTIS EXARATA	SPIKE BENTGRASS	SEED	40.00%
DESCHAMPSIA CESPITOSA	TUFTED HAIRGRASS	SEED	40.00%
LUPINUS POLYPHYLLUS	LARGE LEAVED LUPINE	SEED	10.00%

PLANTING TABLE 7 - ACCESS AREA WETLANDS SEED (925 SQ FT)

HERBACEOUS (SEEDED 40 LBS / ACRE)			
SPECIES	COMMON NAME	SIZE	PERCENT
ACHILLEA MILLEFOLIUM	COMMON YARROW	SEED	10.00%
AGROSTIS EXARATA	SPIKE BENTGRASS	SEED	30.00%
CAREX OBNUPTA	SLOUGH SEDGE	SEED	10.00%
DESCHAMPSIA CESPITOSA	TUFTED HAIRGRASS	SEED	40.00%
SCIRPUS MICROCARPUS	SMALL FRUITED BULLRUSH	SEED	10.00%

PLANTING TABLE 8 - UPLAND ACCESS (16,897 SQ FT)

TREES				
SPECIES	COMMON NAME	SIZE		SPACING
SALIX PIPERI	PIPER WILLOW	3' POLE CUTTING	500	3'
SHRUBS				
SPECIES	COMMON NAME	SIZE		SPACING
CONUS STOLONIFERA	RED OSIER DOGWOOD	3' POLE CUTTING	377	3'
SALIX SITCHENSIS	SITKA WILLOW	3' POLE CUTTING	1000	3'

PLANTING TABLE 9 - UPLAND ACCESS (925 SQ FT)

TREES			
COMMON NAME	SIZE		SPACING
PIPER WILLOW	3' POLE CUTTING	103	3'

WATERWAYS CONSULTING INC.
509A SWIFT ST.
SANTA CRUZ, CA 95060
PH: (831) 457-2742 FAX: (831) 457-2843
WWW.WATWAYS.COM

DRAFT

NOT FOR CONSTRUCTION

PREPARED AT THE REQUEST OF:
LOWER NEHALEM COMMUNITY TRUST

REVEGETATION TABLES

MCCOY WETLAND TIDAL RECONNECTION PROJECT
60% DRAFT DESIGN SUBMITTAL

DESIGNED BY: J.H./D.M.
DRAWN BY: C.B.
CHECKED BY: J.H.
DATE: 10/30/2025
JOB NO.: 21-049

BAR IS ONE INCH ON ORIGINAL DRAWING. ADJUST SCALES FOR REDUCED PLOTS
0 1"

C10

Attachment 2

McCoy Slough Vegetation Enhancement Plan
Revision 6/26/25

Site Narrative:

The McCoy Slough project is located along Highway 101 south of Nahalem, between the intersection of Hwy 101 and Necanicum Hwy and Botts Marsh. The project is an enclosed wetland, almost entirely cut off by a dike from the bordering Nahalem River.

Botanically, the wetlands is quite healthy, containing a dense population of sedges, rushes, and grasses. If connected to the river, the current botanical conditions would support plenty of fish habitat. The buffer zones, elevations above ordinary high water, are for the most part healthy, except for a few large patches of *Rubus armeniacus* (Himalayan blackberry), which is on the wetland side of the dike, and sporadic *Polygonum ssp.* (Knotweed), which is on the river side of the dike. It is noted that although there is quite a bit of knotweed which has washed up in neighboring Botts Marsh, none of it has survived the frequent inundation with brackish waters.

Purpose/Goals:

Waterways Consulting, Inc. has been hired to design a project which reconnects McCoy Slough with the Nehalem River. This plan will include breaching the dike along both the Nehalem River and Botts Marsh, excavating channels in the wetlands, and installing hummocks with woody debris in the wetlands. The purpose of this plan is to provide guidelines for revegetation following construction and invasive species removal throughout the project. It is intended as complementary material with the designs produced by Waterways Consulting, Inc.

Restoration Plan:

There are four primary areas of restoration on the site: Wetland Channels, Hummocks, Diked Uplands, and Access Routes. The Diked Upland zone is the only one which faces major invasive species pressure from *Rubus armeniacus* (Himalayan Blackberry) and *Polygonum ssp.* (Knotweed), which will need to be treated prior to any construction to reduce the chance of re-spread. However, anytime there is ground disturbance, there is a chance of new invasive species

introduction by nearby seed sources or existing buried seed sources. This plan anticipates some degree of vegetation management will need to occur in these healthy areas. The Access Routes, run through each of the zones, but are relegated to a small portion of the site. These should be treated as areas that separate planting areas but then included into the relative elevation zone during maintenance.

Wetland Channels:

No site preparation is recommended for the Wetland Channels. After construction is complete, plug planting (see Plant Table 1) should immediately take place to prevent any invasive species from moving into the disturbed ground. This planting will also assist with limiting erosion.

For the first three years following planting, seasonal maintenance should take place. This includes spring and fall herbicide treatments on any invasive species, summer hand pulling treatments, and winter interplanting.

Hummocks:

No site preparation is recommended for the Hummocks. As soon as these are constructed, planting (see Plant Table 2) and seeding (see Plant Table 3) should immediately take place to prevent invasive species from moving into the disturbed ground. This will also assist with limiting erosion. Due to the high potential of inundation, seeding in this zone should primarily be focused on the apex of the hummocks.

For the first three years following planting, seasonal maintenance should take place. This includes spring and fall herbicide treatments on any invasive species, summer hand pulling treatments, and winter interplanting. This zone has a higher risk of invasive species pressure than the Wetland Channels zone. Additional treatments should be added for species that require off season treatments.

Dike Uplands

Due to the existence of knotweed in the Dike Upland zones, knotweed treatment must take place prior to any construction on site. Inject aquatic glyphosate concentrate into each stem of knotweed using a stem injector. Mash knotweed without severing stem a day after injection to trigger a stress response. For knotweed that is too small for injection, gently mash without severing stem and foliar spray with 4% aquatic glyphosate, 1% non-ionic surfactant. Due to the high density of native plants surrounding the knotweed and the upcoming ground disturbance, it is not recommended to use imazapyr, which is commonly used in knotweed treatments. It is also recommended that Himalayan Blackberry is to be treated prior to construction to reduce a potential invasive seed source. To treat, cut blackberry to 6 inches and then spray with 2% aquatic triclopyr, 2% aquatic glyphosate, and 1% non-ionic surfactant after it regrows to 1 foot. Respray prior to planting.

Immediately after construction, seed (see Plant Table 4) and plant site (see Plant Table 5). Planting and seeding should only take place in areas of disturbed soil or in areas where invasive species removal has taken place.

For the first three years following planting, seasonal maintenance should take place. This includes spring and fall herbicide treatments on any invasive species, summer knotweed stem injection or mash and spray treatments, and winter interplanting. This zone has the highest risk of invasive species pressure. Adaptive management must take place to ensure no disturbed area is recolonized by invasives.

Access Routes

These access routes will be created to allow machinery to conduct the hummock construction and breaches in the dike. These areas should be treated as new construction zones, and planted in high density to return them to their pre-construction quality. Immediately after construction, seed uplands (see Plant Table 6) and wetlands (see Plant Table 7) at 40lbs per acre. Replant uplands (see Plant Table 8) and wetlands (see Plant Table 9) at high density. Planting and seeding should only take place in areas of disturbed soil or in areas where invasive species removal has taken place.

For the first three years following planting, seasonal maintenance should take place. This includes spring and fall herbicide treatments on any invasive species, summer knotweed stem injection or mash and spray treatments, and winter interplanting. This zone has the highest risk of invasive species pressure. Adaptive management must take place to ensure no disturbed area is recolonized by invasives.

Plant Tables:

Plant Table 1 – Wetland Channels (19,640 sq ft)

Herbaceous (Plugs - Clusters of 10, each cluster spaced 5' apart)			
Species	**Common Name**	**Size**	**Spacing**
Carex deweyana	Dewey's sedge	plug	6"
Carex obnupta	Slough sedge	plug	6"
Eleocharis palustris	Creeping spike-rush	plug	6"
Juncus bolanderi	Bolander's rush	plug	6"
Scirpus maritimus	Seacoast bulrush	plug	6"
Scirpus microcarpus	Small-flowered bulrush	plug	6"

Plant Table 2 – Hummocks (29,451 sq ft)

Trees				
Species	**Common Name**	**Size**	**Number**	**Spacing**

Picea sitchensis	Sitka spruce	Plugs	18	3 per hummock log structure planted into logs
Salix piperi	Piper Willow	4' cuttings	1289	4'
Shrubs				
Species	**Common Name**	**Size**	**Number**	**Spacing**
Lonicera involucrata	Black twinberry	1 gallon	184	4'
Rosa pisocarpa	Swamp rose	1 gallon	184	4'
Spiraea douglasii	Douglas spiraea	1 gallon	184	4'
Herbaceous				
Species	**Common Name**	**Size**	**Number**	**Spacing**
Achillea millefolium	Common yarrow	Plugs	1767	6" in clusters of 6, each cluster spaced 5' apart
Agrostis exarata	Spike bentgrass	Plugs	1767	6" in clusters of 6, each cluster spaced 5' apart
Carex obnupta	Slough sedge	Plugs	1767	6" in clusters of 6, each cluster spaced 5' apart
Deschampsia cespitosa	Tufted hairgrass	Plugs	1767	6" in clusters of 6, each cluster spaced 5' apart

Plant Table 3 – Hummock & Channel Grading Area Seed (49,091 sq ft)

Herbaceous (Seeded 25 lbs / acre)			
Species	**Common Name**	**Size**	**Percent**
Achillea millefolium	Common yarrow	seed	10.00%
Agrostis exarata	Spike bentgrass	seed	40.00%
Carex obnupta	Slough sedge	seed	10.00%
Deschampsia cespitosa	Tufted hairgrass	seed	40.00%

Plant Table 4 – Dike Upland Seed (67,458 sq ft)

Herbaceous (Seeded 25 lbs / acre)			
Species	**Common Name**	**Size**	**Percent**
Achillea millefolium	Common yarrow	seed	20.00%
Agrostis exarata	Spike bentgrass	seed	40.00%
Deschampsia cespitosa	Tufted hairgrass	seed	40.00%

Plant Table 5 – Dike Upland (67,458 sq ft)

Trees				
Species	**Common Name**	**Size**		**Spacing**
Alnus rubra	Red alder	2 gallon	50	8'
Picea sitchensis	Sitka spruce	2 gallon	50	8'
Salix piperi	Piper willow	4' pole cutting	2,000	4'
Thuja plicata	Western red cedar	2 gallon	50	8'
Shrubs				
Species	**Common Name**	**Size**		**Spacing**
Conus stolonifera	Red osier dogwood	1 gallon	413	4'
Gaultheria shallon	Salal	1 gallon	413	4'
Lonicera involucrata	Black twinberry	1 gallon	413	4'
Rosa pisocarpa	Swamp rose	1 gallon	413	4'
Symphoricarpos albus	Snowberry	1 gallon	414	4'
Herbaceous (Plugs - Clusters of 5 each spaced 6" apart in cluster. Clusters spaced 10' apart)				
Species	**Common Name**	**Size**		**Percent**
Fragaria vesca	Wood's Straberry	plug	675	20.00%
Geum macrophyllum	Large-leaved avens	plug	675	20.00%
Lupinus polyphyllus	Large-leaved lupine	plug	675	20.00%
Tellima grandiflora	Fringecup	plug	675	20.00%
Tolmiea menziesii	Piggy-back plant	plug	675	20.00%

Plant Table 6 – Access Area Uplands Seed (16,897 sq ft)

Herbaceous (Seeded 25 lbs / acre)			
Species	**Common Name**	**Size**	**Percent**
Achillea millefolium	Common yarrow	seed	10.00%
Agrostis exarata	Spike bentgrass	seed	40.00%
Deschampsia cespitosa	Tufted hairgrass	seed	40.00%
Lupinus polyphyllus	Large leaved lupine	Seed	10.00%

Plant Table 7 – Access Area Wetlands Seed (925sq ft)

Herbaceous (Seeded 40 lbs / acre)			
Species	**Common Name**	**Size**	**Percent**

Achillea millefolium	Common yarrow	seed	10.00%
Agrostis exarata	Spike bentgrass	seed	30.00%
Carex obnupta	Slough sedge	seed	10.00%
Deschampsia cespitosa	Tufted hairgrass	seed	40.00%
Scirpus microcarpus	Small fruited bullrush	Seed	10.00%

Plant Table 8 – Upland Access (16,897 sq ft)

Trees				
Species	**Common Name**	**Size**		**Spacing**
Salix piperi	Piper willow	3' pole cutting	500	3'
Shrubs				
Species	**Common Name**	**Size**		**Spacing**
Conus stolonifera	Red osier dogwood	3' pole cutting	377	3'
Salix sitchensis	Sitka willow	3' pole cutting	1000	3'

Plant Table 9 – Upland Access (925 sq ft)

Trees				
Species	**Common Name**	**Size**		**Spacing**
Salix piperi	Piper willow	3' pole cutting	103	3'

WETLAND DELINEATION / DETERMINATION REPORT COVER FORM **Attachment 3**

A complete report and signed report cover form, along with applicable review fee, are required before a report review timeline can be initiated by the Department of State Lands. All applicants will receive an emailed confirmation that includes the report's unique file number and other information.

Ways to submit report:

- **Under 50MB** - A single unlocked PDF can be emailed to: wetland.delineation@dsl.oregon.gov.
- **50MB or larger** - A single unlocked PDF can be uploaded to DSL's Box.com website. After upload notify DSL by email at: wetland.delineation@dsl.oregon.gov.
- OR a hard copy of the unbound report and signed cover form can be mailed to: Oregon Department of State Lands, 775 Summer Street NE, Suite 100, Salem, OR 97301-1279.

Ways to pay review fee:

- By credit card on DSL's epayment portal after receiving the unique file number from DSL's emailed confirmation.
- By check payable to the Oregon Department of State Lands attached to the unbound mailed hardcopy OR attached to the complete signed cover form if report submitted electronically.

Contact and Authorization Information

☒ Applicant ☐ Owner Name, Firm and Address:
Emily Akdedian, Lower Nehalem Community Trust
532 Landeda Ave, Suite C Manzanita, OR 97130

Business phone # (503) 368-3203
Mobile phone # (optional)
E-mail: emilyakdedian@nehalemtrust.org

☐ Authorized Legal Agent, Name and Address (if different):

Business phone #
Mobile phone # (optional)
E-mail:

I either own the property described below or I have legal authority to allow access to the property. I authorize the Department to access the property for the purpose of confirming the information in the report, after prior notification to the primary contact.

Typed/Printed Name: Emily Akdedian **Signature:** _____

Date: 09/15/2025 Special instructions regarding site access: Prior notification. to LNCT

Project and Site Information

Project Name: McCoy Marsh Tidal Reconnection Project

Latitude: 45.699588N Longitude: 123.878950W
decimal degree - centroid of site or start & end points of linear project

Proposed Use:
Habitat Restoration/Tidal Reconnection

Tax Map # 3N 10 35
Tax Lot(s) 200

Tax Map #
Tax Lot(s)

Project Street Address (or other descriptive location):
Intersection of HWY 53 and HWY 101, South of HWY 101

Township 3N Range 10W Section 35 QQ

Use separate sheet for additional tax and location information

City: Wheeler County: Tillamook

Waterway: Nehalem River River Mile: NA

Wetland Delineation Information

Wetland Consultant Name, Firm and Address:
Tammy Stout, Cascade Environmental Group, LLC
2800 N Lombard Ave, # 803, Portland OR 97217

Phone # (971) 400-6335
Mobile phone # (if applicable)
E-mail: tstout@cascadeenv.com

The information and conclusions on this form and in the attached report are true and correct to the best of my knowledge.

Consultant Signature: _____ Date: 08/28/2025

Primary Contact for report review and site access is ☒ Consultant ☐ Applicant/Owner ☐ Authorized Agent

Wetland/Waters Present? ☒ Yes ☐ No Study Area size: 8.64 ac Total Wetland Acreage: 7.1200

Check Applicable Boxes Below

☐ R-F permit application submitted
☐ Mitigation bank site
☐ EFSC/ODOE Proj. Mgr: _____
☒ Wetland restoration/enhancement project (not mitigation)
☐ Previous delineation/application on parcel
If known, previous DSL # _____

☐ Fee payment submitted $ _____
☐ Resubmittal of rejected report ($100)
☐ Request for Reissuance. See eligibility criteria. (no fee)
DSL # _____ Expiration date_____
☐ LWI shows wetlands or waters on parcel
Wetland ID code _____

For Office Use Only

DSL Reviewer: _____ Fee Paid Date: ____/____/____ DSL WD # _____

Date Delineation Received: ___/___/___ DSL App.# _____

McCoy Marsh Tidal Reconnection Project – Wetlands and Other Waters Delineation

Prepared for:

Prepared by:
Cascade Environmental Group, LLC
2800 N Lombard St, #803
Portland, OR 97217
Contact: Tammy Stout

August 2025

Cascade Environmental Group, LLC. McCoy Wetland Tidal Reconnection Project – Wetlands and Other Waters Delineation Report. August 2025. Portland, OR. Prepared for Lower Nehalem Community Trust.

Table of Contents

List of Tables

List of Appendices

Acronyms and Abbreviations

Corps	U.S. Army Corps of Engineers
DSL	Department of State Lands
E1UBL	estuarine, subtidal, unconsolidated bottom, subtidal
E2EM	estuarine, intertidal, emergent
E2EM1P	estuarine, intertidal, emergent, persistent, irregularly flooded
EPA	Environmental Protection Agency
FAC	facultative
FACU	facultative upland
FACW	facultative wetland
GPS	global positioning system
HMT	Highest Measured Tide
LWI	Local Wetland Inventory
NAVD88	North American Vertical Datum of 1988
NOAA	National Oceanic and Atmospheric Administration
NOL	not on list
NRCS	National Resource Conservation Service
NWI	National Wetland Inventory
OAR	Oregon Administrative Rules
OBL	obligate
PEM1Ch	palustrine emergent, persistent, seasonally flooded, diked/impounded
PFO	palustrine forested
PSS	palustrine scrub-shrub
PSS1R	palustrine scrub-shrub, broad-leafed deciduous, seasonally flooded-tidal
SWI	State Wetland Inventory
UPL	upland
USDA	U.S. Department of Agriculture
USGS	United States Geological Survey
USFWS	United States Fish and Wildlife Service

This page intentionally left blank.

A. Landscape Setting and Land Use

This report has been prepared to provide an assessment of the location and extent of existing wetlands and other waters within the McCoy Wetland Tidal Reconnection Project (Project) site to support the permitting of this voluntary habitat restoration project.

Introduction

The Lower Nehalem Community Trust has proposed a restoration project to restore habitat in tidal and freshwater wetlands by improving connectivity between wetland areas and the tidal reach of the Nehalem River. The Project site includes the Nehalem River levee, the McCoy-Botts Levee that has failed but still impedes surface water movement from tides and high river flows, and the protected wetland known as McCoy Marsh. Project objectives include improving hydraulic connectivity and habitat by breaching the Nehalem River levee, the McCoy-Botts Levee in multiple locations, spoiling materials on site, and installing native vegetation. The Project is located on the Nehalem River, immediately downstream of Highway 101. The study area property is zoned Estuary Natural, located in Tillamook County, Oregon; see Figure 1 in Appendix A. Project activities are regulated under the Clean Water Act by the U.S. Army Corps of Engineers (Corps) and under the Removal-Fill Law by the Oregon Department of State Lands (DSL).

Site Description and Land Use

The Wetlands and Waters Delineation Study Area (Study Area) contains all areas where Project-related disturbance is proposed, including staging, access, excavation, filling, and placement of habitat features. The Study Area consists of 8.64 acres comprising one parcel (200) and Oregon Coast Highway 101 (map numbers 3N 10 35) (Figure 2). The Study Area is located south of Highway 101, along the Nehalem River, and can be accessed from the highway using an unmarked pullout. The Project falls within Township 3N, Range 10 W, Section 35.

The Study Area falls entirely within the Nehalem Bay watershed (12-digit Hydrologic Unit Code # 171002020605) and is situated within the Coast Range Environmental Protection Agency (EPA) Level III ecoregion, which falls within the Marine West Coast Forest EPA Level II ecoregion (Thorson et al. 2003). The Coast Range has high topographic variability and lies within 100 kilometers of the Pacific Ocean. The climate is maritime with substantial rainfall. Temperatures are generally mild. The Coast Range is mostly forested, supporting Sitka spruce (*Picea sitchensis,* FAC), western redcedar (*Thuja plicata,* FAC), and Douglas-fir (*Pseudotsuga menziesii,* FACU).

The McCoy Marsh wetland is located on the east side of Nehalem Bay, just upstream of the community of Wheeler, Oregon. The property was disconnected from tidal influence by the construction of the Nehalem Levee and the McCoy-Botts Levee. The Nehalem Levee is mostly intact but the McCoy-Botts Levee has been abandoned and since eroded.

McCoy Marsh is adjacent to Botts Marsh, a 35-acre larger and tidally connected wetland considered to be a highly valuable high marsh environment containing a well-developed tidal channel network. Bott's Marsh is a conserved salt marsh once designated for development. McCoy Marsh is separated from Bott's Marsh by portion of the constructed levee, which is now degraded and densely vegetated including several very large spruce trees. Tidal water enters McCoy Marsh by overtopping the McCoy-Botts Levee, filling the McCoy wetland or backwatering through the concrete culvert, and then subsequently draining through a culvert back through Bott's marsh. A 12-inch concrete culvert under an eroded part of the levee separating McCoy and Bott's marshes allows some minor tidal exchange at tides above 8 feet elevation but appears to be partially plugged or collapsed. Tidal inundation likely occurs only during very high tides above 10 feet (typically king tides).

Although the property has been isolated from regular tidal influence for at least 80 years by constructed levees, it has retained much of its historic microtopography and wetland character. The ground surface in McCoy Marsh, other than on the levees, is comparable to elevations in the northern extent of Bott's Marsh suggesting the possibility of restoring "high marsh" habitat with similar conditions as in Bott's Marsh. The site is used as open space and habitat preservation. McCoy Marsh (and Botts Marsh) was purchased by the Lower Nehalem Community Trust for the purpose of preservation and restoration.

B. Site Alterations

Site alterations include the Nehalem River Levee, the failed McCoy-Botts Levee, Highway 101 and an Oregon Department of Transportation (ODOT) maintenance parking area on the north side of Highway 101. The McCoy-Botts Levee has eroded and developed vegetation over time and includes the 12-inch concrete culvert that allows flows into and out of the protected area. No other significant alterations to soils and hydrology were found onsite, and evidence of vegetation management was observed.

Aerial imagery was inspected for the effects of these changes (Appendix D); site alterations are described below.

- 1945: Both Nehalem River Levee and the McCoy-Botts Levee are visible, and appear to be intact and fully functional. A road is evident on the Nehalem Levee. A well-developed

tidal channel network is evident in Botts Marsh to the south, no channels are evident in the McCoy Marsh. It is not clear if tidal channels were filled but it is likely. An impoundment of some type also bisects Botts Marsh to the south.

- 1950: Log boom floats are set up along the Nehalem River along the Nehalem Levee. Logs appear to be being removed from Botts Marsh, south of the McCoy-Botts Levee.
- 1960: Tidal channels are starting to reappear in McCoy Marsh and some land disturbance (clearing or log pond?) evident along the McCoy-Botts Levee, and to the south into Botts Marsh.
- 1965: the Nehalem Levee and McCoy-Botts Levees are both overgrown with trees and log storage along the river and in Botts Marsh is less evident. Faint fence lines may be due to grazing in McCoy Marsh.
- 1986: Tidal channel into Botts Marsh appear to have reclaimed drainage patterns and are well developed with impoundments, no log booms or log storage visible. McCoy Marsh is more vegetated and developing tidal channels.

C. Precipitation Data and Analysis

Precipitation data for, and prior to, the date of fieldwork were reviewed to evaluate observed wetland hydrology conditions relative to statistically normal precipitation. Precipitation that deviates from normal ranges can affect site conditions and impact observed wetland hydrology indicators.

Precipitation data were acquired from AgACIS for Tillamook County (FIPS 41057), Oregon and the USACE Antecedent Precipitation Tool to provide context for observed hydrological conditions of the Study Area at the time of the site visit. Table 1 provides precipitation data for the dates of the site visits, precipitation for the 2 weeks prior to each site visit, and a comparison to the normal water year average. A water year is defined as the 12-month period beginning October 1 and ending September 30 of the following year. Climate data are included in Appendix D.

Table 1. Precipitation Summary for Recent Period Preceding Site Visits

	Observed Precipitation [a]				
Date of Site Visit	Date of Visit (inches)	Two Weeks to Date (inches)	Water Year to Date (inches)	Normal Water Year to Date (inches)	Percent of Normal Water Year to Date
11/26/2024	0.00	10.30	22.75	17.38	131%
01/10/2025	0.27	6.63	40.21	35.77	112%

[a] Data provided by the National Oceanic and Atmospheric Administration's AgACIS Tillamook County (FIPS 41057), Oregon station.

Table 2 provides monthly precipitation totals for the 90-day period preceding each site visit along with the normal monthly ranges of precipitation representing 70% probability, as reported in the Natural Resource Conservation Service (NRCS) WETS table for the area using National Oceanic and Atmospheric Administration (NOAA) weather and climate data. WETS tables were developed specifically for application to wetland science and provide data obtained from NOAA National Weather Service climate stations for the purpose of defining a normal range for monthly precipitation and growing seasons (NRCS 2022).

Table 2. Precipitation Summary for Three Months Preceding Site Visit

30 days ending on	Month Weight	Total Precipitation (inches) [a]	WETS Normal Range of Precipitation [a]	Condition Value [b]	Condition Score (month weight x condition value)
11/26/2024	3	21.09	11.28-19.53	3	9
10/27/2024	2	4.49	5.40-9.08	1	2
09/27/2024	1	1.39	1.47-3.65	1	1
					Sum: 12 (normal) [c]
01/10/2025	3	22.72	14.03-20.04	3	9
12/11/2024	2	15.29	11.87-20.50	2	4
11/11/2024	1	11.29	6.46-14.20	2	2
					Sum: 15 (wet) [c]

[a] Data provided by the Antecedent Precipitation Tool,; [b] 1=dry, 2=normal, 3=wet; [c] a condition score of 6-9=drier than normal, 10-14=normal, and 15-18=wetter than normal

Each month is weighted according to its temporal relationship to the date of fieldwork (assuming the more recent the time period, the greater the influence the precipitation conditions exert on the date of fieldwork), as well as a condition value based on the level of

precipitation observed relative to normal (as indicated by the WETS range). The weighted month value and condition values are multiplied to produce a condition score, which is summed to produce a single value representative of the overall hydrological condition leading up to the date of fieldwork. The results are shown in Table 2 for date when the site visit was performed.

Precipitation in September and October was drier than average, and precipitation in November was higher than the WETS normal range, yielding an overall condition score of 12 (normal).

Overall, based on these measures and assessment of the water year to date, the site was likely at normal conditions, and assessments of hydrology or indicators of hydrology could be considered reliable.

D. Methods

This section describes the methods used to determine the extent of wetlands and waters within the Study Area. As part of the methodology, both office and onsite methods were used.

Office Methods

Prior to conducting fieldwork, biologists reviewed the following available data and information:

- U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI)
- Aerial photos: Google Earth, Oregon Statewide Inventory Program – Oregon Imagery Framework Representation Team and U.S. Geological Survey (USGS) Earth Explorer imagery
- U.S. Department of Agriculture (USDA) and NRCS Web Soil Survey Tillamook County Area, Oregon
- Tillamook County Tax Maps (Figure 2)

National, Statewide, Local Wetlands Inventory

NWI data show a PEM1Ch (palustrine emergent, persistent, seasonally flooded, diked/impounded) polygon occupying the emergent wetland portion of the study area, and a PSS1R (palustrine scrub-shrub, broad-leafed deciduous, seasonally flooded-tidal) polygon extending east–west near the southern boundary of the study area (USFWS 2024). Uplands are shown paralleling Highway 101 and in the general north–south dike alignment location that parallels the Nehalem River. Outboard of the dike, the Nehalem River is shown as EIUBL (estuarine, subtidal, unconsolidated bottom, subtidal) polygon, and an E2EM1P (estuarine,

intertidal, emergent, persistent, irregularly flooded) polygon is shown between the north–south dike and the river.

A State Wetland Inventory (SWI) hydric soil polygon is mapped throughout the study area and across Highway 101, where the highway is constructed on an embankment much higher than the surrounding ground.

No Local Wetland Inventory (LWI) data were available for the Study Area or surrounding areas. Figure 3a shows NWI data, and Figure 3b shows SWI data.

USDA/NRCS County Soil Resource Inventory

Web Soil Survey data produced by the NRCS were obtained for the Study Area to assess soil conditions onsite (NRCS 2024); soil data are shown in Figure 4.

Soil Unit 2A: Fluvaquents-Histosols complex, 0-1% slopes

This hydric soil occurs in swamps and tidal marshes and is formed from estuarine deposits. It is very poorly drained and floods frequently. In the Study Area, it makes up the majority of the site. This soil is very slightly to moderately saline and supports Sitka spruce forest and emergent wetlands.

Soil Unit 29E: Templeton-Klootchie complex, 30-60% slopes

This nonhydric soil occurs on mountain ridgetops and slopes in the Coast Range of Oregon. It is deep to very deep and well drained. Commercial uses are primarily timber and recreation.

Soil Unit 102A: Fluvaquents-Histosols complex, 0-1% slopes, diked

This hydric soil occurs in swamps and tidal marshes and is formed from estuarine deposits. It is very poorly drained and would flood frequently if not for dike protections. In the Study Area, it makes up the northern portion of the site where Highway 101 functions as a dike. This soil is very slightly to moderately saline and supports Sitka spruce forest and emergent wetlands.

Site-Specific Methods

The site was delineated according to methodology described in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region Version 2.0* (Corps 2010), the 1987 Corps of Engineers Wetland Delineation Manual (Environmental Laboratory 1987), and Oregon Administrative Rules (OAR) 141-090 et seq.

Fieldwork was performed on November 25, 2024, by Cascade wetland biologists Brent Haddaway and Tammy Stout, and again on January 10, 2025, by Brent Haddaway. The Study Area was easily located in the field using visual markers including the dike, Nehalem River, and

Highway 101and project boundary files loaded into a handheld Trimble Geo7X global positioning system (GPS) unit.

Wetlands were determined based on the presence or absence of wetland indicators. Formal sample plots were established to determine where the wetland boundary occurs. Soil colors were evaluated using a Munsell soil color chart (Gretag Macbeth 2000). Plant indicator statuses were determined using the 2020 National Wetland Plant List (Corps 2020). The location data for boundaries and plots were collected using GPS.

Paired plots were placed in non-wetlands (uplands and non-wetland areas below Highest Measured Tide [HMT]) and wetlands to identify the boundary of wetlands. The presence of vegetation was used to determine the boundary between tidal wetlands and tidal waters (Nehalem River).

For other regulated tidal waters, tidal waters extent was mapped using available LiDAR data and elevations recorded at the tidal gage in Nehalem, Oregon (NRCS Gage 9437908). Ground-level color photographs were also taken throughout the site to convey study area conditions (Appendix C).

E. Description of All Wetlands and Other Non-Wetland Waters

Two wetlands totaling 7.12 acres were identified in the study area, which includes both estuarine and palustrine plant communities. Estuarine conditions exist across all of Wetland 2, and most of the emergent portion of Wetland 1. Palustrine communities occur at higher elevations in Wetland 1 before transitioning to uplands. A tidal segment of the Nehalem River (0.01 acres of open water tidal area) flows along the western portion of the study area. Figure 5 shows an aerial photo of the site; Figure 6a provides wetlands and waters results, including HMT elevations; and Figure 6b shows wetland and waters results with Mean High Water and Highest Astronomical Tide elevations. Data plots were taken to demonstrate typical wetland conditions and adjacent uplands in the Study Area; data sheets are included in Appendix B. Site photographs are included in Appendix C.

Regulated Corps tidal elevations from the nearest tidal gage (Garibaldi Station 9437540) were obtained and correlated to river gage data at the nearby Nehalem River gage. The DSL HMT elevation was obtained from the DSL table on compiled HMT data for the Nehalem River at

Nehalem. Within the 8.64-acre Study Area, the following acreages fall below the tidal elevations that are relevant to Corps and DSL jurisdictions:

- Highest Measured Tide/Highest Recorded Tide: 11.95 feet (7.26 acres)
- Highest Astronomical Tide: 11.48 feet (7.41 acres)
- Mean High Water: 8.45 feet (3.24 acres)

Wetlands

Wetland 1

Wetland 1 (7.04 acres) includes both tidal and nontidal conditions, including estuarine, intertidal, emergent (E2EM) and riverine palustrine scrub-shrub (PSS)/palustrine forested (PFO) wetland types. The wetland was historically protected from tidal inundation by the McCoy-Botts Levee that has since failed and eroded. E2EM communities are supported inboard of the levees below approximately 9 feet (North American Vertical Datum of 1988 [NAVD88]) elevation; PSS and PFO communities are located near the failed McCoy-Botts Levee, at the east end of the study area, and in a few low mounds above elevations that support E2EM communities.

The failed McCoy-Botts Levee is a partial barrier to tidal inundation and floods; surface waters are able to circumvent the McCoy-Botts Levee through a culvert shown on Figure 6 and around the east end of the levee when water levels are high enough. Small drainage channels have formed within the E2EM community, routing surface water toward the culvert as the primary surface water outlet.

E2EM communities are vegetated with triangular club-rush (*Schoenoplectus pungens*, OBL) saltgrass (*Distichlis spicata*, OBL), creeping bentgrass (*Agrostis stolonifera*, FAC), slender cinquefoil (*Argentina anserina*, OBL), and Lyngby's sedge (*Carex lyngbyei*, OBL). These areas were inundated to the surface during fieldwork and do not border uplands; therefore, no data plots were recorded in E2EM areas.

PSS communities are vegetated with twinberry (*Lonicera involucrata*, FACW), salmonberry (*Rubus spectabilis*, FACW), trailing blackberry (*Rubus ursinus*, FACU), Armenian blackberry (*Rubus armeniacus*, FAC), and cascara (*Frangula purshiana*, FAC), with slough sedge (*Carex obnupta*, OBL), sea watch (*Angelica lucida*, NOL), sword fern (*Polystichum munitum*, FACU), and pearly everlasting (*Anaphalis margaritacea*, FACU) in the understory. PFO communities were dominated by Sitka spruce, with an understory of slough sedge, and sword fern and salal (*Gaultheria shallon*, FACU) growing on hummocks. Vegetation within PSS and PFO communities met the dominance test for hydrophytic vegetation; soils met indicators for gleyed matrix (F2),

sandy redox (S5), and depleted matrix (F3); and test plots met hydrology indicators for high water table (A2), soil saturation (A3), and FAC-neutral test (D5).

Wetland 2

Wetland 2 (0.08 acres) occurs outboard of the Nehalem River Levee, along a tidal reach of the Nehalem River, and has an E2EM Cowardin classification and estuarine hydrogeomorphic class. Vegetation in Wetland 2 consists of Baltic rush (*Juncus balticus*, OBL), slender cinquefoil, Lyngby's sedge, creeping bentgrass (*Agrostis stolonifera*, FAC), tall fescue (*Festuca arundinacea*, FAC), and tufted hairgrass (*Deschampsia cespitosa*, FACW)

Vegetation in Wetland 2 met the dominance test for hydrophytic vegetation and soils met indicators for depleted matrix (F3). Wetland hydrology indicators FAC-neutral test (D5), geomorphic position (D2), and oxidized rhizospheres (C3) were all observed.

Other Waters

Onsite delineation waters are based on the elevation of the maximum recorded tide (HMT) at the Nehalem, Oregon, USGS Gage 9437908 (11.95 feet NAVD88). Below this elevation is 0.01 ac of open water of the Nehalem River.

Uplands

Uplands within the Study Area consist of the Nehalem Levee and portions of the McCoy-Botts Levee, the highway embankment, and the ODOT maintenance parking area on the north side of Highway 101. The failed McCoy-Botts Levee was likely constructed of local soils, which were a mix of loams and sandy loam, whereas the Highway 101 embankment soils appeared to be imported fill, consisting of sands and gravel. Uplands occurring as the failed dike and highway embankment supported similar vegetation, Sitka spruce, red alder (*Alnus rubra*, FAC), Armenian blackberry, trailing blackberry, sword fern, bracken fern (*Pteridium aquilinum*, FACU), Scotch broom (*Cytisus scoparius*, UPL), creeping bentgrass, and orchardgrass (*Dactylis glomerata*, FACU); all upland data plots failed to meet hydrophytic vegetation criteria. Upland soils failed to meet any hydric soils criteria, with very dark brown or dark brown matrix colors and textures ranging from sand to loam.

F. Deviation from SWI–NWI

NWI data show a PEM1Ch polygon occupying the emergent wetland portion of the Study Area and a PSS1R polygon where PFO and PSS communities were identified during delineation fieldwork. The emergent wetland area supports salt-tolerant species, indicating that some tidal inundation occurs and suggesting that E2EM may be a more accurate Cowardin classification.

The E2EM1P polygon mapped outboard of the Nehalem Levee is generally accurate. Both PFO and PSS communities, along with a narrow upland, were observed along the failed McCoy-Botts Levee's east–west alignment, and PSS and PFO wetlands were also present in the eastern portion of the study area; the NWI data do not display upland portions of the east–west failed McCoy-Botts Levee or PFO communities.

A SWI hydric soil polygon is mapped throughout the study area and across Highway 101. However, the highway in this location is constructed on an embankment much higher than the surrounding ground. Embankment soils appeared to be imported fill material consisting of sand and gravel.

No LWI data were available for the study area or surrounding areas.

G. Mapping Method

Sample plots, ordinary high water mark boundaries, photos, and wetland boundary points were recorded in the field using TerraSync software on a Trimble Geo7X hand-held GPS unit. GPS data collected were post-processed with GPS Pathfinder Office software resulting in sub-meter positional accuracy. GPS survey data were exported to a GIS format (ESRI shapefile) and mapped in ArcGIS Pro 2.9 desktop software.

H. Additional Information

No additional information on wetlands or waters beyond what is included in earlier sections is presented. Appendix D contains the climate data retrieved for the precipitation analysis.

I. Results and Conclusions

Cascade Environmental Group, LLC, identified two wetlands totaling 7.12 acres within the Study Area. Approximately 7.26 acres of the 8.64-acre Study Area falls below the HMT elevation. Below the HMT elevation, are 0.01 acres of open water portion of the Nehalem River.

J. Disclaimer

This report documents the best professional judgment and conclusions of the investigator. It is correct and complete to the best of our knowledge. It should be considered a Preliminary Jurisdictional Determination of wetlands and other waters and used at one's own risk unless it has been reviewed and approved in writing by the Corps and the Oregon DSL in accordance with OAR 141-090-0005 through 141-090-0055.

Appendix A. Figures

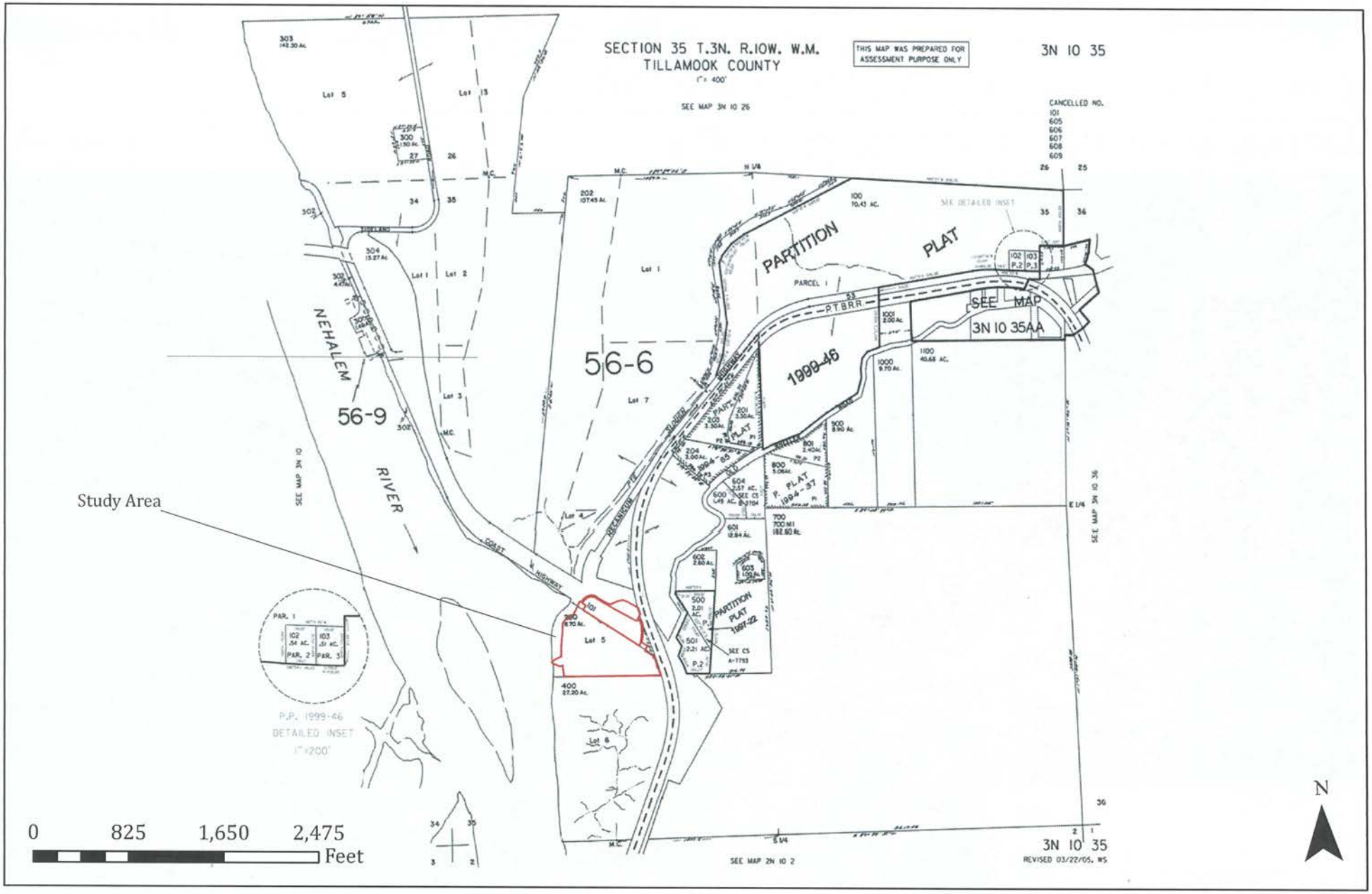
Date: 7/29/2025
Data Source: ESRI, 2025

Figure 1. Location

McCoy Wetland Tidal Reconnection Project

CASCADE ENVIRONMENTAL GROUP

Z:\GIS\336_McCoy\336_McCoy.aprx



Date: 7/29/2025
Data Source: ESRI, 2025; Tillamook County Assessor

Figure 2. Taxlots

McCoy Wetland Tidal Reconnection Project

CASCADE ENVIRONMENTAL GROUP

Z:\GIS\336_McCoy\336_McCoy.aprx

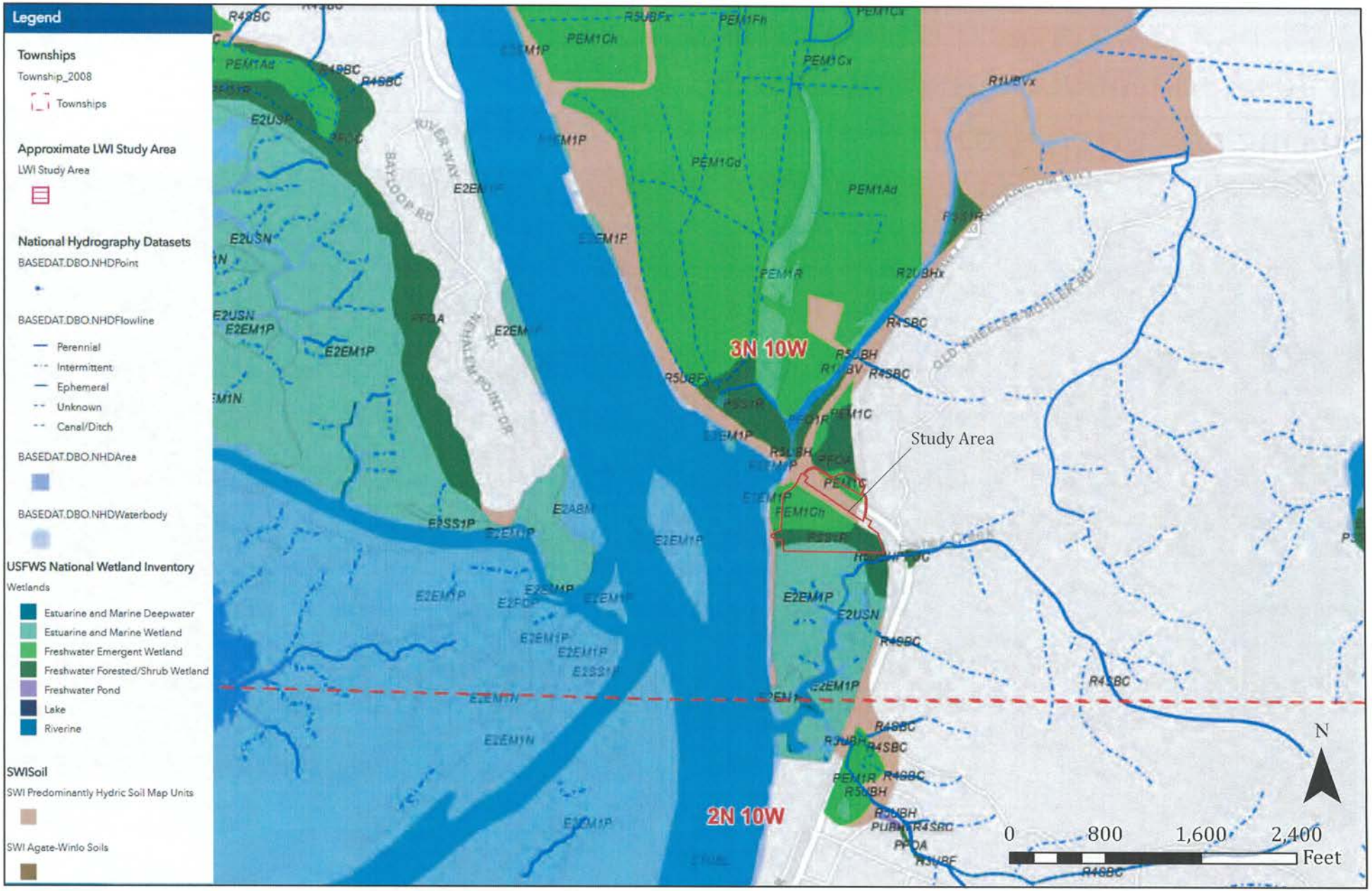
Date: 7/29/2025
Data Source: ESRI, 2025; USFWS

Figure 3a. National Wetland Inventory

McCoy Wetland Tidal Reconnection Project

CASCADE ENVIRONMENTAL GROUP

Z:\GIS\336_McCoy\336_McCoy.aprx



Date: 7/29/2025

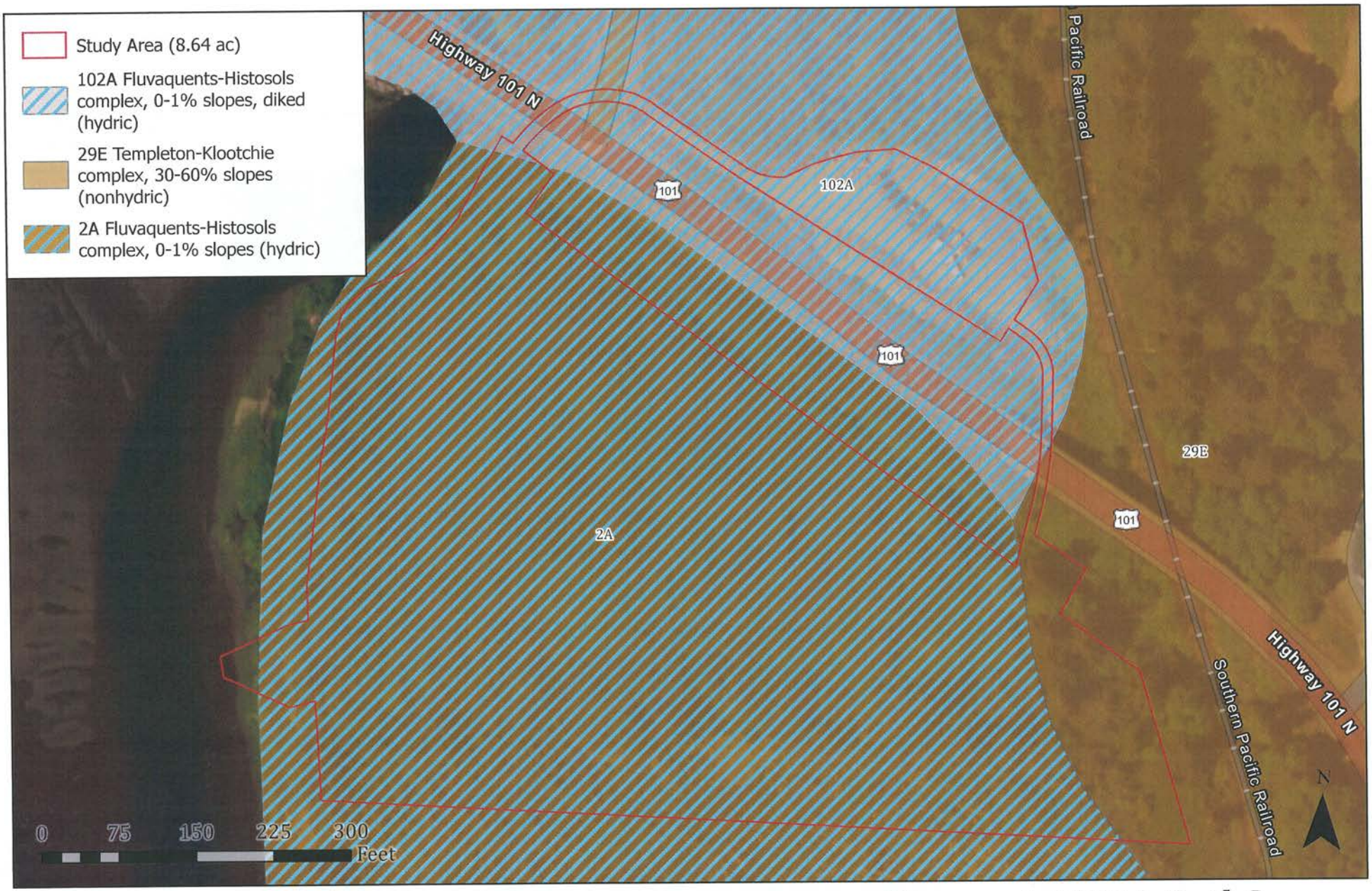
Data Source: ESRI, 2025; USFWS; Oregon DSL

