

**SR 532 Corridor Improvements Project (MP 00.0 to 9.89)  
(Estuarine) Wetland Mitigation Site and Stream 8E Riparian  
Mitigation Site  
WIN # A53210G**

**USACE NWP (14) NWS-2008-1081**

**Northwest Region**

**2015 MONITORING REPORT**

**Wetlands Program**

*Issued March 2016*



**Washington State  
Department of Transportation**

Environmental Services Office

**Author:**

Kristen Andrews

**Editor:**

Doug Littauer

**Contributors:**

Sean Patrick

For additional information about this report or the WSDOT Wetlands Program, please contact:

Doug Littauer, Wetlands Program  
WSDOT, Environmental Services Office  
P. O. Box 47332, Olympia, WA 98504  
Phone: 360-570-2579 E-mail: littaud@wsdot.wa.gov

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# SR 532 Corridor Improvements Project (MP 0.00 to 9.89) (Estuarine) Wetland Mitigation Site and Stream 8E Riparian Mitigation Site

## USACE NWP (14) NWS-2008-1081



General Site Information			
<b>USACE NWP 14 Number</b>	NWS-2008-1081		
<b>Mitigation Location</b>	Below General Mark Clark Bridge adjacent to the Stillaguamish River West Pass		
<b>LLID Number</b>	1223846482400		
<b>Construction Date</b>	2009-2010		
<b>Monitoring Period</b>	2011-2020		
<b>Year of Monitoring</b>	5 of 10		
<b>Type of Project Impact</b>	Estuarine Wetland	Freshwater Wetland	Stream
<b>Area of Project Impact</b>	0.01 acre	2.27 acres	370 linear feet
<b>Type of Mitigation<sup>1</sup></b>	Estuarine Re-establishment	Freshwater Re-establishment	Stream Enhancement
<b>Area of Mitigation</b>	0.23 acre	4.91 acres	388 Linear feet (0.22 acre)

<sup>1</sup>Mitigation for freshwater wetland impacts, partial stream buffer impacts, and in-stream channel habitat impact to the West Pass Stillaguamish River are being provided at the SR 532 Pilchuck Creek Mitigation Site. Wetland impact and mitigation acreage sourced from the revised addendum, WSDOT 2009. Stream impact and mitigation amounts sourced from WSDOT 2009, page 76.

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## Summary of Monitoring Results and Management Activities (2015)

Performance Standards	2015 Results <sup>1</sup>	Management Activities
Conductivity measured at high tide	Measurements indicate a mixohaline environment	
There will be 0.23 acre of re-established estuarine wetland	Present	
Native salt marsh species will have at least 45 percent cover in the emergent wetland community	Cover is estimated at 80% in the wetland community	
Snohomish County noxious weeds will not exceed 20 percent cover	No Noxious weeds present	Weed control occurred at the same time as the riparian site. See below.
<b>Stream 8E:</b> The riparian enhancement areas will have 35 percent cover of native woody vegetation	87% cover (CI <sub>80%</sub> = 78-97%)	
<b>Stream 8E:</b> Snohomish County noxious weeds and species listed in Table 18 will not exceed 30 percent cover	No noxious weeds or species listed in Table 18 observed.	Weed control completed on: July 29, 2014, August 5, 2014, February 10, 2015, March 12, 2015, May 5, 2015, June 12, 2015, July 28, 2015.
<b>Stream 8E:</b> Reed canarygrass will not exceed 30 percent cover in the riparian buffer	Less than 5% cover	