Figure 3b. State Wetland Inventory

McCoy Wetland Tidal Reconnection Project

CASCADE ENVIRONMENTAL GROUP

Z:\GIS\336_McCoy\336_McCoy.aprx



Date: 7/29/2025

Data Source: ESRI, 2025; USDA; NRCS

Figure 4. USDA Soil Survey

McCoy Wetland Tidal Reconnection Project

CASCADE ENVIRONMENTAL GROUP

Z:\GIS\336_McCoy\336_McCoy.aprx

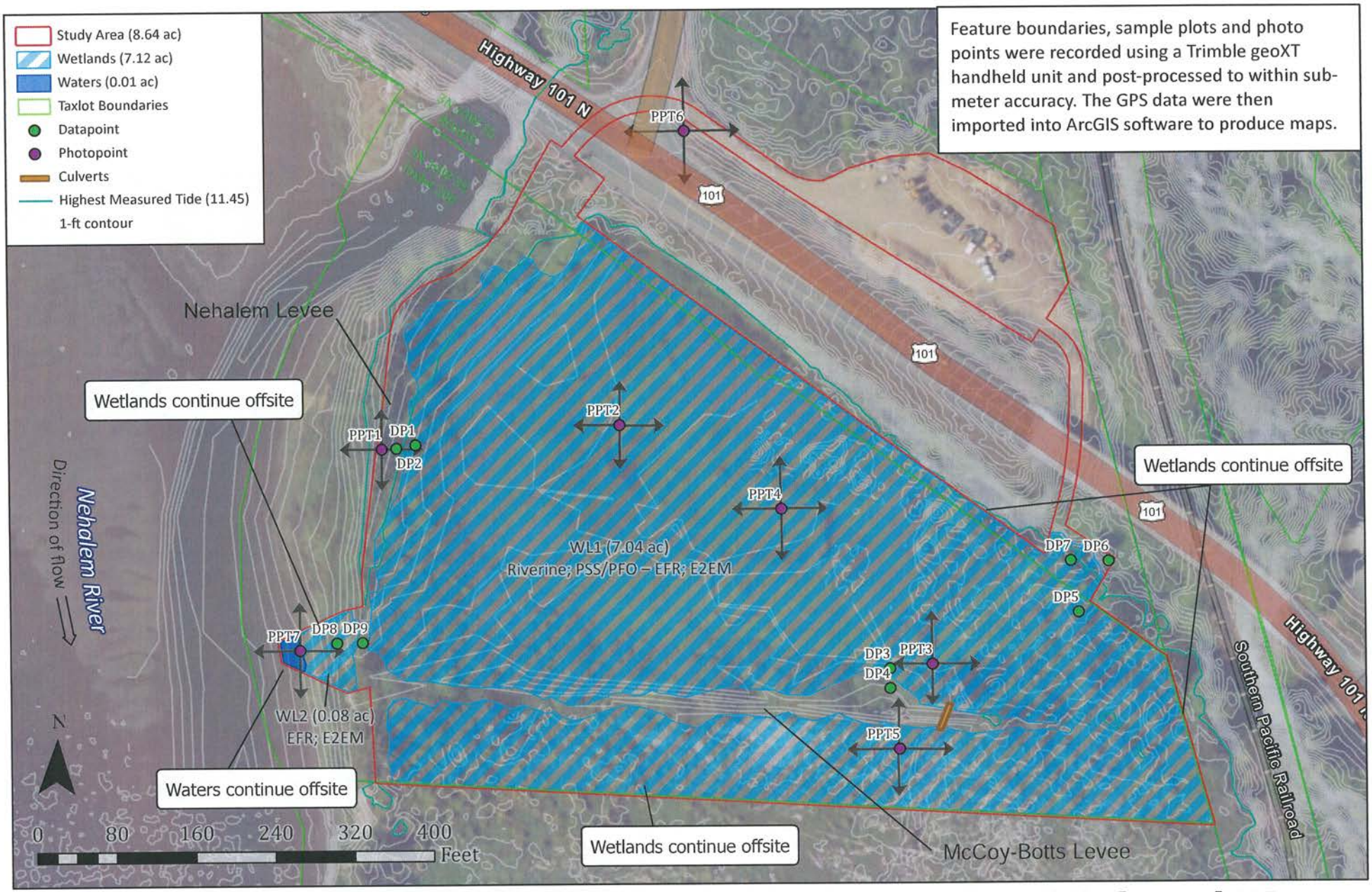
Date: 7/29/2025
Data Source: ESRI, 2025; USDA

Figure 5. Recent Aerial (2022)

McCoy Wetland Tidal Reconnection Project

CASCADE ENVIRONMENTAL GROUP

Z:\GIS\336_McCoy\336_McCoy.aprx



Date: 7/29/2025

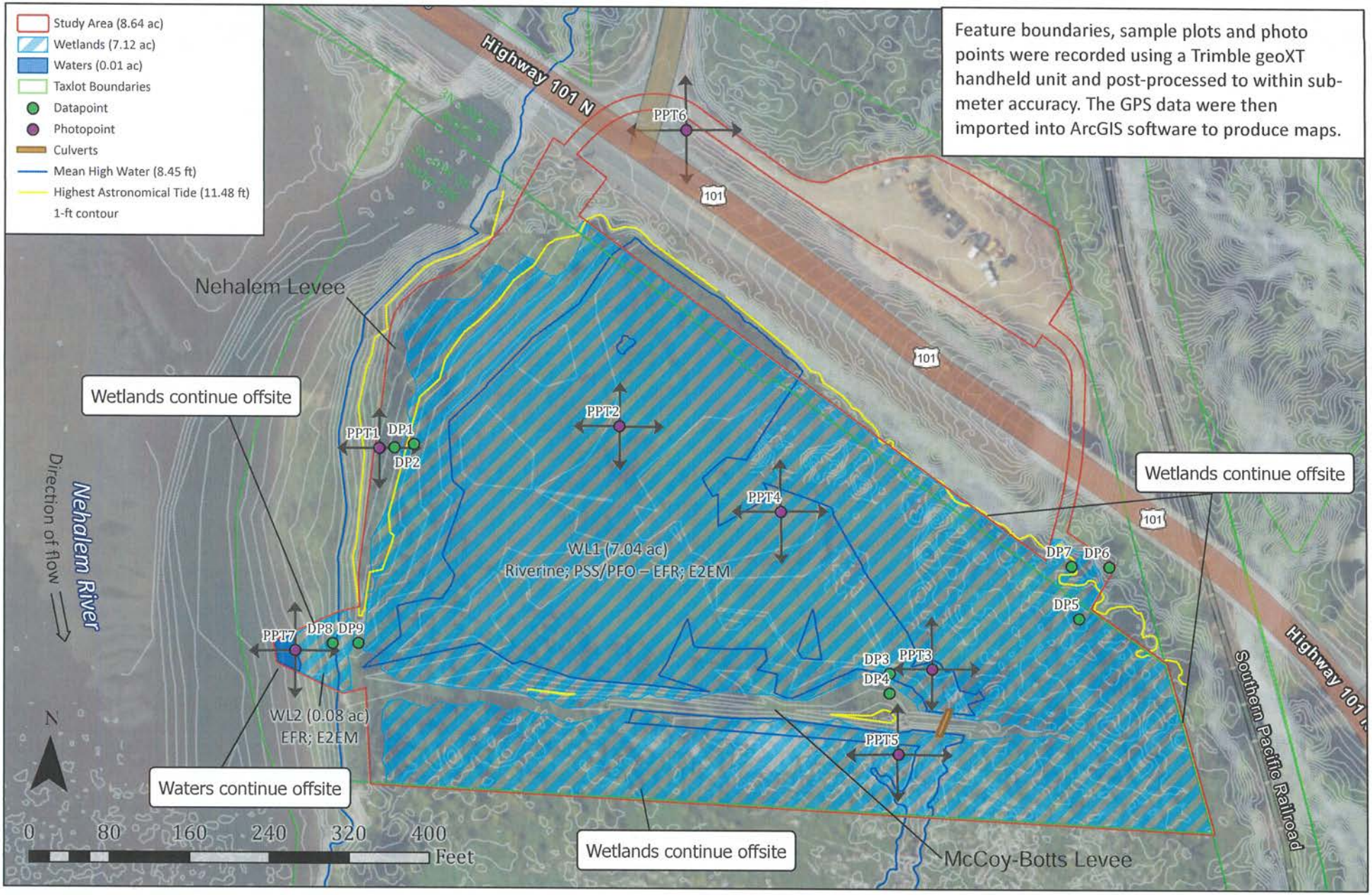
Data Source: ESRI, 2025; NOAA; DOGAMI

Figure 6a. Wetlands and Waters

McCoy Wetland Tidal Reconnection Project

CASCADE ENVIRONMENTAL GROUP

Z:\GIS\336_McCoy\336_McCoy.aprx



Date: 7/29/2025
Data Source: ESRI, 2025; NOAA; DOGAMI

Figure 6b. Wetlands and Waters

McCoy Wetland Tidal Reconnection Project

CASCADE ENVIRONMENTAL GROUP

Z:\GIS\336_McCoy\336_McCoy.aprx

Appendix B. Wetland Data Forms

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: McCoy Wetland City/County: Wheeler, Tillamook Co Sampling Date: 11/26/2024
Applicant/Owner: Lower Nehalem Community Trust State: OR Sampling Point: DP1
Investigator(s): B Haddaway, T Stout Section, Township, Range: S 35T3 N R10W
Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): none Slope (%): 0
Subregion (LRR): Northwest Forests and Coast (LRR A) Lat: 45.700210N Long: 123.880853W Datum: NAD 83
Soil Map Unit Name: Fluvaquents-Histosols, 0 to 1 persecnt slopes NWI Classification: PEM1Ch
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" Present? Yes X No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?**	**Yes X No _____**
Hydric Soil Present?	Yes X No _____		
Wetland Hydrology Present?	Yes X No _____		

Remarks: Plot located at wetland boundary with degraded dike.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status?
1. *Picea sitchensis*	20	Y	FAC
2.			
3.			
4.			
Total Cover:	20		
Shrub Stratum			
1. *Lonicera involucrata*	60	Y	FAC
2.			
3.			
4.			
5.			
Total Cover:	60		
Herb Stratum			
1. *Carex obnupta*	75	Y	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
Total Cover:	75		
Woody Vine Stratum			
1.			
2.			
Total Cover:	0		

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species		x1 =	0
FACW species		x2 =	0
FAC species		x3 =	0
FACU species		x4 =	0
UPL species		x5 =	0
Column Totals:	0 (A)		0 (B)

Prevalence Index = B/A = #DIV/0!

Hydrophytic Vegetation Indicators:
_____ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
3 - Prevalence Index is ≤3.0[1]
_____ 4 - Morphological Adaptation1 (Provide supporting data in Remarks or on a separate sheet)
_____ 5 - Wetland Non-Vascular Plants[1]
_____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SOIL

Sampling Point: 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10 YR 2/2	100					loamy sand	
5-8	10 YR 3/1	95	10 YR 3/3	5	C	M	loamy sand	
8-16	10 YR 3/1	95	5 YR 3/3	5	C	M	sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Muck Mineral (S1)
- ___ Sandy gleyed Matrix (S4)
- X Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water table Present? Yes X No ___ Depth (inches): 7"

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 10"

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: McCoy Wetland City/County: Wheeler, Tillamook Co Sampling Date: 11/26/2024
Applicant/Owner: Lower Nehalem Community Trust State: OR Sampling Point: DP2
Investigator(s): B Haddaway, T Stout Section, Township, Range: S 35T3 N R10W
Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): none Slope (%): 2
Subregion (LRR): Northwest Forests and Coast (LRR A) Lat: 45.700199N Long: 45.700199N Datum: NAD 83
Soil Map Unit Name: Fluvaquents-Histosols, 0 to 1 persecnt slopes NWI Classification: PEM1Ch
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" Present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	**Yes ____ No X**
Hydric Soil Present?	Yes ____ No X		
Wetland Hydrology Present?	Yes ____ No X		

Remarks: Plot located on constructed but derelict dike. Vegetation meets dominance indicator criteria, but does not meet prevalence index criteria; no soils or hydrology indicators present.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status?
1. *Picea sitchensis*	70	Y	FAC
2. *Alnus rubra*	10		FAC
3.			
4.			
Total Cover:	80		
Shrub Stratum			
1. *Cytisus scoparius*	5	Y	NOL
2. *Frangula purshiana*	2	Y	FAC
3.			
4.			
5.			
Total Cover:	7		
Herb Stratum			
1. *Agrostis stolonifera*	85	Y	FAC
2. *Dactylis glomerata*	5		FACU
3. *Polysthicum munitum*	10		FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
Total Cover:	100		
Woody Vine Stratum			
1. *Rubus ursinus*	5	Y	FACU
2.			
Total Cover:	5		

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 5 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 60% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species		x1 =	0
FACW species		x2 =	0
FAC species	167	x3 =	501
FACU species	20	x4 =	80
UPL species	5	x5 =	25
Column Totals:	192 (A)		606 (B)

Prevalence Index = B/A = 3.2

Hydrophytic Vegetation Indicators:
____ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptation1 (Provide supporting data in Remarks or on a separate sheet)
____ 5 - Wetland Non-Vascular Plants[1]
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Vegetation meets dominance test, but fails prevalence index

SOIL

Sampling Point: 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10 YR 3/1	100					loam	
3-9	7.5 YR 4/3	100					loam	
9-16	7.5 YR 3/3	100					sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Muck Mineral (S1)
- ___ Sandy gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks: No inicators met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No indicators met, plot located on constructed dike

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: McCoy Wetland City/County: Wheeler, Tillamook Co Sampling Date: 11/26/2024
Applicant/Owner: Lower Nehalem Community Trust State: OR Sampling Point: DP3
Investigator(s): B Haddaway, T Stout Section, Township, Range: S 35T3 N R10W
Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): none Slope (%): 0
Subregion (LRR): Northwest Forests and Coast (LRR A) Lat: 45.699643N Long: 45.699643N Datum: NAD 83
Soil Map Unit Name: Fluvaquents-Histosols, 0 to 1 persecnt slopes NWI Classification: PEM1Ch
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" Present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	Yes X No
Hydric Soil Present?	Yes X No		
Wetland Hydrology Present?	Yes X No		

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status?
1.			
2.			
3.			
4.			
Total Cover:	0		
Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	0		
Herb Stratum			
1. *Agrostis stolonifera*	40	Y	FAC
2. *Carex obnupta*	60	Y	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
Total Cover:	0		

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:
OBL species	x1 =	0
FACW species	x2 =	0
FAC species	x3 =	0
FACU species	x4 =	0
UPL species	x5 =	0
Column Totals: 0 (A)		0 (B)

Prevalence Index = B/A = #DIV/0!

Hydrophytic Vegetation Indicators:
____ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptation1 (Provide supporting
____ data in Remarks or on a separate sheet)
____ 5 - Wetland Non-Vascular Plants[1]
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No

Remarks:

SOIL

Sampling Point: 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	7.5 YR 2.5/2	100					loam	
3-7	5BG	90	10 YR 4/4	10	C	M	silt loam	
7-16	7.5 YR 3/2	95	2.5 YR 4/4	5	C	M	sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Muck Mineral (S1)
- ___ Sandy gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- X Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water table Present? Yes X No ___ Depth (inches): 9

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 8

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: McCoy Wetland City/County: Wheeler, Tillamook Co Sampling Date: 11/26/2024
Applicant/Owner: Lower Nehalem Community Trust State: OR Sampling Point: DP4
Investigator(s): B Haddaway, T Stout Section, Township, Range: S 35T3 N R10W
Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): none Slope (%): 0
Subregion (LRR): Northwest Forests and Coast (LRR A) Lat: 45.699588N Long: 123.878950W Datum: NAD 83
Soil Map Unit Name: Fluvaquents-Histosols, 0 to 1 persecnt slopes NWI Classification: PEM1Ch
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" Present? Yes X No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?**	**Yes _____ No X**
Hydric Soil Present?	Yes _____ No X		
Wetland Hydrology Present?	Yes _____ No X		

Remarks: Upland paired plot. Vegetation meets dominance criteria, but fails prevalence index. No hydric soils or wetland hydology indicators present.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status?
1.			
2.			
3.			
4.			
Total Cover:	0		
Shrub Stratum			
1. *Cytisus scoparius*	10	Y	NOL
2. *Lonicera involucrata*	15	Y	FAC
3. *Fagella purshiana*	10	Y	FAC
4.			
5.			
Total Cover:	35		
Herb Stratum			
1. *Carex obnupta*	20	Y	OBL
2. *Pteridium aquilinum*	80	Y	FACU
3. *Polystichum munitum*	20	Y	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
Total Cover:	120		
Woody Vine Stratum			
1. *Rubus armeniacus*	10	Y	FAC
2.			
Total Cover:	10		

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)
Total Number of Dominant Species Across All Strata: 7 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 57% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	20	x1 =	20
FACW species		x2 =	0
FAC species	25	x3 =	75
FACU species	100	x4 =	400
UPL species	10	x5 =	50
Column Totals:	155 (A)		545 (B)

Prevalence Index = B/A = 3.5

Hydrophytic Vegetation Indicators:
_____ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
_____ 3 - Prevalence Index is ≤3.0[1]
_____ 4 - Morphological Adaptation1 (Provide supporting data in Remarks or on a separate sheet)
_____ 5 - Wetland Non-Vascular Plants[1]
_____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: Dominance test met, prevalence index criteria not met.

SOIL

Sampling Point: 4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	7.5 YR 2.5/1	100					loam	
2-8	7.5 YR 3/2	100					loamy sand	
8-12	7.5 YR 3/3	100					loamy sand	
12-16	7.5 YR 3/1	95	7.5 YR 3/3	5	C	M	loamy sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Muck Mineral (S1)
- ___ Sandy gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: McCoy Wetland City/County: Wheeler, Tillamook Co Sampling Date: 11/26/2024
Applicant/Owner: Lower Nehalem Community Trust State: OR Sampling Point: DP5
Investigator(s): B Haddaway, T Stout Section, Township, Range: S 35T3 N R10W
Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): none Slope (%): 0
Subregion (LRR): Northwest Forests and Coast (LRR A) Lat: 45.699818N Long: 123.878219W Datum: NAD 83
Soil Map Unit Name: Templeton-Klootchie complex, 30 to 60% slopes NWI Classification: UPL
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" Present? Yes X No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?**	Yes X No _____
Hydric Soil Present?	Yes X No _____		
Wetland Hydrology Present?	Yes X No _____		

Remarks: Unpaired plot taken as representative of mapped soil unit within study area

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status?
1. *Picea sitchensis*	90		FAC
2.			
3.			
4.			
Total Cover:	90		
Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	0		
Herb Stratum			
1. *Carex obnupta*	95	Y	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
Total Cover:	95		
Woody Vine Stratum			
1.			
2.			
Total Cover:	0		

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:
OBL species	x1 =	0
FACW species	x2 =	0
FAC species	x3 =	0
FACU species	x4 =	0
UPL species	x5 =	0
Column Totals: 0 (A)		0 (B)

Prevalence Index = B/A = #DIV/0!

Hydrophytic Vegetation Indicators:
_____ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
3 - Prevalence Index is ≤3.0[1]
_____ 4 - Morphological Adaptation1 (Provide supporting
_____ data in Remarks or on a separate sheet)
_____ 5 - Wetland Non-Vascular Plants[1]
_____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SOIL

Sampling Point: 5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10 YR 4/1	100					silty clay	
4-11	10 YR 4/1	85	2.5YR 4/4	10	C	M	silty clay	
			2.5 YR 4/4	5	C	PL	silty clay	
11-16	10 YR 4/1	70	5 YR 4/6	30	C	M	silty clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Muck Mineral (S1)
- ___ Sandy gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water table Present? Yes X No ___ Depth (inches): 1

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 3

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: McCoy Wetland City/County: Wheeler, Tillamook Co Sampling Date: 1/10/2025
Applicant/Owner: Lower Nehalem Community Trust State: OR Sampling Point: DP6
Investigator(s): B Haddaway, T Stout Section, Township, Range: S 35T3 N R10W
Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): none Slope (%): 0
Subregion (LRR): Northwest Forests and Coast (LRR A) Lat: 45.699961N Long: 45.699961N Datum: NAD 83
Soil Map Unit Name: Templeton-Klootchie complex, 30-60% slopes NWI Classification: UPL
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" Present? Yes X No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No X	**Is the Sampled Area within a Wetland?**	**Yes _____ No X**
Hydric Soil Present?	Yes _____ No X		
Wetland Hydrology Present?	Yes _____ No X		

Remarks: Upland paired plot.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status?
1.			
2.			
3.			
4.			
Total Cover:	0		
Shrub Stratum			
1. *Rubus armeniacus*	50	Y	FAC
2.			
3.			
4.			
5.			
Total Cover:	50		
Herb Stratum			
1. *Polystichum munitum*	35	Y	FACU
2. *Pteridium aquilinum*	20	Y	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
Total Cover:	55		
Woody Vine Stratum			
1. *Rubus laciniatus*	10	Y	FACU
2.			
Total Cover:	10		

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 25% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species		x1 =	0
FACW species		x2 =	0
FAC species	50	x3 =	150
FACU species	65	x4 =	260
UPL species		x5 =	0
Column Totals:	115 (A)		410 (B)

Prevalence Index = B/A = 3.6

Hydrophytic Vegetation Indicators:
_____ 1 - Rapid Test for Hydrophytic Vegetation
_____ 2 - Dominance Test is >50%
_____ 3 - Prevalence Index is ≤3.0[1]
_____ 4 - Morphological Adaptation1 (Provide supporting data in Remarks or on a separate sheet)
_____ 5 - Wetland Non-Vascular Plants[1]
_____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: Dominance test met, prevalence index criteria not met.

SOIL

Sampling Point: 6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 4/3	100					gravel/sand	road embankment fill

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Muck Mineral (S1)
- ___ Sandy gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: McCoy Wetland City/County: Wheeler, Tillamook Co Sampling Date: 1/10/2025
Applicant/Owner: Lower Nehalem Community Trust State: OR Sampling Point: DP7
Investigator(s): B Haddaway, T Stout Section, Township, Range: S 35T3 N R10W
Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): none Slope (%): 0
Subregion (LRR): Northwest Forests and Coast (LRR A) Lat: 45.699959N Long: 123.878257W Datum: NAD 83
Soil Map Unit Name: Templeton-Klootchie complex, 30 to 60% slopes NWI Classification: UPL
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" Present? Yes X No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?**	**Yes X No _____**
Hydric Soil Present?	Yes X No _____		
Wetland Hydrology Present?	Yes X No _____		

Remarks: Wetland paired plot.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status?
1. *Picea sitchensis*	10	Y	FAC
2.			
3.			
4.			
Total Cover:	10		

Shrub Stratum			
1. *Rubus armeniacus*	60	Y	FAC
2.			
3.			
4.			
5.			
Total Cover:	60		

Herb Stratum			
1. *Carex obnupta*	30	Y	OBL
2. *Polysthicum munitum*	10	Y	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
Total Cover:	40		

Woody Vine Stratum			
1.			
2.			
Total Cover:	0		

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 75% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species		x1 =	0
FACW species		x2 =	0
FAC species		x3 =	0
FACU species		x4 =	0
UPL species		x5 =	0
Column Totals:	0 (A)		0 (B)

Prevalence Index = B/A = #DIV/0!

Hydrophytic Vegetation Indicators:
_____ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
3 - Prevalence Index is ≤3.0[1]
_____ 4 - Morphological Adaptation1 (Provide supporting
_____ data in Remarks or on a separate sheet)
_____ 5 - Wetland Non-Vascular Plants[1]
_____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: R. Ameniacus included in shrub stratum because it is large, upright mound.

SOIL

Sampling Point: 7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10 YR 3/2	100					sandy loam	
5-8	10 YR 3/2	100					sand	
8-16	10 YR 3/2	65	10 YR 4/1	30	D	M	sand	
			10 YR 4/4	5	C	M	sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Muck Mineral (S1)
- ___ Sandy gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- X Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Plot fails to meet FAC- neutral test but vegetation meets prevelance index criteria without FAC species. Plot located near upland boundary in sandy soil slope, meets vegetation and soils critieria.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: McCoy Wetland City/County: Wheeler, Tillamook Co Sampling Date: 1/10/2025
Applicant/Owner: Lower Nehalem Community Trust State: OR Sampling Point: DP8
Investigator(s): B Haddaway, T Stout Section, Township, Range: S 35T3 N R10W
Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): none Slope (%): 0
Subregion (LRR): Northwest Forests and Coast (LRR A) Lat: 45.699656N Long: 123.881137W Datum: NAD 83
Soil Map Unit Name: Fulvaquents-Histosols Complex, 0-1% slopes NWI Classification: UPL
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" Present? Yes X No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?**	**Yes X No _____**
Hydric Soil Present?	Yes X No _____		
Wetland Hydrology Present?	Yes X No _____		

Remarks: Wetland paired plot.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status?
1. *Picea sitchensis*	10	Y	FAC
2.			
3.			
4.			
Total Cover:	10		
Shrub Stratum			
1. *Rubus armeniacus*	60	Y	FAC
2.			
3.			
4.			
5.			
Total Cover:	60		
Herb Stratum			
1. *Carex lyngbei*	30	Y	OBL
2. *Juncus balticus*	20	Y	OBL
3. *Argentina anserina*	30	Y	OBL
4. *Agrostis stolonifera*	20	Y	FAC
5. *Deschampsia cespitosa*	15		FACW
6. *Festuca arundinacea*	25	Y	FAC
7.			
8.			
9.			
10.			
11.			
Total Cover:	140		
Woody Vine Stratum			
1.			
2.			
Total Cover:	0		

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)
Total Number of Dominant Species Across All Strata: 6 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 83% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species		x1 =	0
FACW species		x2 =	0
FAC species		x3 =	0
FACU species		x4 =	0
UPL species		x5 =	0
Column Totals:	0 (A)		0 (B)

Prevalence Index = B/A = #DIV/0!

Hydrophytic Vegetation Indicators:
_____ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
3 - Prevalence Index is ≤3.0[1]
_____ 4 - Morphological Adaptation1 (Provide supporting
_____ data in Remarks or on a separate sheet)
_____ 5 - Wetland Non-Vascular Plants[1]
_____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SOIL

Sampling Point: 8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	7.5 YR 4/3	100					sandy loam	
4-9	10 YR 4/2	80	7.5 YR 4/6	15	C	M	sandy loam	
			2.5 YR 4/4	5	C	M		
9-16	10 YR 4/2	60	7.5 YR 4/6	15	C	M	loam	
			2.5 YR 3/6	25	C	M/PL		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Muck Mineral (S1)
- ___ Sandy gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- C Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 10

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: McCoy Wetland City/County: Wheeler, Tillamook Co Sampling Date: 1/10/2025
Applicant/Owner: Lower Nehalem Community Trust State: OR Sampling Point: DP9
Investigator(s): B Haddaway, T Stout Section, Township, Range: S 35T3 N R10W
Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): none Slope (%): 0
Subregion (LRR): Northwest Forests and Coast (LRR A) Lat: 45.699660N Long: 123.881036W Datum: NAD 83
Soil Map Unit Name: Fulvaquents-Histosols Complex, 0-1% slopes NWI Classification: UPL
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" Present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	**Is the Sampled Area within a Wetland?**	**Yes ____ No X**
Hydric Soil Present?	Yes ____ No X		
Wetland Hydrology Present?	Yes ____ No X		

Remarks: Wetland paired plot.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status?
1. *Picea sitchensis*	100	Y	FAC
2.			
3.			
4.			
Total Cover:	100		
Shrub Stratum			
1. *Gaultheria shallon*	40	Y	FACU
2.			
3.			
4.			
5.			
Total Cover:	40		
Herb Stratum			
1. *Polysthicum munitum*	10		FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
Total Cover:	10		
Woody Vine Stratum			
1. *Rubus ursinus*	25		FACU
2.			
Total Cover:	25		

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 25% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species		x1 =	0
FACW species		x2 =	0
FAC species	100	x3 =	300
FACU species	75	x4 =	300
UPL species		x5 =	0
Column Totals:	175 (A)		600 (B)

Prevalence Index = B/A = 3.4

Hydrophytic Vegetation Indicators:
____ 1 - Rapid Test for Hydrophytic Vegetation
____ 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤3.0[1]
____ 4 - Morphological Adaptation1 (Provide supporting data in Remarks or on a separate sheet)
____ 5 - Wetland Non-Vascular Plants[1]
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL

Sampling Point: 9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-7	10 YR 4/3	100					sandy loam	lots of organic material, roods

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Muck Mineral (S1)
- ___ Sandy gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Roots
Depth (inches): 7"

Hydric Soil Present? Yes ___ No X

Remarks: Plot located on eroded dike with extensive root system and nurselogs making much of the substrate.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___
Water table Present? Yes ___ No X Depth (inches): ___
Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Plot located on top of weathered dike, located on a ridge with no source of hydrology.

Appendix C. Site Photographs

Photopoint 1 Photo 1: Looking north along overgrown dike

Photopoint 1 Photo 2: Looking east towards Wetland 1

Photopoint 1Photo 3: Looking south along overgrown dike.

Photopoint 1 Photo 4: Looking west towards Nehalem River.

Photopoint 2 Photo 1: Looking north at Wetland 1.

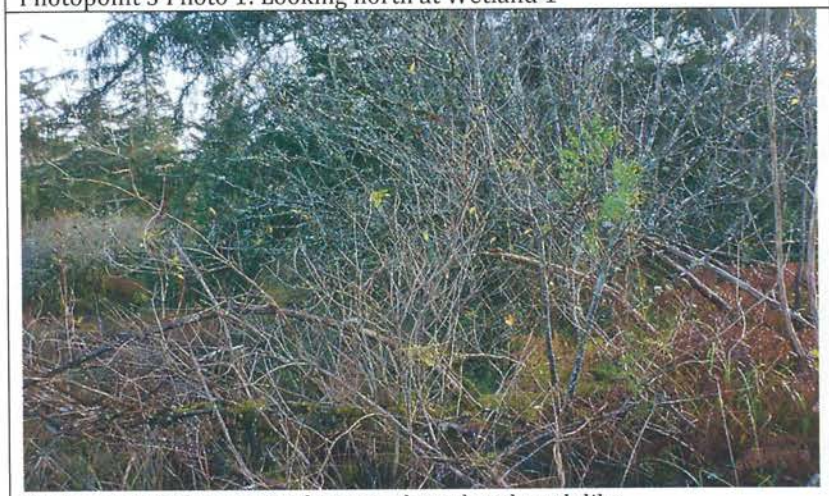
Photopoint 2 Photo 2: Looking east at Wetland 1 and Hwy 101.

Photopoint 2, Photo 3: Looking south

Photopoint 2 Photo 4: Looking west

Photopoint 3 Photo 1: Looking north at Wetland 1

Photopoint 3, Photo 2: Looking east along dike and Wetland 1.



Photopoint 3 Photo 3: Looking south at abandoned dike.

Photopoint 3 Photo 4: Looking west.

Photopoint 4 Photo 1: Looking north at hummock.

Photopoint 4 Photo 2: Looking east at Wetland 1

Photopoint 4 Photo 3: Looking south at Wetland 1

Photopoint 4 Photo 4: Looking west at Wetland 1.

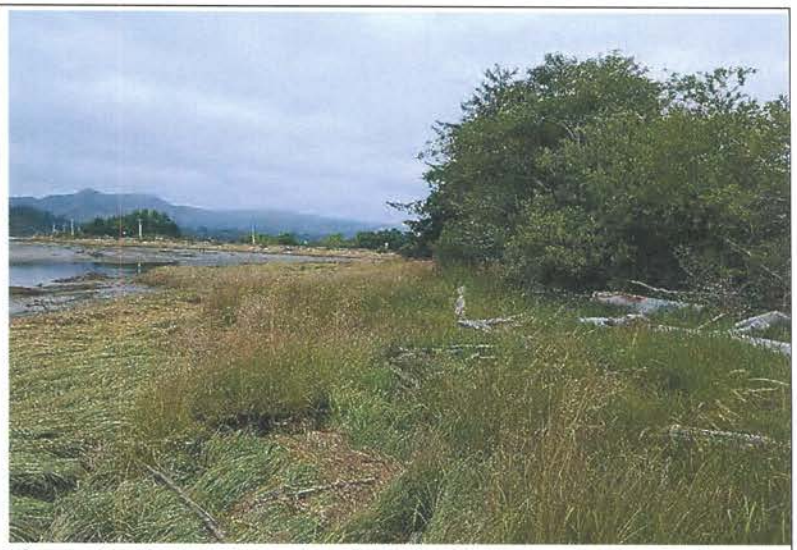
Photopoint 5 Photo 1: Looking north at abandoned dike.

Photopoint 5 Photo 2. Looking east.

Photopoint 5, Photo 3: Looking south at Botts Marsh.

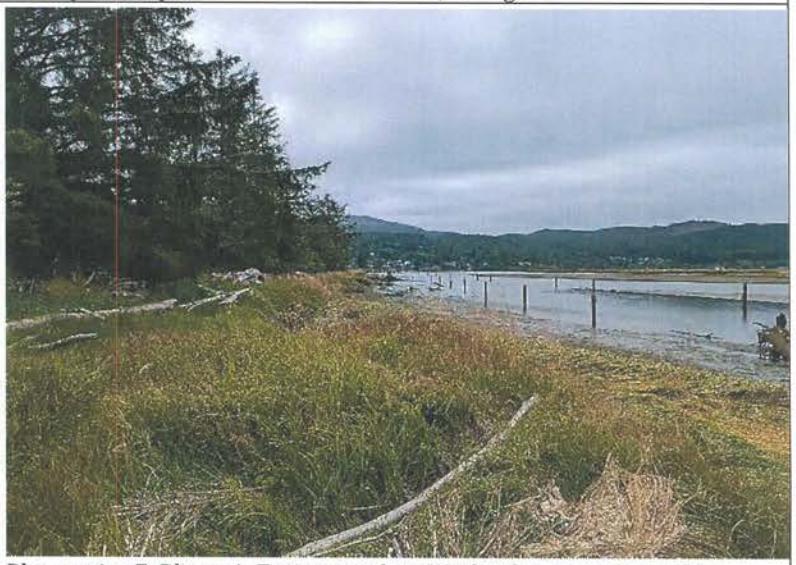
Photopoint 5, Photo 4. Looking west

Photopoint 6, Photo 1: ODOT parking area/construction staging area.

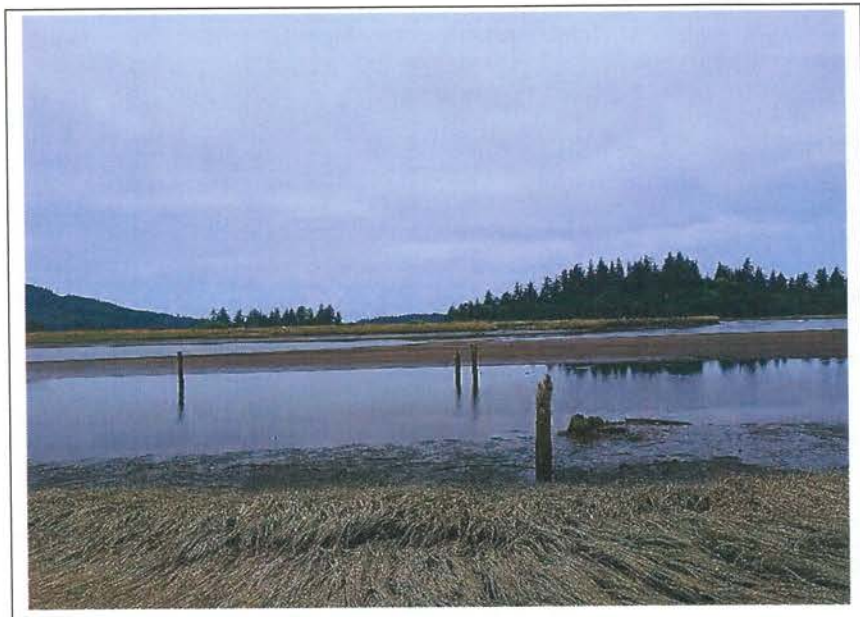


Photopoint 7, photo 1: Outboard of dike, facing north in Wetland 2.

Photopoint 7, Photo 2: Facing east, eroded and overgrown dike.



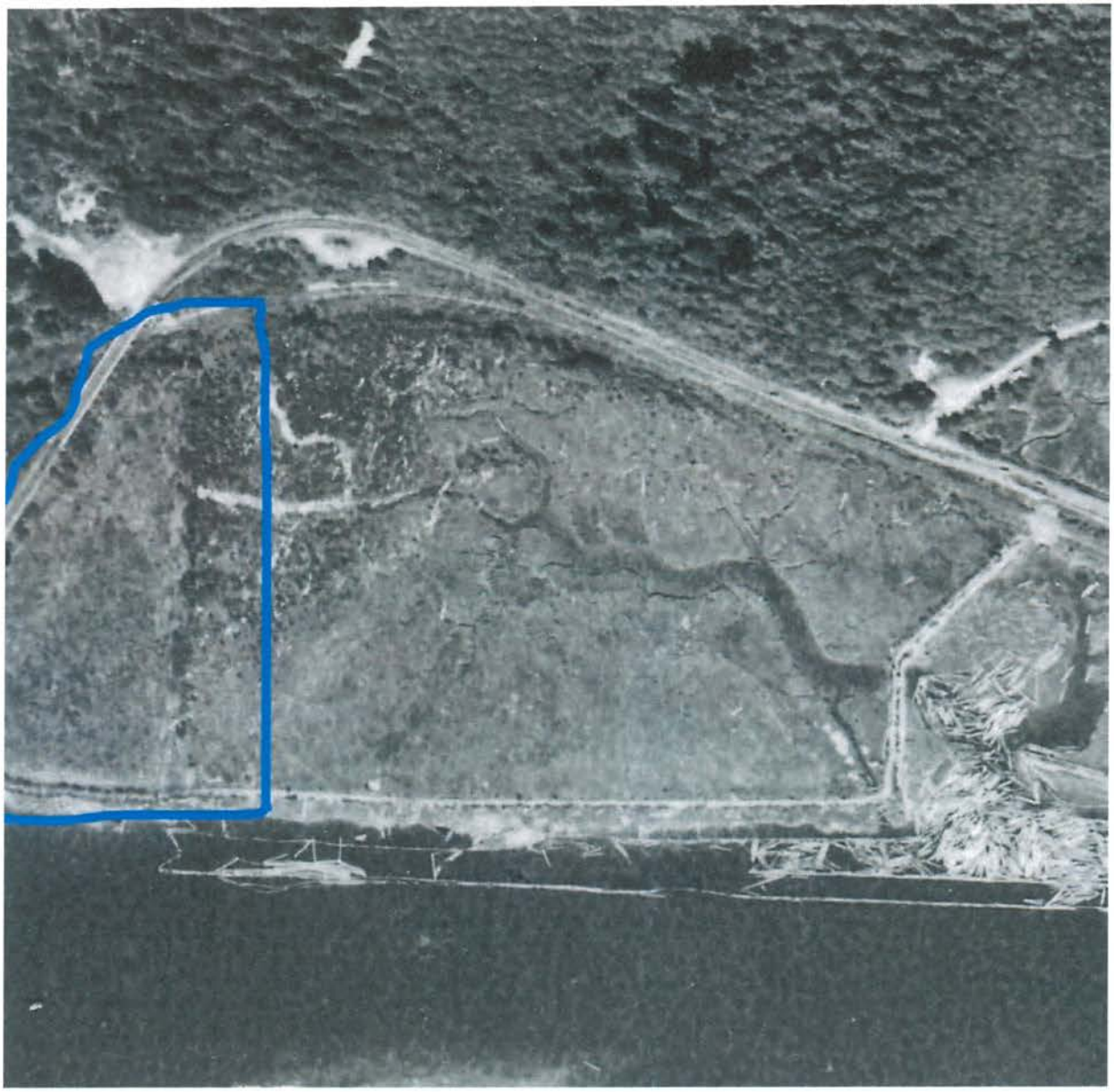
Photopoint 7, Photo 4: Facing south at Wetland 2, overgrown dike and Nehalem River.



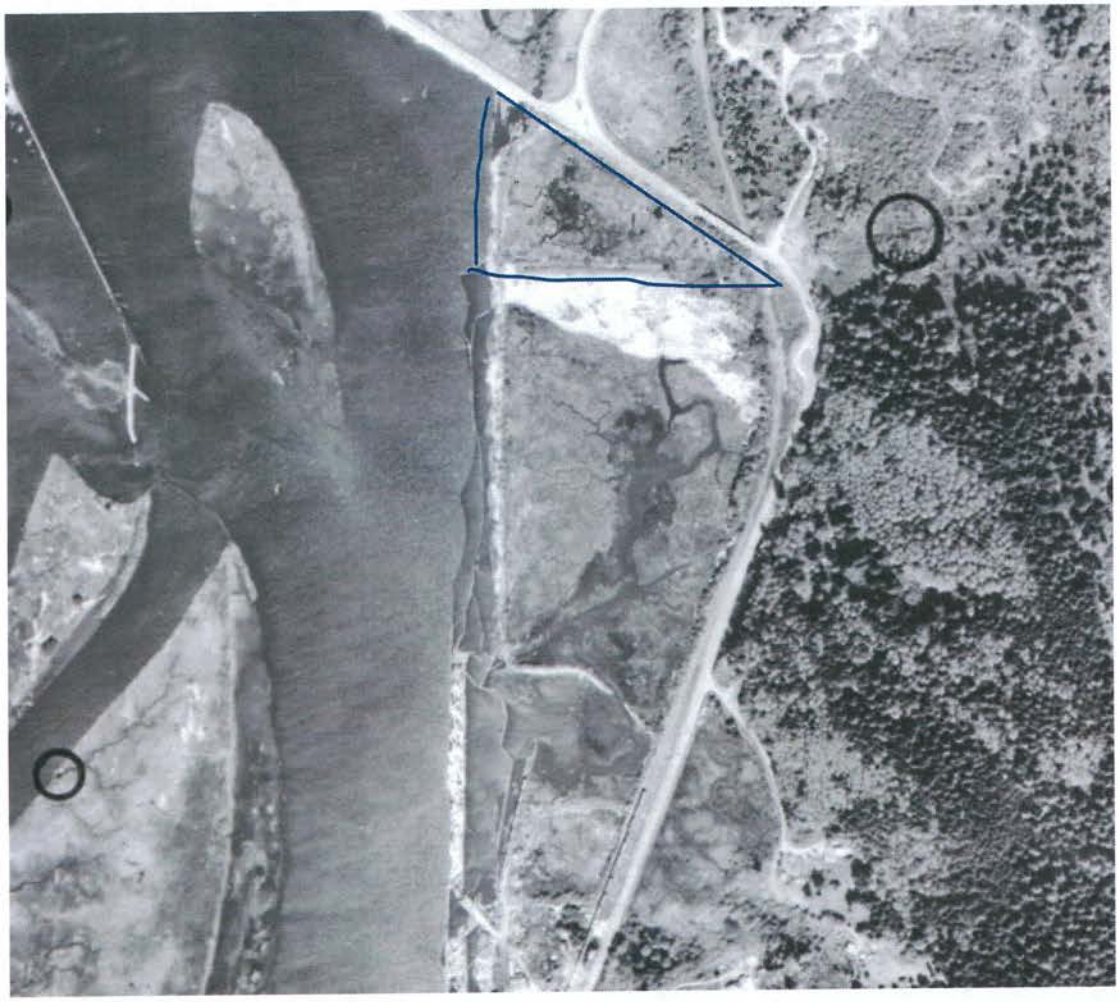
Photopoint 7, Photo 1: Facing west at Nehalem River.

Appendix D. Additional Tables and Information

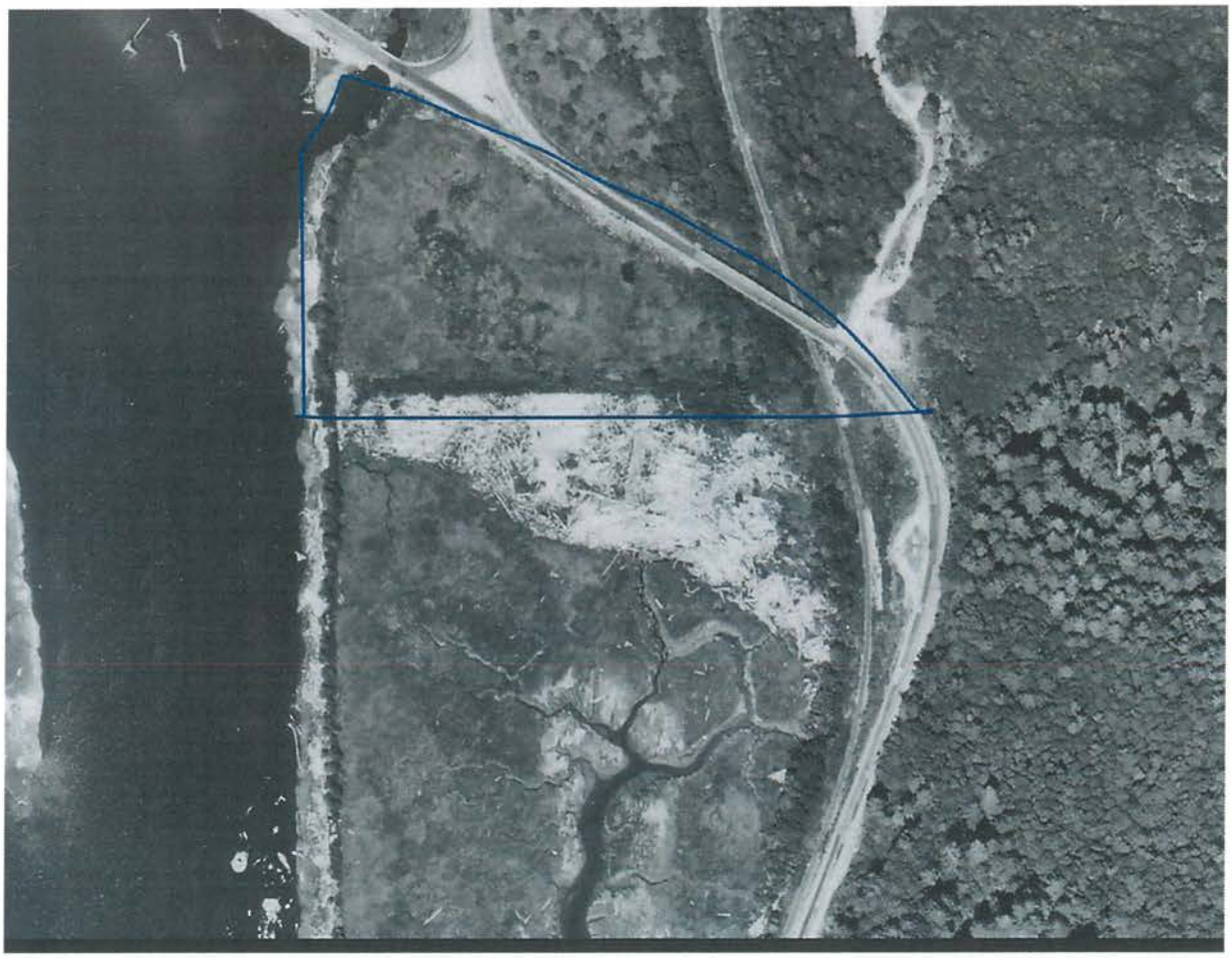
1945 Photo



1950 Photo



1960 Photo

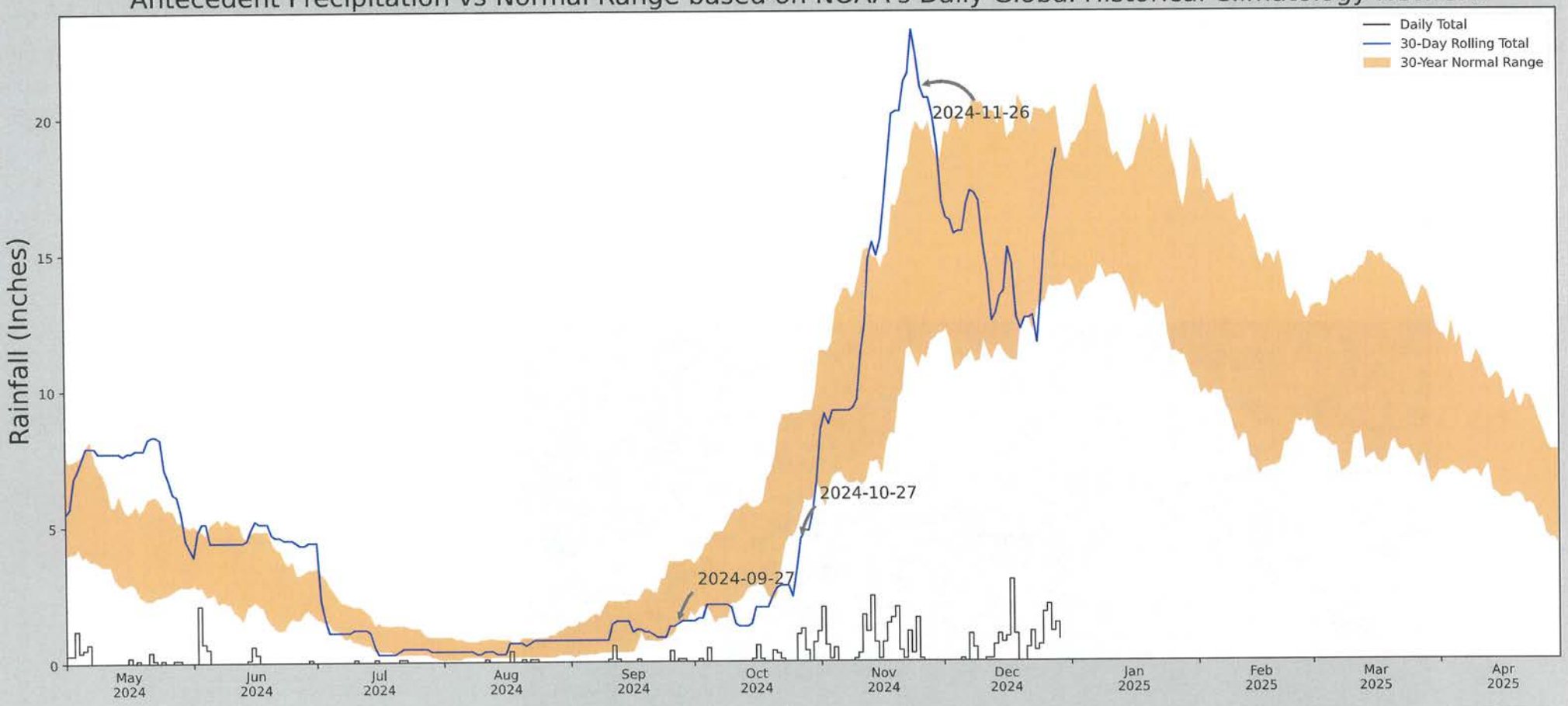


1965 Photo

1986 Photo.

2024 Google Earth Photo

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	45.700140, -123.880360
Observation Date	2024-11-26
Elevation (ft)	8.677
Drought Index (PDSI)	Incipient wetness
WebWIMP H_2O Balance	Wet Season

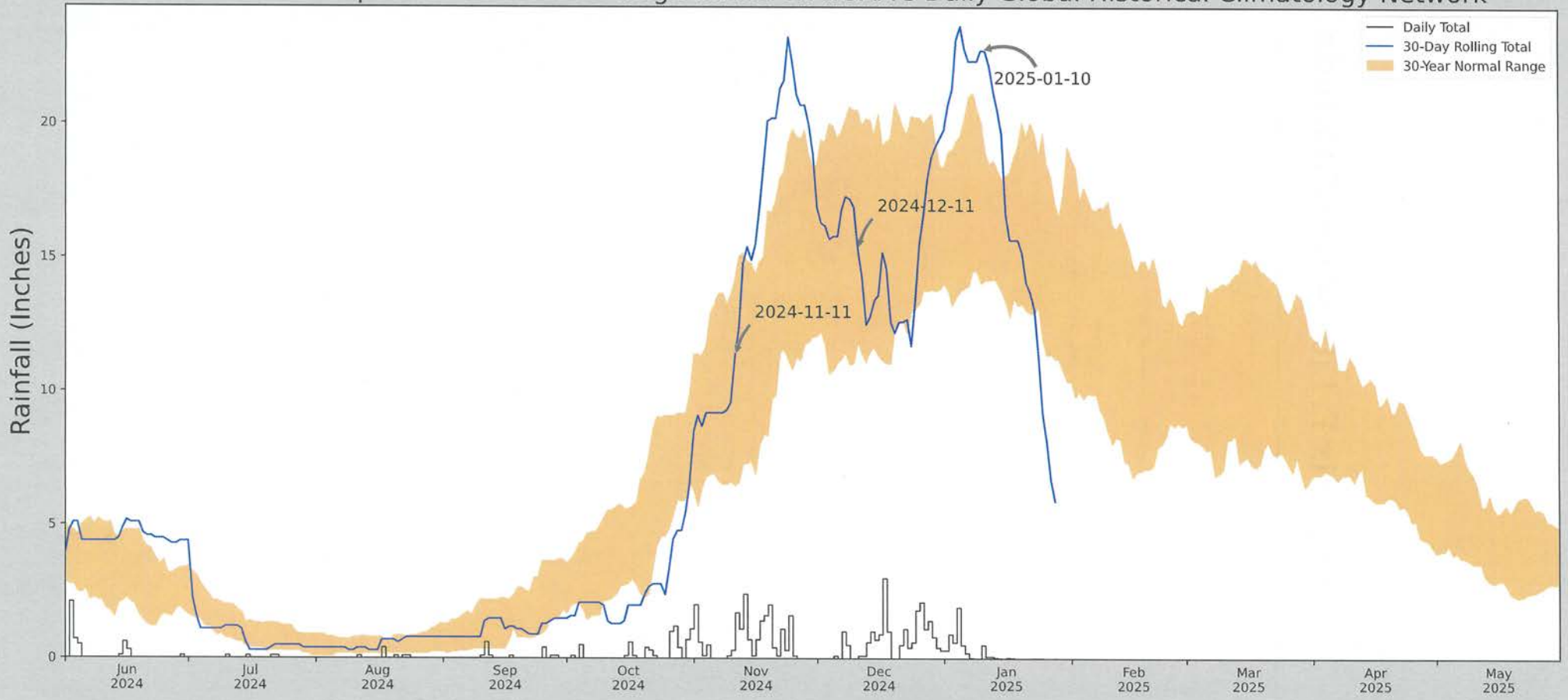
30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-11-26	11.287008	19.528741	21.090552	Wet	3	3	9
2024-10-27	5.403543	9.08189	4.492126	Dry	1	2	2
2024-09-27	1.479134	3.653543	1.393701	Dry	1	1	1
Result							Normal Conditions - 12

Figure and tables made by the **Antecedent Precipitation Tool** Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
Saddle Mountain	45.54, -123.37	3109.908	27.031	3101.231	95.994	11346	89
TILLAMOOK 17.3 NE	45.6017, -123.5466	658.137	9.546	2451.771	27.7	4	0
TILLAMOOK 16.1 ENE	45.584, -123.5592	539.042	9.644	2570.866	29.133	1	0
TIMBER 0.3 NNE	45.7238, -123.294	911.089	13.22	2198.819	35.017	2	1

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	45.700140, -123.880360
Observation Date	2025-01-10
Elevation (ft)	8.677
Drought Index (PDSI)	Not available
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2025-01-10	14.031497	20.048032	22.716536	Wet	3	3	9
2024-12-11	11.867323	20.501969	15.291339	Normal	2	2	4
2024-11-11	6.468898	14.195276	11.291339	Normal	2	1	2
Result							Wetter than Normal - 15

Figure and tables made by the
Antecedent Precipitation Tool
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
Saddle Mountain	45.54, -123.37	3109.908	27.031	3101.231	95.994	11346	89
TILLAMOOK 17.3 NE	45.6017, -123.5466	658.137	9.546	2451.771	27.7	4	0
TILLAMOOK 16.1 ENE	45.584, -123.5592	539.042	9.644	2570.866	29.133	1	1
TIMBER 0.3 NNE	45.7238, -123.294	911.089	13.22	2198.819	35.017	2	0

Appendix E. Literature Citations

Environmental Laboratory. 1987. U.S. Army Corps of Engineers Wetland Delineation Manual. Technical Report Y-87-1. U.S. Army Waterways Experiment Station. Vicksburg, MS.

Corps (U.S. Army Corps of Engineers). 2010. U.S. Army Corps of Engineers Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Mountains, Valley and Coast Region (Version 2.0). Technical Report ERDC/EL TR-08-28. U.S. Army Engineer Research and Development Center. Vicksburg, MS.

Corps. 2020. National Wetland Plant List, version 3.5. U.S. Army Corps of Engineers Engineer Research and Development Center. Cold Regions Research and Engineering Laboratory, Hanover, NH. Available at: http://wetland-plants.usace.army.mil/

Gretag Macbeth. 2000. Revised Edition. Munsell Soil Color Charts. New Windsor, NY.

NRCS (National Resources Conservation Service). 2022. Wetlands Climate Tables. Available at: https://www.nrcs.usda.gov/sites/default/files/202211/Wetlands%20Climate%20Tables%20.pdf

NRCS. 2024. Web Soil Survey. Soil Survey Staff, United States Department of Agriculture NRCS. Accessed July 23, 2024. Available at: http://websoilsurvey.sc.egov.usda.gov/.

Thorson, T.D., Bryce, S.A., Lammers, D.A., Woods, A.J., Omernik, J.M., Kagan, J., Pater, D.E., and Comstock, J.A., 2003. Ecoregions of Oregon (color poster with map, descriptive text, summary tables, and photographs): Reston, Virginia, U.S. Geological Survey (map scale 1:1,500,000). Accessed July 23, 2024. Available at: https://gaftp.epa.gov/EPADataCommons/ORD/Ecoregions/or/or_eco_lg.pdf

USFWS (U.S. Fish and Wildlife Service). 2024. National Wetland Inventory – Wetlands Mapper. Accessed July 12, 2024. Available at: https://www.fws.gov/wetlands/data/Mapper.html.

McCoy Marsh Tidal Reconnection Project
Draft 60% Basis of Design Report

View of McCoy Marsh Looking South from Along Highway 101

prepared for

Lower Nehalem Community Trust

Wild Salmon Center

prepared by

Waterways Consulting, Inc.

1020 SW Taylor St. Suite 380
Portland, Oregon 97205

July 2, 2025

CONTENTS

FIGURES

TABLES

APPENDICES

1.0 INTRODUCTION

1.1 Project Overview

The McCoy Marsh Tidal Reconnection project provides an opportunity to create immediate ecological uplift and reclaim tidal wetlands in the Nehalem River estuary through breaching dikes that no longer serve any practical purpose. The McCoy property, a 9-acre diked former tidal wetland purchased by the Lower Nehalem Community Trust (LNCT) for preservation and restoration, is located along the east edge of Nehalem Bay just north of the town of Wheeler (**Figure 1**). The property is directly adjacent to Bott's Marsh, a 35-acre intact tidal wetland also owned and managed by LNCT. Waterways was hired by LNCT to assist the landowner and its project partners – including Wild Salmon Center (WSC), Oregon Department of Fish and Wildlife (ODFW), Tillamook Estuary Partnership (TEP), and Nehalem Bay Watershed Council (NBWC) – in collaboratively developing a restoration plan and designing the project.

This report describes the existing features and processes at the site, modeling of the existing and proposed conditions tidal hydraulics, documents the alternatives analysis and selection process, and explains the basis for the project design for the preferred alternative. The report is accompanied by a series of Appendices that provide supplemental information to the main report. The 60% (permit-ready) plans are provided as **Appendix A**.

***Figure 1**. Location of Project Area within Nehalem Bay, Shown at Low Tide (from Google Earth).*

1.2 Project Goals and Objectives

An initial kickoff site visit was attended by the entire design and technical advisory team (LNCT, WSC, ODFW, TEP, NBWC, and Waterways). During the site visit, the team reviewed the potential site opportunities and constraints and discussed the project goals and objectives. Following the initial site visit, the design team (LNCT, WSC, and Waterways) led a brief process to collaboratively define the goals and objectives for the project. **Appendix B** contains information on the feedback received, and documents project partners' input on refining and prioritizing the objectives. Through this process the group adopted the following goals and objectives for the project:

Goal Statement

> "Restore tidal processes to the entirety of the 9-acre McCoy Wetland, which are currently inhibited by perimeter dikes, to create critical estuarine habitats "

Objectives

At the kickoff site visit, seven specific project objectives were identified and later refined by the group. Each attendee provided specific feedback and/or wording of the objectives and ranked the objectives in order of priority, from first to seventh. An average "priority score" helped to show which objectives were most important to the group. **Table 1** summarizes the project objectives and priorities. In summary, the primary objectives include re-introducing tidal exchange, providing off-channel tidal rearing habitat for salmonids, and creating the conditions to allow for "high marsh" habitat to form on much of the property. Secondary objectives, to be achieved if possible and practical, include maximizing the extent of removal of artificial fill, and expanding tidal Sitka spruce wetland in parts of the property. Recreational and educational objectives were also considered, but the design team and technical advisors concluded that such project elements, including parking, post-construction site access, trails, and signage, will be considered later by LNCT, separately from the habitat restoration effort. That said, one of the requirements of the project designs will be that LNCT crews must be able to access the site for planned vegetation monitoring and maintenance.

Table 1. *Project Objectives and Priorities*

	Objective #	Initial Objectives (to be quantified later)	Average Priority Score
Primary Objectives	1	Re-introduce salt water tidal exchange with a frequency and extent resembling the pre-dike condition.	2.0
	2	Provide off-channel rearing habitat to salmonids during highest tides and river flows (above 7.5' elevation)	2.2
	3	Create "high marsh" habitat similar to non-channelized parts of Botts Marsh	3.3
	4	Provide off-channel rearing habitat to salmonids during more frequent periods (above 4' elevation)	3.8
Secondary Objectives	5	Remove as much of the artificial levee as possible	4.6
	6	Expand tidal sitka spruce wetland around Nehalem Bay	5.5
	7	Provide recreational or educational access and opportunities	6.3

2.0 EXISTING CONDITIONS

2.1 Project Area Overview

The McCoy Marsh wetland is a 9-acre parcel on the east side of Nehalem Bay, just upstream of the community of Wheeler, Oregon (**Figure 1**). The property has been disconnected from tidal influence by the construction of dikes, and is adjacent to Botts Marsh, a larger and tidally connected wetland considered to be a highly valuable high marsh environment containing a well-developed tidal channel network. McCoy Marsh is separated from Bott's Marsh by a constructed levee, which is now degraded and densely vegetated including several very large spruce trees. A 12-inch concrete culvert under an eroded part of the levee separating McCoy and Bott's marshes (**Figure 2A**) allows some minor tidal exchange at tides above 8 feet elevation. During very high tides above 10 feet (typically king tides), tidal water overtops the levee and fills the McCoy wetland, which subsequently drains slowly through the culvert back into Bott's marsh.

Although the property has been isolated from regular tidal influence for at least 80 years by constructed levees, it was not filled or graded and retains much of its historic microtopography and wetland character. The ground surface in McCoy Marsh is generally between 8- and 10-feet elevation (NAVD88), comparable to elevations in the northern extent of Bott's Marsh (**Figure 2B**). This suggests the possibility of restoring "high marsh" habitat with similar conditions as in Bott's Marsh.

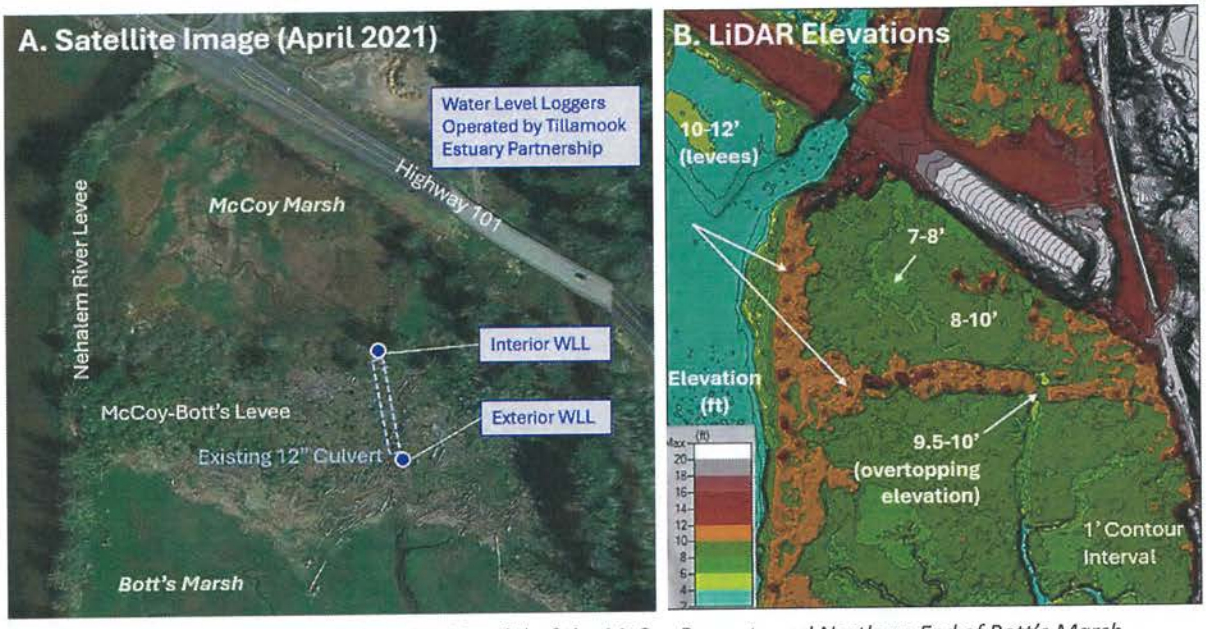


Figure 2. *Satellite Image (A) and Elevation Map (B) of the McCoy Property and Northern End of Bott's Marsh.*

2.2 Vegetation

To better understand existing botanical conditions, potential future conditions, and inform revegetation planning, Ash Creek Forest Management (Ash Creek) performed an initial site visit to the property and to a nearby "reference site" at a similar elevation on the northern margin of Nehalem Bay considered to support healthy tidal wetland vegetation. Ash Creek's description of existing conditions, included in the Revegetation Plan (**Appendix C**), is summarized below:

> The parts of the McCoy property below about 9 feet elevation contain a dense population of wetland sedges, rushes, and grasses. Vegetation in the buffer zones and elevations above ordinary high water are for the most part healthy, except for a few large patches of *Rubus armeniacus* (Himalayan blackberry), which is on the wetland side of the dike. Some *Polygonum ssp.* (Knotweed) is established on the river side of the dike.

One relevant observation made by Ash Creek is that, although substantial knotweed is present in Bott's Marsh as tidal wrack or drift material, little to no knotweed has become established on the high marsh surfaces. Ash Creek interprets this as meaning that while propagules are introduced through tidal exchanges, knotweed may not be able to survive and establish in the areas in Bott's Marsh, probably because they are frequently inundated with brackish waters. When the levees are breached, McCoy Marsh will probably also receive knotweed propagules, but Ash Creek infers that these may not be able to establish in the frequently inundated areas of the property. Even so, careful monitoring and possible management of knotweed and other invasive species should be performed following the project.

Wetlands

Cascade Environmental Group (CEG) mapped wetlands on the site based on plant species, soil properties, and other indicators (see **Appendix D** for full report). Based on this mapping, nearly all the site is wetland except for narrow areas along the levees above about nine feet elevation (**Figure 3**). The wetlands shown in **Figure 3** include both tidal and nontidal conditions, including estuarine E2EM and flat PSS/PFO wetland types. The wetland was protected from tidal inundation by a dike that has since partially eroded. E2EM communities are supported both inboard and outboard of the dike below approximately nine feet, NAVD 88 feet elevation; PSS and PFO communities are located near the degraded dike at the east end of the study area and in a few low mounds above elevations that support E2EM communities.

The degraded dikes are a partial barrier to tidal inundation and floods, but surface water is able to circumvent the dike through a culvert (**Figure 2A**). Small drainage channels have formed within the E2EM community, routing surface water towards the culvert as the primary surface water outlet.

E2EM communities are vegetated with triangular club-rush (*Schoenoplectus pungens*, OBL) saltgrass (*Distychilis spicata*, OBL), creeping bentgrass (*Agrostis stolonifera*, FAC), slender cinquefoil (*Argentina anserina*, OBL), Lyngby's sedge (*Carex lyngbei*, OBL) and E2EM communities were inundated to the surface during fieldwork and do not border uplands, no data plots were recorded in E2EM areas.

PSS communities are vegetated with twinberry (*Lonicera involucrata*, FACW), salmonberry (*Rubus spectabilis*, FACW), trailing blackberry (*Rubus ursinus*, FACU), and Armenian blackberry (*Rubus armeniacus*, FAC), cascara (*Frangula purshiana*, FAC) with slough sedge (*Carex obnupta*, OBL), sea watch (*Angelica lucida*, NOL), sword fern (*Polystichum munitum*, FACU), and pearly everlasting (*Anaphalis margaritacea*, FACU). PFO communities were dominated by Sitka spruce (*Picea sitchensis*, FAC), with slough sedge, and sword fern, and salal (*Gaultheria shallon*, FACU) growing on hummocks in the understory. Vegetation within PSS and PFO communities met the dominance test for hydrophytic vegetation; soils met indicators for loamy gleied matrix (F2), sandy redox (S5), and depleted matrix; and test plots met hydrology indicators for high water table (A2), soil saturation A3, and FAC-neutral test.

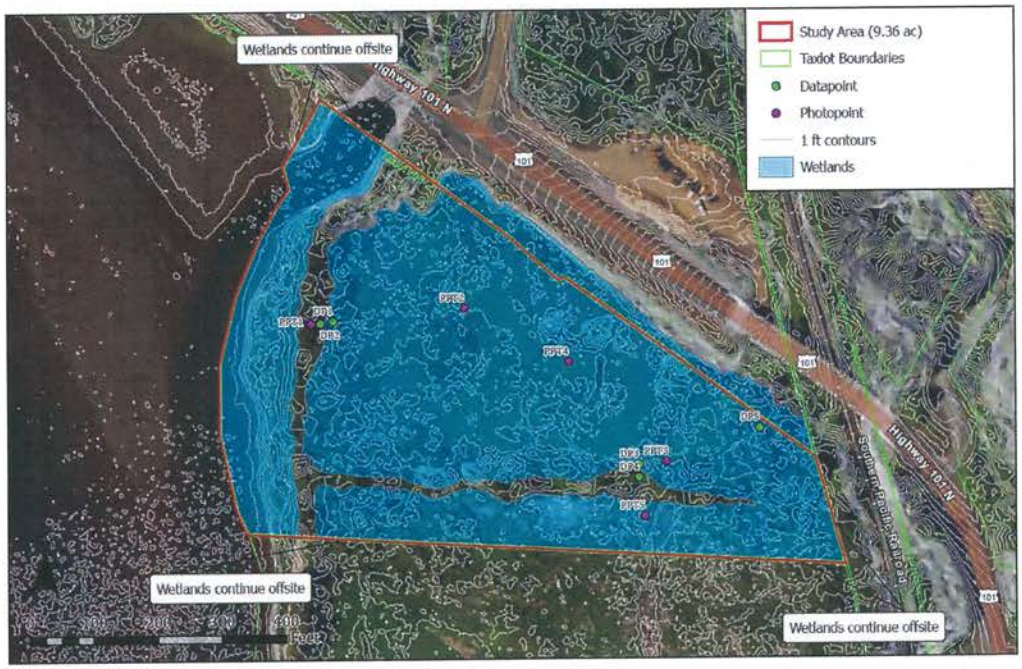


Figure 3. *Mapped Wetlands in Project Area (Preliminary Data Provided by Cascade Environmental Group, 2024)*

Uplands

Uplands within the study area consist of the degraded dikes, the highway embankment, and the ODOT maintenance parking area on the north side of Highway 101. The dike was likely constructed of local soils, which are a mix of loams and sandy loam, whereas the Highway 101 embankment soils appeared to be imported fill, consisting of sands and gravel. Uplands occurring as the failed dike and highway embankment supported similar vegetation, Sitka spruce, red alder (*Alnus rubra*, FAC), Armenian blackberry, trailing blackberry, sword fern, bracken fern (*Pteridium aquilinum*, FACU), Scotch broom (*Cytisus scoparius*, UPL), creeping bentgrass, and orchardgrass (*Dactylis glomerata*, FACU). All upland

data plots failed to meet hydrophytic vegetation criteria. Upland soils failed to meet any hydric soils criteria, with very dark brown or dark brown matrix colors and textures ranging from sand to loam.

2.3 Fish and Wildlife Use

The Nehalem River estuary is extensively used by many native and non-native fish species at all life stages. Salmonid species in the Nehalem River include Chinook, coho, and chum salmon, as well as steelhead and coastal cutthroat trout. Of these, coho and steelhead are the most threatened. At present, the project area includes wetland that has been isolated from the Nehalem River for at least 80 years and essentially no fish use McCoy Marsh. Historically, and under proposed future conditions, tidal channels on the property can provide opportunities for juvenile fish to shelter and feed in areas outside the main channel. Off-channel tidal rearing areas, where food is more plentiful and juvenile fish are less vulnerable to predation, are critical and limited habitats for recovering coho populations in the Nehalem River. The Nehalem Basin Strategic Action Plan for Coho Salmon Recovery (Wild Salmon Center and Coast Coho Partnership, 2023) set a long-term objective of reconnecting 300 acres of tidal wetlands over the next 20 years, and this project would contribute towards that outcome.

McCoy Marsh also provides habitat that may be used by many birds, mammals, amphibians, and reptiles. Based on habitat surveys of similar estuarine sites in the region, more than 100 species of birds use similar habitats on the margins of the Nehalem Bay, including waterfowl and shorebirds, wading birds, marsh and forest songbirds, and raptors. While we have not seen any evidence of beaver presence in McCoy Marsh, beaver could potentially populate the site once the levees are breached and tidal channels excavated. Coyotes, bears, mountain lions, and a resident herd of Roosevelt Elk are present in similar environments around the Nehalem Bay, although large mammals may be less likely to use McCoy Marsh due to the proximity of Highway 101. Amphibian and reptile species including Western Toad, red-legged frog, and salamanders may also be present in wetland and riparian zones in the Nehalem estuary.

2.4 Site Hydrology

There are no significant tributary inflows into McCoy Marsh, so the water on the site presently comes from direct rainfall onto the site, periodic tidal inundation through the small culvert in the southeast corner of the property, and occasional levee overtopping during very high tides.

This section describes the available data on water levels inside and outside the project site, and the derivation of estimates of jurisdictional water levels (Highest Measured Tide, Mean High Water, and High Tide Line) needed for permitting purposes.

Measured Water Levels

The U.S. Geological Survey operates a flow and water level gage on the Nehalem River at the Highway 101 Bridge (USGS 1430140) about 0.7 miles upstream of the project site (see **Figure 1**). This is a relatively new gage and collects instantaneous information on both water levels and water velocities. Because of the short distance and low gradient between the McCoy property and the gage, this gage serves as a good estimate of water levels in the Nehalem River immediately outside the project site. Therefore, data from this gage is used as a boundary condition for the hydraulic modeling as well as for computing jurisdictional water levels. Data from this gage are available from April 2024 to present.

In addition to the USGS gage, Tillamook Estuary Partnership (TEP) installed to water level recorders at the McCoy site at the request of LNCT. In December 2023, prior to the beginning of the current alternatives analysis and design, two pressure transducers with data recorders (also called water level loggers) were installed on the inside and outside of the culvert connecting Bott's and McCoy Marsh (see **Figure 2** for location). TEP provided water level data for these gages at 15-minute intervals, adjusted for barometric pressure.

Collectively the water level data from the Nehalem River and from inside and outside the McCoy-Bott's levee provide a good understanding of the existing conditions hydrology of the McCoy site. **Figure 4** is a 5-day sample of water level data from the three sites. The TEP water level loggers, which are installed close to the ground elevation of about 7 feet, are above the Nehalem Bay tidal water level most of the time. During the first two days of the data set shown in **Figure 4**, the TEP sensors remained dry or within small tide pools most of the time. In the first two days, the loggers were submerged only during high tides. When water level exceeded about 7 feet, the water level at both sensors rose and then fell about 1.5 feet, in parallel with the Nehalem River tides.

The final three days of the record shown in **Figure 4** shows what happens in McCoy Marsh when water levels exceed about 10 feet. At this tidal level, enough water enters the enclosed basin, probably through overtopping the levee at eroded sections, to fill it to nearly the same level as Nehalem Bay (10 feet). Under these conditions, the site drains slowly due through the undersized culvert (see high tides on 2/28, 2/29, and 3/1 in **Figure 4**).

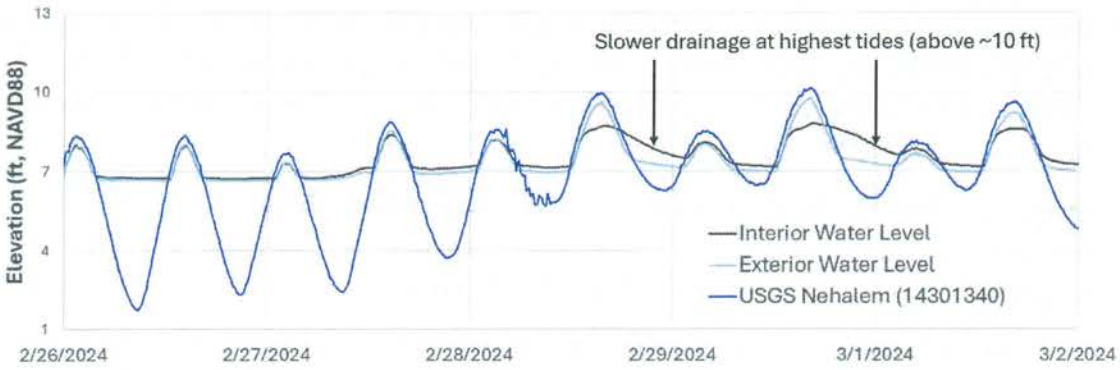


Figure 4. *Example of Water Level Data Showing How the Site Fills and Empties in Different Size Tides.*

Jurisdictional Water Levels

For the purposes of permitting with the Oregon Department of State Lands (DSL) and U.S. Army Corps of Engineers (USACE), it was necessary to identify the tidal elevations at the project site subject to different jurisdictions by the two agencies. DSL regulates activities below the highest measured tide (HMT), whereas the USACE, through the Clean Water Act, applies to areas below the "high tide line". The USACE also regulates areas below "mean high water" (MHW) via the Rivers and Harbors Act (see https://www.nwp.usace.army.mil/Missions/Regulatory/Jurisdiction.aspx for a visual explanation of jurisdictions in coastal tidelands and wetlands). The upcoming Joint Permit Application that will be submitted to both agencies for this project will require computing the fill and removal volumes of sediment below the HMT, HTL, and the MHW, so these jurisdictional water elevations must be shown in the design drawings. These datums are typically provided by NOAA for coastal tidal gages. Unfortunately, the USGS Nehalem gage is not a tidal gage for which these datums are provided, so they were estimated for the current site using different methods (**Table 2**).

The jurisdictional water levels were estimated as follows:

- ***Highest Measured Tide***. DSL has analyzed NOAA data to determine the HMT for many sites along the Oregon Coast (DSL, 2010; available here: https://www.oregon.gov/dsl/wetlands-waters/Documents/DeterminingHighestMeasuredTide.pdf). These expanded sites include the Nehalem River at the Highway 101 bridge. From this document, the estimated HMT for the Nehalem River at Highway 101 is an elevation of 11.95 feet (NAVD88).
- ***High Tide Line.*** For practical purposes, the HTL is assumed to be equivalent to the Highest Astronomical Tide (HAT) which is reported for NOAA tidal gages. The nearest NOAA tidal gage in coastal Oregon is in Garabaldi, in Tillamook Bay. Based on data, NOAA estimates the HTL at the Garabaldi NOAA gage is 10.43 ft MLLW datum, which converts to 10.11 ft NAVD88. To estimate the HAT for the USGS Nehalem gage, we searched the Garabaldi record for a high tide event

with an elevation near 10.11 ft, and found the peak water elevation at the Nehalem at the same time. A high tide with a similar elevation was on 12/4/24; the equivalent water level for the USGS Nehalem gage at that time was 11.48 ft (NAVD88). This is the recommended HAT and HTL for the project area.

- ***Mean High Water.*** Similarly, the reported MHW for the Garabaldi gage was 7.295 ft NAVD88. This tide was reached on 12/15/24, and the concurrent water level at Nehalem was 8.45 ft NAVD88. This value is the recommended MHW for the project area.

The estimated jurisdictional water levels provided above are physically reasonable. The HTL and MHW are 1.4 feet and 1.2 feet higher, respectively, in Nehalem compared to Garabaldi (**Table 2**). Whereas Garabaldi is in Tillamook Bay, Nehalem is on the Nehalem River. The river provides a base flow that would tend to augment the tides by one to two feet.

Table 2. *Analysis of Regulatory Datums for McCoy Tidal Wetland Project*

	MLLW (ft)	Date and Time Specified Water Elevation was Reached at Garabaldi	NAVD88 (ft)	Conversion Difference btwn MLLW and NAVD88 (ft)	Location
Mean High Water					
Girabaldi MHW (water elevation at 12:15 am on 12/15/2024, per USGS data)	7.61	12/15/24 12:15 PM	*7.295*	-0.315	Garabaldi
Concurrent Water Elevation at Nehalem (@ 12:15 am 12/15/2024, from USGS Nehalem Gage)			8.45		
Concurrent Elevation Difference (Nehalem minus Garabaldi)			1.155		
High Tide Line - equivalent to Highest Astronomical Tide (HAT)					
Girabaldi HAT (per NOAA web site)	10.43	12/4/24 10:00 AM	*10.115*	-0.315	Garabaldi
Concurrent Water Elevation at Nehalem (@ 10 am 12/4/2024 from USGS Nehalem Gage)			11.48		
Concurrent Elevation Difference (Nehalem minus Garabaldi)			1.365		
Highest Measured Tide (HMT)					
Garibaldi HMT using DSL table	11.96		*11.64*	-0.32	Garabaldi
Garabaldi Highest Observed Tide (1/4/2022 @ 01:30, per NOAA website)	12.08		12.4	-0.32	Garabaldi
Concurrent Water Elevation @ Nehalem	*Nehalem Gage was not yet Operational in 2022*				
Elevation at Nehalem using DSL table	11		11.95	0.95	Nehalem

Notes:
Recommended Regulatory Water Levels for this project are in the cells highlighted yellow
1. McCoy project location is very close to the new USGS Nehalem Gage (operational since 2023); estimated MHW, HTL, and HMT are based on correlations to that gage .
2.Elevations reported in italics were converted using the NOAA online conversion tool at https://vdatum.noaa.gov/vdatumweb

2.5 Existing Conditions Hydraulic Model

To better understand site conditions and develop initial design concepts, Waterways created Existing Conditions 2-dimensional (2D) hydraulic models of the project area using the U.S. Army Corps of Engineers' Hydraulic Engineering Center River Analysis System (HEC-RAS).

Two Existing Conditions models were created for the purposes of this project: one used the unmodified LiDAR data as a modeling terrain, and one incorporated survey data collected for this project. There are advantages and disadvantages to both models. The LiDAR elevations are comprehensive, with millions of data points and high resolution; however, LiDAR elevations are known to be higher than actual ground surfaces in some areas due to the presence of vegetation. The survey data is more accurate, but

for this project, with a single day of survey and sight lines that were difficult in some key areas, a model based on survey will have inaccuracies due to limited topographic data. Both models have been used by the design team for the purposes of understanding, design, and communications. The discussion below of existing conditions is based on analysis of the model that is based on LiDAR data. The discussion of proposed conditions hydraulics discussed later (in Section 5) is based on the terrain derived from the ground survey.

The following data were used to run the Existing Conditions model:

- Topography from LiDAR and ground survey,
- Manual digitization of breaklines along known geomorphic boundaries along the base and tops of levees, slopes, channels, and tidal benches,
- Mapping of vegetation roughness using aerial imagery, and
- Boundary condition water levels from the USGS Nehalem gage.

To validate the model and gain a better understanding of its limitations, the model was run for several tidal cycles using the USGS Nehalem data as the boundary condition and compared with data from the TEP water level loggers inside and outside the McCoy project site. **Figure 5** compares the modeled and measured water levels at the TEP water level loggers for four typical tidal cycles in winter 2025. The validation run leads to the following observations about the model accuracy:

- The model tends to slightly overpredict water levels on both sides of the Bott's/McCoy levee during high tides. The error is less than 0.25 foot (3 inches) during typical high and low tides, but the error increases to as much as 0.5 foot (6 inches) during a large high tide. The predicted water levels are considered to be reasonably good for an uncalibrated model based on LiDAR without survey data. Some of the discrepancy may be due to errors in the LiDAR data, roughness estimates, and/or limitations related to the cell size, computational interval, or other model details.
- The errors are similar for both inside and outside the levee. Therefore, the model seems to reasonably replicate flow through the culvert, including the tendency for slow drainage following tides approaching 10 feet, as shown in **Figure 4** above.
- There is a lag time of an hour between the modeled and measured high tides. This might be expected due to the time it takes for a tidal signal to propagate through Bott's Marsh, which is not represented by the model. This lag time error is not important to any of the questions needed to be answered for this design effort.

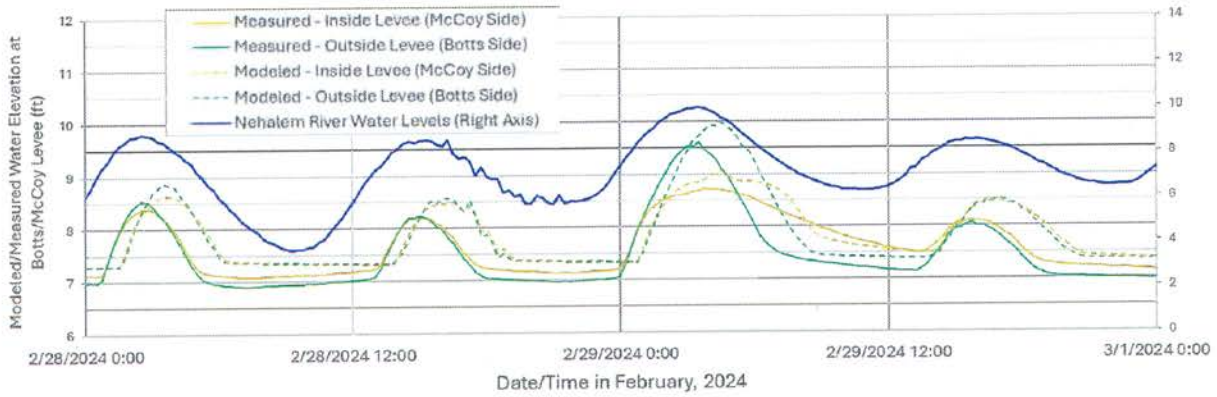


Figure 5. *Existing Conditions Model Validation Runs.*

The existing conditions model was run for a range of low and high flows and different tidal conditions to gain a more complete understanding of the existing hydraulic conditions of the site and support the development of potential project alternatives. **Figure 6** shows the extent and depth of modeled water inundation for several tidal scenarios: typical summer low tide, typical summer high tide, typical winter high tide, and a king tide.

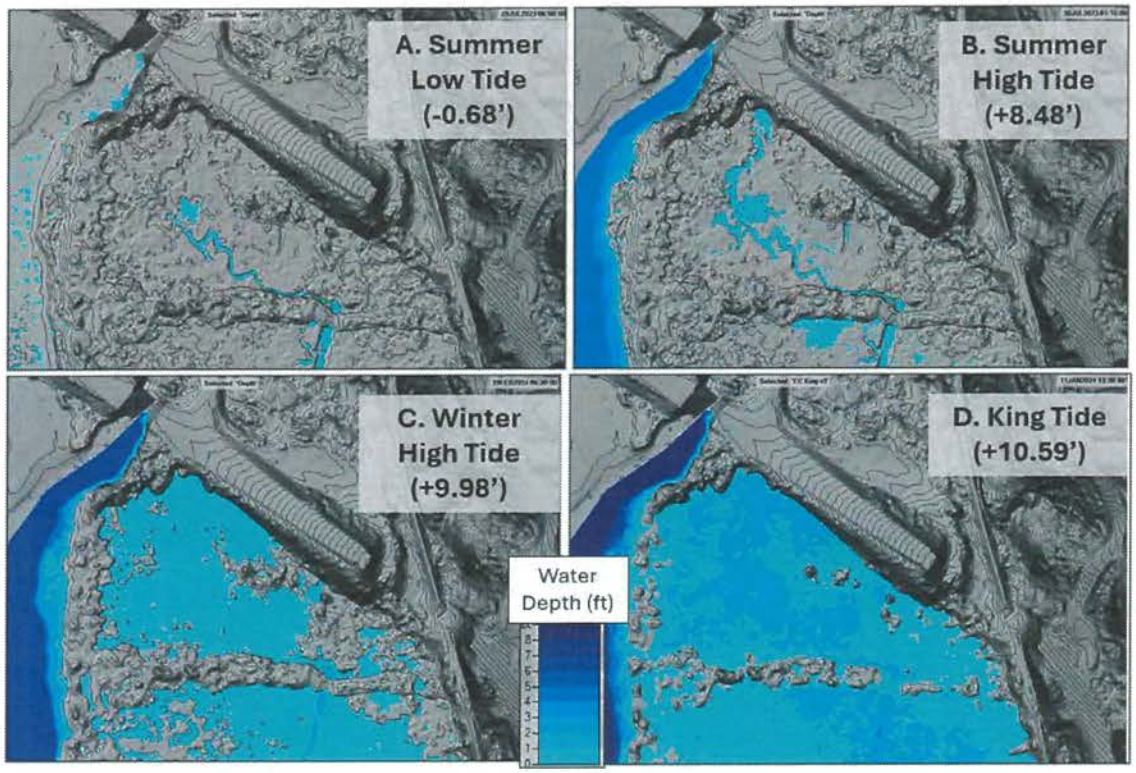


Figure 6. *Existing Conditions Modeled Water Inundation and Depths for Different Tidal Scenarios*

Some of the key observations of the existing conditions model are summarized as follows:

- During low tides (**Figure 6A**), the site mostly drains, leaving some ponded water in some of the lower areas within the site. This is consistent with observations. However, some of the ponding shown in **Figure 6A** could also be an artifact of small errors in the LiDAR data.
- During a typical summer high tide of about 8.5 feet, tidal water enters the site through the culvert in the southeast of the project area, and this water remains within the small channels on site (**Figure 6B**). This is also consistent with observations.
- During a typical winter high tide close to 10 feet elevation (**Figure 6C**) tidal water overflows the small channels in McCoy marsh and inundates much of the project area. This is probably due to

a combination of water through entering through the culvert along with water flowing over low points in the Bott's-McCoy Levee.

- During king tides, tidal water overtops large portions of the levees and fills most of the site up to the Highway 101 road prism, and subsequently drains slowly through the 12-inch culvert. This is also consistent with observations and photos of the site.
- From a restoration perspective, breaching the levees without excavation on the interior would allow fish to access the site only a small percentage of the time during the highest tides in winter. To provide significant fish benefit, interior grading of channels on the property would be necessary.

3.0 ALTERNATIVES EVALUATION

As described in Section 1, Lower Nehalem Community Trust and Wild Salmon Center led a collaborative process among the design team and technical advisory team to define the project goals and objectives, and the group adopted the following four primary ecological objectives for the project designs:

1. Reintroduce salt water tidal exchange on the property
2. Provide off-channel rearing habitat at higher tides (above 7.5 feet elevation)
3. Create "high marsh" habitat similar to the non-channelized parts of Bott's Marsh
4. Provide off-channel rearing habitat at moderate tides (above 4 feet)

Based on the objectives, the project team considered three basic alternatives. These are laid out in an Alternatives Deliverable (**Appendix E**), which includes drawings and rough cost estimates, and are summarized in **Figure 7** below. **Appendix E** also contains an annotated slide show that was presented to the Technical Advisory Team and landowner representatives to assist in evaluating the alternatives and selecting a preferred alternative. The slides include a discussion of each alternative, potential costs and benefits, engineering challenges, modeling of each of the Alternatives, and evaluation of how each alternative meets or does not meet the project objectives. The full alternatives evaluation is provided in the Appendix and briefly summarized below.

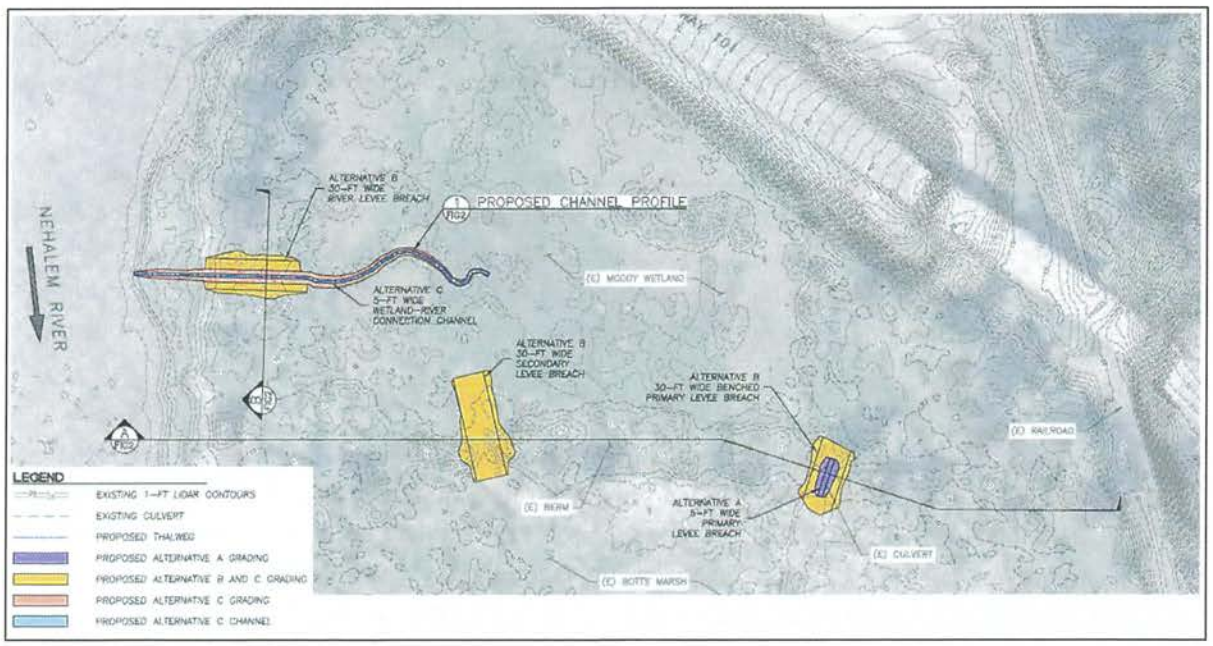


Figure 7. *Primary Alternatives Considered*

Alternative A: *Single Breach at McCoy-Botts Levee*

Alternative A is the option to reconnect McCoy Marsh to Bott's Marsh with a minimum of excavation, shown in purple in **Figure 7**. This alternative would create a single breach in the McCoy-Bott's levee at or near the existing culvert, while avoiding disturbance to mature spruce trees. This would be the smallest and lowest impact of the three alternatives. The estimated construction cost was about than $75,000.

Modeling of Alternative 1 (**Figure 8B** and **9B**) shows this option would moderately increase tidal exchange during high and very high tides (8 feet and above), which would provide little to no fish access to the marsh. One risk noted for Alternative A is that logs could accumulate at the breach and reduce the connectivity over time.

Alternative A would partially address Objectives 1 and 3 above, as it would reintroduce limited tidal exchange through a single breach. Alternative A would not achieve Objectives 2 and 4, as it would have little to no fish benefit.

Alternative B: *Breaches at Both McCoy/Bott's and Nehalem River Levees*

Alternative B would include three separate levee breaches (gold in **Figure 7**) to allow for more tidal exchange and connectivity between the Nehalem River, McCoy Marsh, and Bott's Marsh. Two of the breaches would be in the McCoy/Bott's levee, and one would be in the Nehalem River levee. The work would focus on removing artificial fill with no interior grading or enhancements, such as excavating tidal channels or installing large wood. This option would cost around $160,000 to construct (not including design, oversight, permitting, revegetation, or other costs).

Alternative B would not provide much more connectivity compared with Alternative A, as shown in **Figures 8C** and **9C**). During higher tides, there would be slightly more connectivity, but this option would also not provide much fish access. This option would likely achieve Objectives 1, 2, and 3 – re-introducing tidal exchange, restoring high marsh habitat, and providing limited fish rearing opportunities during high and very high tides. Objective 4, providing fish rearing at moderate tides, would not be met.

Alternative C: *Breaches and Interior Grading*

Alternative C would include the three breaches along with excavating a small tidal channel network that would provide more access to fish during moderate tides. The channels would be graded to tie into the bed of the Nehalem River, which is at an elevation of around 2 feet (NAVD88) near the project site. Tidal channel grading could be supplemented by adding large wood to the tidal channels, and through building hummocks and floodplain log structures to enhance the tidal channels and high marsh floodplain. The construction costs for grading related to this option are close to $200,000 (this does not include costs for log structures).

Alternative C is the only alternative that will provide fish access during moderate tides (**Figure 8C**) and will meet all the Objectives 1 through 4.

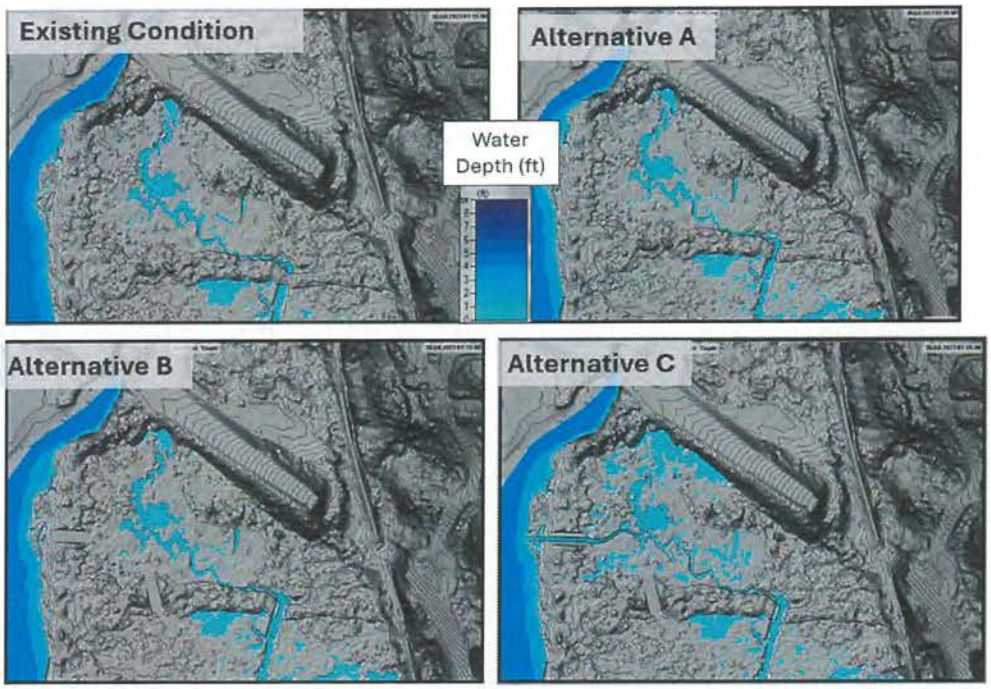


Figure 8. *Comparison of Alternatives in a Typical Summer High Tide (about 8.5')*

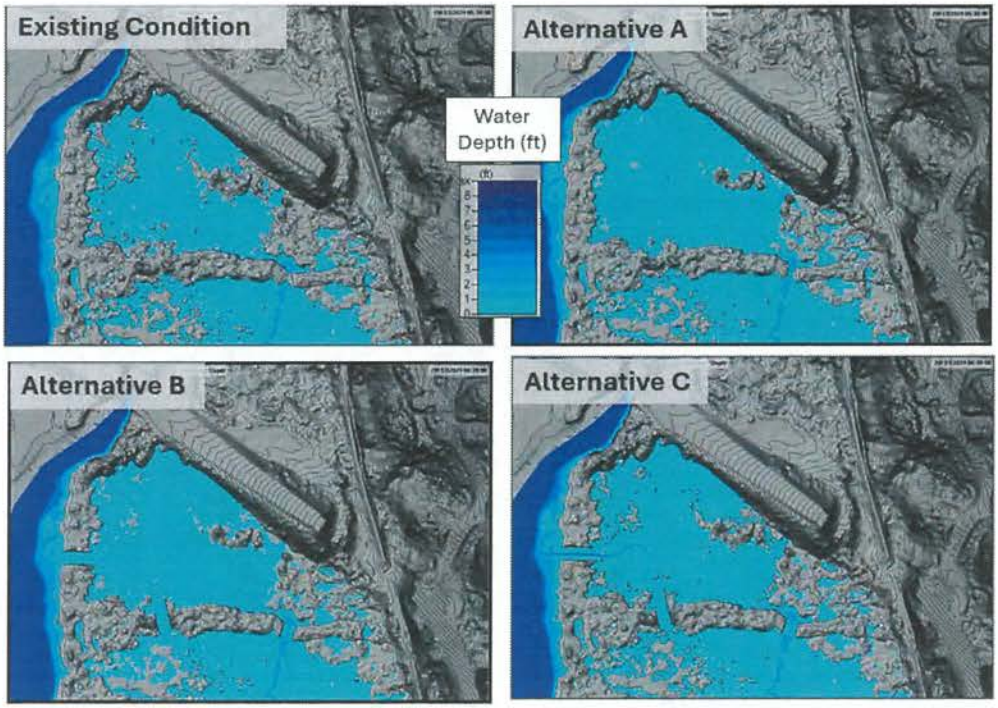


Figure 9. *Comparison of Alternatives in a Typical Winter High Tide (about 10.0').*

4.0 BASIS OF DESIGN

The design team (consisting of LNCT, WSC, and Waterways) and technical advisory team (including ODFW, TEP, and NBWC) reviewed the project alternatives (**Appendix E**) and provided written comments prior to a video conference at which the group discussed the three alternatives and selected an enhanced version of Alternative C as the preferred Alternative. Alternative C includes three levee breaches, tidal channel excavation, hummocks and large wood, and meets all four of the primary project objectives (Section 1.2). The 60% (permit-ready) designs are provided as **Appendix A**. The plans identify the proposed project elements and layout. This section provides a more detailed explanation of the rationale for the various design elements.

4.1 Levee Breaches and Tidal Channels

Levees would be breached in three locations to allow tidal exchange on McCoy Marsh (gold shaded areas on **Figure 10**): one breach on the west side of the property connecting it with the Nehalem River, and two breaches on the on the south side of the property connecting it with Bott's Marsh. The breaches will include removing the artificial fill material down to near the ground surface around 8 to 9 feet elevation to allow high tides to enter the McCoy property. The Nehalem River breach will be 50 feet wide at its widest point, and the breaches to the south will each be 30 feet wide. The purpose of the wide breaches is to allow woody debris to more easily enter the McCoy property to provide additional habitat complexity once the construction is completed.

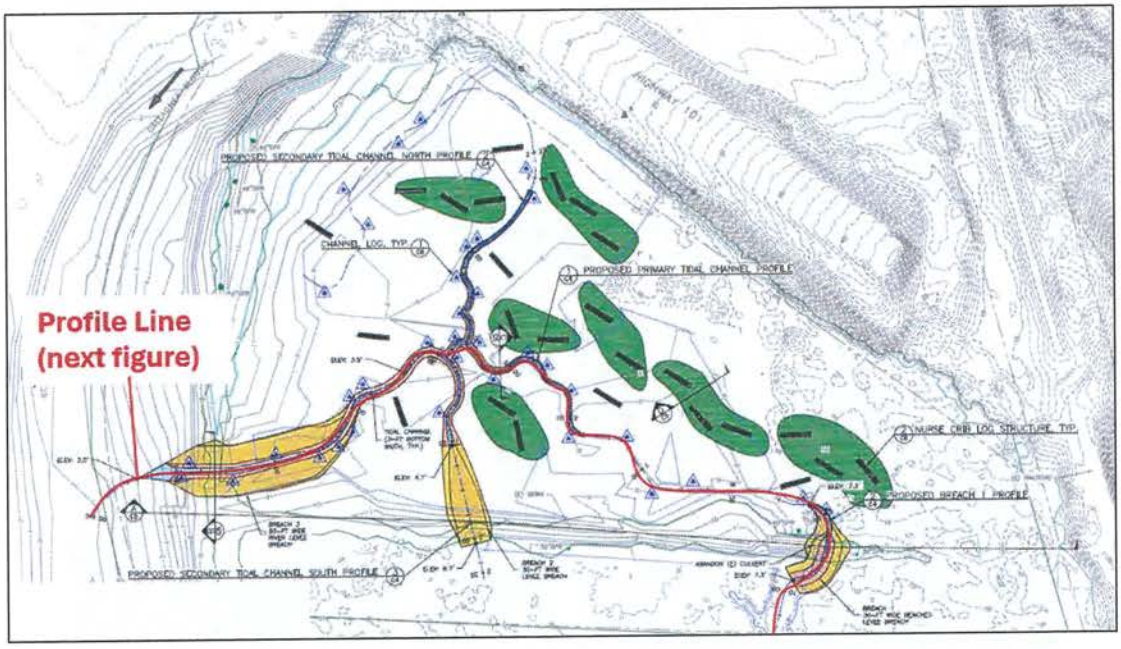


Figure 10. *Design Overview Showing Breaches (Gold), Tidal Channels (Pink), Hummocks (Green), and Log Structures (Brown Rectangles and Blue Triangles). Red line shows the location of the profile in Figure 11 (next page).*

A small tidal channel network will be excavated into the surface of the marsh with a connection point on the southwest corner of the property. The tidal channel network will tie into the Nehalem Bay at an elevation of around 2 feet (**Figure 11**), allowing at least some inundation during most tidal water levels. The channel bottom will be graded at a slope of 0.5% for about 365 feet, which is flat enough to ensure that part of the channel retains water much of the time, while still allowing positive drainage. The main tidal channel bifurcates at a distance of about 400 feet from the Nehalem Bay, with one secondary channel to the north and another channel that continues to the east. The east channel steepens to a slope of 1.5% to intersect with the ground surface at a distance of 625 feet (**Figure 11**), where it ties into the existing small channel that connects to the eastern breach connection with Bott's Marsh.

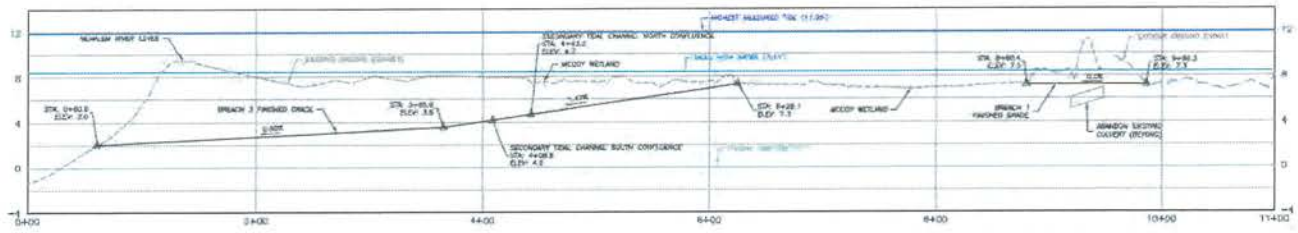


Figure 11. *Profile of the Main Tidal Channel from Nehalem Bay to Bott's Marsh (Profile Line Shown in Red in Previous Figure).*

4.2 Hummocks

A series of "hummocks" will be built from material excavated to create the breaches and tidal channels (**Figure 10**, green shading). The hummocks are low, oval shaped mounds of soil rising from the marsh surface to a maximum of 2 feet above adjacent wetland elevations (10 feet elevation) (**Figure 12**). The hummocks will have low side slopes of about 5 H: 1 V and are meant to serve multiple purposes including providing topographic diversity, creating more edge habitat, catching drift logs in advantageous locations, and allowing woody vegetation (willow and spruce) and shrubs to establish on the high marsh surface. Floodplain logs and nurse crib structures (discussed below) will be installed on the hummock surfaces to enhance their ability to support willow and to trap drift logs within the project area.

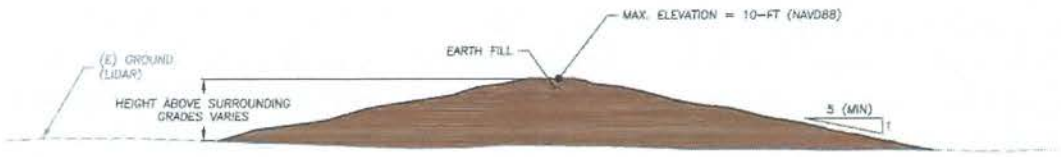


Figure 12. *Typical Section of a Hummock*

Initially, several small hummocks were planned as a minor feature in the 30% designs. They were specifically located in areas where the vegetation quality is relatively less healthy (as mapped by Ash

Creek) to reduce their impact on existing high quality wetland vegetation assemblages. Following Oregon Department of Transportation's review of the 30% design, ODOT requested that the designs include measures to prevent drift logs and wave energy from impacting and eroding the road prism. Rather than armoring the base of the road with riprap, the design team proposed that the hummocks be expanded and arranged in a way that will reduce the possibility of drift logs and waves impacting the road. The arrangement of the hummocks shown in **Figure 10** and in the 60% plan set (Appendix A, Sheet C3) aims to balance disturbance of wetlands, meeting ODOT's requests, and providing areas where wood will rack close to the tidal channels.

The specific locations and shapes of the hummocks may be modified in later stages of the design process in consultation with design team, technical advisory team, wetland and vegetation experts (CEG and Ash Creek), and permitting agencies (primarily DSL), to maximize their benefits and minimize any potential negative impacts to existing wetlands. The extent of hummocks shown in the 60% designs in **Appendix A** represents a maximum. Any changes made to the hummock arrangement in later stages of the design will either maintain or reduce, not increase, the volume and aerial extent of the hummocks within areas mapped as wetlands.

4.3 Large Wood

An important feature of the fish habitat improvements will be installing large wood. Two types of wood installations are included in the designs (**Figures 13** and **14** and **Appendix A**, sheet C6):

- **Channel Logs.** Proposed channel logs (blue triangles in **Figure 10**) are individual logs with root wads attached, driven into the excavated banks of the tidal channels (**Figure 13**). The logs will vary in size but are anticipated to average around 18 inches diameter and about 15 feet long. They are primarily meant to provide cover and complexity for fish in the tidal channels, and therefore, the larger the root wads the better. They will be placed individually or in clusters as illustrated conceptually in **Figure 13** (plan view) and in the locations specified in the plans (**Figure 10**)
- **Nurse Crib Log Structures.** The "Nurse Crib Log Structures" are pairs of logs anchored into the marsh surface or hummock surfaces using pile logs, with the space between the two logs filled with amended soil and planted (**Figure 14**). The purposes of the nurse cribs are to provide suitable microenvironments for the establishment of woody vegetation and to trap drift logs. The nurse crib structures will be placed at a variety of locations and orientations on the marsh surface and would be concentrated on the hummocks, where they are most likely to be at elevations that could allow spruce establishment.

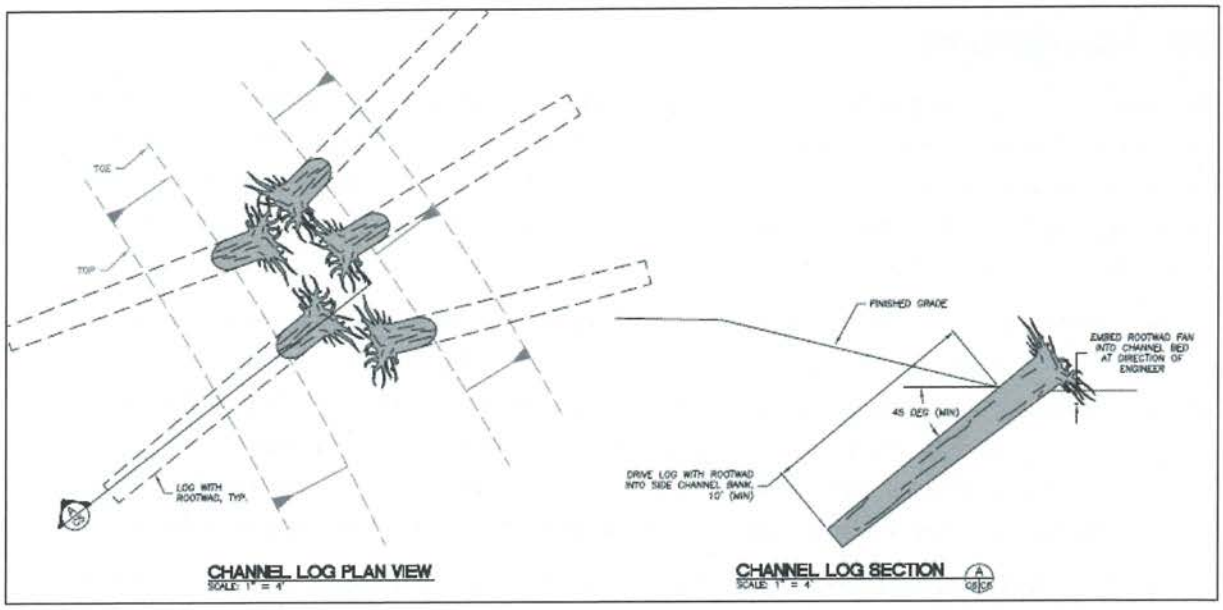


Figure 13. *Sketches Showing Channel Logs*

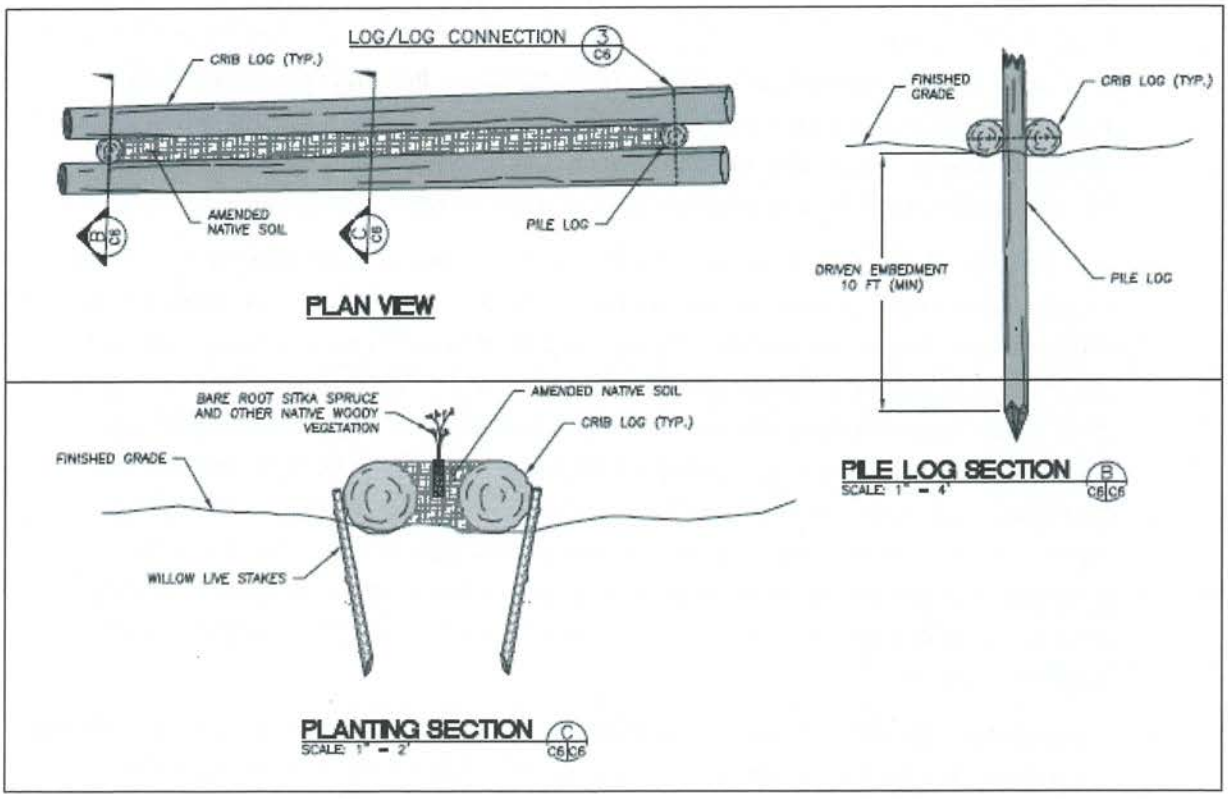


Figure 14. *Nurse Crib Log Structure Details*

4.4 Revegetation

Ash Creek provided a Vegetation Enhancement Plan (**Appendix D**), or revegetation plan, for the site that provides guidelines for revegetation following construction, and invasive species removal prior to, during, and following construction. The revegetation plan specifies recommendations for site preparation, planting, and maintenance in four types of treatment areas: wetland channels, hummocks, dike uplands, and access routes.

- Wetland Channels: This includes the excavated portions of the tidal channels within the site. No site preparation for these areas is recommended and plug planting will take place immediately following construction to reduce erosion on the newly exposed bank surfaces and reduce invasive species colonization of the disturbed ground. Three years of seasonal maintenance will take place following planting, which will include herbicide treatments, hand pulling, and winter interplanting. The wetland channel plugs include seven species of herbaceous sedge and rush.
- Hummocks: This includes the areas shown as hummocks on the design. No site preparation is recommended for these areas either, as they will not exist prior to project implementation. Planting and seeding will occur immediately after construction to limit erosion and invasive species colonization. Three years of monitoring and maintenance are recommended following planting, and it is acknowledged that the hummocks have a high risk of invasive species pressure. The plant table for hummocks includes trees (Sitka spruce plugs and willow cuttings), shrubs (twinberry, rose, and spirea potted plants), several types of herbaceous plugs, and a herbaceous seed mix dominated by spike bentgrass (40%) and tufted hairgrass (40%).
- Dike Uplands: The current dikes above the native ground level already have some knotweed, blackberry and other invasive species. Pre-treatment of these areas is recommended in summer 2025. The specifics and costs of the knotweed treatment and blackberry management are described in **Appendix D**. Immediately after construction, the areas of disturbed soil on the dikes will be seeded and planted. Seasonal maintenance should be done for three years following construction, including spring and fall herbicide treatments, summer knotweed treatments, and winter interplanting. It is acknowledged by Ash Creek that this zone has the highest risk of invasive species pressure, so adaptive management must be done to ensure the disturbed areas are not recolonized by invasive species. The disturbed area plant list includes potted trees (alder, spruce, and cedar) and willow cuttings, along with potted shrubs and herbaceous plants.
- Access Routes: The access routes are to allow machinery to conduct the dike breaches, channel excavation, hummock construction, and log placement. Although the project will follow guidelines meant to minimize the disturbance along these routes, for the purpose of revegetation they will be treated as disturbed areas and will be planted in high density to return

them to their pre-construction condition. Immediately after construction, the uplands and wetlands along the access routes will be seeded with the seed mixes specified in **Appendix D**. Three years of seasonal maintenance should occur following construction, including spring and fall herbicide treatments, summer knotweed treatments, and interplantings in winter. Adaptive management must take place to ensure that these areas are not recolonized by invasives. The upland seed mixes include common yarrow, spike bentgrass, tufted hairgrass, and lupine, whereas the wetland seed mixes also include slough sedge and bullrush. These would be supplemented by upland shrubs and pole cuttings including red osier dogwood, Sitka spruce, and piper willow. Revegetation is not planned for the existing staging area on ODOT property on the opposite side of Highway 101.

5.0 ANTICIPATED PROJECT OUTCOMES

Following construction, brackish tidal water will enter the site immediately through the breaches during moderate and high tides. A Proposed Conditions model was developed that simulates water movement and inundation patterns under proposed conditions (**Figure 15**). It should be noted that the Proposed Conditions model is based on the limited ground survey data, rather than LiDAR, because for the evaluation below, elevational accuracy of the surveyed points is considered more important than the details provided by the LiDAR, and the LiDAR may contain systematic elevation errors (artificially high elevations) due to the presence of vegetation. The Proposed Conditions model also does not include the hummocks, which will impact some of the detailed inundation patterns. The purpose here is to provide a general picture of anticipated project outcomes, rather than a detailed map of inundated areas.

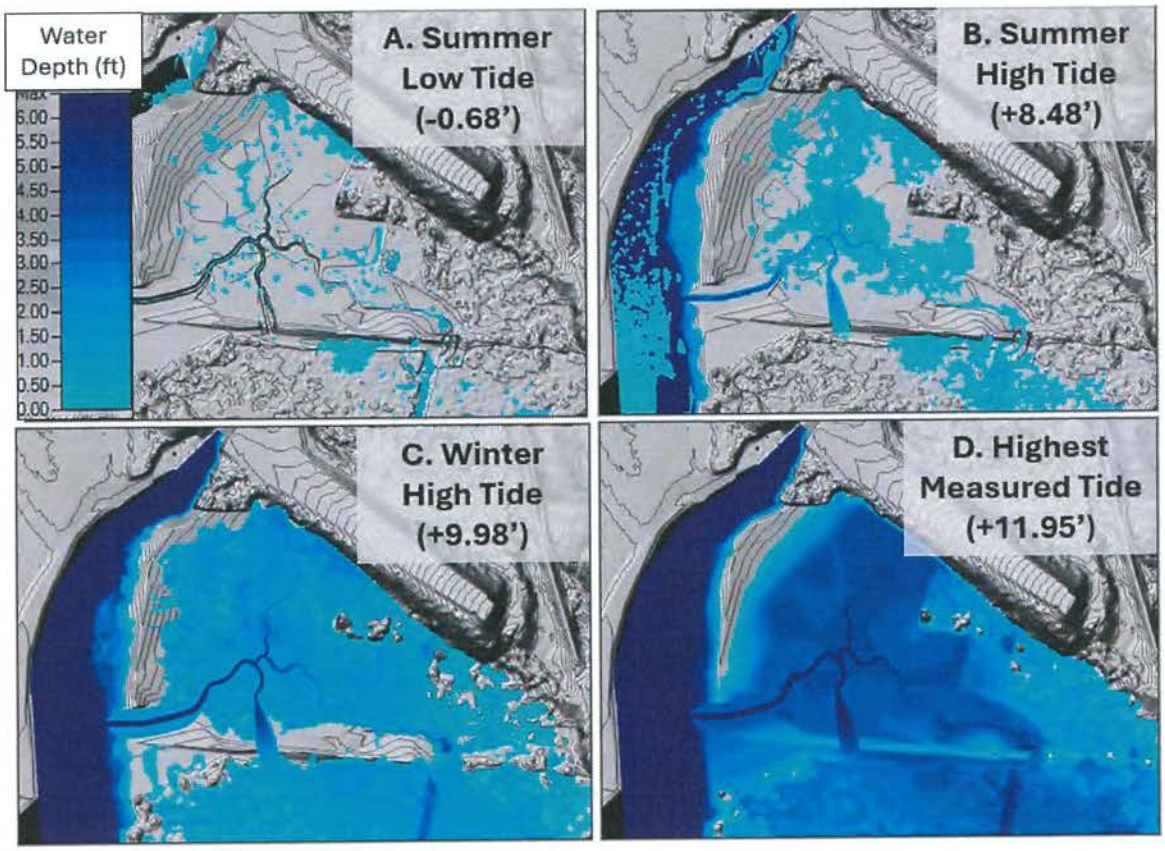


Figure 15. *Proposed Conditions Modeled Water Depths for A Range of Tidal Scenarios*

Based on the model, the channels and floodplain will mostly empty during summer low tides (**Figure 15A**), except in areas that retain shallow ponded water due to microtopographic barriers. During a typical summer high tide of about 8.5 feet elevation, water will fill the tidal channels and inundate parts

of the marsh with zero to one foot of water (**Figure 15B**). During moderately high tides such as those seen in summer, water will enter the site through the western breach and channel, fill the channels and slightly spill out onto the marsh surface. Some water may also enter the site through the channel in the southeastern breach in the McCoy-Bott's levee, which will have a bottom elevation of about 7.25 feet.

During an example winter high tide of about 10 feet **(Figure 15C**), the model shows that the entire site will be inundated with water depths of about 1.5 to 3 feet over the marsh surface, and a maximum of about 7 feet in the main constructed tidal channel. In the "highest measured tide" scenario (11.95 feet water surface elevation) (**Figure 15D**), the model shows water overtops the southern levee entirely, and overtops the western levee over much of its length. The formerly enclosed basin will be filled with water equilibrated to the high water levels in Nehalem Bay. This outcome is essentially the same as what currently occurs during very high tides that overtop the levees.

Inundation Frequency. Under current conditions, McCoy Marsh is almost always isolated from tidal exchange, except following very high tides that overtop the artificial levees and fill the enclosed basin. Under proposed conditions, the site will be restored to a more natural tidal exchange through levee breaches. The levee breaches alone will allow high tides above about 7.5 feet to enter the high marsh, which occurs about 10 to 15 percent of the time over the course of a typical year (**Figure 16**). Adding the excavated tidal channels will significantly increase the amount of time that tidal water and fish are able access the marsh. About 350 feet of the main tidal channel is below 4 feet elevation (see **Figure 11**). The tidal water elevation exceeds 4 feet about 65 percent of the time (**Figure 16**), ensuring that fish should have access to at least some of the property most of the time.

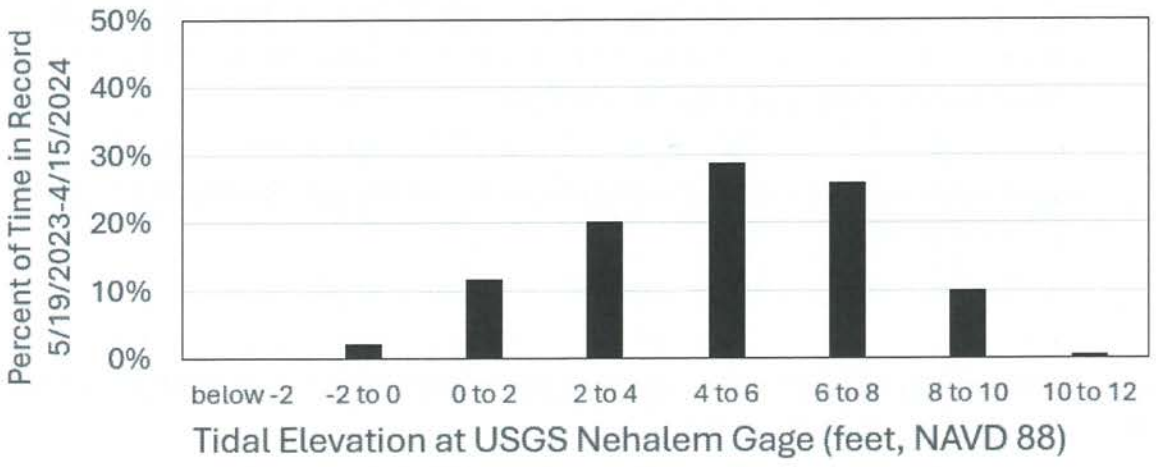


Figure 16. *Proposed Conditions Modeled Water Depths for A Range of Tidal Scenarios*

6.0 PROJECT PLANNING RISKS AND CONSIDERATIONS

This section discusses several issues, considerations, and risks associated with the project. These issues have been discussed among the design team, technical advisory team, funders, and agencies throughout the design process, and are summarized below.

6.1 Log Structure Ballasting Calculations

This project includes an important component of installing large wood to enhance fish benefit of the project, to encourage racking of drift logs, and to improve the chances of woody vegetation establishing in the high marsh. Two types of wood structures are planned: channel logs and nurse crib log structures. To ensure the stability of the logs following construction, both structures will rely on soil friction to provide resistance against buoyancy. The channel logs will be secured by driving their trunks beneath the marsh surface, and the nurse crib logs will be secured by mechanically attaching them to vertical wood piles driven into the marsh soils.

This project is considered high risk from a log stability perspective given the fact that there is public use adjacent to this site for recreation/marine navigation and there is state property (Highway 101) that could be impacted should the log structures become unstable. Given this risk assessment, the 100-year return event flood is the design event for the ballasted log structures (water surface elevation 13.1 feet based on FEMA FIRM maps). The factor of safety for the ballasted log structures is 2.0 the buoyancy force. Stability calculations for each log structure type are based on the following assumptions:

- The failure potential of the nurse crib log structures and channel logs from sliding are considered negligible given the low tidal velocities, so factors of safety for sliding were not calculated. All structures will be keyed into the stream bank or attached to pile logs, which will prevent them from sliding from the low lateral forces of currents.
- The failure potential of the nurse crib log structures and channel logs from rotation is considered negligible given that all structures are wide and flat, so factors of safety for rotation were not calculated.
- The ballasting calculations assume Sitka spruce as the wood species.

Stability of the structures will be achieved via passive ballasting methods using a combination of stream bank substrate and log piles. Nurse crib log structures will be bolted together to ensure that the ballast is evenly distributed over the entire structure.

The log structure stability calculations are included as **Appendix F** of this report.

6.2 Vegetation Impacts

The project aims to hydraulically reconnect the property to the larger Nehalem Bay, which will fundamentally alter the hydrology, salinity, nutrient inputs, and other physical, chemical, and biologic characteristics of the site. These induced changes are an overarching goal of the project, so they cannot be avoided, and they will certainly impact the existing vegetation on the site, which is currently fairly healthy as a non-tidal wetland (see Section 2.2). There will also be ground disturbance due to construction, and this will provide surfaces where non-native vegetation could colonize. Therefore, this project presents a risk of allowing non-native/invasive plants to establish where they don't currently exist.

Currently, invasives on the site include knotweed and blackberry, but most of these are limited to the uplands along the levees, and some limited areas in the wetland itself. The revegetation plan (**Appendix D**) was prepared by Ash Creek primarily to try to prevent the expansion of invasives such as knotweed, blackberry, and reed canary grass. The revegetation plan prescribes both pre-treatment activities as well as a seasonal maintenance plan to help reduce colonization by non-native plants. Nevertheless, the actual outcome will depend on the success of ongoing maintenance at the site and other factors that cannot be anticipated at this time.

6.3 Pollution from Gallagher Slough

The inlet to the tidal network is close to the outlet of Gallagher Slough, a tidal slough draining an area used for dairy farming. During the design process, a concern was raised about bacteria and other pollutants entering McCoy Marsh following breaching the levee. Initial modeling during the alternatives analysis process showed that water entering McCoy Marsh will likely move through the site and enter Bott's Marsh during a high tide (**Figure 17**). This highlights the possibility that bacteria or other pollutants that enter McCoy Marsh could move into Bott's Marsh because of the breaching both levees. The design and advisory team discussed these concerns several times during the design process, and the joint decision was made to move ahead with the project despite these concerns. The discussions and decisions made included the following points:

- The pollutant issue in Gallagher Slough has not been clearly established. While TEP has been recently collecting water quality data in Gallagher Slough, it is not yet known for certain whether there is really a pollutant concern.
- If there are pollutants of concern coming from Gallagher Slough, those pollutants would be moving out of the slough and be present near the McCoy tidal channel entrance during falling tides, when water is also emptying out of the project area. Water will only enter the project area during incoming tides. During incoming tides, the water that will enter the proposed breach will presumably be coming from the direction of the ocean in Nehalem Bay, not from

Gallagher Slough. Therefore, the water entering McCoy Marsh during high tides should not contain bacterial pollutants from the Gallagher Slough drainage.

The landowner and technical team judged that based on these points, the problem is not a significant enough concern to prevent the project from moving forward.

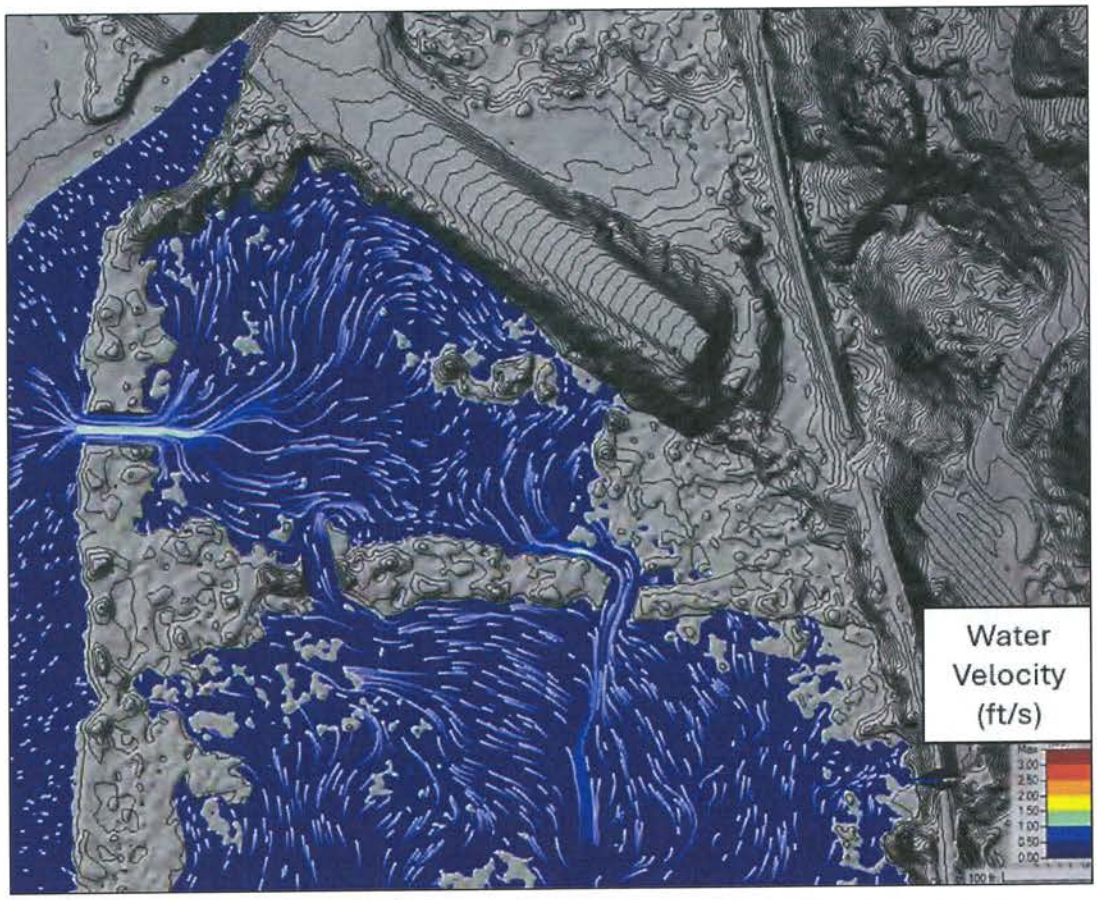


Figure 17. *Modeled Water Velocities and Flow Tracking Showing Flow Patterns During Incoming King Tide*

6.4 US Army Corps of Engineers 408 Process

The project is near the U.S. Army Corps of Engineers (USACE) Sunset levee system, which protects the agricultural area to the north of the project and to the east of Highway 101 (**Figure 18**). Because the project is close to a USACE federal civil works project, Waterways applied for a determination whether the project would be covered under Section 14 of the Rivers and Harbors Act of 1899, which is codified at 33 U.S.C. § 408 (referred to as "Section 408"). The Portland District of USACE reviewed the application and determined that the proposed project "will not alter, occupy, or use a USACE federally authorized

project", and would therefore not require permission from the USACE under Section 408 (determination received February 27, 2025).

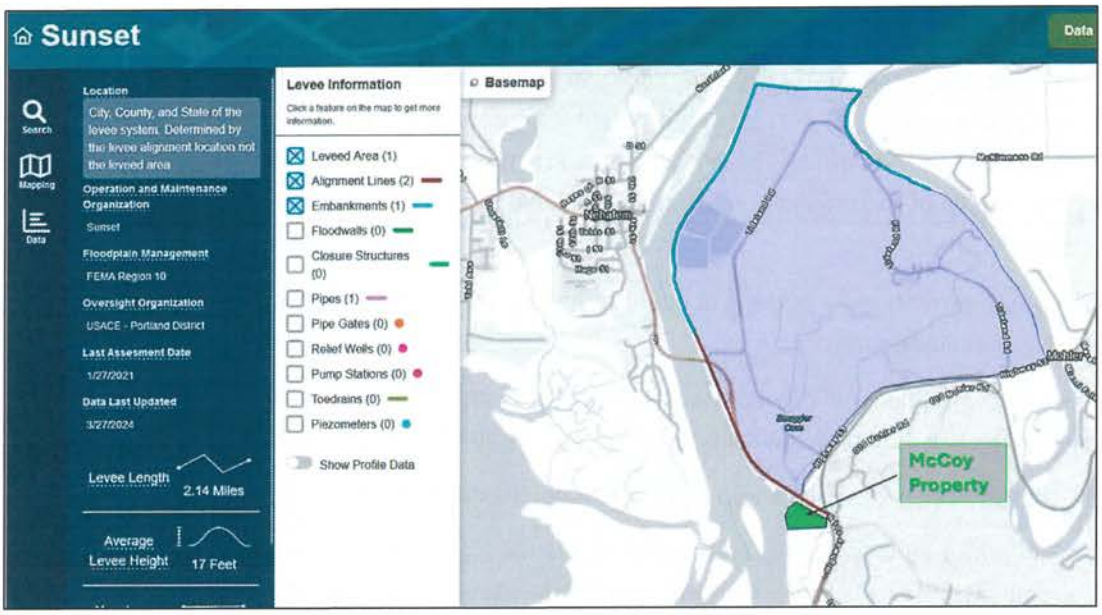


Figure 18. *Annotated Screen Shot of the USACE's National Levee Database Showing Proximity to the Sunset Levee Project*

6.5 Oregon Department of Transportation

The project is adjacent to the Highway 101 road prism which is managed by the Oregon Department of Transportation (ODOT). Waterways shared an early version of the design drawings (30% plan set) with ODOT and met with representatives of ODOT to explain the project and receive feedback and concerns. At that meeting, ODOT communicated that their primary requirements for this project were that (1) the project would not increase flooding on the ODOT right-of-way; (2) the project would not result in increased erosion due to wood racking at the toe of the road prism; (3) the project would not result in increased erosion due to increased wave activity after breaching the dikes; and (4) the project would not include log structures or other habitat features within the ODOT right-of-way. ODOT also confirmed that the project could use the ODOT staging area to the east of Highway 101 and south of Highway 53 during construction.

Following the meeting with ODOT, the project plans were modified to better meet requirements #2 and #3 above. Several analyses and modifications were made to meet ODOT's requirements for the project:

- Floodplain logs were initially planned to be unballasted at the request of technical advisory team members. The plans were modified so there would not be any unballasted wood in the project that could be floated during high tides and accumulate at the toe of the road prism.
- We increased the number and size of the hummocks and nurse crib structures, and modified their arrangement in a way that will create a series of obstructions to prevent floating logs from reaching the road prism. These hummocks and nurse cribs will trap incoming drift logs closer to the middle of the project area where they would have more benefit to the project (see **Figure 10**).
- Hydraulic modeling was done to confirm that the project would not increase flooding per ODOT's requirements.

The plans were modified and resubmitted as draft 60% plans. ODOT responded that they accepted the proposed project as modified, but required a hydraulic report certifying the following

"1. The existing levees provide no flood protection to the Highway.

2. The proposed levee breach does not increase the highest measured tide elevation along the roadway prism due to the increase volume of water entering the wetland. It is worth investigating because if the tide can rise and fall before the wetland is fully inundated with tidewater, then by breaching the levee and allowing more water in, it may have an impact on how much water the road prism sees, and therefore would require at a minimum riprap protection.
3. If confirmed, please state in your report: 'The proposed changes do not alter flood flows at the toe of the embankment in a manner that increases flow velocities or risk of embankment scour due to flooding.' "

The requested hydraulic memo will be provided as **Appendix G** of this current report.

(Note: at the time of writing this report draft, Waterways has performed initial hydraulic modeling to confirm the project meets the requirements as specified by ODOT, but the hydraulic memo has not yet been completed.)

7.0 CONSTRUCTION CONSIDERATIONS

7.1 Construction Cost Estimate

The engineer's construction cost estimate is provided in **Table 3** below. This includes the earthwork, revegetation site preparation and planting, and the 3 years of recommended vegetation monitoring and maintenance. The cost estimate assumes the Contractor will be responsible for supply of all logs. The primary cost drivers on the project are for earthwork, log sourcing and placement, and for implementing the revegetation plan supplied by Ash Creek (**Appendix C**). The costs associated with supplying logs would be expected to be reduced by approximately 50% in the event free logs can be secured by the project proponents. Consultant costs associated with final design, permitting, and construction phase services is not included in the construction cost estimate.

MCCOY WETLAND TIDAL RECONNECTION PROJECT
60% DESIGN SUBMITTAL

ENGINEER'S ESTIMATE OF PROBABLE CONSTRUCTION COSTS

Job No. 21-049 — 7/1/2025

ITEM NO.	SPECIFICATION	ITEM	ESTIMATED QUANTITY	UNIT	UNIT COST	TOTAL
1	015000	MOBILIZATION	1	LS	$58,400	$58,400
2	311100	TEMPORARY EROSION CONTROL AND BMP'S	1	LS	$20,000	$20,000
3	311100	CLEARING AND GRUBBING	1	LS	$13,000	$13,000
4	312319	DEWATERING	1	LS	$20,000	$20,000
5	312316	EXCAVATION	1,100	CY	$45	$49,500
6	312316	HUMMOCK FILL	900	CY	$25	$22,500
7	312316	SOIL OFFHAUL	200	CY	$25	$5,000
8	354200	SUPPLY LOGS WITH ROOTWADS	36	EA	$1,200	$43,200
9	354200	SUPPLY NURSE CRIB LOGS	100	EA	$1,000	$100,000
10	354200	SUPPLY PILE LOGS	100	EA	$800	$80,000
11	354200	INSTALL CHANNEL LOGS	36	EA	$1,200	$43,200
12	354200	INSTALL NURSE CRIB LOG STRUCTURES	50	EA	$868	$43,400
13	329000	SEEDING	3	AC	$17,000	$51,000
14	329000	REVEGETATION INSTALLATION	1	LS	$81,500	$81,500
15	329000	PLANT MAINTENANCE AND MONITORING	3	YR	$10,720	$32,160
					SUBTOTAL	$662,860
					CONTINGENCY (20%)	$132,572
					TOTAL	$795,432

NOTES:
1. Cost estimate does not include aquatic organism relocation.
2. Cost estimate assumes all logs are supplied by the Contractor.

Table 3. *Engineer's Construction Cost Estimate*

7.2 Disturbance Impacts

Within the Project Area, there is approximately 4.5 acres within the limits of disturbance, triggering the need for a 1200C Permit and Temporary Erosion and Sediment Control Plan to be developed prior to construction. Much of the disturbance is associated with the levee breaches, channel excavation, hummock placement, site access, and the staging area, which is outside of the project area on ODOT's right of way.

7.3 Material Quantities

The project design includes approximately 1,100 cubic yards of excavation from the breaches and channel excavation, and about 900 cubic yards of fill (hummock construction), with the remaining 200 cubic yards needing to be hauled off site. There will be a total of 236 logs used for the channel logs and nurse crib log structures. Plant quantities are included in **Appendix C**.

7.4 Temporary Water Management

Temporary water management will consist of isolating the marsh from Bott's Marsh by installing a temporary tide gate on the existing culvert to allow the site to drain, then blocking off the Bott's Marsh channel with sandbag berms, then pumping any remaining water from within the work area and salvaging aquatic organisms. Once the interior channel network is excavated and hummocks are formed, breaches into Bott's March and the Nehalem River will be made during favorable tidal conditions when the water surface elevations are below elevations of excavations.

7.5 Construction Staging and Access

The staging area will be on the opposite side of the Highway 101 bridge, with equipment access the site from on both the west and east sides (Appendix A, Sheet C7).

7.6 Implementation Schedule

Based on our experience, we believe the work currently proposed can be completed in one construction season (4 to 6 weeks). The in-water work period for the project site in the Nehalem River Estuary is in the winter (November 1- February 15; ODFW, 2024), but a variance may be requested to allow the work inside the levees to proceed during the drier months and connected at the beginning of the in-water work window.

The specific implementation schedule will be determined later, in consultation with the selected construction contractor.

7.7 Permit Conditions

Lower Nehalem Community Trust and Wild Salmon Center are leading the permitting effort for this project with support from Waterways and Cascade Environmental Group. Based on the current schedule, we anticipate obtaining all state and federal permits well ahead of the construction, which is anticipated in 2026 pending permit approval and implementation funding.

Prior to construction, Waterways will incorporate agency comments into the Drawings and Technical Specifications. Waterways will prepare a draft 1200-C construction stormwater permit Erosion and Sediment Control Plan that will be transferred to the Contractor prior to construction.

7.8 Construction Monitoring

Due to the variability of materials and sensitive site conditions, projects of this nature require construction observation by an engineer, geomorphologist, biologist, and archaeologist with relevant project experience and understanding of the project intent. Key phases requiring observation would include:

- Grading Associated with Interior Tidal Channels and Hummocks
- Installation of Channel Logs and Nurse Crib Structures
- Levee Breaches
- Temporary Erosion and Sediment Control Measure Removal

8.0 REFERENCES

Nehalem Basin Partnership. 2023. Strategic Action Plan for the Protection and Restoration of Coho Salmon Habitat in the Nehalem River.

Oregon Department of Fish and Wildlife. 2024. Oregon Guidelines for Timing of In-Water Work to Protect Fish and Wildlife Resourcs. March 2024.

Attachment 5.

Megan Hilgart
NOAA Restoration Center NW
1201 NE Lloyd Blvd, Suite 1100
Portland, OR 97232
megan.hilgart @noaa.gov

December 30, 2025

Emily Akdedian
Lower Nehalem Community Trust
532 Laneda Ave
Manzanita, OR 97130

Dear Emily:

The NOAA Restoration Center (RC) has awarded funds to the Lower Nehalem Community Trust through a subaward from the Wild Salmon Center for the restoration of the McCoy Marsh along the lower Nehalem River on the Oregon Coast through the Community-based Restoration Program. This federal funding constitutes a federal nexus under the Endangered Species Act (ESA). Under Section 7 of the ESA, consultation with the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) is required for any federal action that could affect ESA-listed species or their habitats. In addition, consultation with NMFS is required under the Magnuson-Stevens Fishery Conservation and Management Act (MSA) for any federal action that could affect designated Essential Fish Habitat (EFH) for coho, pink, and Chinook salmon, groundfish, and coastal pelagic species.

In December 2013 and May 2015, the Programmatic Restoration Opinion for Joint Ecosystem Conservation by the Services (PROJECTS) were issued by NMFS and USFWS, respectively. PROJECTS concludes that the restoration activities most commonly implemented with RC funding are not likely to jeopardize NMFS or USFWS species in the Pacific Northwest. PROJECTS provides non-discretionary terms and conditions intended to minimize the potential for incidental take of listed species. The document also includes measures intended to avoid and minimize potential impacts on EFH, and satisfies the consultation requirement for eligible activities under the MSA.

Your project has been reviewed by RC staff and a NMFS fish passage engineer, and it has been determined that the proposed activities are eligible for inclusion under PROJECTS. The project has also received fish passage approval from the NOAA engineering services. This means that if you follow the terms and conditions and meet the requirements outlined in this letter, you will satisfy the ESA/EFH consultation obligation for the RC-funded portion of your project. Please note that ESA/EFH coverage under PROJECTS does not satisfy any other federal, state, or local laws or permit requirements.

Your obligations under PROJECTS are as follows:

1) As the responsible project manager, you must ensure that the terms and conditions attached to this letter are followed, in their entirety, as applicable to your project. If you do not understand any of the terms and conditions, or believe that they cannot be implemented for any reason, you must contact RC staff immediately and obtain guidance.

2) If before or during project implementation you become aware of new information or unforeseen circumstances such that the project cannot be completed according to the scope of effects or the terms and conditions in the Opinion, you must inform RC staff. You must stop all project operations, except for efforts to avoid or minimize resource damage, pending completion of an individual consultation on the project.

3) If at any time during or after project implementation you identify a sick, injured, or dead specimen of a threatened or endangered species, you must notify NMFS Office of Law Enforcement at (503) 231-6240 or (206) 526-6133. The finder must take care in handling of sick or injured specimens to ensure effective treatment, and in handling dead specimens to preserve biological material in the best possible condition for later analysis of cause of death. The finder also has the responsibility to carry out instructions provided by the Office of Law Enforcement to ensure that evidence intrinsic to the specimen is not disturbed unnecessarily.

4) Within 60 days of completing a capture and release action in a given year, you must submit a complete Salvage Reporting Form to your NOAA RC technical monitor. Please find the Salvage Report Form as an appendix to the PROJECTS Action Notification and Completion Forms (attached).

5) Within 60 days of completing all work below ordinary high water in a given year, you must provide an Action Completion Report that describes your success in meeting the conservation measures, reasonable and prudent measures, and associated terms and conditions of the Opinion. Please find the Action Completion Report as an appendix to the PROJECTS Action Notification and Completion Forms (attached). As part of this report, you will need to determine the area restored/treated, among other information, as well as conduct turbidity monitoring (see an excerpt in the pages below from the Opinion that outlines the required turbidity monitoring).

The following conservation measures and terms and conditions are applicable to your project. These sections of the NMFS and USFWS Biological Opinions are enclosed with this letter.

- Project Design Criteria - General Construction Measures 1.3.1.2 (NMFS, p. 10, 2013)
- Project Design Criteria - Types of Restoration Actions 1.3.1.3 (NMFS, p. 22, 2013)
- Turbidity Monitoring (NMFS, p. 174, 2013)
- Conservation Measures for Northern Spotted Owl and Marbled Murrelet

Once you have read, understood, and made provisions to implement these measures, you are authorized to proceed with your project. If you have questions or need additional information, please contact me at 971-245-2605.

Sincerely,

Megan Hilgart

Megan Hilgart
Regional Supervisor

1.3.1.2 Project Design Criteria - General Construction Measures

13. Project Design

a. Use the best available scientific information regarding the likely effects of climate change on resources in the project area, including projections of local stream flow and water temperature, to ensure that the project will be adaptable to those changes.
b. Obtain all applicable regulatory permits and official project authorizations before beginning construction.
c. Minimize the extent and duration of earthwork, *e.g.*, compacting, dredging, drilling, excavation, and filling.
    i. Avoid use of heavy equipment, vehicles or power tools below bankfull elevation unless project specialists determine such work is necessary, or will result in less risk of sedimentation or other ecological damage than work above that elevation.
    ii. Complete earthwork in wetlands, riparian areas, and stream channels as quickly as possible.
d. Cease project operations when high flows may inundate the project area, except for efforts to avoid or minimize resource damage.

14. Site Contamination Assessment

a. The level of detail and resources committed to such an assessment will be commensurate with the level and type of past or current development at the site. Assessments may include the following:
    i. Review available records, such as former site use, building plans, and records of any prior contamination events.
    ii. If the project site was used for industrial processes (*i.e.*, mining or manufacturing with chemicals), inspect to determine the environmental condition of the property.
    iii. Interview people who are knowledgeable about the site, *e.g.*, site owners, operators, and occupants, neighbors, or local government officials.
b. Retain contaminant survey information in the project file. Consult with NMFS if ground disturbance to accomplish the proposed project will potentially release contaminants to aquatic habitat that supports listed fish species.

15. Site Layout and Flagging

a. Before any significant ground disturbance or entry of mechanized equipment or vehicles into the construction area, clearly mark with flagging or survey marking paint the following areas:
    i. Sensitive areas, *e.g.*, wetlands, water bodies, ordinary high water, spawning areas
    ii. Equipment entry and exit points
    iii. Road and stream crossing alignments
    iv. Staging, storage, and stockpile areas
b. Before the use of herbicides, clearly flag no-application buffer zones.

16. Staging, Storage, and Stockpile Areas

a. Designate and use staging areas to store hazardous materials, or to store, fuel, or service heavy equipment, vehicles and other power equipment with tanks larger than 5 gallons, that are at least 150 feet from any natural water body or wetland, or on an established paved area, such that sediment and other contaminants from the staging area cannot be deposited in the floodplain or stream.
b. Natural materials that are displaced by construction and reserved for restoration, *e.g.*, LW, gravel, and boulders, may be stockpiled within the 100-year floodplain.

c. Dispose of any material not used in restoration and not native to the floodplain outside of the functional floodplain.
d. After construction is complete, obliterate all staging, storage, or stockpile areas, stabilize the soil, and revegetate the area.[1]

17. Erosion Control

a. Use site planning and site erosion control measures commensurate with the scope of the project to prevent erosion and sediment discharge from the project site.
b. Before significant earthwork begins, install appropriate, temporary erosion controls downslope to prevent sediment deposition in the riparian area, wetlands, or water body.
c. During construction, if eroded sediment appears likely to be deposited in the stream during construction, install additional sediment barriers as necessary.
d. Temporary erosion control measures may include fiber wattles, silt fences, jute matting, wood fiber mulch and soil binder, or geotextiles and geosynthetic fabric.
e. Soil stabilization utilizing wood fiber mulch and tackifier (hydro-applied) may be used to reduce erosion of bare soil if the materials are noxious weed free and nontoxic to aquatic and terrestrial animals, soil microorganisms, and vegetation.
f. Remove sediment from erosion controls if it reaches 1/3 of the exposed height of the control.
g. Whenever surface water is present, maintain a supply of sediment control materials and an oil-absorbing floating boom at the project site.
h. Stabilize all disturbed soils following any break in work unless construction will resume within four days.
i. Remove temporary erosion controls after construction is complete and the site is fully stabilized.

18. Hazardous Material Spill Prevention and Control

a. At the project site:
    i. Post written procedures for notifying environmental response agencies, including an inventory and description of all hazardous materials present, and the storage and handling procedures for their use.
    ii. Maintain a spill containment kit, with supplies and instructions for cleanup and disposal, adequate for the types and quantity of hazardous materials present.
    iii. Train workers in spill containment procedures, including the location and use of the spill containment kits.
b. Temporarily contain any waste liquids generated under an impervious cover, such as a tarpaulin, in the staging area until the wastes can be properly transported to, and disposed of, at an approved receiving facility.

19. Equipment, Vehicles, and Power Tools

a. Select, operate and maintain all heavy equipment, vehicles, and power tools to minimize adverse effects on the environment, *e.g.*, low pressure tires, minimal hard-turn paths for track vehicles, use of temporary mats or plates to protect wet soils.
b. Before entering wetlands or working within 150 feet of a waterbody, replace all petroleum-based hydraulic fluids with biodegradable products.[2]

---

[1] Road and path obliteration refers to the most comprehensive degree of decommissioning and involves decompacting the surface and ditch, pulling the fill material onto the running surface, and reshaping to match the original contour.

[2] For additional information and suppliers of biodegradable hydraulic fluids, motor oil, lubricant, or grease, see Environmentally Acceptable Lubricants by the U.S. EPA (2011); *e.g.*, mineral oil, polyglycol, vegetable oil, synthetic ester; Mobil® biodegradable hydraulic oils, Total® hydraulic fluid, Terresolve Technologies Ltd.® bio-based

c. Invasive species prevention and control.
    i. Before entering the project site, power wash all heavy equipment, vehicles and power tools, allow them to fully dry, and inspect them to make certain no plants, soil, or other organic material is adhering to their surface.
    ii. Before entering the water, inspect any watercraft, waders, boots, or other gear to be used in or near water and remove any plants, soil, or other organic material adhering to the surface.
d. Inspect all equipment, vehicles, and power tools for fluid leaks before they leave the staging area.
e. Before operation within 150 feet of any waterbody, and as often as necessary during operation, thoroughly clean all equipment, vehicles, and power tools to keep them free of external fluids and grease and to prevent leaks and spills from entering the water.
f. Generators, cranes or other stationary heavy equipment operated within 150 feet of any waterbody will be maintained and protected as necessary to prevent leaks and spills from entering the water.

20. Temporary Access Roads and Paths

a. Whenever reasonable, use existing access roads and paths preferentially.
b. Minimize the number and length of temporary access roads and paths through riparian areas and floodplains.
c. Minimize removal of riparian vegetation.
d. When it is necessary to remove vegetation, cut at ground level (no grubbing).
e. Do not build temporary access roads or paths where grade, soil, or other features suggest slope instability.
f. Any road on a slope steeper than 30% will be designed by a civil engineer with experience in steep road design.
g. After construction is complete, obliterate all temporary access roads and paths, stabilize the soil, and revegetate the area.
h. Temporary roads and paths in wet areas or areas prone to flooding will be obliterated by the end of the in-water work window. Decompact road surfaces and drainage areas, pull fill material onto the running surface, and reshape to match the original contours.

21. Dust Abatement

a. Employ dust abatement measures commensurate with soil type, equipment use, wind conditions, and the effects of other erosion control measures.
b. Sequence and schedule work to reduce the exposure of bare soil to wind erosion.
c. Maintain spill containment supplies on-site whenever dust abatement chemicals are applied.
d. Do not use petroleum-based products.
e. Do not apply dust-abatement chemicals, *e.g.*, magnesium chloride, calcium chloride salts, ligninsulfonate, within 25 feet of a water body, or in other areas where they may runoff into a wetland or water body.
f. Do not apply ligninsulfonate at rates exceeding 0.5 gallons per square yard of road surface, assuming a 50:50 solution of ligninsulfonate to water.

---

biodegradable lubricants, Cougar Lubrication® 2XT Bio engine oil, Series 4300 Synthetic Bio-degradable Hydraulic Oil, 8060-2 Synthetic Bio-Degradable Grease No. 2, *etc*. The use of trade, firm, or corporation names in this opinion is for the information and convenience of the action agency and applicants and does not constitute an official endorsement or approval by the U.S. Department of Commerce or NMFS of any product or service to the exclusion of others that may be suitable.

22. **Temporary Stream Crossings**
    a. No stream crossing may occur at active spawning sites, when holding adult listed fish are present, or when eggs or alevins are in the gravel.
    b. Do not place temporary crossings in areas that may increase the risk of channel re-routing or avulsion, or in potential spawning habitat, *e.g.*, pools and pool tailouts.
    c. Minimize the number of temporary stream crossings; use existing stream crossings whenever reasonable.
    d. Install temporary bridges and culverts to allow for equipment and vehicle crossing over perennial streams to access construction areas.
    e. Wherever possible, vehicles and machinery will cross streams at right angles to the main channel.
    f. Equipment and vehicles may cross the stream in the wet only where the streambed is bedrock where the streambed is naturally stable, or where mats or off-site logs are placed in the stream and used as a crossing.
    g. Obliterate all temporary stream crossings as soon as they are no longer needed, and restore any damage to affected stream banks or channel.

23. **Surface Water Withdrawal and Construction Discharge Water**
    a. Surface water may be diverted to meet construction needs, but only if developed sources are unavailable or inadequate.
    b. Diversions may not exceed 10% of the available flow and will have a juvenile fish exclusion device that is consistent with NMFS' criteria (NMFS 2011a).[3]
    c. Treat all construction discharge water using best management practices to remove debris, sediment, petroleum products, and any other pollutants likely to be present (*e.g.*, green concrete, contaminated water, silt, welding slag, sandblasting abrasive, grout cured less than 24 hours, drilling fluids), to ensure that no pollutants are discharged to any perennial or intermittent waterbody.

24. **Fish Passage**
    a. Provide fish passage for any adult or juvenile ESA-listed fish likely to be present in the action area during construction, unless passage did not exist before construction, stream isolation and dewatering is required during project implementation, or the stream is naturally impassable at the time of construction.
    b. After construction, provide fish passage that meets NMFS' fish passage criteria for any adult or juvenile ESA-listed fish (NMFS 2011a), for the life of the action.

25. **Timing of In-Water Work**
    a. The in-water work window will be identified as the limit to in-water construction specified in the project notification form. The construction schedule will conform to the windows established in Oregon, Washington, and Idaho by the Oregon Department of Fish and Wildlife (ODFW 2008), Washington Department of Fish and Wildlife (WDFW 2010), and Idaho Department of Fish and Game, respectively. Any exceptions to in-water work windows recommended by ODFW, WDFW, or IDFG will be approved by NMFS. In the Willamette River below Willamette Falls, the winter work window (December 1 – January 31) is not approved for actions under this opinion.
    b. Hydraulic and topographic measurements and placement of LW, boulders, or gravel may be completed anytime, provided the affected area is not occupied by adult fish congregating for spawning, or in an area where redds are occupied by eggs or pre-emergent alevins.

---

[3] National Marine Fisheries Service. 2011. Anadromous salmonid passage facility design. Northwest Region.

26. **Fisheries, Hydrology, Geomorphology, Wildlife, Botany, and Cultural Surveys in Support of Aquatic Restoration** include assessments and monitoring projects that are associated with planning, implementation, and monitoring of aquatic restoration projects covered by this opinion. Such support projects may include surveys to document the following aquatic and riparian attributes: fish habitat, hydrology, channel geomorphology, water quality, fish spawning, fish presence[4], macroinvertebrates, riparian vegetation, wildlife, and cultural resources (including excavating test pits less than 1 m^2 in size). This also includes effectiveness monitoring associated with projects implemented under this opinion, provided the effectiveness monitoring is limited to the same survey techniques described in this section.
    a. Train personnel in survey methods to prevent or minimize disturbance of fish. Contract specifications should include these methods where appropriate.
    b. Avoid impacts to fish redds. When possible, avoid sampling during spawning periods.
    c. Coordinate with other local agencies to prevent redundant surveys.
    d. Locate excavated material from cultural resource test pits away from stream channels. Replace all material in test pits when survey is completed and stabilize the surface.
    e. Does not include research projects that have or should obtain a permit pursuant to section 10(a) of the ESA.

27. **Work Area Isolation**
    a. Isolate any work area within the wetted channel from the active stream whenever ESA-listed fish are reasonably certain to be present, or if the work area is less than 300 feet upstream from known spawning habitats. However, work area isolation may not always be necessary or practical in certain settings; *i.e.,* dry streambeds and tidal zones, respectively.
    b. Engineering design plans for work area isolation will include all isolation elements.
    c. Dewater the shortest linear extent of work area practicable, unless wetted in-stream work is deemed to be minimally harmful to fish, and is beneficial to other aquatic species.[5]
        i. Use a coffer dam and a by-pass culvert or pipe, or a lined, non-erodible diversion ditch to divert flow around the dewatered area. Dissipate flow energy to prevent damage to riparian vegetation or stream channel and provide for safe downstream reentry for fish, preferably into pool habitat with cover.
        ii. Where gravity feed is not possible, pump water from the work site to avoid rewatering. Maintain a fish screen on the pump intake to avoid juvenile fish entrainment (NMFS 2011a).
        iii. Pump seepage water to a temporary storage and treatment site, or into upland areas, to allow water to percolate through soil or to filter through vegetation before reentering the stream channel with a treatment system comprised of either a hay bale basin or other sediment control device.
        iv. Monitor below the construction site to prevent stranding of aquatic organisms.
        v. When construction is complete, re-water the construction site slowly to prevent loss of surface flow downstream, and to prevent a release of suspended sediment.
    d. Whenever a pump is used to dewater the isolation area and ESA-listed fish may be present, a fish screen will be used that meets the most current version of NMFS' fish screen criteria (NMFS 2011a). NMFS approval is required for pumping that exceeds 3 cfs.

---

[4] Capture or enumeration by non-lethal techniques, *i.e.,* snorkel, minnow trapping; not hooking or electrofishing.

[5] For instructions on how to dewater areas occupied by lamprey, see *Best management practices to minimize adverse effects to Pacific lamprey* (*Entosphenus tridentatus*) (USFWS 2010).

28. Fish Capture and Release

a. If practicable, allow listed fish species to migrate out of the work area or remove fish before dewatering; otherwise remove fish from an exclusion area as it is slowly dewatered with methods such as hand or dip-nets, seining, or trapping with minnow traps (or gee-minnow traps).
b. Fish capture will be supervised by a qualified fisheries biologist, with experience in work area isolation and competent to ensure the safe handling of fish.
c. Conduct fish capture activities during periods of the day with the coolest air and water temperatures possible, normally early in the morning to minimize stress and injury of species present.
d. Monitor the nets frequently enough to ensure they stay secured to the banks and free of organic accumulation.
e. Electrofishing will be used during the coolest time of day, and only after other means of fish capture are determined to be not feasible or ineffective.
    i. Follow the most recent version of NMFS (2000) electrofishing guidelines.
    ii. Do not electrofish when the water appears turbid, *e.g.*, when objects are not visible at depth of 12 inches.
    iii. Do not intentionally contact fish with the anode.
    iv. Use direct current (DC) or pulsed direct current within the following ranges:
        1. If conductivity is less than 100 µs, use 900 to 1100 volts.
        2. If conductivity is between 100 and 300 µs, use 500 to 800 volts.
        3. If conductivity greater than 300 µs, use less than 400 volts.
    v. Begin electrofishing with a minimum pulse width and recommended voltage, then gradually increase to the point where fish are immobilized.
    vi. Immediately discontinue electrofishing if fish are killed or injured, *i.e.*, dark bands visible on the body, spinal deformations, significant de-scaling, torpid or inability to maintain upright attitude after sufficient recovery time. Recheck machine settings, water temperature and conductivity, and adjust or postpone procedures as necessary to reduce injuries.
f. If buckets are used to transport fish:
    i. Minimize the time fish are in a transport bucket.
    ii. Keep buckets in shaded areas or, if no shade is available, covered by a canopy.
    iii. Limit the number of fish within a bucket; fish will be of relatively comparable size to minimize predation.
    iv. Use aerators or replace the water in the buckets at least every 15 minutes with cold clear water.
    v. Release fish in an area upstream with adequate cover and flow refuge; downstream is acceptable provided the release site is below the influence of construction.
    vi. Be careful to avoid mortality counting errors.
g. Monitor and record fish presence, handling, and injury during all phases of fish capture and submit a fish salvage report (Appendix A) to NMFS within 60 days of capture that documents date, time of day, fish handling procedures, air and water temperatures, and total numbers of each salmon, steelhead and eulachon handled, and numbers of ESA-listed fish injured or killed.

31. Site Restoration

a. Restore any significant disturbance of riparian vegetation, soils, stream banks or stream channel.
b. Remove all project related waste; *e.g.*, pick up trash, sweep roadways in the project area to avoid runoff-containing sediment, *etc.*
c. Obliterate all temporary access roads, crossings, and staging areas.

d. Loosen soil in compacted areas when necessary for revegetation or infiltration.
e. Although no single criterion is sufficient to measure restoration success, the intent is that the following features should be present in the upland parts of the project area, within reasonable limits of natural and management variation:
    i. Human and livestock disturbance, if any, are confined to small areas necessary for access or other special management situations.
    ii. Areas with signs of significant past erosion are completely stabilized and healed, bare soil spaces are small and well-dispersed.
    iii. Soil movement, such as active rills and soil deposition around plants or in small basins, is absent or slight and local.
    iv. Native woody and herbaceous vegetation, and germination microsites, are present and well distributed across the site; invasive plants are minimal or absent.
    v. Plants have normal, vigorous growth form, and a high probability of remaining vigorous, healthy and dominant over undesired competing vegetation.
    vi. Plant litter is well distributed and effective in protecting the soil with little or no litter accumulated against vegetation as a result of active sheet erosion ("litter dams").
    vii. A continuous corridor of shrubs and trees appropriate to the site are present to provide shade and other habitat functions for the entire streambank/shoreline.

32. Revegetation

a. Plant and seed disturbed areas before or at the beginning of the first growing season after construction.
b. Use a diverse assemblage of vegetation species native to the action area or region, including trees, shrubs, and herbaceous species. Vegetation, such as willow, sedge and rush mats, may be gathered from abandoned floodplains, stream channels, *etc.* When feasible, use vegetation salvaged from local areas scheduled for clearing due to development.
c. Use species that will achieve shade and erosion control objectives, including forb, grass, shrub, or tree species that are appropriate for the site and native to the project area or region.
d. Short-term stabilization measures may include use of non-native sterile seed mix if native seeds are not available, weed-free certified straw, jute matting, and similar methods.
e. Do not apply surface fertilizer within 50 feet of any wetland or water body.
f. Install fencing as necessary to prevent access to revegetated sites by livestock or unauthorized persons.
g. Do not use invasive or non-native species for site restoration.
h. Conduct post-construction monitoring and treatment to remove or control invasive plants until native plant species are well-established.

1.3.1.3 Project Design Criteria – Types of Restoration Actions

34. **Large Wood (LW), Boulder, and Gravel Placement** includes LW and boulder placement, ELJs, constructed riffles, porous boulder structures and vanes, gravel placement, and tree removal for LW projects. Such activities will occur in areas where channel structure is lacking due to past stream cleaning (LW removal), riparian timber harvest, and in areas where natural gravel supplies are low due to anthropogenic disruptions. These projects will occur in stream channels and adjacent floodplains to increase channel stability, rearing habitat, pool formation, spawning gravel deposition, channel complexity, hiding cover, low velocity areas, and floodplain function.

a. **Large wood and boulder projects**
   i. Place LW and boulders in areas where they would naturally occur and in a manner that closely mimics natural accumulations for that particular stream type. For example, boulder placement may not be appropriate in low-gradient meadow streams.
   ii. Structure types shall simulate disturbance events to the greatest degree possible and include, but are not limited to, log jams, debris flows, wind-throw, and tree breakage.
   iii. No limits are to be placed on the size or shape of structures as long as such structures are within the range of natural variability of a given location and do not block fish passage.
   iv. Projects can include grade control and streambank stabilization structures, while size and configuration of such structures will be commensurate with scale of project site and hydraulic forces.
   v. The partial burial of LW and boulders is permitted and may constitute the dominant means of placement. This applies to all stream systems but more so for larger stream systems where use of adjacent riparian trees or channel features is not feasible or does not provide the full stability desired.
   vi. LW includes whole conifer and hardwood trees, logs, and rootwads. LW size (diameter and length) should account for bankfull width and stream discharge rates. When available, trees with rootwads should be a minimum of 1.5x bankfull channel width, while logs without rootwads should be a minimum of 2.0 x bankfull widths.
   vii. Structures may partially or completely span stream channels or be positioned along stream banks.
   viii. Stabilizing or key pieces of LW will be intact, hard, with little decay, and if possible have root wads (untrimmed) to provide functional refugia habitat for fish. Consider orienting key pieces such that the hydraulic forces upon the LW increase stability.
   ix. Anchoring LW – Anchoring alternatives may be used in preferential order:
      1. Use of adequate sized wood sufficient for stability
      2. Orient and place wood in such a way that movement is limited
      3. Ballast (gravel or rock) to increase the mass of the structure to resist movement
      4. Use of large boulders as anchor points for the LW
      5. Pin LW with rebar to large rock to increase its weight. For streams that are entrenched (Rosgen F, G, A, and potentially B) or for other streams with very low width to depth ratios (less than 12) an additional 60% ballast weight may be necessary due to greater flow depths and higher velocities.
      6. Anchoring LW by cable is not allowed under this opinion.

39. **Set-Back or Removal of Existing Berms, Dikes, and Levees** will be conducted to reconnect historical fresh-water deltas to inundation, stream channels with floodplains, and historical estuaries to tidal influence. Such projects will take place where estuaries and floodplains have been disconnected from adjacent rivers through drain pipes and anthropogenic fill.

b. **Estuary restoration**
   i. Project implementation shall be conducted in a sequence that will not preclude repairing or restoring estuary functions once dikes/levees are breached and the project area is flooded.

ii. Culverts and tide gates will be removed using the PDC and conservation measures, where appropriate, as described in Work Area Isolation (PDC 27), Surface Water Withdrawals (PDC 23), and Fish Capture and Release (PDC 28) and Fish Passage Restoration (PDC 33) above.

iii. Temporary roads within the project area should be removed to allow free flow of water. Material either will be placed in a stable area above the ordinary high water line or highest measured tide or be used to restore topographic variation in wetlands.

iv. To the extent possible, remove segmented drain tiles placed to drain wetlands. Fill generated by drain tile removal will be compacted back into the ditch created by removal of the drain tile.

v. Channel construction may be done to recreate channel morphology based on aerial photograph interpretation, literature, topographic surveys, and nearby undisturbed channels. Channel dimensions (width and depth) are based on measurements of similar types of channels and the drainage area. In some instances, channel construction is simply breaching the levee. For these sites, further channel development will occur through natural processes.

vi. Fill ditches constructed and maintained to drain wetlands. Some points in an open ditch may be over-filled, while other points may be left as low spots to enhance topography and encourage sinuosity of the developing channel.

Section 2.8.1, Amount or Extent of Take: Harm due to habitat-related effects

USFWS and NOAA RC will complete and record the following water quality observations to ensure that any increases in suspended sediment do not exceed background levels:

1. Take a turbidity sample using an appropriately and regularly calibrated turbidimeter, or a visual turbidity observation, every 4 hours when work is being completed, or more often as necessary to ensure that the in-water work area is not contributing visible sediment to water, at a relatively undisturbed area approximately 100 feet upstream from the project area, or 300 feet from the project area if it is subject to tidal or coastal scour. Record the observation, location, and time before monitoring at the downstream point.
2. Take a second visual observation, immediately after each upstream observation, approximately 50 feet downstream from the project area in streams that are 30 feet wide or less, 100 feet from the project area for streams between 30 and 100 feet wide, 200 feet from the discharge point or nonpoint source for streams greater than 100 feet wide, and 300 feet from the discharge point or nonpoint source for areas subject to tidal or coastal scour. Record the downstream observation, location, and time.
3. Compare the upstream and downstream observations. If more turbidity or pollutants is/are observed downstream than upstream, the activity will be modified to reduce pollution. Continue to monitor every 4 hours.
4. If the exceedance continues after the second monitoring interval (after 8 hours), the activity will stop until the levels returns to background.

3.5.7 Conservation Measures for Northern Spotted Owl

The proposed conservation measures for spotted owl are:

a. To reduce adverse effects to spotted owl, projects will not generally occur during the critical breeding period between March 1 to July 15. Exact timing for a given location may vary and deviations from the above breeding period can be modified with approval of the local Service office. Projects should (a) be delayed until after the critical breeding season (unless the action

involves Type I helicopters, which extends the critical nesting window to September 30); (b) delayed until it is determined that young are not present.

b. The Service wildlife biologist may extend the restricted season based on site-specific information (such as a late nesting attempt).

c. Table 12 shows disruption distances applicable to the equipment types proposed in the BA. These distances can be locally altered based on current information.

d. No activity within this proposed action will cause adverse effects to spotted owl critical habitat when analyzed at the appropriate local scale as determined by the Service wildlife biologist.

e. For (LW) projects, follow conservation measures as outlined in the Tree Removal for LW Projects under PDC 34f.

f. No hovering or lifting within 152 m (500 feet) of the ground within occupied northern spotted owl habitat during the critical breeding season by Incident Command System

1. Action Completion Report

A) RESTORATION PROJECT ACTIVITIES: Within 60 days of completing all restoration work as part of an action completed under PROJECTS, submit the completed Action Completion Form with the following information to your NOAA contact.

Actual Start and End Dates for the Completion of Work:	**Start:**	**End:**
Actual Start and End Dates for the Completion of In-water Work:	**Start:**	**End:**
Turbidity Monitoring/Sampling Completed	Yes No	Not Required

TURBIDITY MONITORING. Provide records of turbidity monitoring (visual or by turbidimeter) including dates, times and location of monitoring. Include any exceedances and steps taken to reduce turbidity observed.

Type here to enter text.

Take/Amount of effect: Please provide the amount of take observed, or assumed, or "calculated"- use the same units as take statement:

Affected Species	**Type of Action** For fish: modification of active channel or herbicide treatment ***(do not include fish salvage- use Section 2 of this form)***	**Amount of take or effect. For fish record as:** For fish: Actual linear feet of modification in active channel or actual acreage of herbicide treatment

EROSION AND CONTAMINANT INFORMATION: For aquatic projects, include a summary of the results of pollution and erosion control inspections, including any erosion control failure, contaminant release, and correction effort.

Type to enter text.

COMMENTS AND RECOMMENDATIONS: Please provide feedback that would improve the implementation of this BO and or minimize negative effects to listed species in the future. Examples include suggestions to improve PROJECTS, PDCs, or Conservation Measures (i.e. Lessons Learned); and any deviations from proposed project and how those were addressed. For herbicide use, information on the type of herbicide used and its effectiveness, as well as non-target impacts of the herbicide would also be useful.

Type here to enter text.

2. Fish Salvage Reporting Form

If applicable: Within 60 days of completing a capture and release as part of an action completed under PROJECTS, the applicant must submit a complete Salvage Reporting Form, with the following information to your NOAA contact.

Date(s) of Fish Salvage Operation(s): _____

Supervisory Fish Biologist: _____

Address: _____

Telephone Number: _____

Waterbody/Location: _____

Describe methods that were used to isolate the work area and remove fish

Type here to enter text.

Fish Salvage Data

Water Temperature:

Air Temperature:

Time of Day:

ESA-Listed Species	Number Handled		Number Injured		Number Killed	
	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult

Lower Columbia River Chinook salmon						
Upper Willamette River Chinook salmon						
Upper Columbia R. spring-run Chinook salmon						
Snake River spring/summer-run Chinook salmon						
Snake River fall-run Chinook salmon						
Puget Sound Chinook salmon						
Lake Ozette sockeye salmon						
Columbia River chum salmon						
Hood Canal chum salmon						
Lower Columbia River coho salmon						
Oregon Coast coho salmon						
S. Oregon/N. California Coasts coho salmon						
Snake River sockeye salmon						
Lower Columbia River steelhead						
Upper Willamette River steelhead						
Middle Columbia River steelhead						
Upper Columbia River steelhead						
Snake River Basin steelhead						
Puget Sound steelhead						
Eulachon						
Green Sturgeon						
Yelloweye Rockfish						
Canary Rockfish						
Bocaccio Rockfish						

Bull trout (FWS)						
Lahontan cutthroat trout (FWS)						
Warner sucker (FWS)						

PROJECTS Action Notification Form

Project managers shall submit the completed Action Notification (ANF) portion of this form to NMFS and/or USFWS at least 30 calendar days prior to undertaking restoration activities. **If an ANF is not submitted, then the project has no ESA coverage.**

USFWS and/or NMFS will notify project managers within 30 calendar days if the action is approved or disqualified **only** if a response is required based on the project activity category and species affected. When requested, USFWS or NMFS will provide an estimate of the time necessary to complete the review. Approval may be delayed if a substandard design is submitted and significant revision is necessary. These reviews are best initiated during the preliminary project development phase, when project team members are developing goals and objectives.

Additional information may be attached to an e-mail message as necessary, and may include:

- Fish passage approval
- Monitoring and Adaptive Management Plans
- Responses to the 16 RiverRAT questions
- Minor variance approvals
- Erosion and pollution control plan
- Engineering designs
- Fire, herbicide, or forest harvest plans, as warranted
- Comprehensive management plans
- Other approval documentation

Project Reporting. The project manager shall submit the following reports to USFWS and/or NMFS as necessary:

1. **Action Notification:** at least **30** days prior to undertaking restoration activities.

2. **Action Completion Reporting:** within **60** days of completing all work below ordinary high water (OHW) or end of construction.

3. **Fish Salvage Reporting:** within **60** days of completing a capture and release as part of an action completed under PROJECTS.

Completion of the Action Implementation Form. Documents compliance with PROJECTS. It may be used to support, but does not necessarily substitute, for ESA documentation requirements by individual offices.

NOTE: ***It is the responsibility of the project manager to ensure ESA compliance is properly documented in project files according to each office's policies and procedures.***

PROJECTS Action Notification Form

NMFS Tracking #: NWR-2013-10221
USFWS Tracking #: 01EOFW00-2014-F-0222

Lead Action Agency: NOAA Restoration Center **Date of Request:** November 26, 2025

Project Title: *McCoy Wetland Project Levee Breach*
NOAA RC RCDB number: 5861
Nature of Habitat: ☑ Aquatic ☐ Upland

State(s): ☐ Idaho ☑ Oregon ☐ Washington

County: Tillamook
Project Lead: megan hilgart
Project Lead Phone/Email: (971) 245-2605 / megan.hilgart@noaa.gov
6th field HUC/Name: 171002 / Northern Oregon Coastal
Latitude and Longitude: 45.7002, -123.8801

Statutory Authority: ☑ ESA (USFWS) ☑ ESA (NMFS) ☑ EFH (NMFS)

Proposed work period: 07/15/2026 — 11/30/2026
Fish salvage Required? ☑ Yes ☐ No

In water work period? ☑ Yes ☐ No

Start/end date for In Water Work Period: 07/15/2026 — 09/15/2026

Check All Required Reviews/Approvals:

Type of Review/Approval	Date Received
☐ RRT review	
☐ Fish Passage Engineer approval	
☐ USFWS Office Approval	
☐ Minor Variance	

USFWS Species/Critical Habitat in Action Area

Species: Marbled murrelet
Critical Habitat: No
Is the project Likely to Adversely Affect (LAA)? NLAA

Species: Northern spotted owl
Critical Habitat: No
Is the project Likely to Adversely Affect (LAA)? NLAA

NMFS Species/Critical Habitat or Essential Fish Habitat in Present in Action Area

Species: Oregon Coast coho salmon
Critical Habitat: Yes
Is the project Likely to Adversely Affect (LAA)? LAA

ANTICIPATED EFFECTS
Number of individuals captured during salvage: 100
Number of individual mortalities during salvage: 5
Length of streambank/channel disturbance or alteration: 110 Feet
The extent of take during in water work for turbidity is estimated by the length of a turbidity plume downstream from the project site.
Based on an approximate reported stream width of **750** ft. the **plume can extend 300 ft downstream**.
Remember, if turbidity is **over 10%** below this distance, pause operations and reinforce erosion and pollution controls.
Does the project use herbicide in riparian areas: Yes
Estimated area treated with herbicide: 10 Acres
Is this less than 10% of the riparian habitat in the 6th field HUC: Yes

---

Species: Salmon, Chinook (EFH)
Is the project Likely to Adversely Affect (LAA)? NLAA

Species: Salmon, Coho (EFH)
Is the project Likely to Adversely Affect (LAA)? NLAA

Types of Restoration Actions

The project includes all of the checked actions and will be consistent with the project design criteria in the PROJECTS BO. All actions marked with (**) require approval – see PROJECTS BO for additional detail.

☐	****Fish Passage Restoration (PDC 33a-f)**		
☐	**Stream Simulation projects requesting or requiring a minor waiver related to deviating from PROJECTS Stream Simulation criteria (33a)	☐	**Irrigation Diversion Replacement/Relocation (33f)
☐	Headcut and Grade Stabilization (33d; **implementing grade control or scour countermeasures)	☐	**Screen Installation/Replacement (33f)
☐	**Fish Ladder (33e)		
☐	**Stream Channel Enhancement (PDC 34)**		
☐	Large Wood or Boulders (34a)	☐	Porous Boulder Structures and Vanes (34d)
☐	Engineered Logjams (34b)	☐	Gravel Augmentation (34e)
☐	Constructed Riffles (34c)	☐	Tree Removal for LW Projects (34f)
☐	**Dam and Legacy Structure Removal (PDC 35)**		
☐	**Dam Removal (35a)	☐	Legacy Structure Removal (35b)
☐	****Fluvial Channel Reconstruction/Relocation (PDC 36)**		
☐	**Off- and Side Channel Habitat Restoration (PDC 37)**		
☐	**Reconstruction is >20% of bankfull flow		
☐	**Streambank Restoration (PDC 38)**		
☐	Large alluvium placement (38d)	☐	LW placement occupying > 25% of the bankfull cross section (38e)
☑	**Set-Back or Removal of Existing Berms, Dikes, and Levees (PDC 39)**		
☐	Floodplains & Freshwater Deltas (39a)	☑	Estuary Restoration (39b)
☐	**Reduction/Relocation of Recreational Impacts (PDC 40)**		
☐	**Livestock Fencing, Stream Crossing and Off-Channel Livestock Watering (PDC 41)**		
☐	Livestock Fencing (41a)	☐	Off-channel livestock watering (41c)
☐	Livestock stream crossings (41b)		
☐	**Piling, Marine Debris, and other Structure Removal (PDC 42)**		
☐	**Shellfish Bed/Nearshore Habitat Restoration (PDC 43)**		
☐	Shellfish bed restoration (43a)	☐	**Beach Nourishment (43c)
☐	Replacing hard armoring w/ alternative (43b)		

☐	**In-channel Nutrient Enhancement (PDC 44)**		
☐	**Road and Trail Erosion Control and Decommissioning (PDC 45)**		
☐	Road Decommissioning/ Stormproofing (45a)	☐	Road Relocation (45b)
☐	**Juniper Tree Removal (PDC 46)**		
☐	**Native Fish Protection (PDC 47)**		
☐	Electrofishing		
☐	**Beaver Habitat Restoration (PDC 48)**		
☐	In-channel Structures (48a)	☐	Habitat Restoration (48b)
☐	**Wetland Restoration (PDC 49)**		
☐	****Tide/Flood Gate Removal, Replacement, or Retrofit (PDC 50)**		
☐	**Removal	☐	**Replacement
☐	**Retrofit	☐	**Dike breach or setback
☐	**Culvert or bridge		
☑	**Native Vegetation Restoration and Management (PDC 51)**		
☑	Manual/ Mechanical	☑	Herbicide Treatments (see also PDC 29)
☐	Grazing	☐	Plant population enhancement/ restoration
☐	Prescribed Fire	☐	Surveys/ Monitoring (see also PDC 26)
☐	**Upland Silvicultural Treatments (PDC 52)**		
☐	Forest thinning	☐	Limb pruning
☐	Planting of native species (PDC 32)	☐	Control of invasive species (PDC 29)
☐	**Install Wildlife Structures (PDC 53)**		

General Construction Measures

The project will be consistent with the following measures from PROJECTS BO. All measures marked with ("**") require approval – see PROJECTS BO for additional detail.

☑	Site Layout and Flagging (PDC 15)	☐	Temporary Fish Passage (PDC 24)
☑	Staging, Storage, and Stockpile Areas (PDC 16)	☑	Timing of In-Water Work (PDC 25)
☑	Erosion Control (PDC 17)	☐	Surveys in Support of Habitat Restoration (PDC 26)
☑	Hazardous Material Spill Prevention and Control (PDC 18)	☑	Work area isolation (PDC 27) ☐ **Fish screen for pump intakes to dewater at >3 cfs
☑	Equipment, Vehicles, and Power Tools (PDC 19)	☑	Fish Capture and Release (PDC 28)
☑	Temporary Access Roads and Paths (PDC 20)	☑	Invasive Species and Nonnative Plant Control (PDC 29) ☑ Mechanical means ☑ Herbicides
☐	Dust Abatement (PDC 21)	☐	**Piling Installation (PDC 30)
☑	Temporary Stream Crossing (PDC 22)	☑	Site restoration (PDC 31)
☐	Surface Water Withdrawal and Construction Discharge Water (PDC 23)	☑	Revegetation (PDC 32)

Project Description

List the project activities and describe the intended result(s); tell when the project is to occur; describe how the activities will be implemented; provide any other pertinent information. ***Note: If you are utilizing herbicides during your restoration, please provide specific information regarding:***

- *Herbicide and Surfactants to be used*
- *Targeted non-desired (i.e. invasive, non-native, etc.) species – scientific name (common name)*
- *Application method and timing of application*
- *Site-specific BMPs employed*

The McCoy Marsh wetland is a 9-acre parcel on the east side of Nehalem Bay, just upstream of the community of Wheeler, Oregon. The property was disconnected from tidal influence by the construction of the Nehalem Levee and the McCoy-Botts Levee. The Nehalem Levee is mostly intact but the McCoy-Botts Levee has been abandoned and since eroded; a 12-inch concrete culvert under an eroded part of the levee separating McCoy and Bott's marshes allows some minor tidal exchange at tides above 8 feet elevation. The McCoy Marsh Tidal Reconnection project provides an opportunity to create immediate ecological uplift and reclaim tidal exchange in existing wetlands in the Nehalem River estuary through levee breaching, improving water and habitat quality in the wetland for rearing salmonids as
well as salmon prey species that are critical for juvenile salmonid growth and survival.

Levees would be breached in three locations to allow tidal exchange in McCoy Marsh. The breaches will include removing the levee material to near the ground surface around 8 to 9 feet elevation to allow high tides to enter the McCoy property. The purpose of the wide breaches is to allow woody debris to more easily enter the McCoy property to provide additional habitat complexity once the construction is completed. A brief description of project features is as follows:

Breaches

• Breach 1 is located in the southeast corner of the McCoy Marsh, where a 30-foot opening will be made through the McCoy-Botts Levee, and a channel will be graded to connect to an existing tidal channel that currently drains through the concrete culvert. The culvert will be plugged and remain in place.

• Breach 2 is located at the approximate midpoint of the McCoy-Botts Levee and will also be 30-feet wide. The breach will tie into the ground surface elevation of the adjoining Botts Marsh and lower in elevation to the north towards existing tidal wetland areas and converges with the channel at Breach 3.

• Breach 3 is a 50-foot wide opening in the Nehalem Levee and will allow flows from the Nehalem River on the west side of the property connecting it with the Nehalem River. Breach 3 will tie into the Nehalem Bay at an elevation of approximately 2 feet, allowing some inundation during most tidal water levels. The channel bottom will maintain 0.5 %

slope for 365 feet towards the site interior.

• Breach 2 and 3 converge in the marsh interior and branch into a primary and secondary channel that convey tidal flows north and east at a slope of 1.5% gradient. The primary tidal channel terminates into an existing defined channel that connects to Breach 1.

Hummocks

A series of "hummocks" will be built from project spoils of levee material excavated to create the breaches and tidal channels. The hummocks are low, oval shaped mounds of soil rising from the marsh surface to a maximum of 2 feet above existing ground surface elevations (max fill at 10-feet elevation to maintain wetland conditions). The hummocks will serve multiple purposes: providing topographic diversity, creating more edge habitat, support woody vegetation (willow and spruce), and catching drift logs in advantageous locations and eliminate the need for riprap along HWY 101. Floodplain logs and nurse crib structures (discussed below) will be installed on the hummock surfaces to enhance their ability to support Sitka spruce and willow, and to trap drift logs within the project area.

Large Wood

Two types of wood installations are included in the designs: channel logs and nurse crib log structures. Wood structures will be constructed using countersunk threaded rebar and pile logs, no chains will be used.

Remaining Upland Levees

The existing degraded levee segments will be left in place outside of breach areas. The levees support Sitka spruce and other native species and woody debris that compliment site restoration. The existing levees also provide informal highway protection by collecting wood material and providing wave break function during high water events.

Revegetation

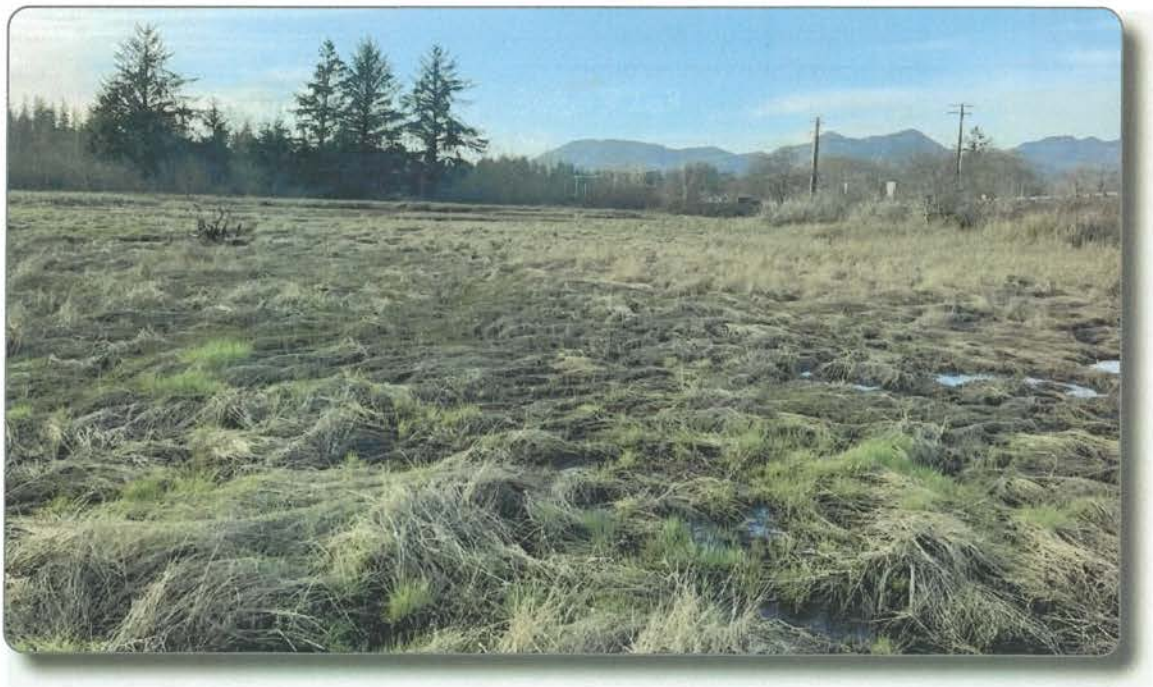
Ash Creek Forest Management, LLC provided a Vegetation Enhancement Plan for the site that provides guidelines for invasive species treatments (which was consulted on in a previous ANF submittal) and revegetation following construction. The revegetation plan specifies recommendations for site preparation, planting of native species, and maintenance in four types of treatment areas: wetland channels, hummocks, levee uplands, and access routes.

All in-water work will occur in the work window established by ODFW from July 1 – September 15. Block nets installation, fish salvage, and dewatering will occur prior to construction. Channels excavation, hummocks, and large wood will be constructed first, prior to breaching, to keep areas isolated and minimize impacts to water quality. Isolation devices are not practical during the levee breaching due to daily tidal fluctuations. However, turbidity curtains will be installed at breach location to minimize impacts to water quality. Levee breaching will occur during low tide, to the extent practicable. Planting could occur into the late fall.

File(s) uploaded:

McCoy Marsh Tidal Reconnection 60% Designs_Project Description.pdf

McCoy Wetland Design Project
Hydraulic Analysis Report



prepared for

Lower Nehalem Community Trust

LNCT

prepared by

Jake Hofeld, P.E.

Digitally signed by Jake Hofeld, P.E.
DN: C=US, E=jakeh@watways.com, O="Waterways Consulting, Inc.", CN="Jake Hofeld, P.E."
Reason: I am approving this document
Date: 2026.02.24 16:50:29-08'00'

REGISTERED PROFESSIONAL ENGINEER
77870PE
OREGON
JANUARY 3, 2011
JAKE DYLAN HOFELD
EXPIRES: 6/30/2027

WATERWAYS CONSULTING, INC.

February 24, 2026

WATERWAYS CONSULTING

Contents

List of Figures

List of Attachments

INTRODUCTION

Waterways Consulting Inc. (Waterways) was retained by the Lower Nehalem Community Trust (LNCT) to evaluate the hydraulic effects of the proposed McCoy Marsh Tidal Reconnection Project on the Nehalem River during the 100-year base flood discharge. The project site is located on the east (left) bank floodplain of the Nehalem River at Tax Lot 3N10350000200 in Tillamook County, Oregon, immediately north of the town of Wheeler (Figure 1).

The McCoy property consists of approximately 9 acres of diked former tidal wetland that was acquired by LNCT for preservation and ecological restoration. The proposed project presents an opportunity to restore tidal function and achieve immediate ecological benefits within the Nehalem River estuary by breaching existing dikes that no longer serve a functional purpose. Project elements include earthwork associated with three levee breaches, excavation of tidal channels, installation of large wood structures, and construction of floodplain hummocks (i.e. shallow soil mounds).

The McCoy property lies entirely within the Federal Emergency Management Agency (FEMA) designated Zone AE (1-percent annual chance of exceedance), effective September 28, 2018 (Figure 2). A portion of the proposed grading work occurs within the FEMA floodway.

This report has been prepared in support of floodplain development permitting with Tillamook County. It presents the results of a hydraulic analysis of existing and proposed conditions for the 100-year flood event along the Nehalem River in the vicinity of the McCoy property. The analysis was conducted in accordance with Section 3.510(9)(a) of the Tillamook County Land Use Ordinance, which requires certification by a professional registered civil engineer demonstrating, through hydrologic and hydraulic analysis performed in accordance with standard engineering practice, that the proposed encroachment will not result in any increase in flood levels during the base flood discharge.

HYDRAULIC MODELING METHODOLOGY

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) identifies the Nehalem River within the project area as a Special Flood Hazard Area (SFHA), partially within the regulatory floodway and entirely within Zone AE (Figure 2). FEMA provided Waterways Consulting Inc. with an existing hydraulic model of the Nehalem River encompassing the project area that was developed in support of a Letter of Map Revision (LOMR), effective February 11, 2015 (Case No. 14-10-1695P).

The LOMR hydraulic analysis was performed using the U.S. Army Corps of Engineers (USACE) Hydraulic Engineering Center River Analysis System (HEC-RAS) and updated a previous HEC-2 model using revised topographic data and additional hydraulic cross sections. The provided HEC-RAS model is referenced to the North American Vertical Datum of 1988 (NAVD 88) and incorporates flood elevations from the effective FIRM panels dated December 7, 1982. This model served as the baseline for all subsequent hydraulic analyses.

Waterways updated the hydraulic analysis using HEC-RAS version 6.7. A one-dimensional hydraulic model was developed to evaluate existing and proposed conditions at the project site under the 100-year recurrence interval peak flow for the Nehalem River. Two additional cross sections were added within the project area, and two additional cross sections were added downstream of the property to improve model resolution. Two modeling scenarios were evaluated: an Existing Conditions Model ("Ex. Cond." plan identifier) and a Proposed Conditions Model ("Prop. Cond." plan identifier).

Figure 4 illustrates the proposed project location, hydraulic cross-section locations used in the analysis, and the effective FEMA floodplain and floodway boundaries (FEMA, 2018).

Existing Conditions Model

Additional cross sections incorporated into the LOMR-based hydraulic model were developed from a terrain surface generated using a combination of site-specific ground survey data collected by Waterways in 2024 and 2025 and LiDAR data from the Oregon Department of Geology and Mineral Industries (DOGAMI) North Coast dataset collected by Watershed Sciences, Inc. in 2009. Channel bathymetry for the added cross sections was interpolated from adjacent upstream and downstream cross sections within the original LOMR model. The design drawings in Appendix A present the existing topographic data collected at the McCoy property along with the proposed project features.

The hydraulic model extends approximately 1.0 mile downstream of the project area and approximately 2.6 miles upstream of the project area (Figure 4). The Highway 101 bridge crossing located upstream of the project area was incorporated into the model using geometric information provided in the LOMR model. Hydraulic roughness coefficients for the additional cross sections were assigned based on Manning's *n* values published in the provided LOMR model. A summary of the Manning's roughness values applied in the analysis is provided in Table 1.

Table 1. *Manning's Roughness for Different Land Use Types*

Land Use Type	Manning's 'n'
Channel	0.026 – 0.03
Overbank	0.06 – 0.2

Proposed Conditions Model

The Proposed Conditions Model incorporates the additional cross sections developed for the Existing Conditions Model. The existing terrain surface was modified to reflect proposed excavation associated with the levee breaches and tidal channel construction (Figure 3).

Boundary Conditions

The downstream boundary condition for both the Existing and Proposed Conditions models was defined using a known water surface elevation of 13.1 feet (NAVD 88), as specified in the FEMA Flood Insurance

Study (FIS). A downstream boundary cross section was added to the Waterways model and located near the river mile corresponding to a location just upstream of the confluence of Vosburg Creek and the Nehalem River. The effective LOMR model does not include cross sections downstream of the McCoy property.

Peak Flow Hydrology

Based on the FEMA FIS and the provided hydraulic model, the 100-year peak flow for this reach of the Nehalem River at the McCoy property is 74,000 cubic feet per second (cfs). Accordingly, a discharge of 74,000 cfs was used as the base flood discharge for all modeled scenarios.

RESULTS

Results of the hydraulic modeling are presented in Attachment A. The analysis indicates that the proposed project will not result in an increase in water surface elevations at any modeled cross section. The absence of a measurable change between the Existing and Proposed Conditions models is attributable to the relatively small extent of excavation at the McCoy property in comparison to the width and conveyance capacity of the Nehalem River.

CONCLUSIONS

The hydraulic analysis demonstrates that the Proposed Conditions Model results in no increase in 100-year water surface elevations relative to the Existing Conditions Model. Therefore, the proposed project complies with the requirements of Section 3.510(9)(a) of the Tillamook County Land Use Ordinance.

REFERENCES

Federal Emergency Management Agency. 2018. Flood Insurance Rate Maps (FIRMs) for Tillamook County (panel 209), Oregon and Incorporated Areas. September 28, 2018.

Federal Emergency Management Agency. 2018. Flood Insurance Study (FIS) for Tillamook County, Oregon and Incorporated Areas. September 8, 2018.

U.S. Army Corps of Engineers. Hydrologic Engineering Center. Computer Program HEC-RAS Version 6.7Low Davis, California. June 2023.

U.S. Army Corps of Engineers. Hydrologic Engineering Center. Hydraulic Reference Manual. Version 5.0 Davis, California. February 2016.

Watershed Sciences. LiDAR Remote Sensing Data Collection Oregon North Coast. Prepared for Department of Geology and Mineral Industries (DOGAMI). December 21, 2009.

Figures

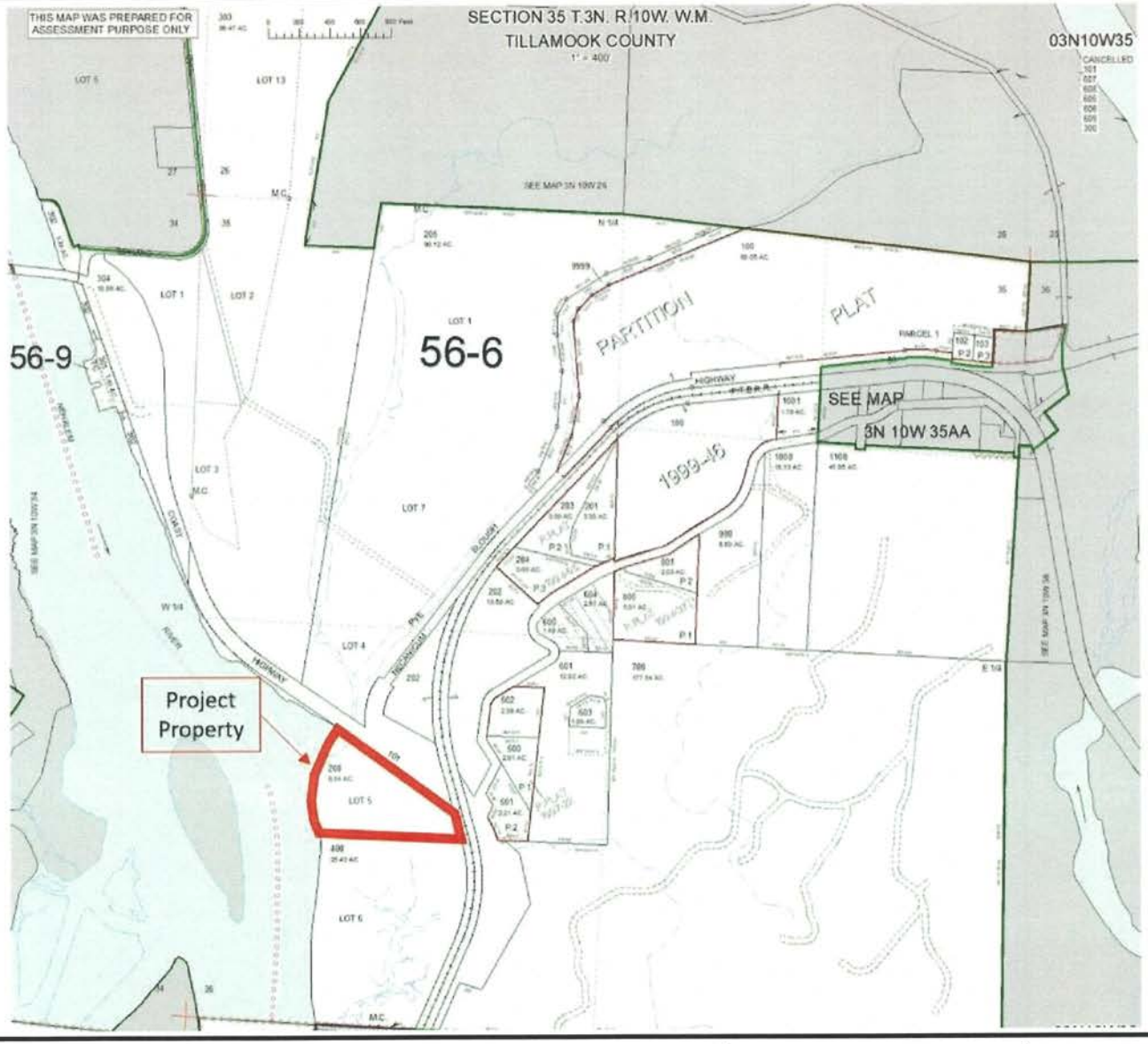


FIGURE 1

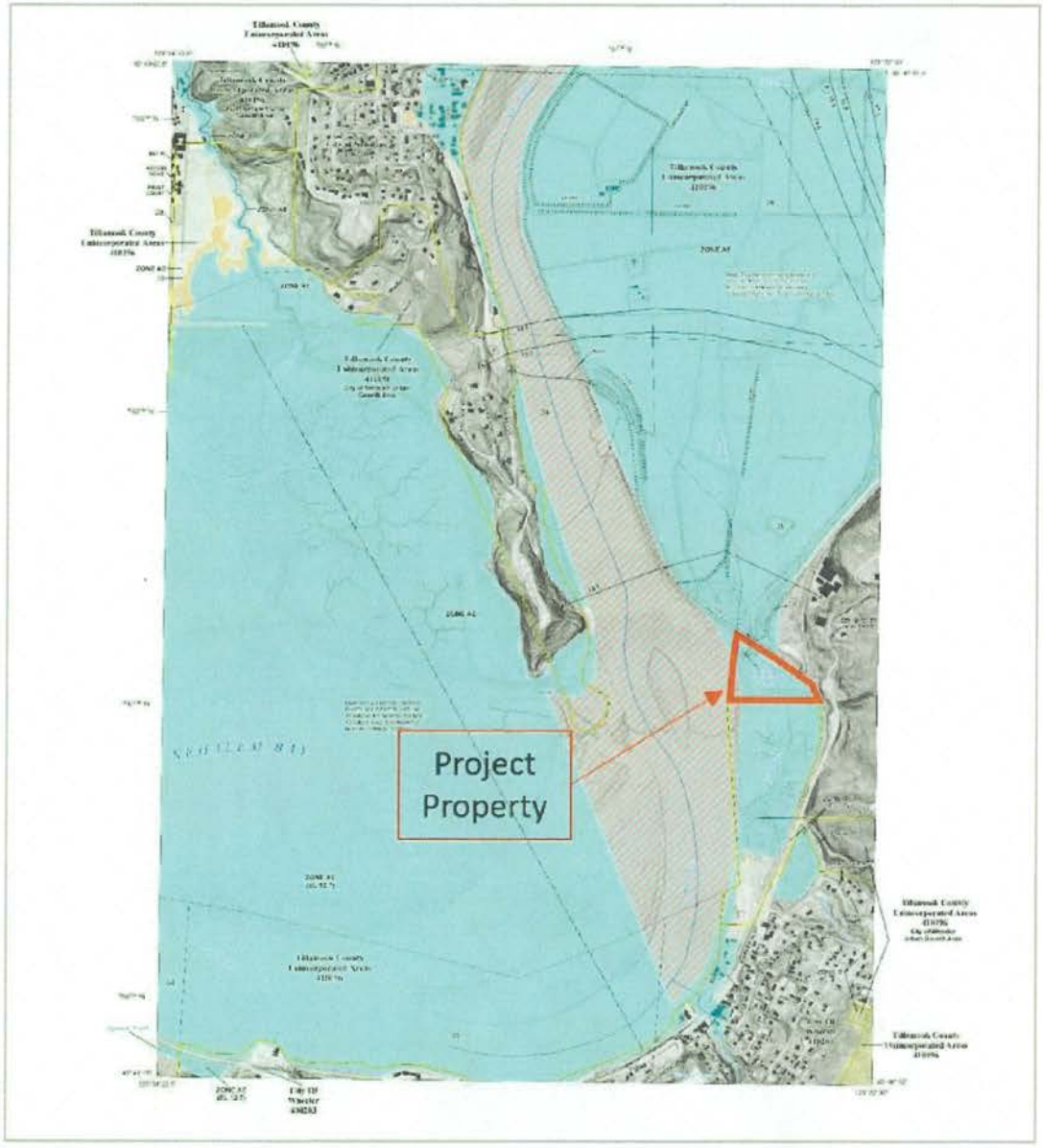
Tax Lot Location

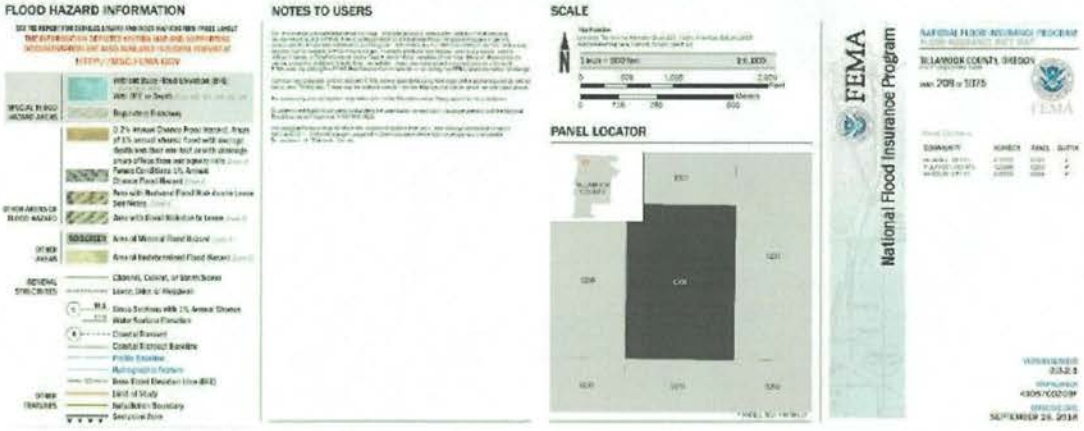
(Map Sourced from Tillamook County Assessment and Taxation Website)

McCoy Wetland Design Project - Hydraulic Analysis Report

WATERWAYS CONSULTING, INC.

Santa Cruz, CA | watways.com | Portland, OR



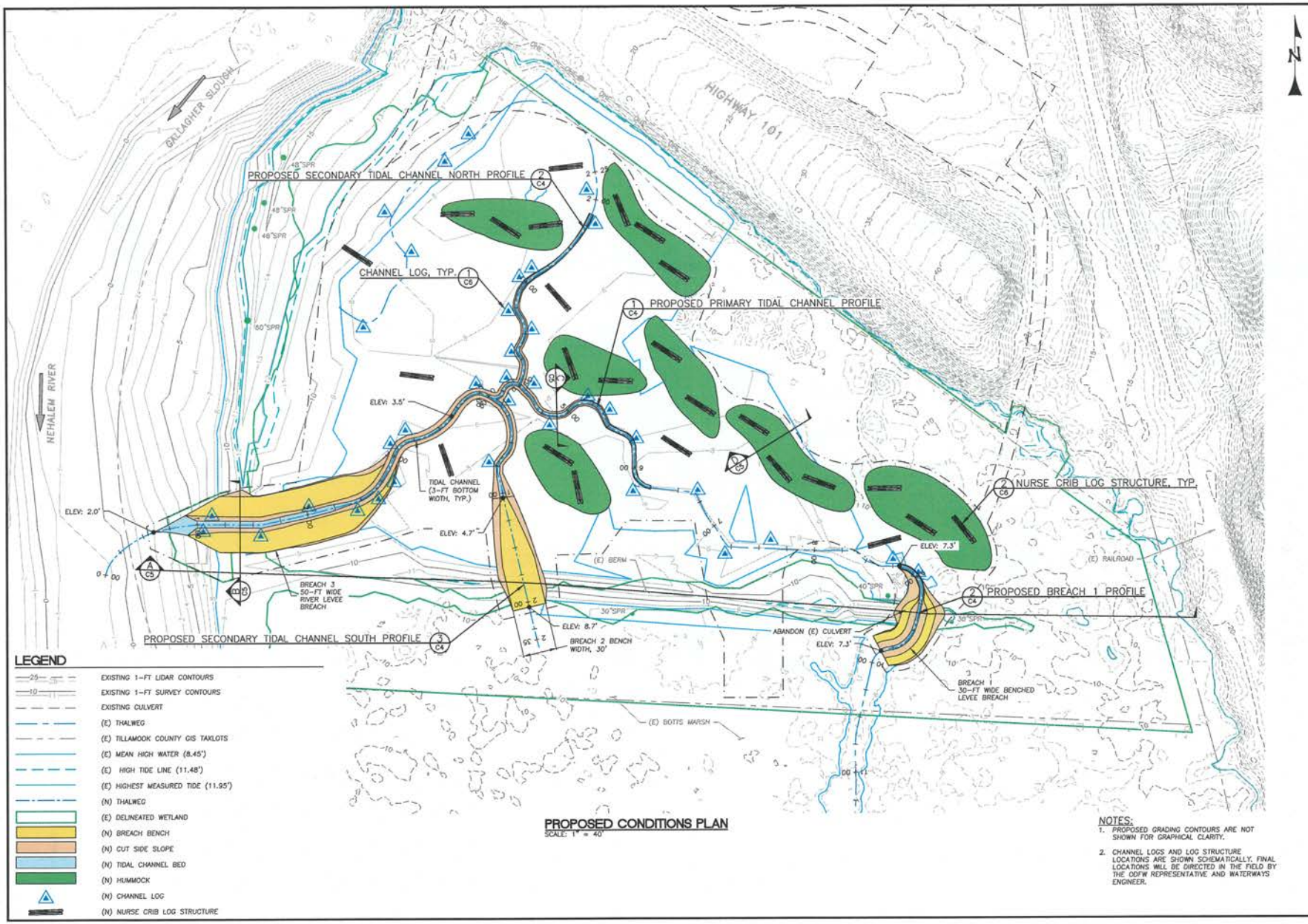


FEMA FIRM Panel

McCoy Wetland
Design Project -
Hydraulic Analysis Report

WATERWAYS CONSULTING, INC.
Santa Cruz, CA | watways.com | Portland, OR

FIGURE
2



PROPOSED CONDITIONS PLAN

SCALE: 1" = 40'

NOTES:

1. PROPOSED GRADING CONTOURS ARE NOT SHOWN FOR GRAPHICAL CLARITY.
2. CHANNEL LOGS AND LOG STRUCTURE LOCATIONS ARE SHOWN SCHEMATICALLY. FINAL LOCATIONS WILL BE DIRECTED IN THE FIELD BY THE ODFW REPRESENTATIVE AND WATERWAYS ENGINEER.

WATERWAYS CONSULTING INC.
509A SWIFT ST.
SANTA CRUZ, CA 95060
PH: (831) 713-4440 FAX: (831) 515-6447
WWW.WATWAYS.COM

DRAFT

NOT FOR CONSTRUCTION

PREPARED AT THE REQUEST OF:

LOWER NEHALEM COMMUNITY TRUST

PROPOSED CONDITIONS PLAN

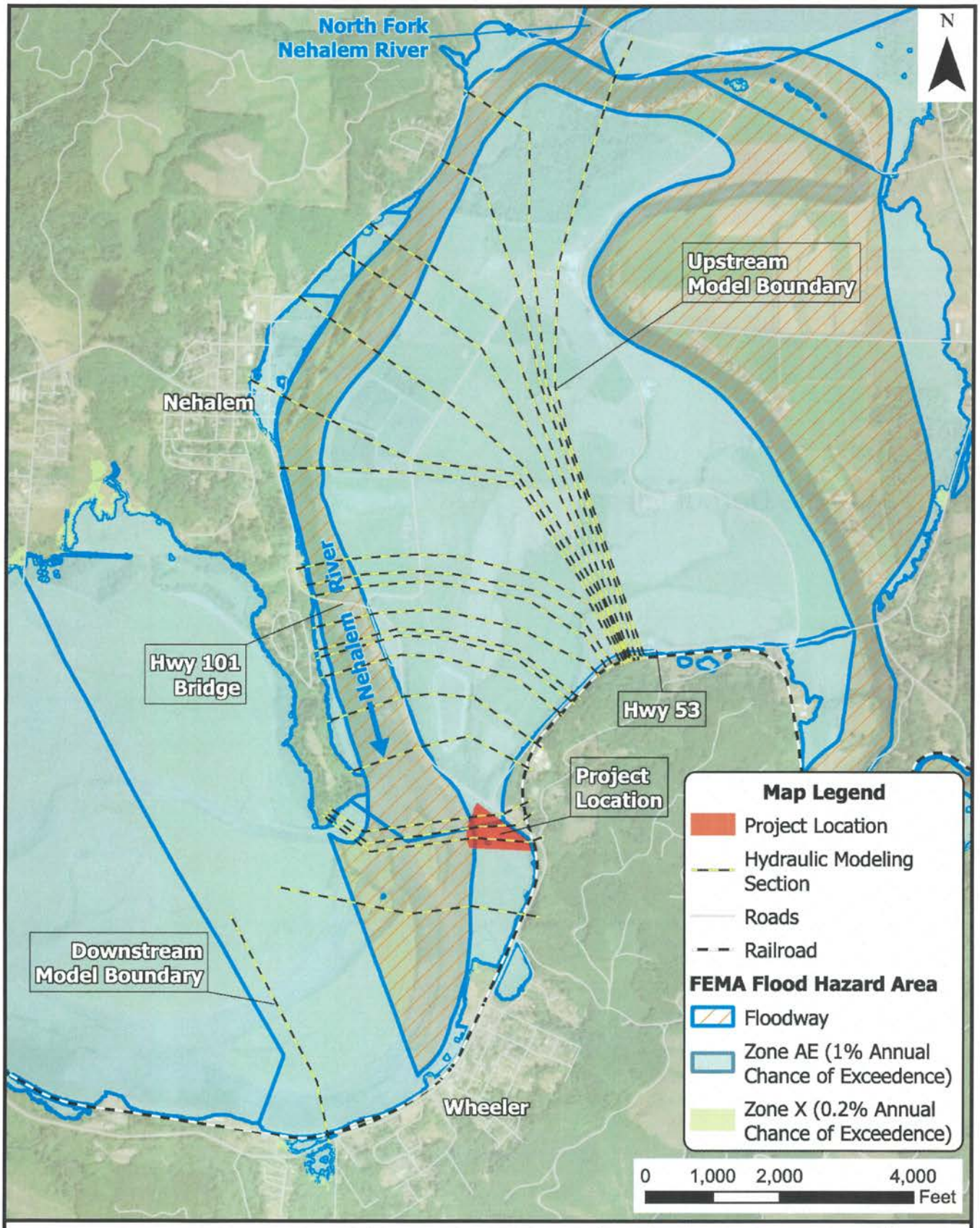
MCCOY WETLAND TIDAL RECONNECTION PROJECT
90% DRAFT DESIGN SUBMITTAL - REVISION 1

DESIGNED BY: J.H./D.M.
DRAWN BY: C.B.
CHECKED BY: J.H.
DATE: 1/8/2026
JOB NO.: 21-049

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS

0 1"

Fig. 3



Hydraulic Analysis Overview Map

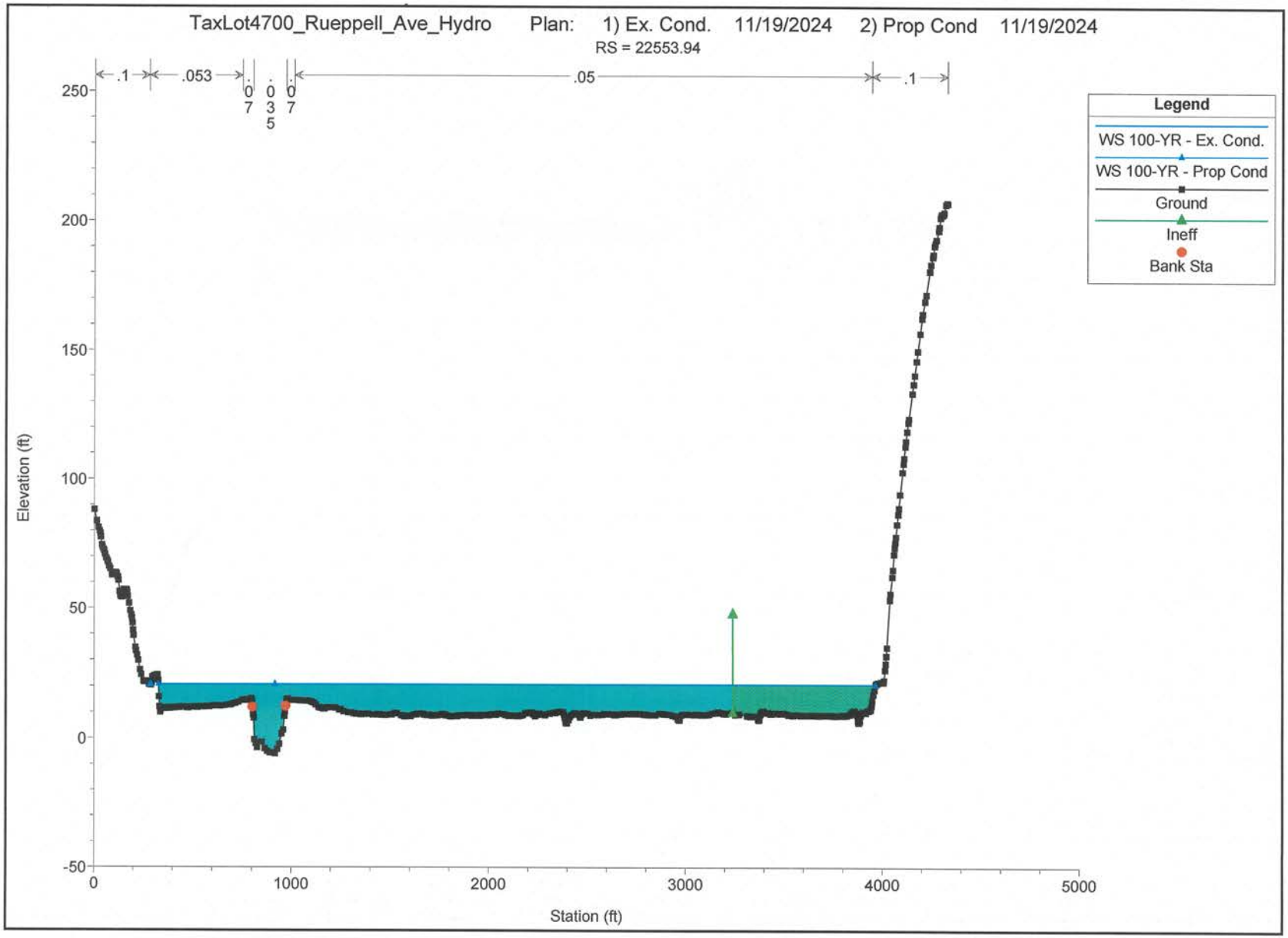
McCoy Wetland Design Project - Hydraulic Analysis Report

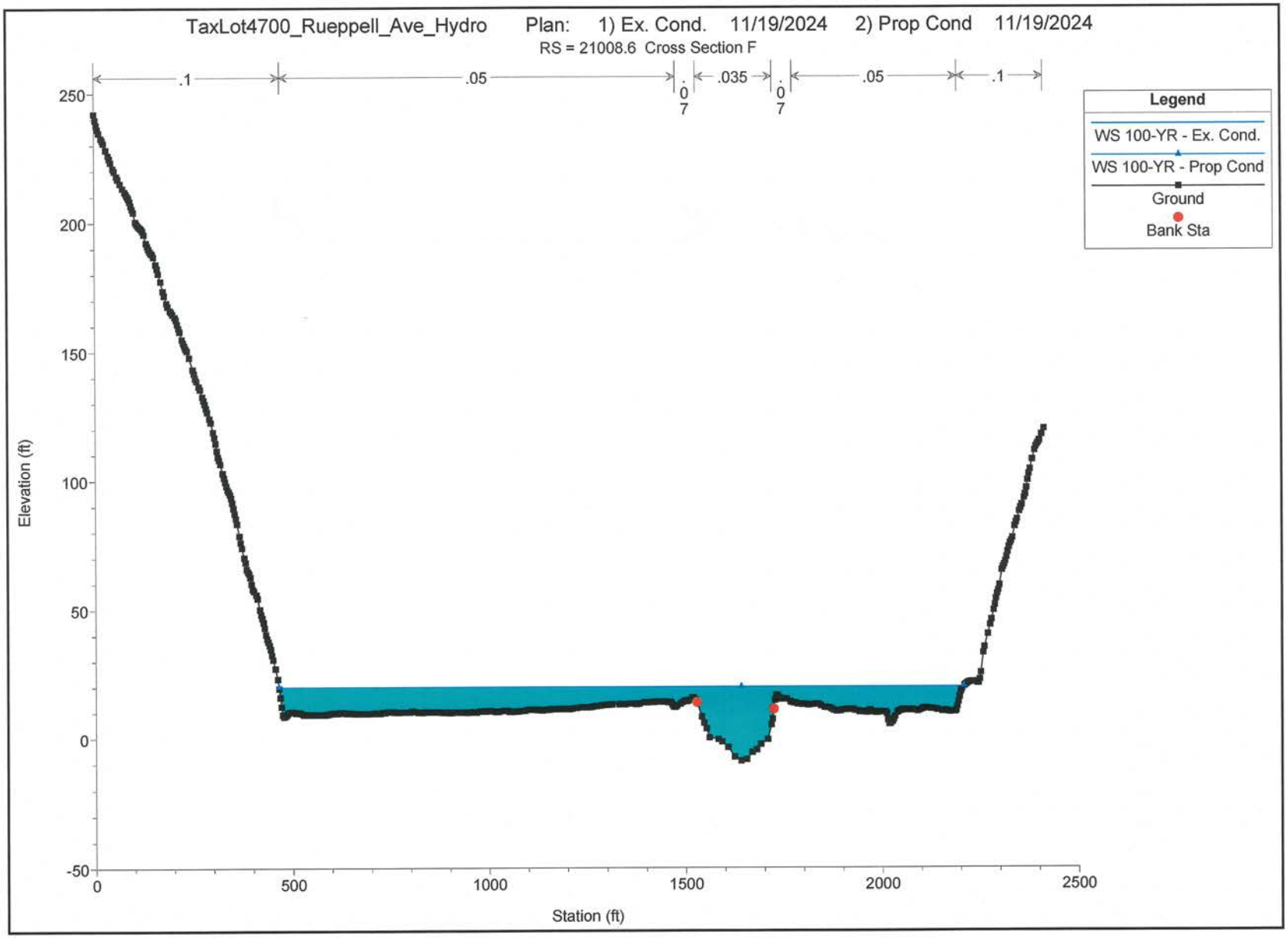
WATERWAYS CONSULTING, INC.
Santa Cruz, CA | watways.com | Portland, OR

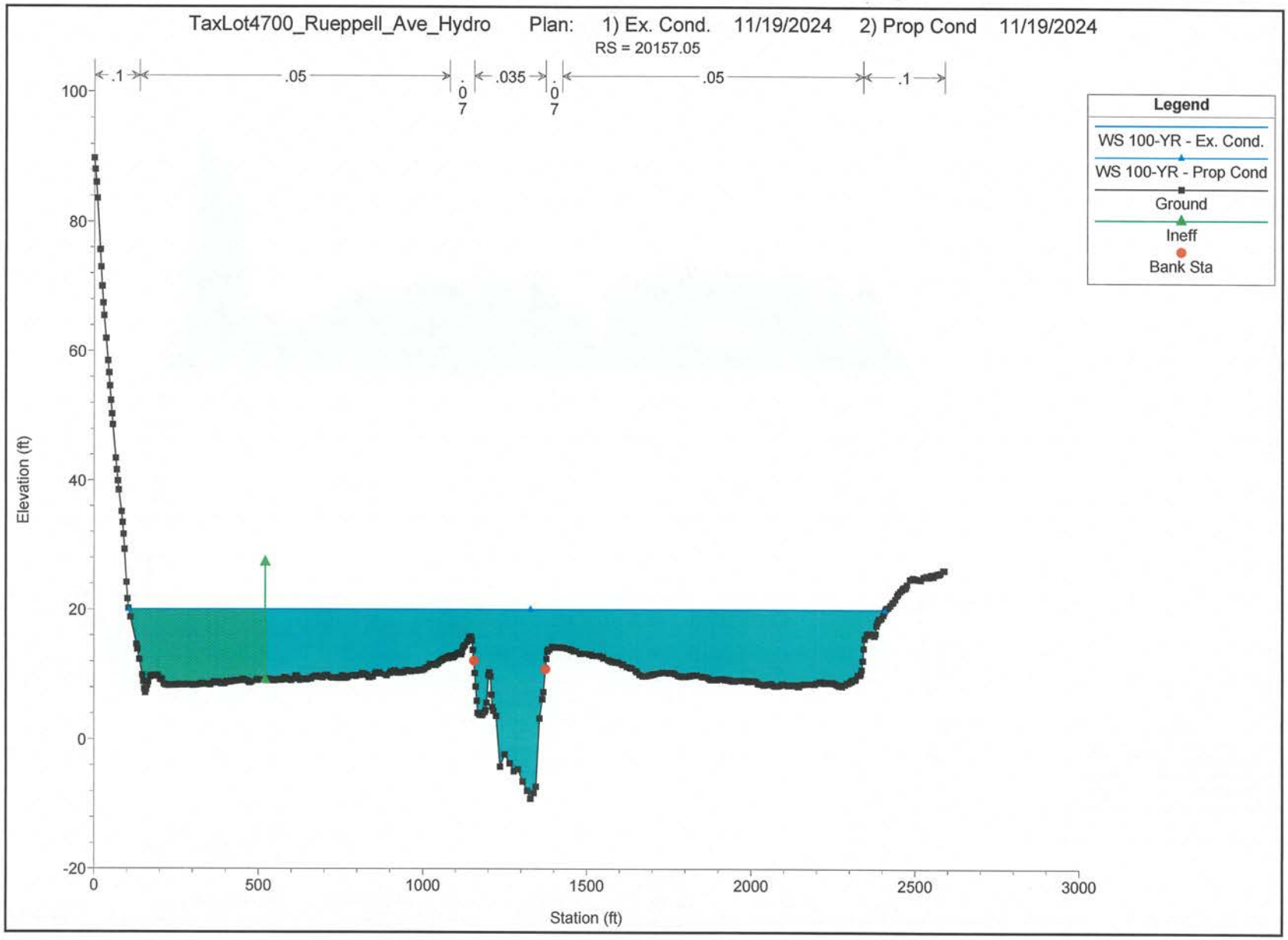
FIGURE 4

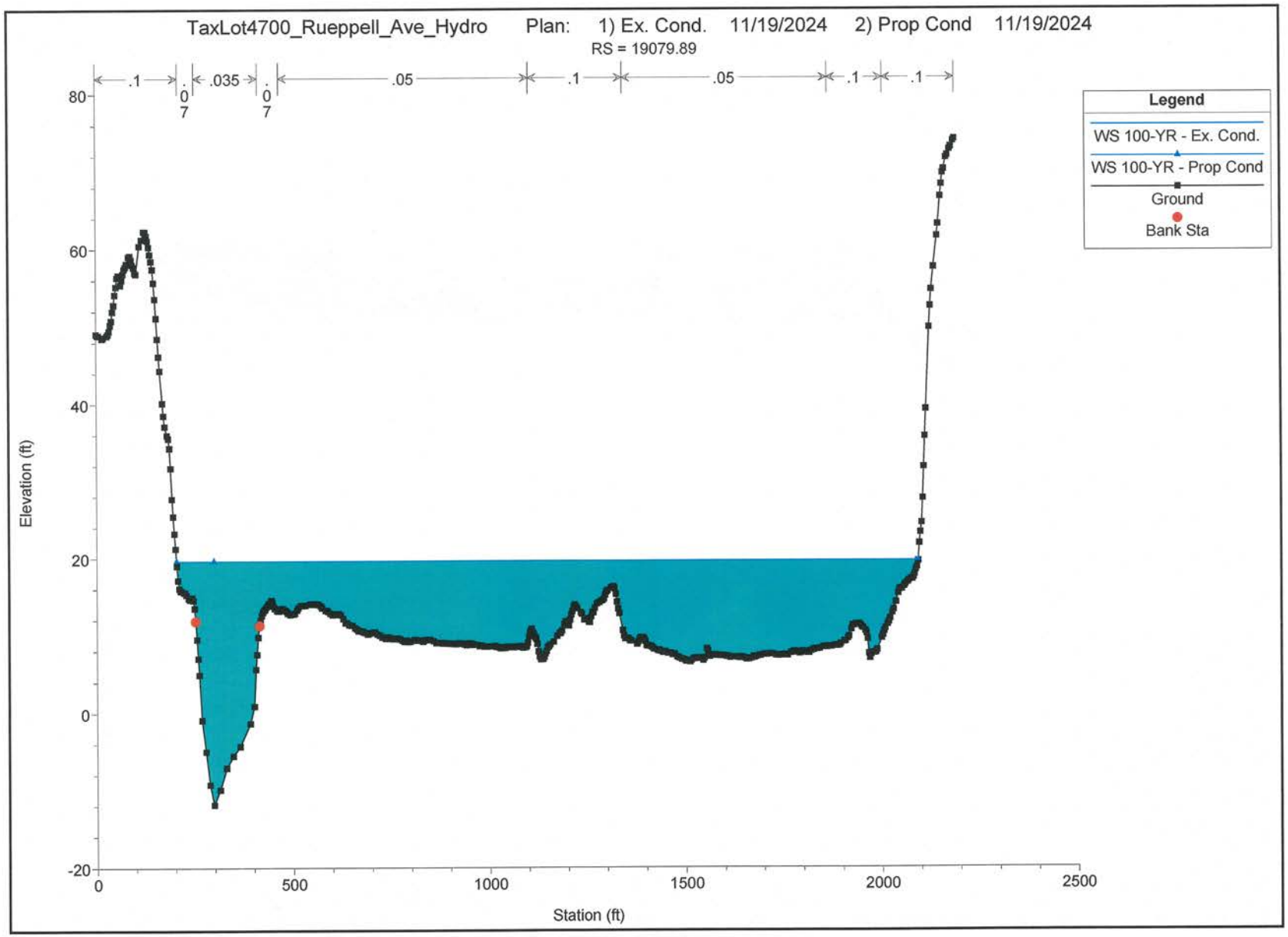
Attachment A

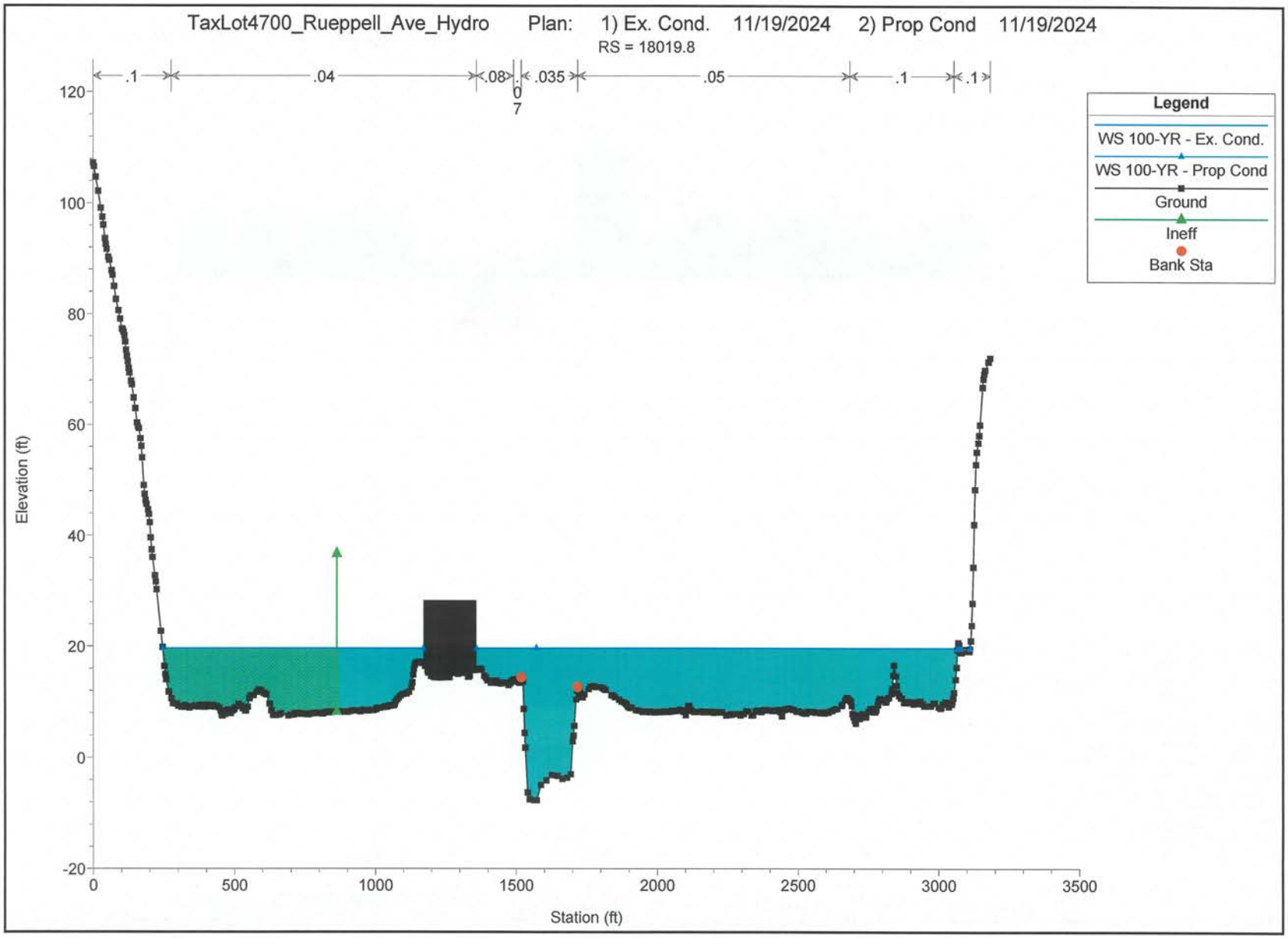
HEC-RAS Output Files

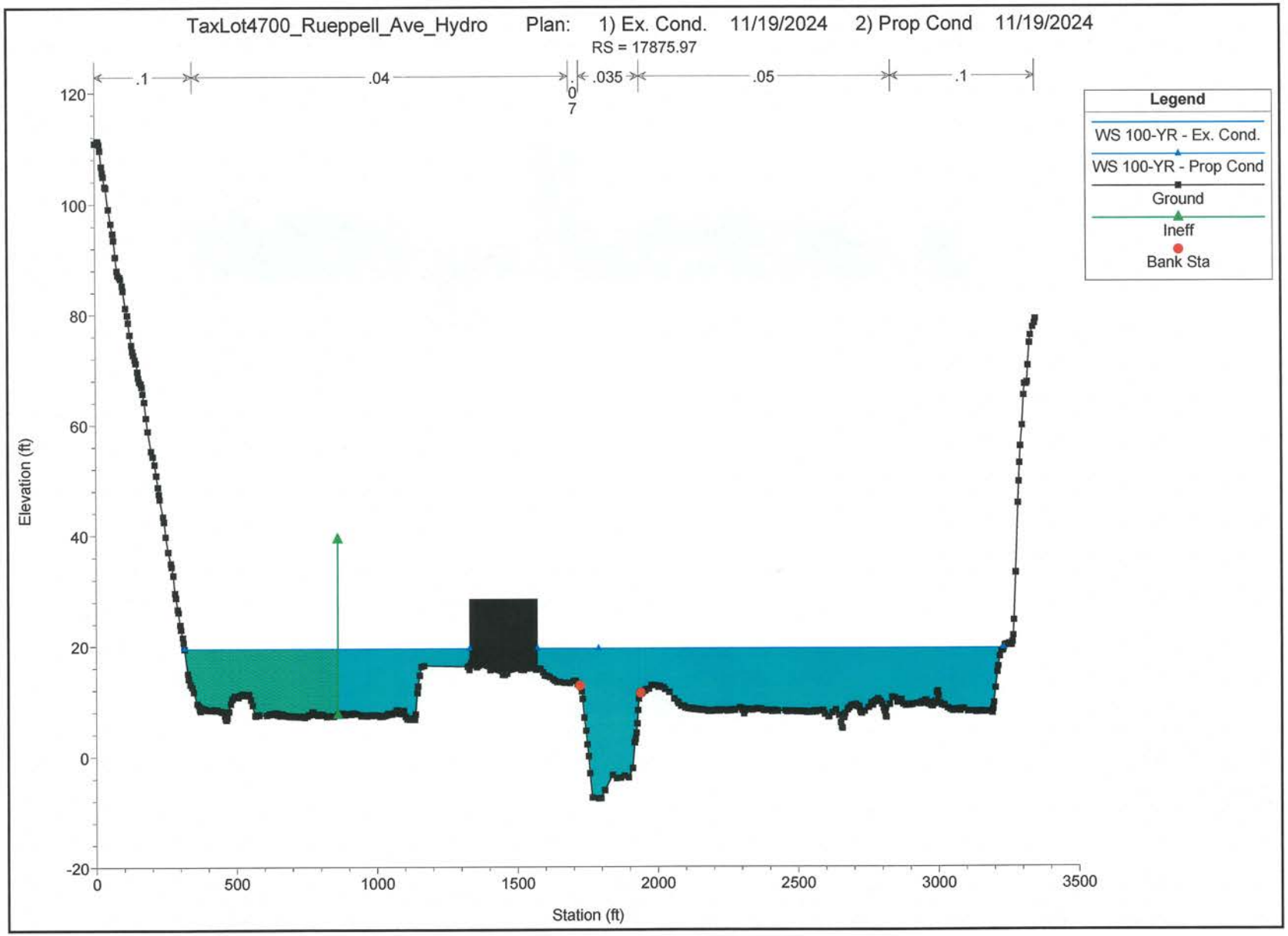

TaxLot4700_Rueppell_Ave_Hydro Plan: 1) Ex. Cond. 11/19/2024 2) Prop Cond 11/19/2024
RS = 22553.94
.1
.053
.07
.035
.07
.05
.1
Legend
WS 100-YR - Ex. Cond.
WS 100-YR - Prop Cond
Ground
Ineff
Bank Sta
Elevation (ft)
250
200
150
100
50
0
-50
0
1000
2000
3000
4000
5000
Station (ft)

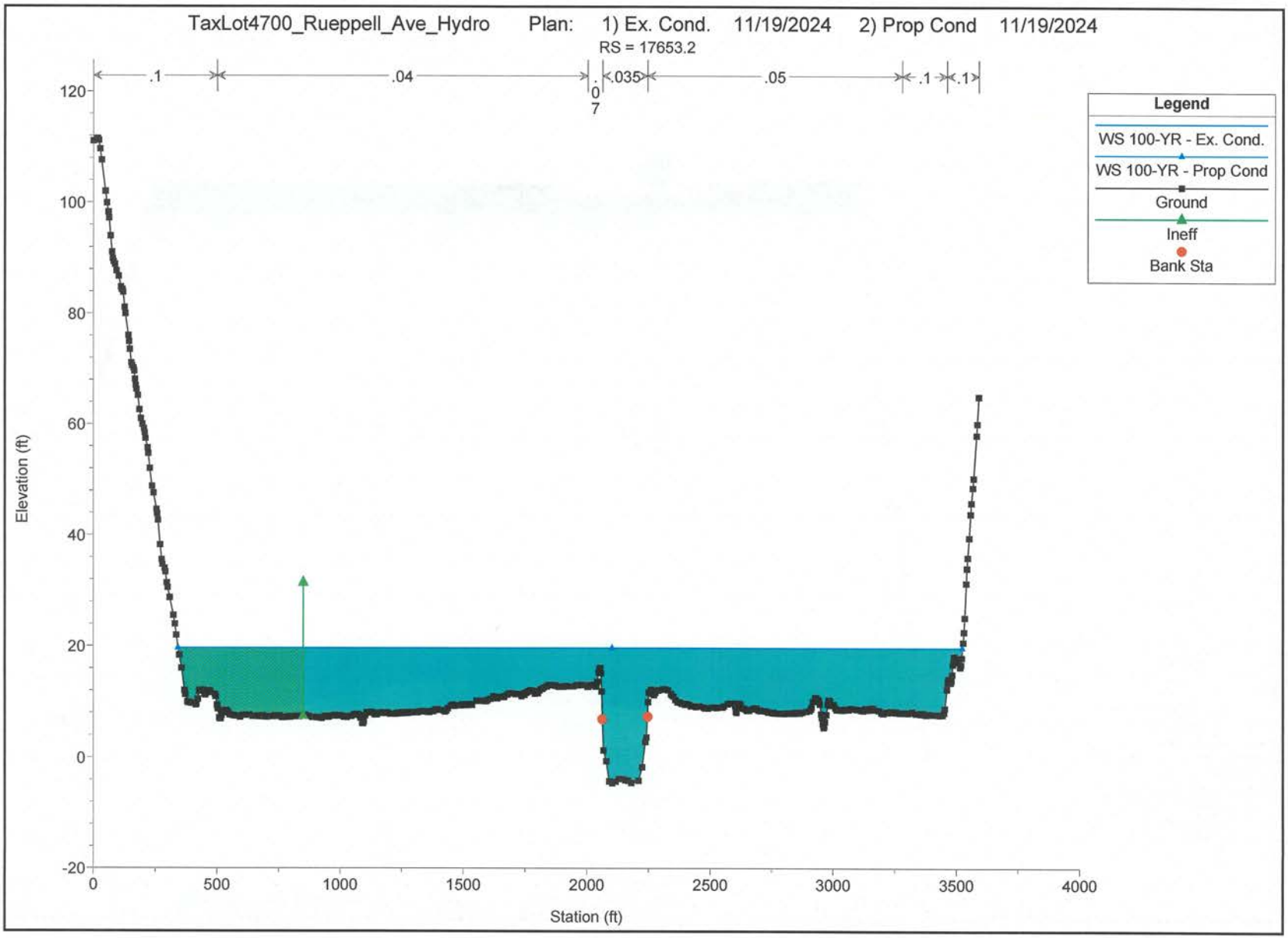

TaxLot4700_Rueppell_Ave_Hydro Plan: 1) Ex. Cond. 11/19/2024 2) Prop Cond 11/19/2024
RS = 21008.6 Cross Section F
.1
.05
.07
.035
.07
.05
.1
Legend
WS 100-YR - Ex. Cond.
WS 100-YR - Prop Cond
Ground
Bank Sta
Elevation (ft)
250
200
150
100
50
0
-50
0
500
1000
1500
2000
2500
Station (ft)

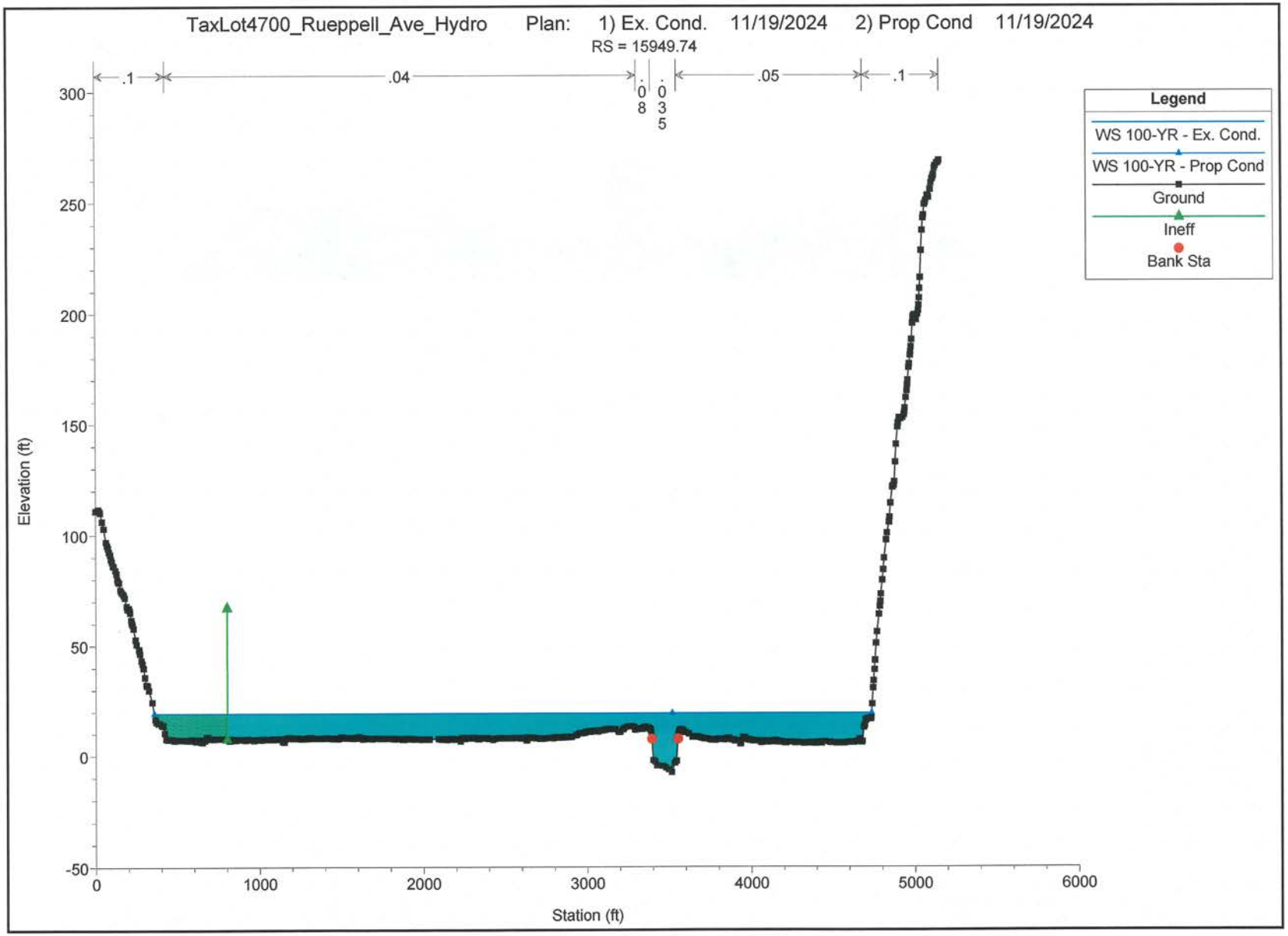

TaxLot4700_Rueppell_Ave_Hydro Plan: 1) Ex. Cond. 11/19/2024 2) Prop Cond 11/19/2024
RS = 20157.05
.1
.05
.07
.035
.07
.05
.1
Legend
WS 100-YR - Ex. Cond.
WS 100-YR - Prop Cond
Ground
Ineff
Bank Sta
Elevation (ft)
100
80
60
40
20
0
-20
0
500
1000
1500
2000
2500
3000
Station (ft)

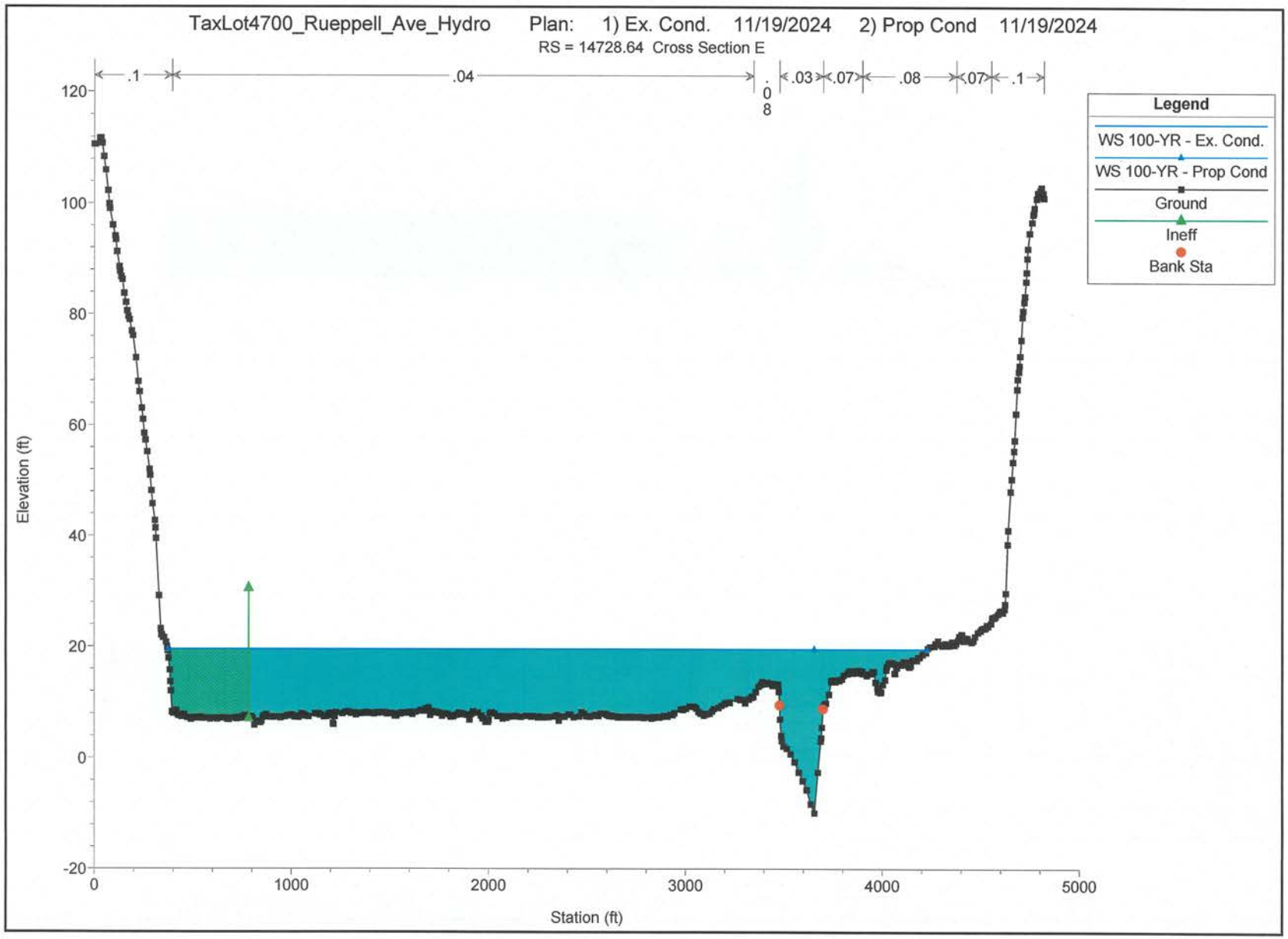

TaxLot4700_Rueppell_Ave_Hydro Plan: 1) Ex. Cond. 11/19/2024 2) Prop Cond 11/19/2024
RS = 19079.89
.1
.07
.035
.07
.05
.1
.05
.1
.1
Legend
WS 100-YR - Ex. Cond.
WS 100-YR - Prop Cond
Ground
Bank Sta
Elevation (ft)
80
60
40
20
0
-20
0
500
1000
1500
2000
2500
Station (ft)

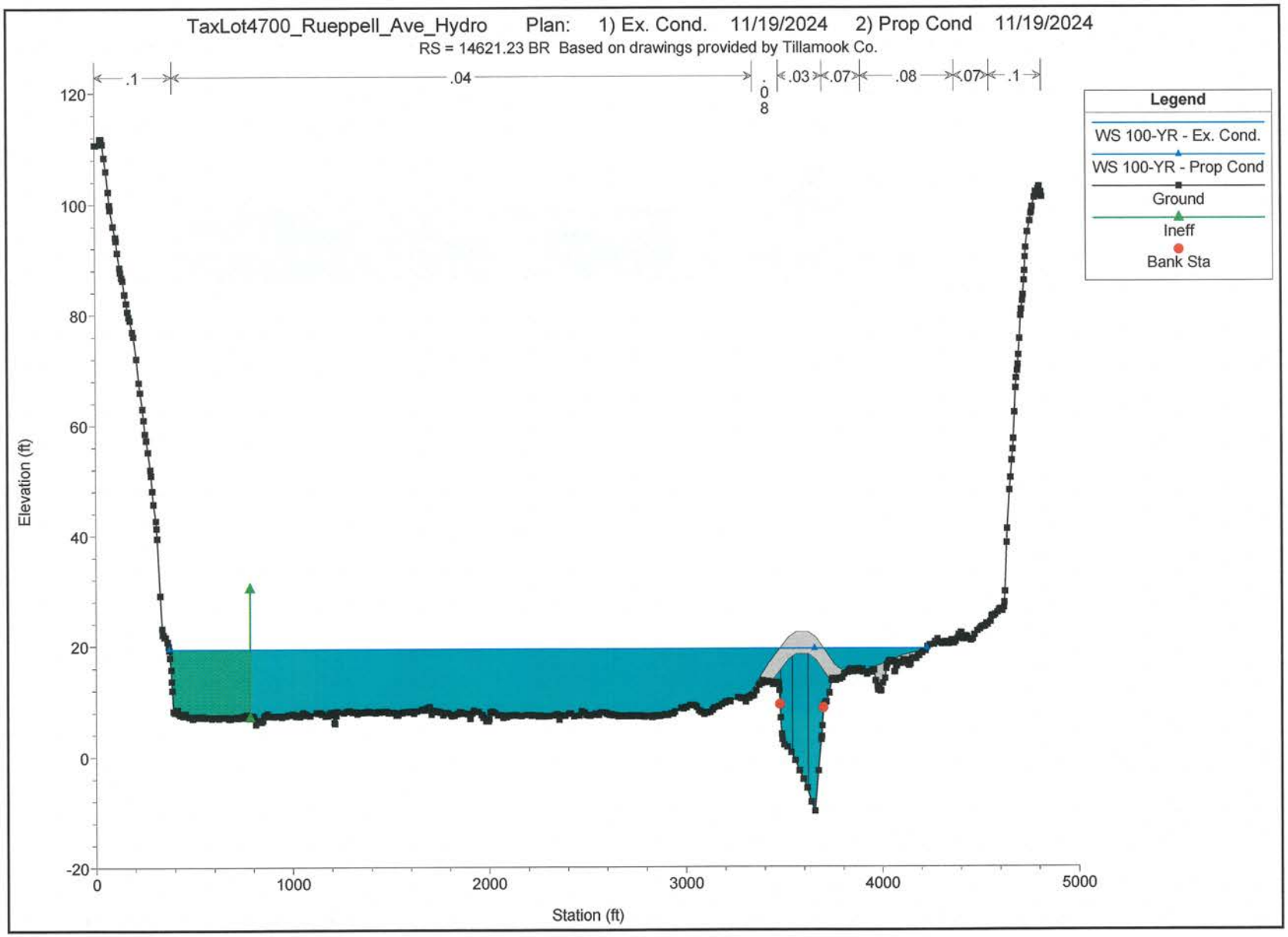

TaxLot4700_Rueppell_Ave_Hydro Plan: 1) Ex. Cond. 11/19/2024 2) Prop Cond 11/19/2024
RS = 18019.8
.1
.04
.08
.035
.05
.1
.1
Legend
WS 100-YR - Ex. Cond.
WS 100-YR - Prop Cond
Ground
Ineff
Bank Sta
Elevation (ft)
120
100
80
60
40
20
0
-20
0
500
1000
1500
2000
2500
3000
3500
Station (ft)

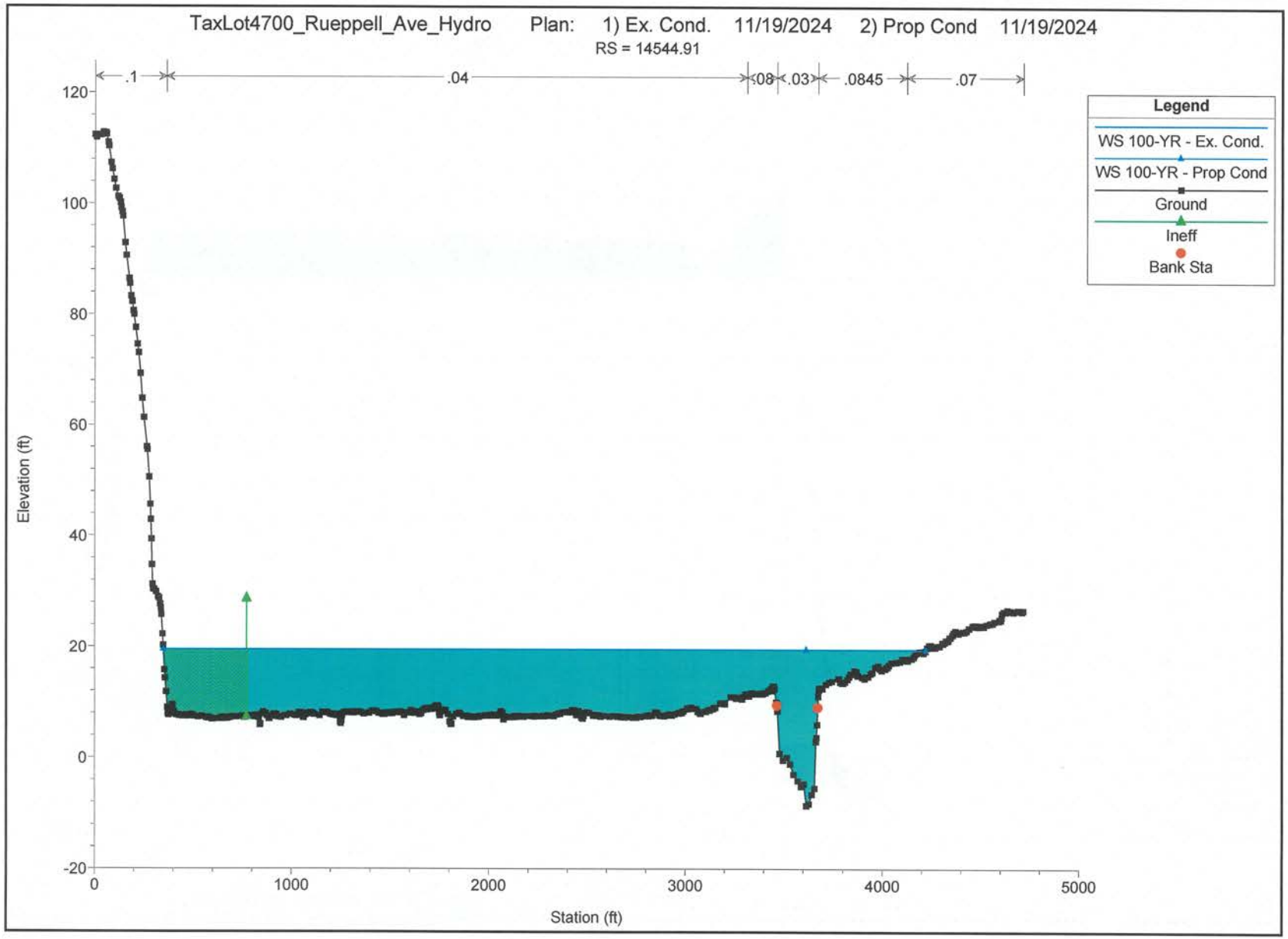

TaxLot4700_Rueppell_Ave_Hydro Plan: 1) Ex. Cond. 11/19/2024 2) Prop Cond 11/19/2024
RS = 17875.97
.1
.04
.07
.035
.05
.1
Legend
WS 100-YR - Ex. Cond.
WS 100-YR - Prop Cond
Ground
Ineff
Bank Sta
Elevation (ft)
120
100
80
60
40
20
0
-20
0
500
1000
1500
2000
2500
3000
3500
Station (ft)

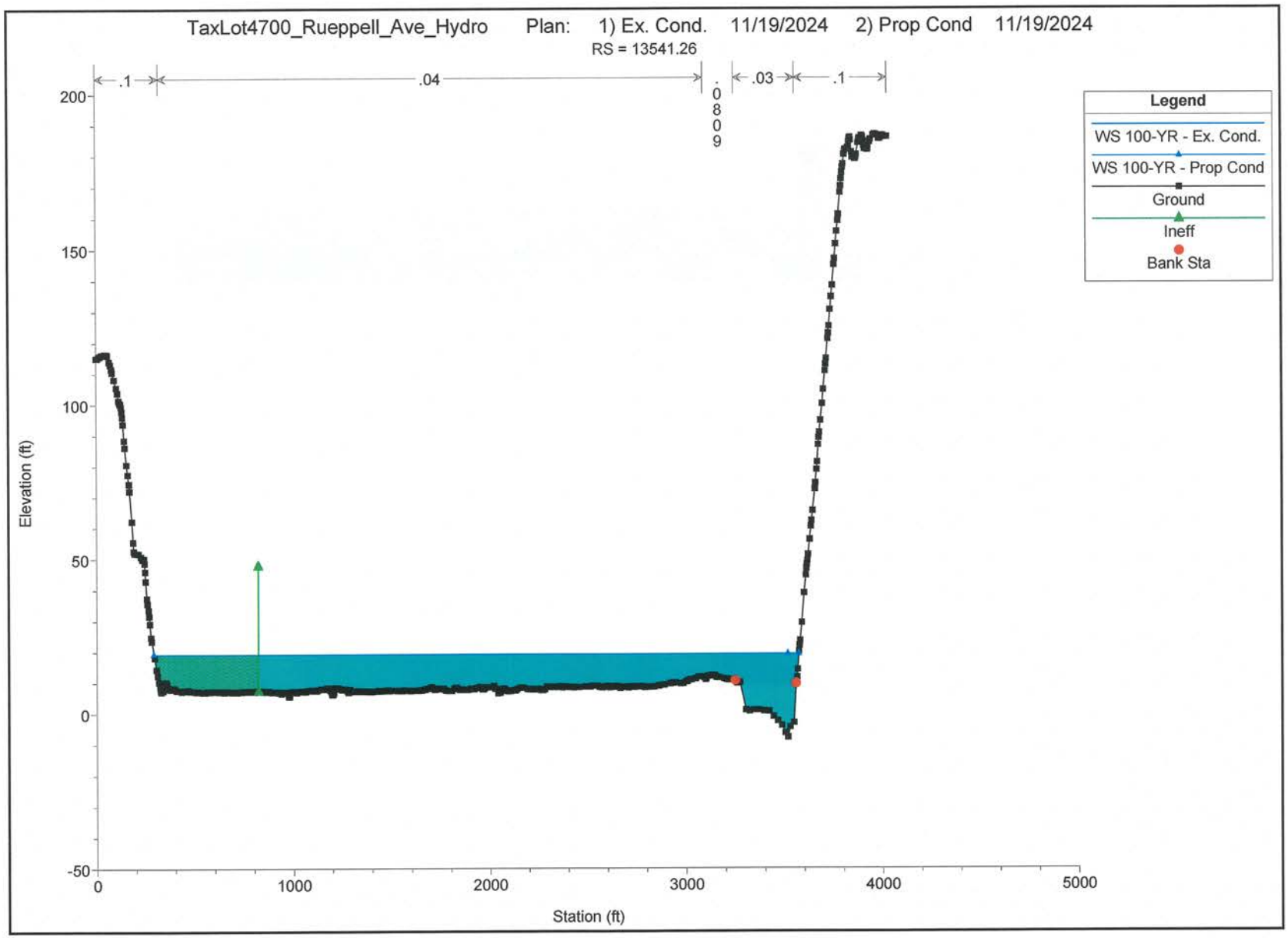

TaxLot4700_Rueppell_Ave_Hydro Plan: 1) Ex. Cond. 11/19/2024 2) Prop Cond 11/19/2024
RS = 17653.2
.1
.04
.07
.035
.05
.1
.1
Legend
WS 100-YR - Ex. Cond.
WS 100-YR - Prop Cond
Ground
Ineff
Bank Sta
Elevation (ft)
120
100
80
60
40
20
0
-20
0
500
1000
1500
2000
2500
3000
3500
4000
Station (ft)

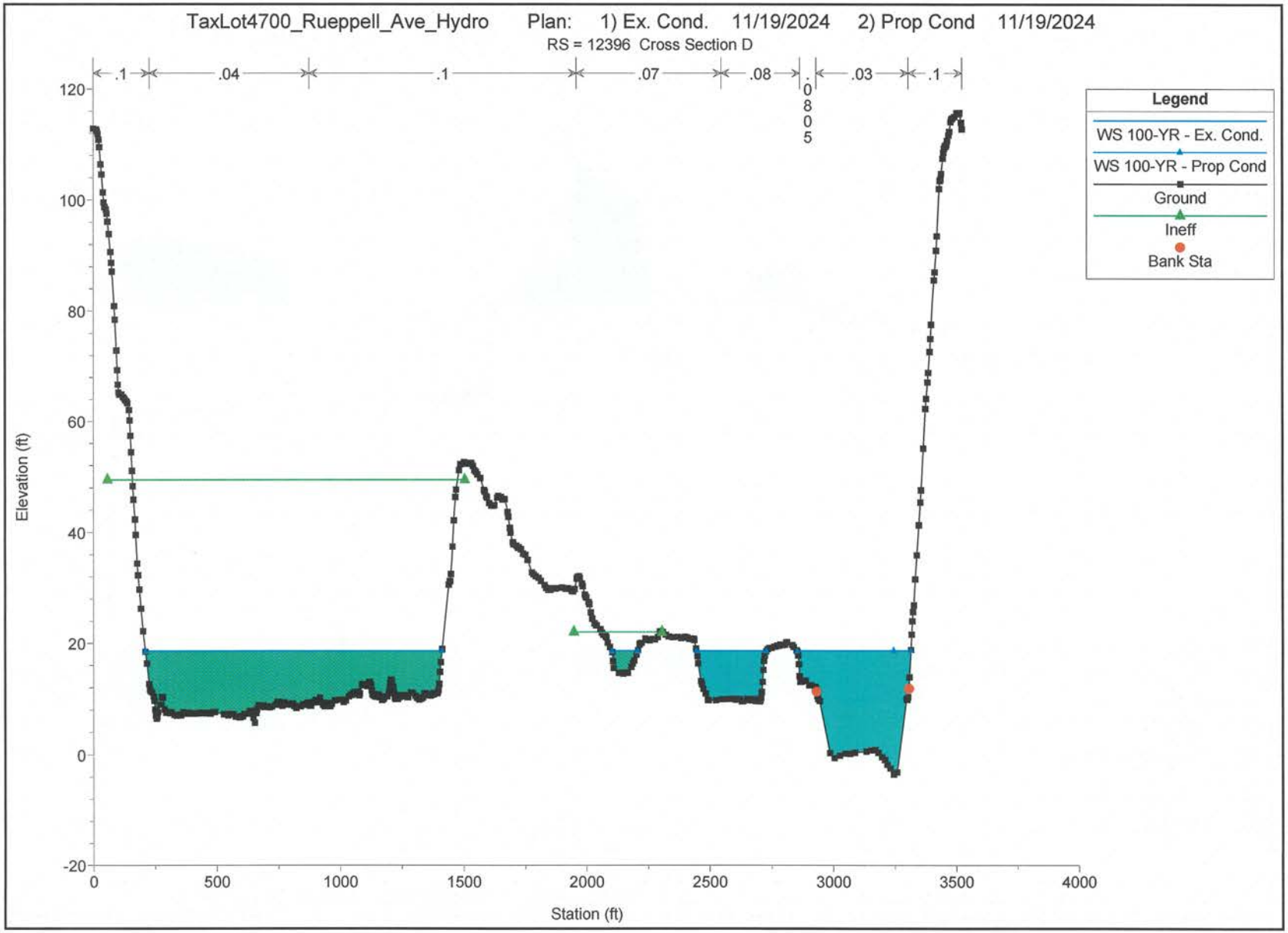

TaxLot4700_Rueppell_Ave_Hydro Plan: 1) Ex. Cond. 11/19/2024 2) Prop Cond 11/19/2024
RS = 15949.74
.1
.04
.08
.035
.05
.1
Legend
WS 100-YR - Ex. Cond.
WS 100-YR - Prop Cond
Ground
Ineff
Bank Sta
Elevation (ft)
300
250
200
150
100
50
0
-50
0
1000
2000
3000
4000
5000
6000
Station (ft)

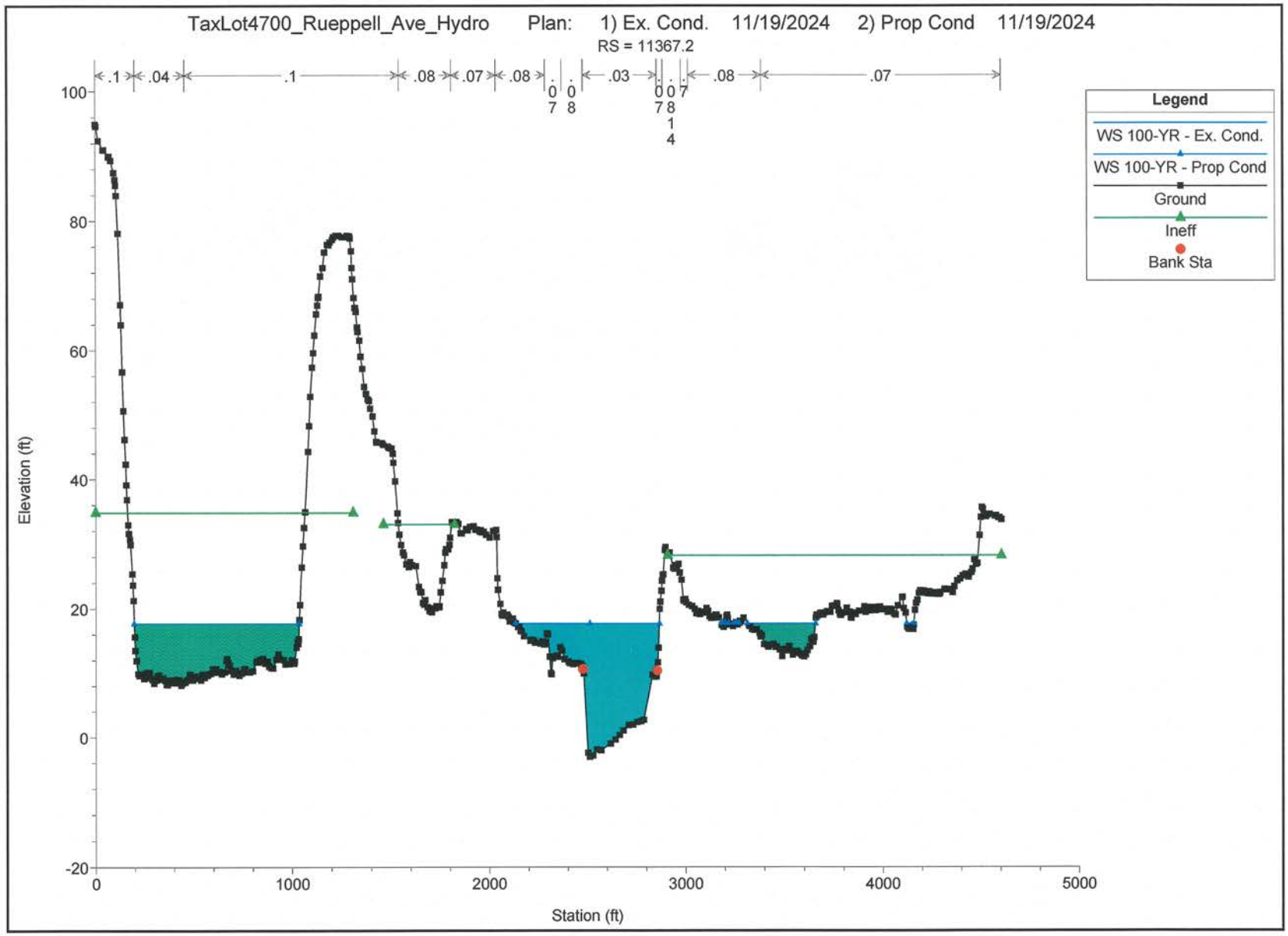

TaxLot4700_Rueppell_Ave_Hydro Plan: 1) Ex. Cond. 11/19/2024 2) Prop Cond 11/19/2024
RS = 14728.64 Cross Section E
.1
.04
.08
.03
.07
.08
.07
.1
Legend
WS 100-YR - Ex. Cond.
WS 100-YR - Prop Cond
Ground
Ineff
Bank Sta
Elevation (ft)
120
100
80
60
40
20
0
-20
0
1000
2000
3000
4000
5000
Station (ft)

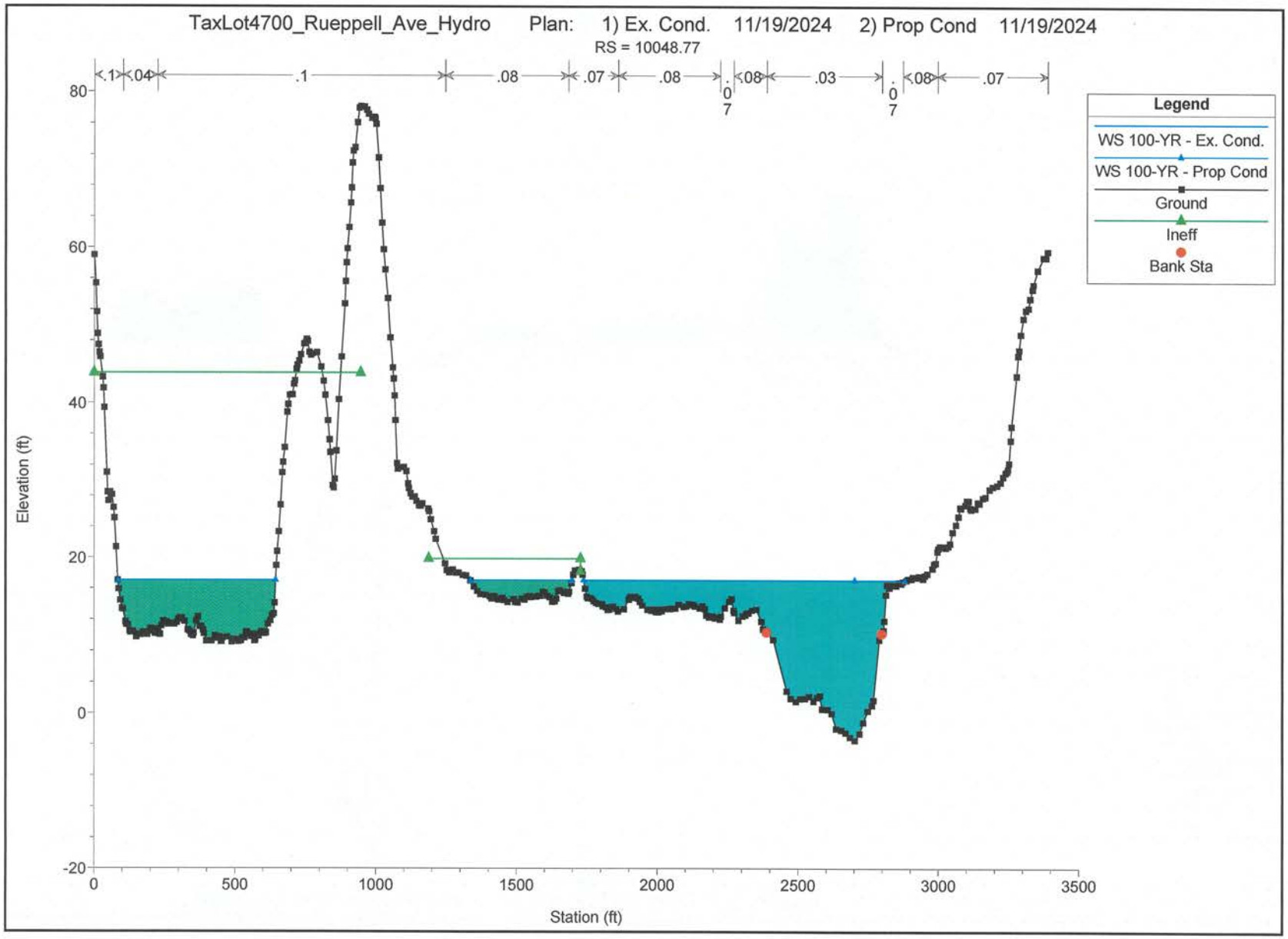

TaxLot4700_Rueppell_Ave_Hydro Plan: 1) Ex. Cond. 11/19/2024 2) Prop Cond 11/19/2024
RS = 14621.23 BR Based on drawings provided by Tillamook Co.
.1
.04
.08
.03
.07
.08
.07
.1
Legend
WS 100-YR - Ex. Cond.
WS 100-YR - Prop Cond
Ground
Ineff
Bank Sta
Elevation (ft)
120
100
80
60
40
20
0
-20
0
1000
2000
3000
4000
5000
Station (ft)

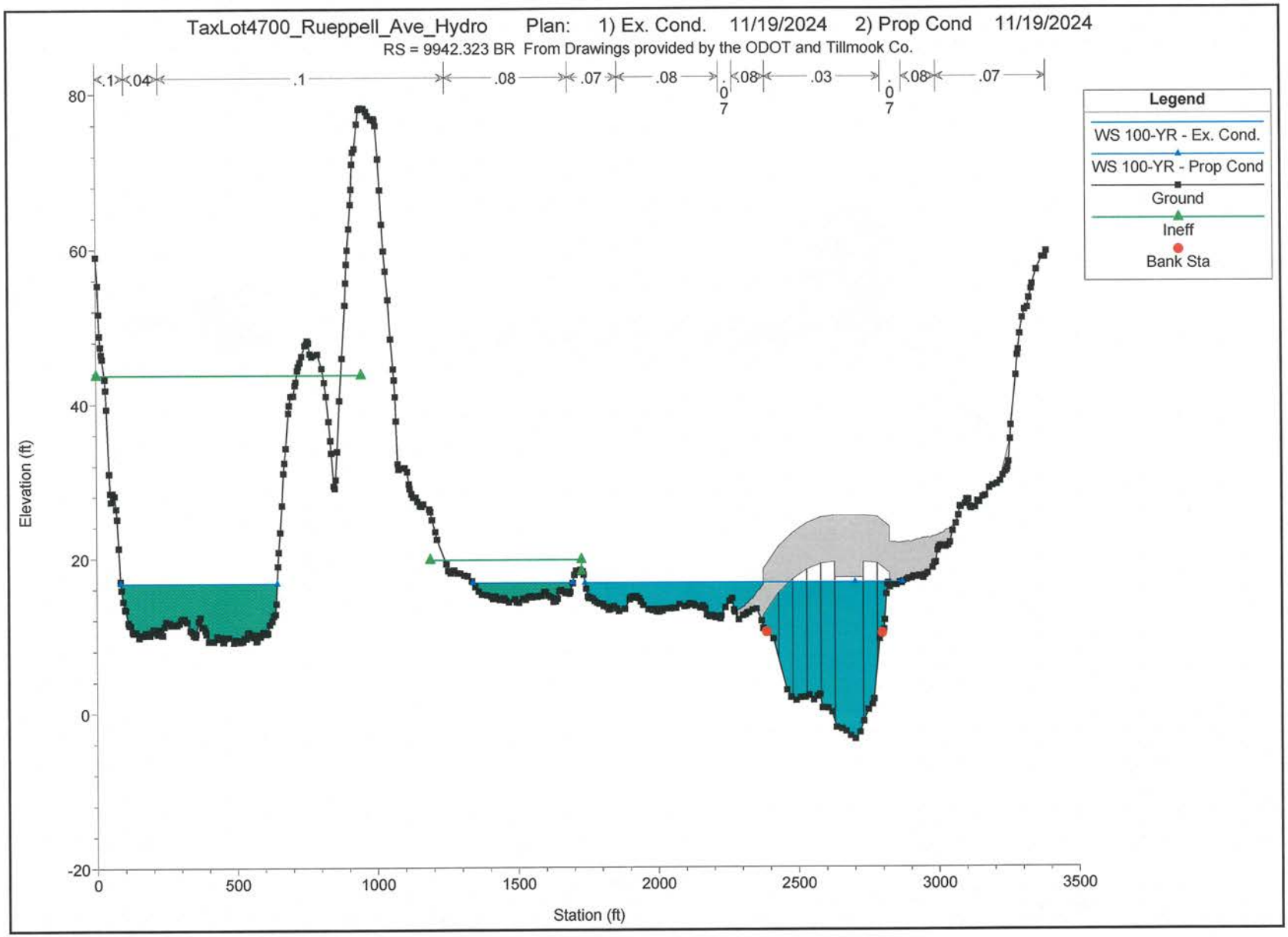

TaxLot4700_Rueppell_Ave_Hydro Plan: 1) Ex. Cond. 11/19/2024 2) Prop Cond 11/19/2024
RS = 14544.91
.1
.04
.08
.03
.0845
.07
Legend
WS 100-YR - Ex. Cond.
WS 100-YR - Prop Cond
Ground
Ineff
Bank Sta
Elevation (ft)
120
100
80
60
40
20
0
-20
0
1000
2000
3000
4000
5000
Station (ft)

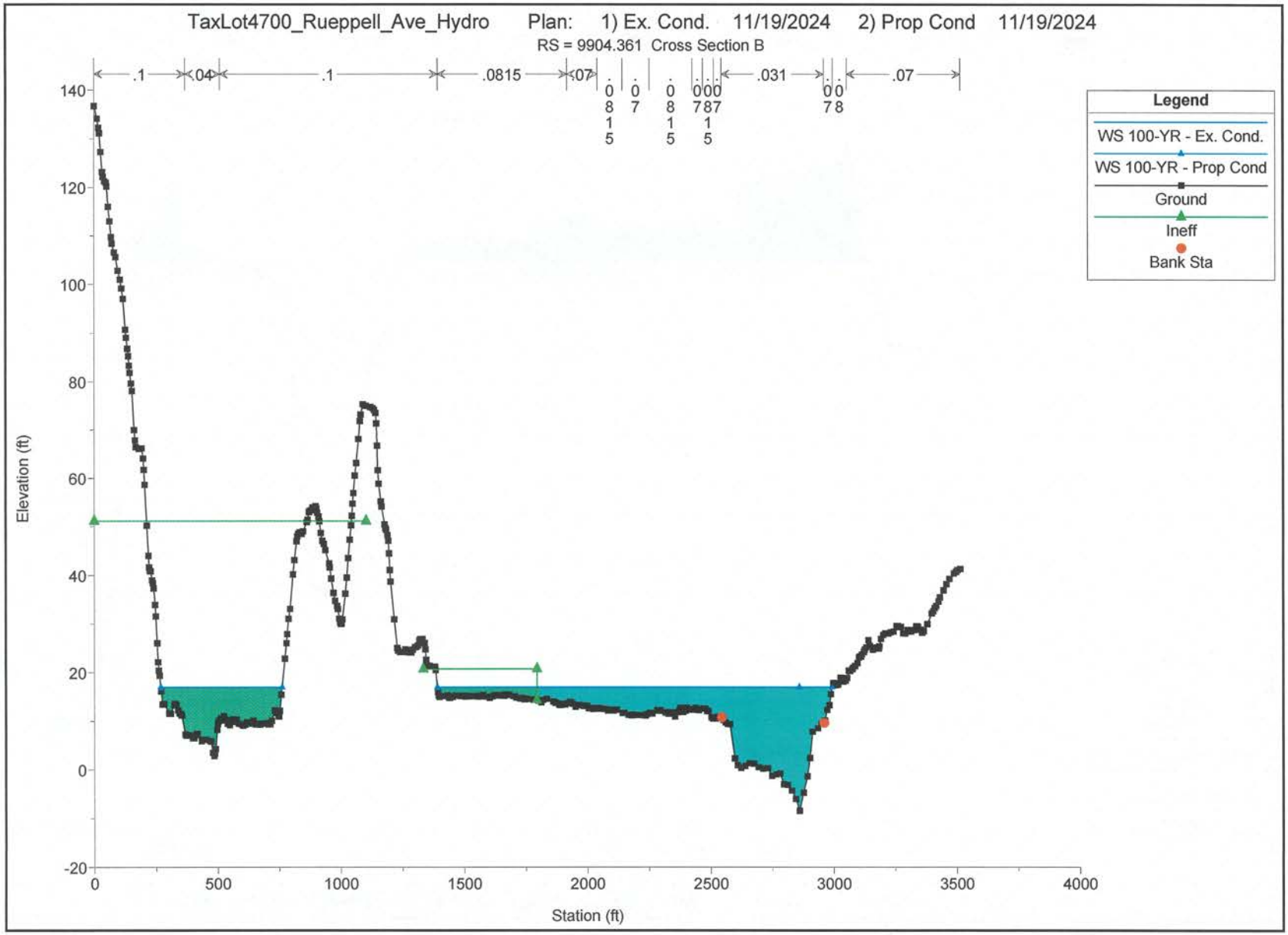

TaxLot4700_Rueppell_Ave_Hydro Plan: 1) Ex. Cond. 11/19/2024 2) Prop Cond 11/19/2024
RS = 13541.26
.1
.04
.0809
.03
.1
Legend
WS 100-YR - Ex. Cond.
WS 100-YR - Prop Cond
Ground
Ineff
Bank Sta
Elevation (ft)
200
150
100
50
0
-50
0
1000
2000
3000
4000
5000
Station (ft)

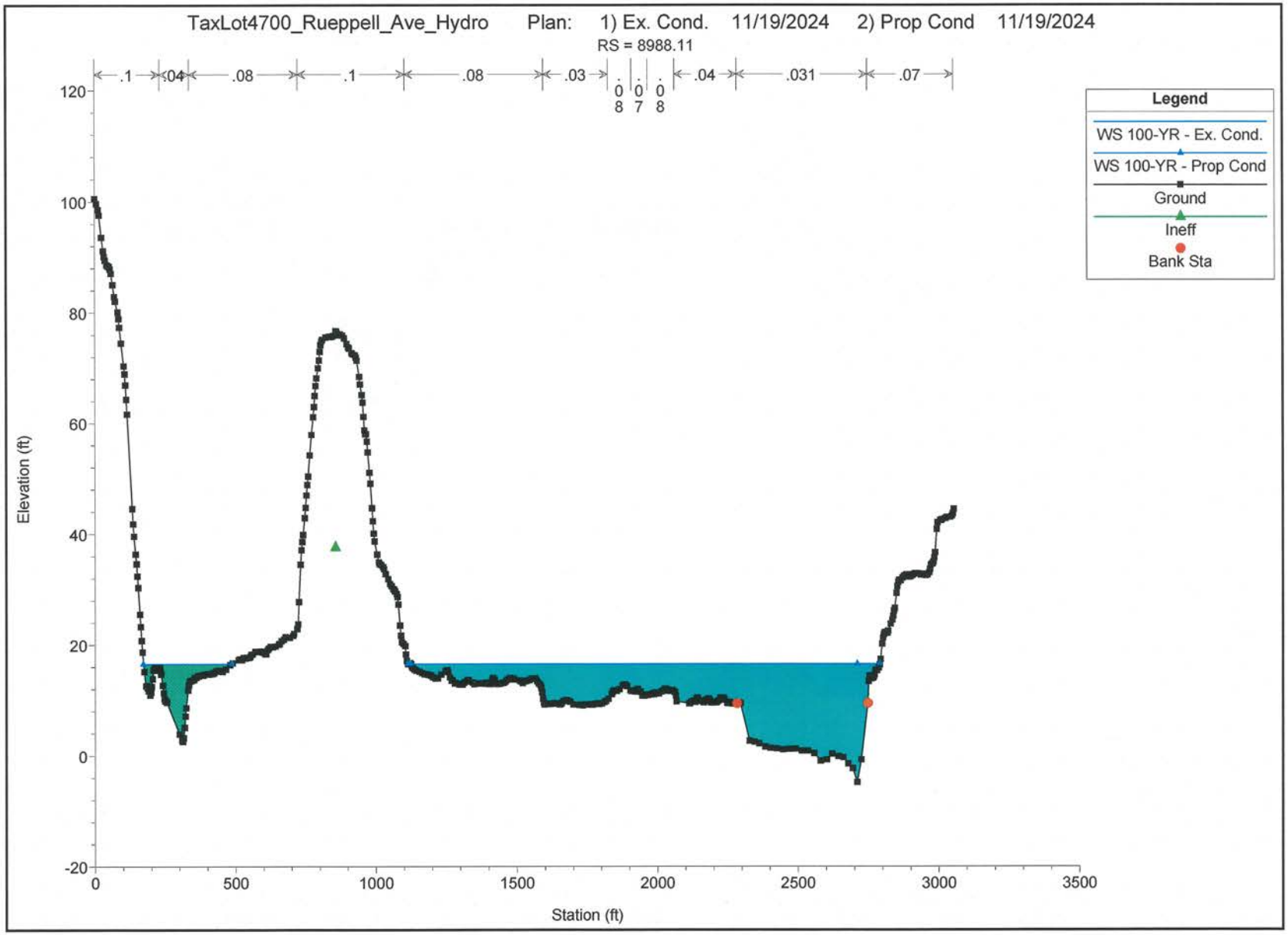

TaxLot4700_Rueppell_Ave_Hydro Plan: 1) Ex. Cond. 11/19/2024 2) Prop Cond 11/19/2024
RS = 12396 Cross Section D
.1
.04
.1
.07
.08
.0805
.03
.1
Legend
WS 100-YR - Ex. Cond.
WS 100-YR - Prop Cond
Ground
Ineff
Bank Sta
Elevation (ft)
120
100
80
60
40
20
0
-20
0
500
1000
1500
2000
2500
3000
3500
4000
Station (ft)

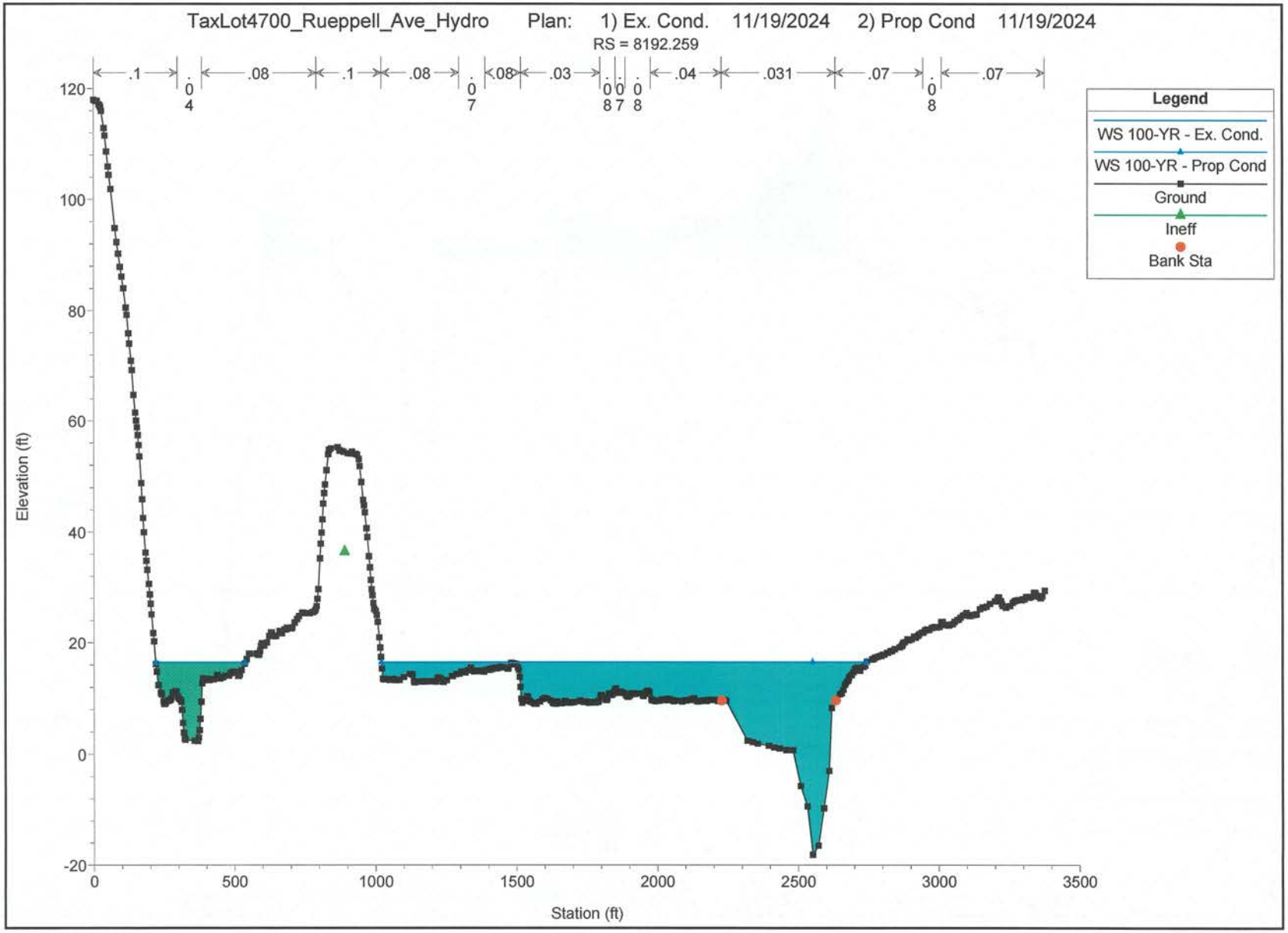

TaxLot4700_Rueppell_Ave_Hydro Plan: 1) Ex. Cond. 11/19/2024 2) Prop Cond 11/19/2024
RS = 11367.2
.1
.04
.1
.08
.07
.08
.03
.08
.07
Legend
WS 100-YR - Ex. Cond.
WS 100-YR - Prop Cond
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
100
80
60
40
20
0
-20
0
1000
2000
3000
4000
5000

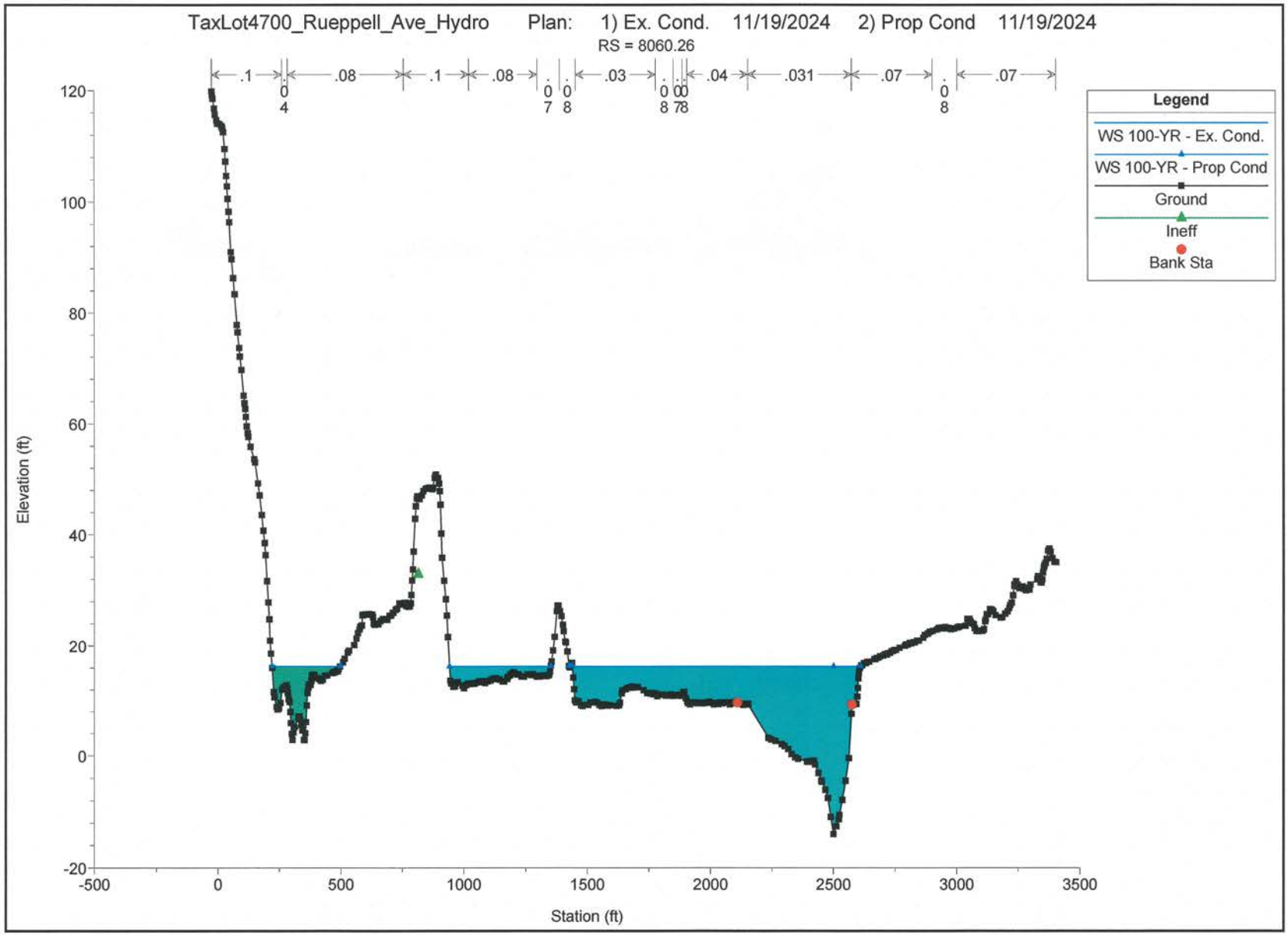

TaxLot4700_Rueppell_Ave_Hydro Plan: 1) Ex. Cond. 11/19/2024 2) Prop Cond 11/19/2024
RS = 10048.77
.1
.04
.1
.08
.07
.08
.07
.08
.03
.07
.08
.07
Legend
WS 100-YR - Ex. Cond.
WS 100-YR - Prop Cond
Ground
Ineff
Bank Sta
Elevation (ft)
80
60
40
20
0
-20
0
500
1000
1500
2000
2500
3000
3500
Station (ft)

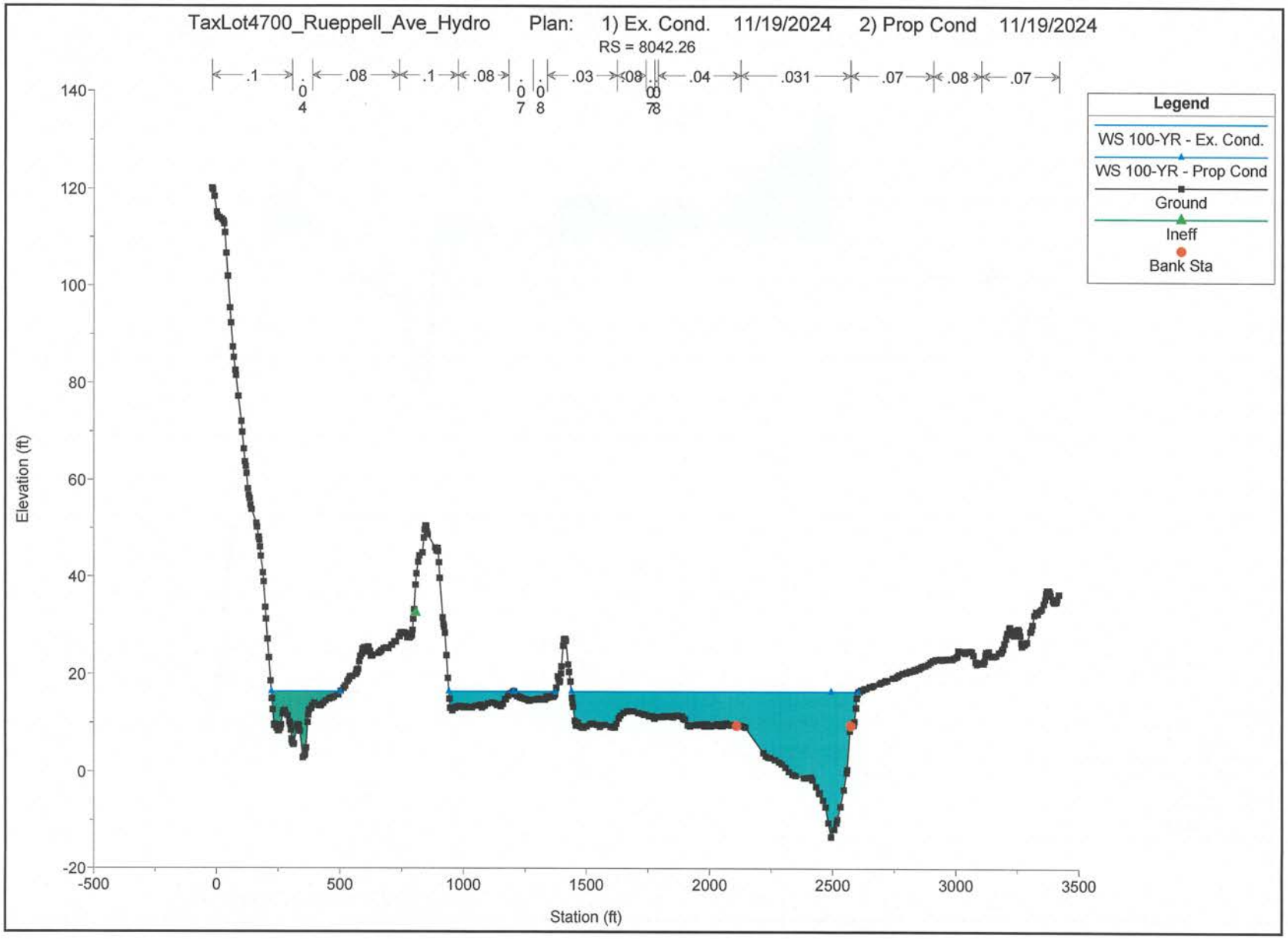

TaxLot4700_Rueppell_Ave_Hydro Plan: 1) Ex. Cond. 11/19/2024 2) Prop Cond 11/19/2024
RS = 9942.323 BR From Drawings provided by the ODOT and Tillmook Co.
.1
.04
.1
.08
.07
.08
.08
.03
.08
.07
Legend
WS 100-YR - Ex. Cond.
WS 100-YR - Prop Cond
Ground
Ineff
Bank Sta
Elevation (ft)
80
60
40
20
0
-20
0
500
1000
1500
2000
2500
3000
3500
Station (ft)

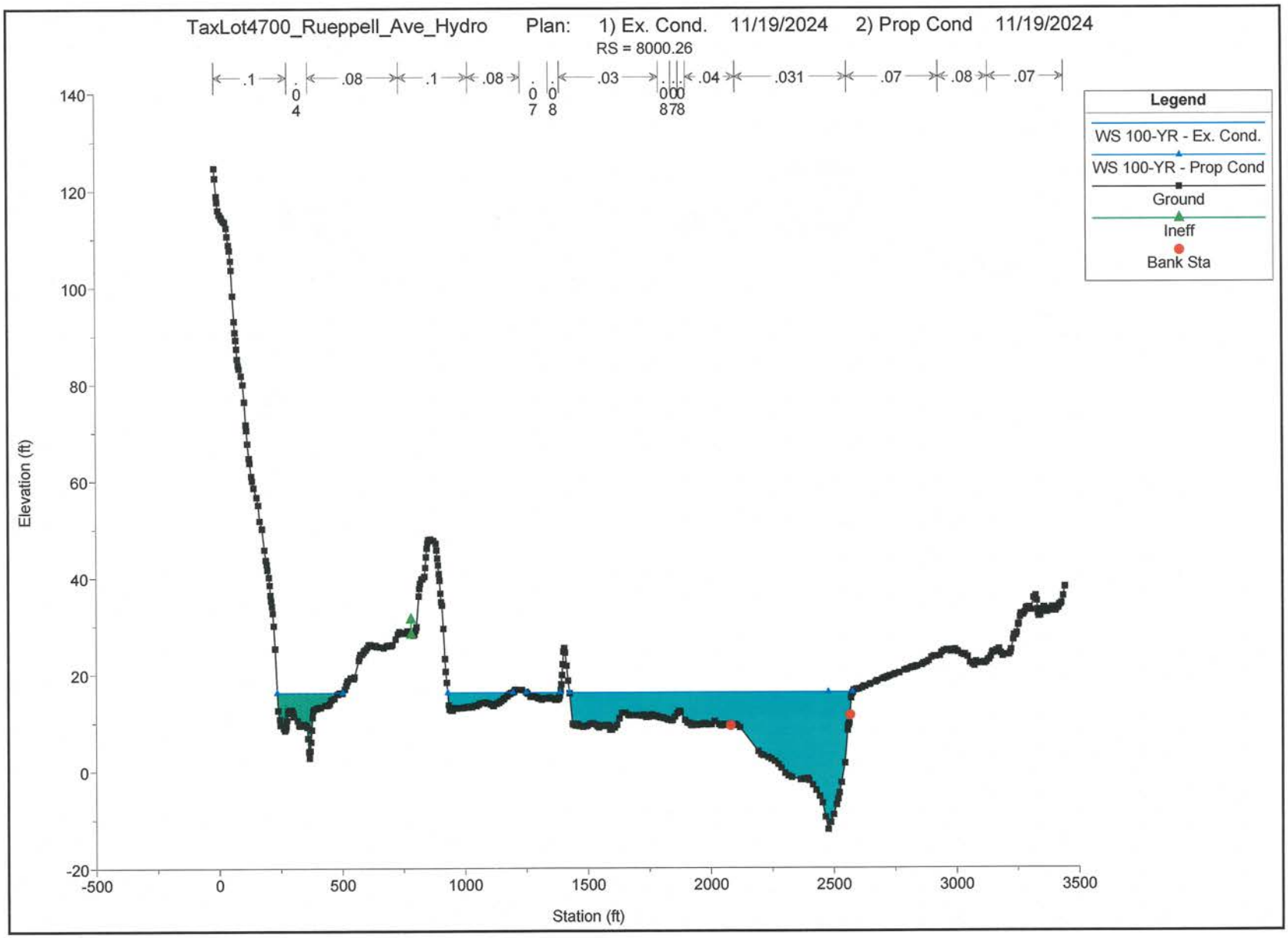

TaxLot4700_Rueppell_Ave_Hydro Plan: 1) Ex. Cond. 11/19/2024 2) Prop Cond 11/19/2024
RS = 9904.361 Cross Section B
.1
.04
.1
.0815
.07
.031
.07
Legend
WS 100-YR - Ex. Cond.
WS 100-YR - Prop Cond
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
140
120
100
80
60
40
20
0
-20
0
500
1000
1500
2000
2500
3000
3500
4000

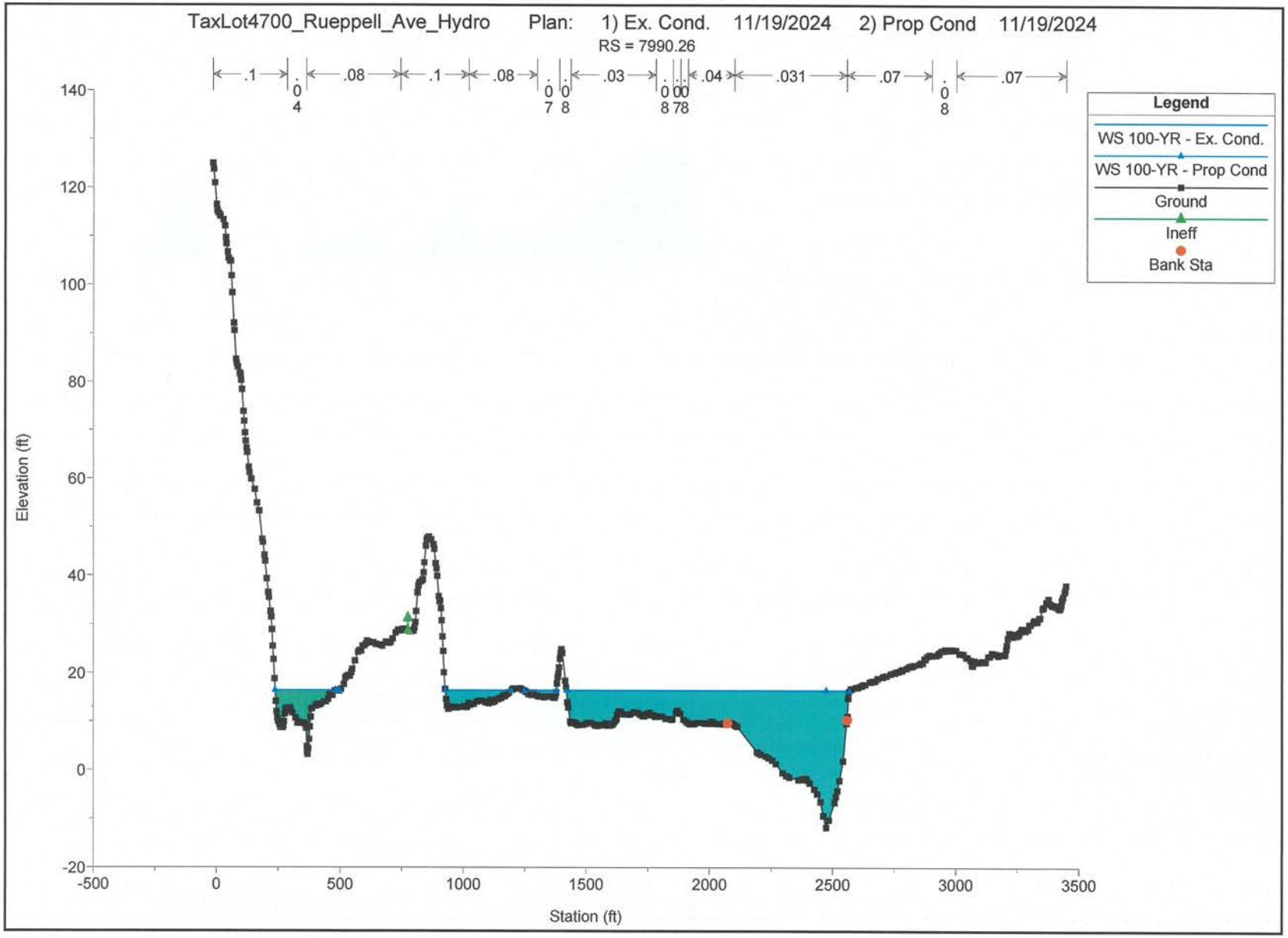

TaxLot4700_Rueppell_Ave_Hydro Plan: 1) Ex. Cond. 11/19/2024 2) Prop Cond 11/19/2024
RS = 8988.11
.1
.04
.08
.1
.08
.03
.08
.07
.04
.031
.07
Legend
WS 100-YR - Ex. Cond.
WS 100-YR - Prop Cond
Ground
Ineff
Bank Sta
Elevation (ft)
120
100
80
60
40
20
0
-20
0
500
1000
1500
2000
2500
3000
3500
Station (ft)

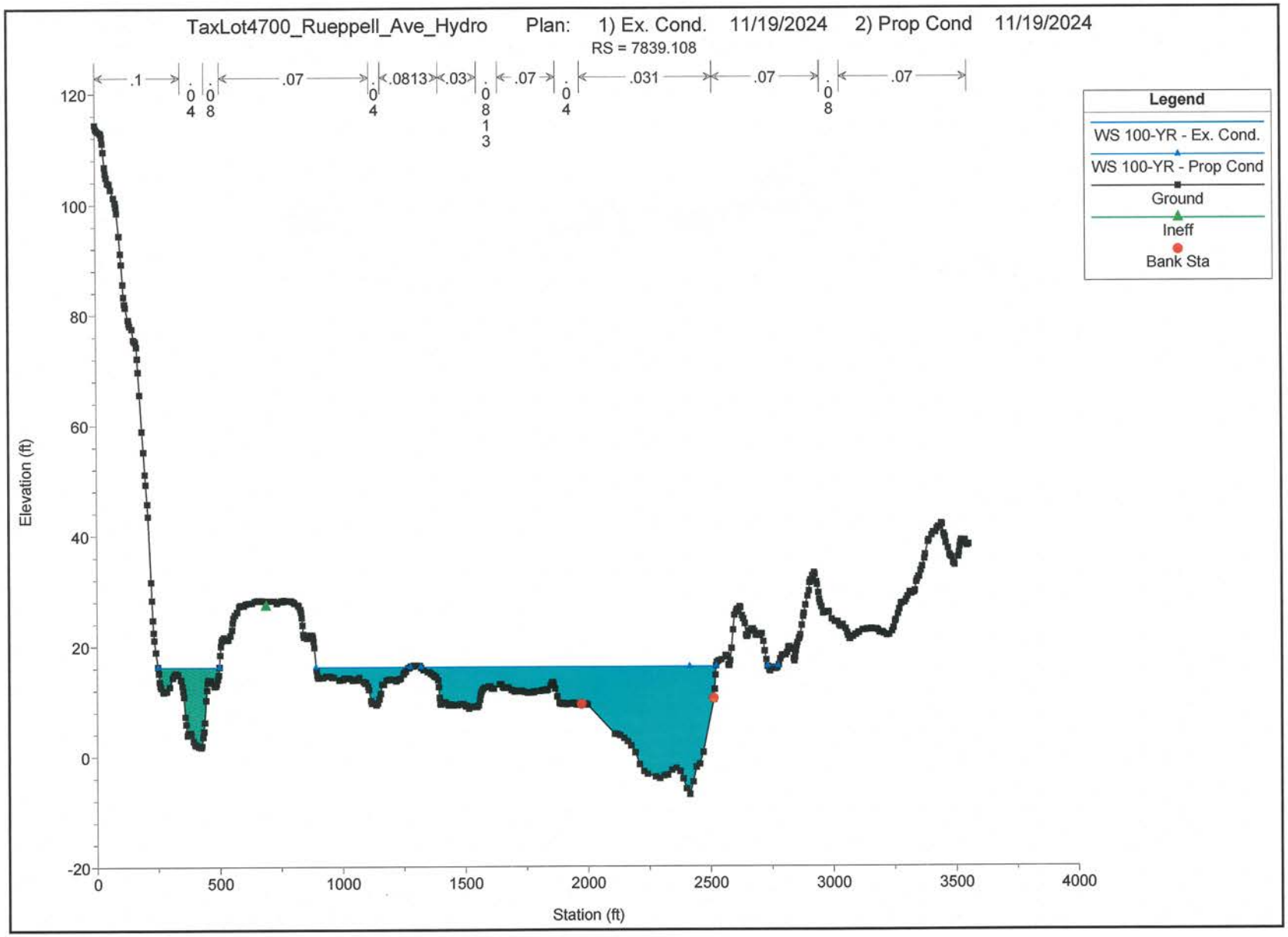

TaxLot4700_Rueppell_Ave_Hydro Plan: 1) Ex. Cond. 11/19/2024 2) Prop Cond 11/19/2024
RS = 8192.259
.1
.04
.08
.1
.08
.07
.08
.03
.08
.07
.08
.04
.031
.07
.07
Legend
WS 100-YR - Ex. Cond.
WS 100-YR - Prop Cond
Ground
Ineff
Bank Sta
Elevation (ft)
120
100
80
60
40
20
0
-20
0
500
1000
1500
2000
2500
3000
3500
Station (ft)

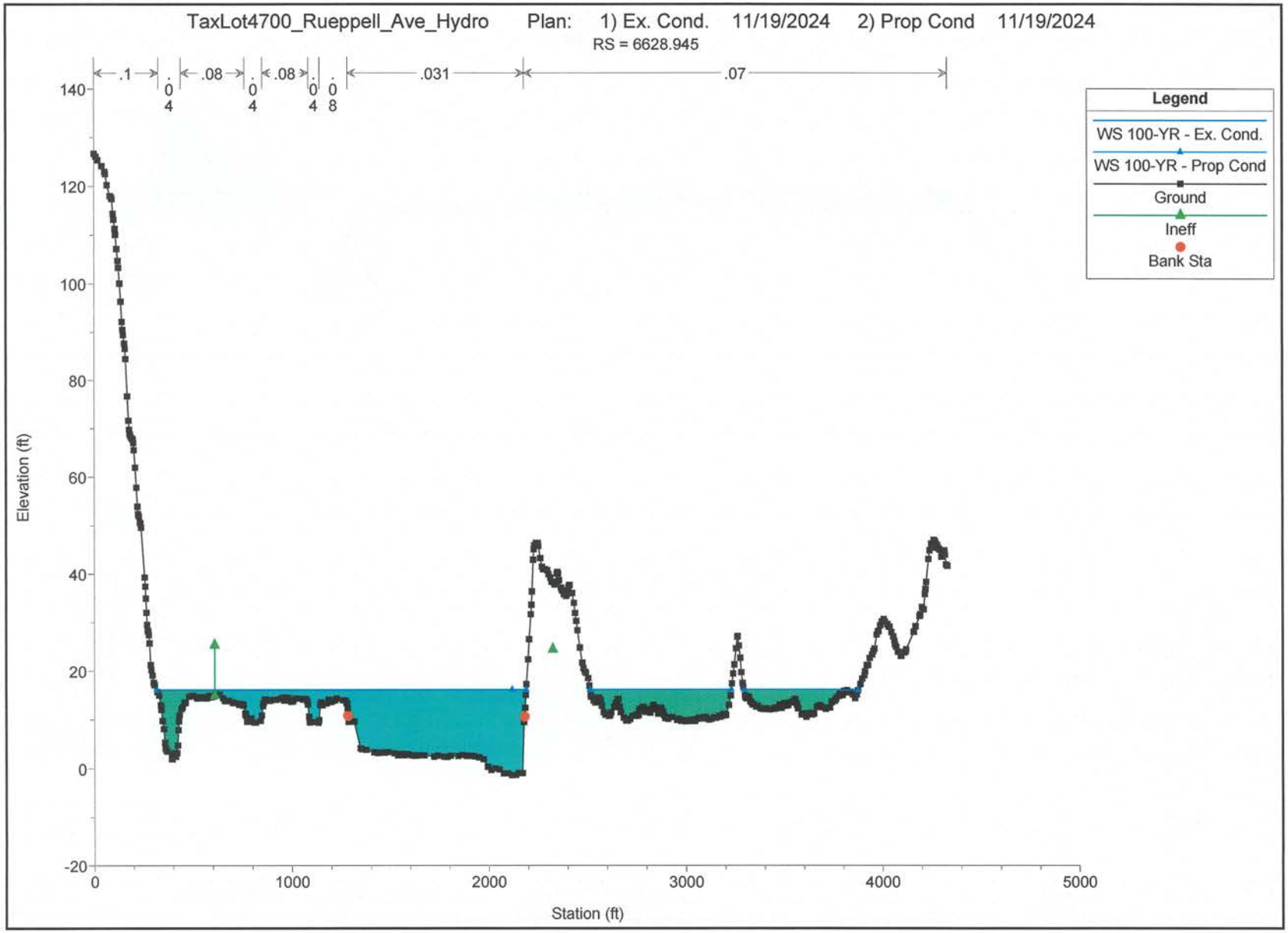

TaxLot4700_Rueppell_Ave_Hydro Plan: 1) Ex. Cond. 11/19/2024 2) Prop Cond 11/19/2024
RS = 8060.26
.1
.08
.1
.08
.03
.04
.031
.07
.07
Legend
WS 100-YR - Ex. Cond.
WS 100-YR - Prop Cond
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
120
100
80
60
40
20
0
-20
-500
0
500
1000
1500
2000
2500
3000
3500

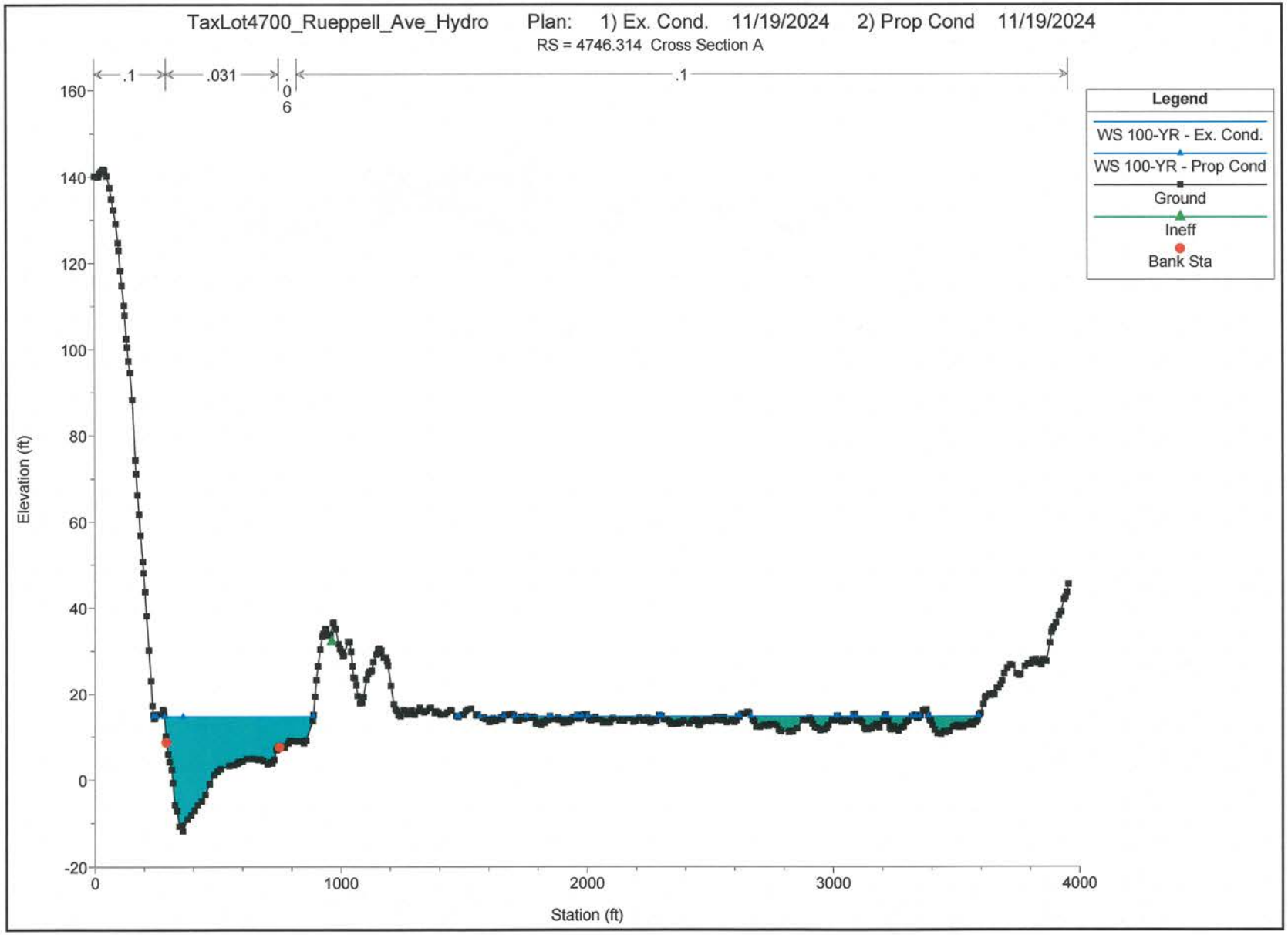

TaxLot4700_Rueppell_Ave_Hydro Plan: 1) Ex. Cond. 11/19/2024 2) Prop Cond 11/19/2024
RS = 8042.26
.1
.04
.08
.1
.08
.07
.08
.03
.08
.04
.031
.07
.08
.07
Legend
WS 100-YR - Ex. Cond.
WS 100-YR - Prop Cond
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
140
120
100
80
60
40
20
0
-20
-500
0
500
1000
1500
2000
2500
3000
3500

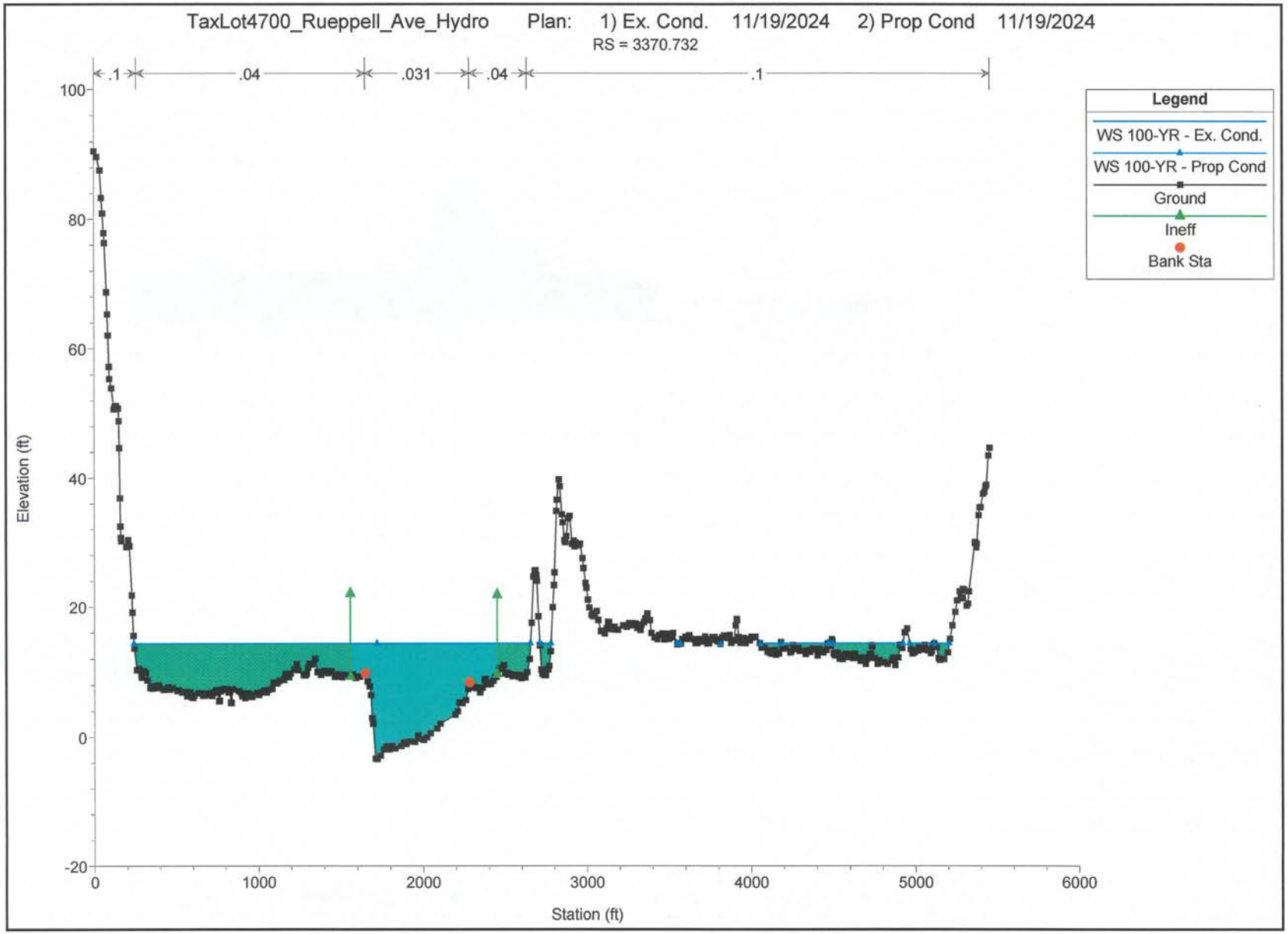

TaxLot4700_Rueppell_Ave_Hydro Plan: 1) Ex. Cond. 11/19/2024 2) Prop Cond 11/19/2024
RS = 8000.26
.1
.04
.08
.1
.08
.07
.03
.04
.031
.07
.08
.07
Legend
WS 100-YR - Ex. Cond.
WS 100-YR - Prop Cond
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
140
120
100
80
60
40
20
0
-20
-500
0
500
1000
1500
2000
2500
3000
3500

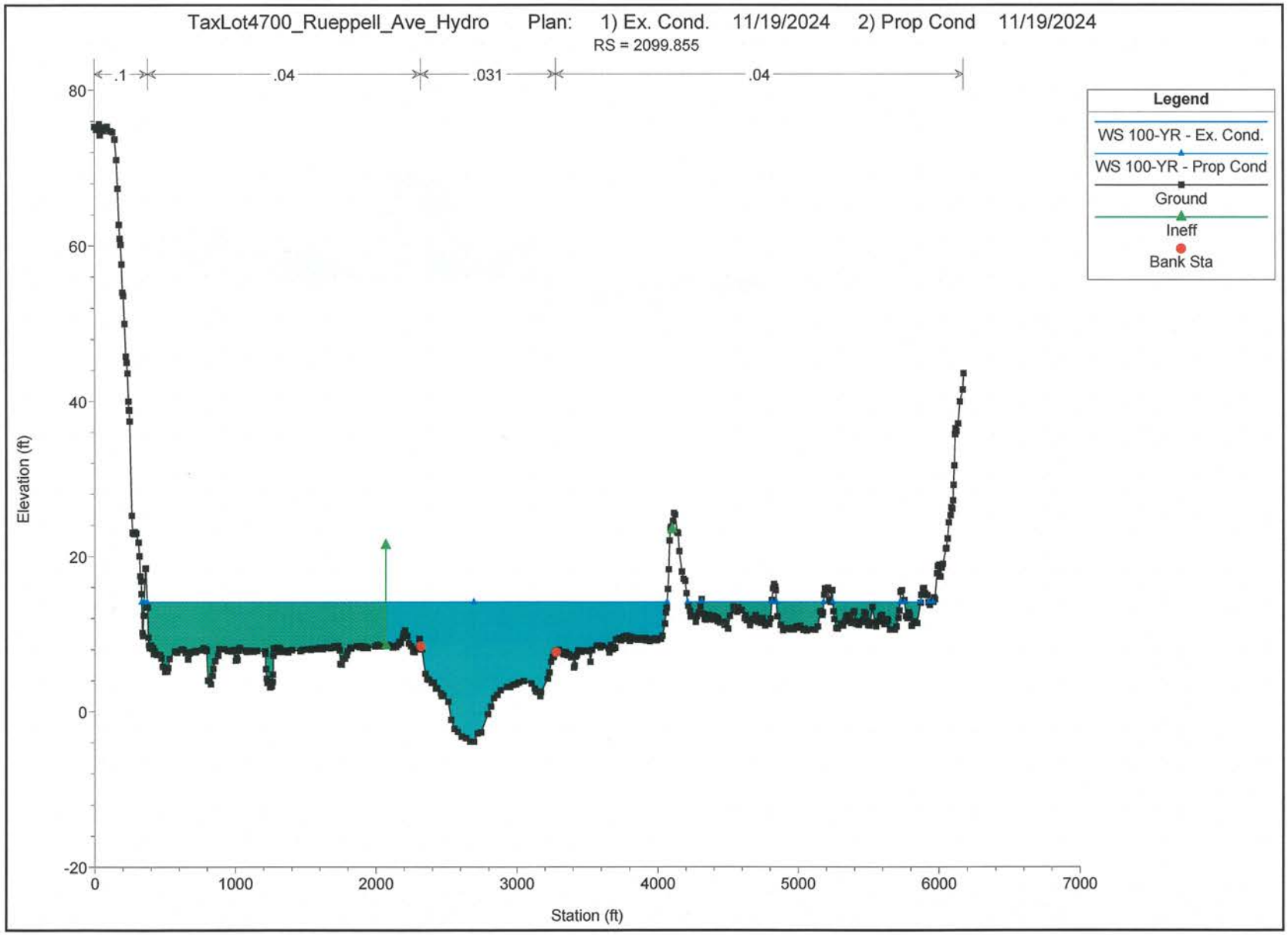

TaxLot4700_Rueppell_Ave_Hydro Plan: 1) Ex. Cond. 11/19/2024 2) Prop Cond 11/19/2024
RS = 7990.26
.1
.08
.1
.08
.03
.04
.031
.07
.07
Legend
WS 100-YR - Ex. Cond.
WS 100-YR - Prop Cond
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
140
120
100
80
60
40
20
0
-20
-500
0
500
1000
1500
2000
2500
3000
3500


TaxLot4700_Rueppell_Ave_Hydro Plan: 1) Ex. Cond. 11/19/2024 2) Prop Cond 11/19/2024
RS = 7839.108
.1
.04
.08
.07
.04
.0813
.03
.0813
.07
.04
.031
.07
.08
.07
Legend
WS 100-YR - Ex. Cond.
WS 100-YR - Prop Cond
Ground
Ineff
Bank Sta
Elevation (ft)
120
100
80
60
40
20
0
-20
0
500
1000
1500
2000
2500
3000
3500
4000
Station (ft)


TaxLot4700_Rueppell_Ave_Hydro Plan: 1) Ex. Cond. 11/19/2024 2) Prop Cond 11/19/2024
RS = 6628.945
.1
.04
.08
.04
.08
.04
.08
.031
.07
Legend
WS 100-YR - Ex. Cond.
WS 100-YR - Prop Cond
Ground
Ineff
Bank Sta
Elevation (ft)
140
120
100
80
60
40
20
0
-20
0
1000
2000
3000
4000
5000
Station (ft)


TaxLot4700_Rueppell_Ave_Hydro Plan: 1) Ex. Cond. 11/19/2024 2) Prop Cond 11/19/2024
RS = 4746.314 Cross Section A
.1
.031
.06
.1
Legend
WS 100-YR - Ex. Cond.
WS 100-YR - Prop Cond
Ground
Ineff
Bank Sta
Elevation (ft)
160
140
120
100
80
60
40
20
0
-20
0
1000
2000
3000
4000
Station (ft)


TaxLot4700_Rueppell_Ave_Hydro Plan: 1) Ex. Cond. 11/19/2024 2) Prop Cond 11/19/2024
RS = 3370.732
.1
.04
.031
.04
.1
Legend
WS 100-YR - Ex. Cond.
WS 100-YR - Prop Cond
Ground
Ineff
Bank Sta
Elevation (ft)
100
80
60
40
20
0
-20
0
1000
2000
3000
4000
5000
6000
Station (ft)


TaxLot4700_Rueppell_Ave_Hydro Plan: 1) Ex. Cond. 11/19/2024 2) Prop Cond 11/19/2024
RS = 2099.855
.1
.04
.031
.04
Legend
WS 100-YR - Ex. Cond.
WS 100-YR - Prop Cond
Ground
Ineff
Bank Sta
Elevation (ft)
80
60
40
20
0
-20
0
1000
2000
3000
4000
5000
6000
7000
Station (ft)

HEC-RAS River: Nestucca River Reach: Lower Profile: 100-YR

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Lower	22553.94	100-YR	Ex. Cond.	49700.00	-5.99	20.50	12.22	20.55	0.000090	3.06	32242.73	3644.56	0.11
Lower	22553.94	100-YR	Prop Cond	49700.00	-5.99	20.50	12.22	20.55	0.000090	3.06	32241.22	3644.53	0.11
Lower	21008.6	100-YR	Ex. Cond.	49700.00	-8.92	20.09		20.31	0.000259	5.18	17862.67	1743.76	0.20
Lower	21008.6	100-YR	Prop Cond	49700.00	-8.92	20.09		20.31	0.000259	5.19	17861.66	1743.76	0.20
Lower	20157.05	100-YR	Ex. Cond.	49700.00	-9.15	19.94	12.36	20.10	0.000212	4.43	20011.35	2302.26	0.17
Lower	20157.05	100-YR	Prop Cond	49700.00	-9.15	19.94	12.36	20.10	0.000212	4.43	20010.22	2302.26	0.17
Lower	19079.89	100-YR	Ex. Cond.	49700.00	-11.85	19.70		19.89	0.000229	5.03	20292.05	1888.75	0.18
Lower	19079.89	100-YR	Prop Cond	49700.00	-11.85	19.70		19.89	0.000229	5.03	20290.84	1888.75	0.18
Lower	18019.8	100-YR	Ex. Cond.	49700.00	-7.69	19.54	11.35	19.68	0.000186	4.32	22186.38	2668.23	0.16
Lower	18019.8	100-YR	Prop Cond	49700.00	-7.69	19.54	11.35	19.68	0.000187	4.32	22185.01	2668.22	0.16
Lower	17875.97	100-YR	Ex. Cond.	49700.00	-7.60	19.52	11.05	19.65	0.000168	4.13	23060.67	2677.02	0.16
Lower	17875.97	100-YR	Prop Cond	49700.00	-7.60	19.52	11.05	19.65	0.000168	4.13	23059.24	2677.02	0.16
Lower	17653.2	100-YR	Ex. Cond.	49700.00	-4.67	19.54	11.28	19.60	0.000095	3.22	29276.81	3181.64	0.12
Lower	17653.2	100-YR	Prop Cond	49700.00	-4.67	19.54	11.28	19.60	0.000095	3.22	29275.02	3181.63	0.12
Lower	15949.74	100-YR	Ex. Cond.	49700.00	-7.67	19.49	9.86	19.51	0.000032	1.90	46740.28	4377.64	0.07
Lower	15949.74	100-YR	Prop Cond	49700.00	-7.67	19.49	9.86	19.51	0.000032	1.91	46737.63	4377.64	0.07
Lower	14728.64	100-YR	Ex. Cond.	49700.00	-9.90	19.44	10.23	19.48	0.000043	2.46	37323.92	3855.74	0.09
Lower	14728.64	100-YR	Prop Cond	49700.00	-9.90	19.44	10.23	19.48	0.000043	2.46	37321.56	3855.73	0.09
Lower	14621.23			Bridge									
Lower	14544.91	100-YR	Ex. Cond.	49700.00	-8.62	19.42	10.32	19.46	0.000045	2.54	36908.18	3871.08	0.10
Lower	14544.91	100-YR	Prop Cond	49700.00	-8.62	19.42	10.32	19.46	0.000045	2.54	36905.81	3871.07	0.10
Lower	13541.26	100-YR	Ex. Cond.	49700.00	-7.81	19.37	10.21	19.42	0.000052	2.50	32790.70	3280.38	0.10
Lower	13541.26	100-YR	Prop Cond	49700.00	-7.81	19.37	10.21	19.42	0.000052	2.50	32788.79	3280.38	0.10
Lower	12396	100-YR	Ex. Cond.	49700.00	-3.59	18.51		19.22	0.000462	7.06	9097.24	2050.16	0.30
Lower	12396	100-YR	Prop Cond	49700.00	-3.59	18.51		19.22	0.000462	7.06	9096.65	2050.11	0.30
Lower	11367.2	100-YR	Ex. Cond.	49700.00	-3.05	17.74	9.51	18.65	0.000620	7.83	7537.51	2018.83	0.34
Lower	11367.2	100-YR	Prop Cond	49700.00	-3.05	17.74	9.51	18.65	0.000620	7.83	7536.81	2018.61	0.34
Lower	10048.77	100-YR	Ex. Cond.	49700.00	-3.49	16.98	9.18	17.81	0.000617	7.53	8685.25	2063.21	0.34
Lower	10048.77	100-YR	Prop Cond	49700.00	-3.49	16.98	9.18	17.81	0.000618	7.53	8683.86	2063.07	0.34
Lower	9942.323			Bridge									
Lower	9904.361	100-YR	Ex. Cond.	49700.00	-8.44	16.83	8.05	17.52	0.000540	6.93	10035.71	2094.17	0.31
Lower	9904.361	100-YR	Prop Cond	49700.00	-8.44	16.83	8.05	17.52	0.000540	6.93	10034.18	2094.16	0.31
Lower	8988.11	100-YR	Ex. Cond.	49700.00	-4.80	16.62	8.14	16.98	0.000328	5.35	12967.10	1987.49	0.24
Lower	8988.11	100-YR	Prop Cond	49700.00	-4.80	16.62	8.14	16.97	0.000329	5.35	12964.76	1987.37	0.24
Lower	8192.259	100-YR	Ex. Cond.	49700.00	-18.19	16.36	6.30	16.73	0.000307	5.46	12941.69	2042.03	0.23
Lower	8192.259	100-YR	Prop Cond	49700.00	-18.19	16.36	6.30	16.73	0.000307	5.46	12939.08	2042.00	0.23
Lower	8060.26	100-YR	Ex. Cond.	49700.00	-13.99	16.33	6.43	16.69	0.000300	5.32	12652.10	1863.66	0.23
Lower	8060.26	100-YR	Prop Cond	49700.00	-13.99	16.32	6.43	16.69	0.000300	5.32	12649.66	1863.57	0.23
Lower	8042.26	100-YR	Ex. Cond.	49700.00	-13.42	16.31	6.44	16.68	0.000311	5.38	12449.58	1871.44	0.24
Lower	8042.26	100-YR	Prop Cond	49700.00	-13.42	16.30	6.44	16.68	0.000314	5.40	12243.84	1822.13	0.24
Lower	8000.26	100-YR	Ex. Cond.	49700.00	-12.08	16.32	6.48	16.66	0.000316	5.15	12454.82	1826.78	0.23
Lower	8000.26	100-YR	Prop Cond	49700.00	-12.08	16.30	6.48	16.66	0.000324	5.21	12232.06	1781.83	0.23
Lower	7990.26	100-YR	Ex. Cond.	49700.00	-11.76	16.30	6.48	16.66	0.000313	5.21	12388.74	1794.44	0.23
Lower	7990.26	100-YR	Prop Cond	49700.00	-11.76	16.30	6.48	16.66	0.000313	5.21	12388.74	1794.44	0.23
Lower	7839.108	100-YR	Ex. Cond.	49700.00	-6.96	16.25	6.76	16.61	0.000310	5.16	12464.76	1879.15	0.23
Lower	7839.108	100-YR	Prop Cond	49700.00	-6.96	16.25	6.76	16.61	0.000310	5.16	12464.76	1879.15	0.23
Lower	6628.945	100-YR	Ex. Cond.	49700.00	-1.36	16.04	6.84	16.27	0.000208	3.91	14212.35	3171.30	0.19
Lower	6628.945	100-YR	Prop Cond	49700.00	-1.36	16.04	6.84	16.27	0.000208	3.91	14212.35	3171.30	0.19
Lower	4746.314	100-YR	Ex. Cond.	49700.00	-11.72	14.76	7.45	15.56	0.000672	7.30	7417.23	2442.34	0.34
Lower	4746.314	100-YR	Prop Cond	49700.00	-11.72	14.76	7.45	15.56	0.000672	7.30	7417.23	2442.34	0.34
Lower	3370.732	100-YR	Ex. Cond.	49700.00	-3.40	14.28	6.63	14.73	0.000430	5.53	9803.55	3594.57	0.27
Lower	3370.732	100-YR	Prop Cond	49700.00	-3.40	14.28	6.63	14.73	0.000430	5.53	9803.55	3594.57	0.27
Lower	2099.855	100-YR	Ex. Cond.	49700.00	-3.90	14.15	5.85	14.31	0.000175	3.42	17693.71	5262.50	0.17
Lower	2099.855	100-YR	Prop Cond	49700.00	-3.90	14.15	5.85	14.31	0.000175	3.42	17693.71	5262.50	0.17

NOAA Restoration Center NEPA Inclusion Analysis

RECEIVED
MAR 1 1 2026
BY:

Award Number
NA24NMFX463C0076

I. IDENTIFYING PROJECT INFORMATION

Project Name	Project State
Oregon Coho Recovery Plan Implementation: McCoy Wetland Enhancement - Phase 3	OR

Project Proponent / Applicant	Project Contact
Wild Salmon Center	Cyndi Curtis

II. OTHER FEDERAL PARTNERS AND LEVEL OF NEPA ANALYSIS

Has another Federal agency completed NEPA?	☐ Yes	☑ No
Is NOAA the lead federal agency for this NEPA analysis?	☑ Yes	☐ No

III. PROJECT DESCRIPTION / SCOPE OF ACTIVITIES FOR ANALYSIS

Please check one of the following conditions:

☐ *I am analyzing impacts of project planning and design activities, in order to gather all required project information*

☑ *I have all information needed to complete the final analysis of impacts for the entire project*

Has a NEPA review been conducted for prior project activities?	Date of NEPA completion for prior phase
✓ Yes / No	4/22/2025

Describe the full scope of the project, including historic/ geographic/ ecological context, the type of restoration, and how it will be conducted.

NOAA is providing funding for the Wild Salmon Center to plan, design, and implement 11 projects in four Oregon coast watersheds: the Coquille, Coos, Siuslaw, Siletz, and Nehalem watersheds. All the restoration projects advance the goal of recovering populations for Oregon Coast (OC) coho salmon through the restoration of floodplain and estuary habitat. One of these projects will improve habitat in the Nehalem Estuary for juvenile coho by breaching levees that disconnect the McCoy Marsh, located just upstream from the town of Wheeler, from tidal influence and inundation. Restored tidal connectivity will significantly improve the wetland's currently altered hydrology, and improve water and habitat quality in the wetland for rearing salmonids as well as salmon prey species that are critical for juvenile salmonid growth and survival. A phase 1 NEPA analysis was completed on the design and permitting of the all the projects included in this award. A phase 2 NEPA analysis was completed on the removal of invasive vegetation at the McCoy Marsh Site.

Describe the proposed action (i.e. the portion of the project that NOAA is funding/approving).

NOAA is analyzing the impacts of construction (minus invasive plant removal) and post-project monitoring (Phase 3) of the McCoy Wetland Enhancement. Levees would be breached in three locations by removing the levee material to near the ground surface to allow high tides to enter the McCoy property. Other projects elements include the construction of tidal channels and vegetated hummocks, placement of large woody debris, and native plantings.

Check the types of activities being conducted in this project

Technical Assistance

☐ Planning, Feasibility Studies, Design Engineering, and Permitting		
☑ Implementation and Effectiveness Monitoring	☐ Fish and Wildlife Monitoring	☐ Environmental Education Classes, Programs, Centers, Partnerships and Materials; Training Programs

Riverine and Coastal Habitat Restoration

☐ Beach and Dune Restoration	☐ Bank Restoration and Erosion Reduction	☐ Water Conservation and Stream Diversion
☐ Debris Removal	☐ Coral Reef Restoration	☑ Levee & Culvert Removal, Modification, Set-back
☐ Dam and Culvert Removal & Replacement	☐ Shellfish Reef Restoration	☐ Fringing Marsh and Shoreline Stabilization
☐ Technical and Nature-like Fishways	☐ Artificial Reef Restoration	☐ Sediment Removal
☐ Invasive Species Control	☐ Road Upgrading/Decommissioning; Trail Restoration	☐ Sediment/Materials Placement
☐ Prescribed Burns/Forest Management	☐ Signage and Access Management	☑ Wetland Planting
☐ Species Enhancement	☐ SAV Restoration	
☐ Channel Restoration	☐ Marine Algae Restoration	

Conservation Transactions

☐ Land Acquisition	☐ Water Transactions	Restoration/Conservation Banking

NEPA Inclusion Analysis

IV. PROJECT IMPACT ANALYSIS

Core Questions

*1. Are the **activities** to be carried out under this project fully described in Section 2.2 of the NOAA RC PEIS?*	☑ Yes	☐ No
*2. Are the specific **impacts** that are likely to result from this project fully described in Section 4.5.2 of the NOAA RC PEIS?*	☑ Yes	☐ No
3. Does the level of adverse impact for the project exceed that described in Table 11 of the NOAA RC PEIS for any resource, including significant adverse impact?	☐ Yes	☑ No

4. Describe the project impacts to resources (including beneficial impacts) and any mitigating measures being implemented.

The analysis and underlying assumptions in the RC PEIS were reviewed, and it was determined they remain valid and are relevant to the proposed action. The restoration activities being analyzed under this review are fully described in NOAA's RC PEIS Sections 2.2.1.2 Implementation and Effectiveness Monitoring, 2.2.2.11.1 Levee and Culvert Removal, Modification, and Setback, and 2.2.2.11.5 Wetland Planting. Potential impacts due to these restoration activities fall within the scope of the analysis as described in Section 4.5.1.2 as it relates to monitoring, Section 4.5.2.11.1 as it relates to levee modification, and 4.5.2.11.3 as it relates to to Wetland Planting.

5. Describe any potential cumulative impacts that may result from past, present or reasonably foreseeable future actions (beneficial or adverse).

Other restoration projects are planned in the Nehalem River watershed and in other watersheds on the Oregon Coast that could have additive short-term adverse and long-term beneficial impacts. After the proposed technical assistance activities and habitat restoration actions have been completed, if any future similar work is conducted nearby, the potential cumulative adverse impacts from these actions could likely be a mix of direct and indirect, short-term, minor, and a mix of local for the same resources as described in IV.4 above. These cumulative adverse impacts would not exceed those described in the PEIS for these activities. The anticipated cumulative beneficial impacts that may result from this project could include direct and indirect, long term, and minor to major benefits for these same

6. Describe the public outreach and/or opportunities for public comment that have taken place to this point. Are any future opportunities for public input anticipated?

This project was included and evaluated in the Nehalem Strategic Action Plan, which was developed in partnership with regional stakeholder teams under a broader state-federal partnership. The landowner and owner of the adjacent parcel is also the lead project implementer and is supportive of the project. In addition, a state highway borders one side of the property so coordination with the Oregon Department of Transportation has taken place and their concerns are being addressed during the designs. A public comment period will take place in the future related to permitting of the levee breach portion of the project.

7. Have any public comments raised issues of scientific/environmental controversy? Please describe.

There have not been any public comments raised that were controversial in nature specific to this project.

8. Describe the most common positive and negative public comments on issues other than scientific controversy described above in Question 7.

There have not been public comments specific to this project.

Levee and Culvert Removal, Modification and Set-back

Describe the extent and the height of the levee/culvert targeted in the restoration project. How is it consistent with the types and impacts of species enhancement presented in the NOAA RC PEIS in Sections 2.2 and 4.5.2?

Two levees separate the McCoy Marsh from the Nehalem River and the adjacent Bott's March. The Nehalem Levee is mostly intact but the McCoy-Botts Levee has been abandoned and since eroded; there is a 12-inch concrete culvert under an eroded part of the levee separating McCoy and Bott's marshes. The culvert will be removed entirely. The height of the levee at the three breach locations and it post breach heights are (approximately) as follows: Breach 1 - 12 ft to 7 ft , Breach 2 - 12 ft to 8ft , Breach 3 - 9ft to 2 ft.

NOAA Restoration Center NEPA Inclusion Analysis

V. NEPA DETERMINATION

☑ The action is completely covered by the impact analysis within the NOAA RC Programmatic EIS (PEIS). The project and its potential impacts may be limited through terms or conditions placed on the recipient of NOAA funds. It requires no further environmental review. An EIS Inclusion Document will be prepared.

☐ The action analyzed here has unknown impacts. At this time, funding will be limited to those portions of the action and impacts analyzed in the PEIS. These limitations will be described in terms or conditions placed on the recipient of NOAA funds. If all remaining activities and impacts are later determined to be described in the PEIS, this analysis will be documented in the program record and the applicant may then proceed with the project. If all remaining activities and impacts are later determined to not be described in the PEIS, further NEPA review will be required; see below.

☐ The action or its impacts are not covered by the analysis within the PEIS. It will require preparation of an individual EA, a supplemental EIS, adoption of another agency's EA or EIS, or will be covered by a Categorical Exclusion.

Signature JACKELS.CHEMINE.R.1363423040 Digitally signed by JACKELS.CHEMINE.R.1363423040 Date: 2025.10.14 09:36:32 -07'00'

Date Signed _____

Award Number	Applicant Name	
NA24NMFX463C0076	WILD SALMON CENTER	
Project Name Oregon Coho Recovery Plan Implementation: McCoy Wetland Enhancement - Phase 3	**State** OR	**Federal Program Officer** Gabrielle Keeler-May
	Program Name CRP	
Award Amount $355,948.00	**Total Project Cost** $355,948.00	**Competition** IIJA

Project Description

NOAA is providing funding for the Wild Salmon Center to plan, design, and implement 11 projects in four Oregon coast watersheds: the Coquille, Coos, Siuslaw, Siletz, and Nehalem watersheds. All the restoration projects advance the goal of recovering populations for Oregon Coast (OC) coho salmon through the restoration of floodplain and estuary habitat. One of these projects will improve habitat in the Nehalem Estuary for juvenile coho by breaching levees that disconnect the McCoy Marsh, located just upstream from the town of Wheeler, from tidal influence and inundation. Restored tidal connectivity will significantly improve the wetland's currently altered hydrology, and improve water and habitat quality in the wetland for rearing salmonids as well as salmon prey species that are critical for juvenile salmonid growth and survival. A phase 1 NEPA analysis was completed on the design and permitting of the all the projects included in this award. A phase 2 NEPA analysis was done on the removal of invasive vegetation at the McCoy Marsh Site.

Proposed Action Description

NOAA is analyzing the impacts of construction (minus invasive plant removal) and post-project monitoring (Phase 3) of the McCoy Wetland Enhancement. Levees would be breached in three locations by removing the levee material to near the ground surface around 8 to 9 feet elevation to allow high tides to enter the McCoy property. Other projects elements include the construction of tidal channels and vegetated hummocks, placement of large woody debris, and native plantings.

NEPA Coordinator Grant Baysinger **Review Date** 10/21/2025

As the Responsible Program Manager, or delegate, I certify that the proposed actions described here, including both the activity and level of impact, are analyzed within the Restoration Center Programmatic Environmental Impact Statement.

Chris Doley

Christopher Doley
Decision Maker/Division Chief

Date
10/21/2025