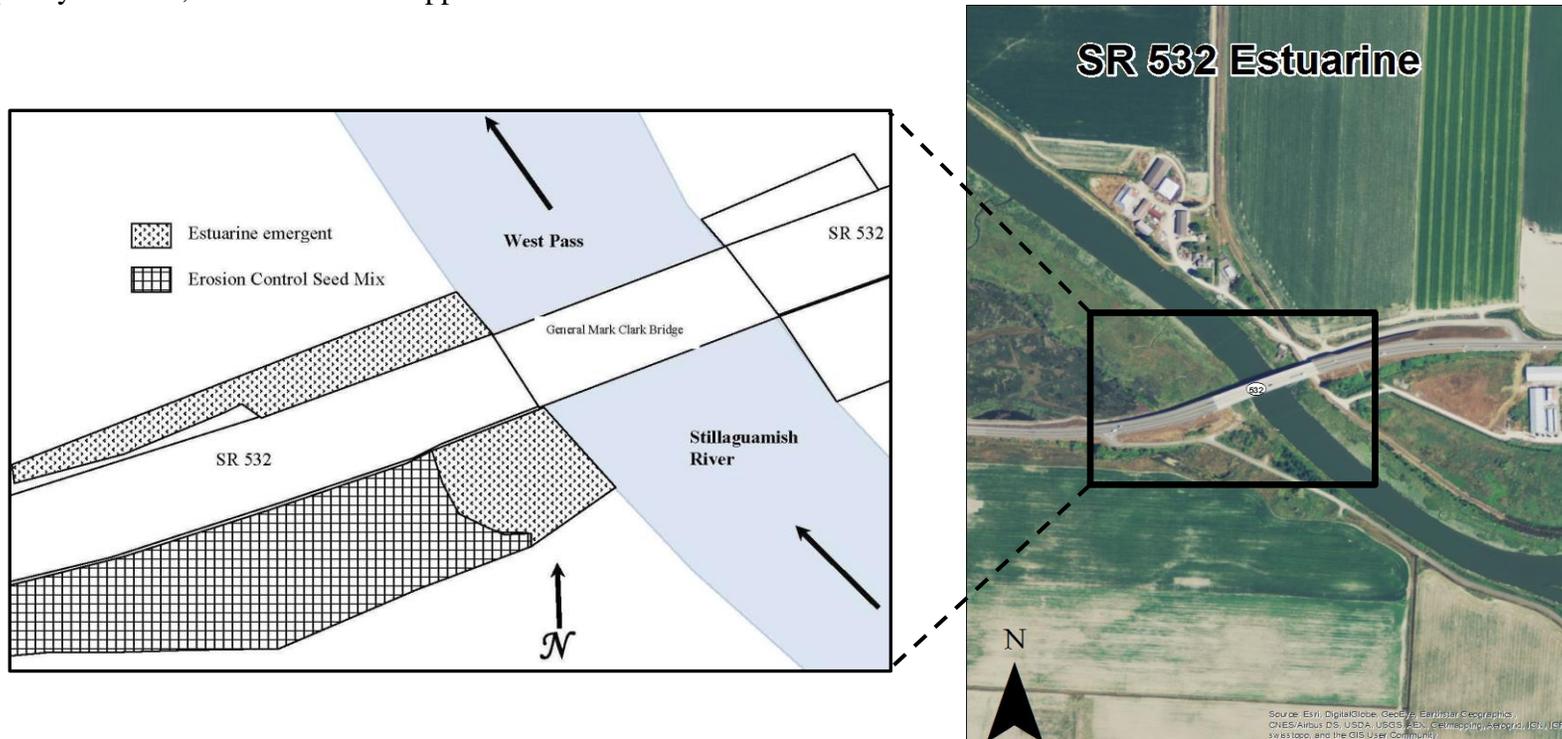
## Report Introduction

This report summarizes fifth-year (Year-5) monitoring activities at the State Route (SR) 532 Estuarine Mitigation Site. Included are a site description, the performance standards, an explanation of monitoring methods, and an evaluation of site success. Monitoring activities included vegetation surveys and photo-documentation on September 1, 2015.

<sup>1</sup> Estimated values are presented with their corresponding statistical confidence interval. For example, 87% cover (CI<sub>80%</sub> = 78-97%) means we are 80% confident that the true cover value is between 78% and 97%.

## What is the SR 532 Estuarine Mitigation Site?

This mitigation site (Figure 1) is re-established wetland under the Gary Clark Bridge along the West Pass of the Stillaguamish River. This site was created to compensate for the loss of 0.01 acre of estuarine wetlands due to the replacement of the Gary Clark Bridge. The site is designed to restore a portion of the historic estuary at this location. The intent is to have a self-sustaining, functional wetland system with intertidal salt marsh habitat that provides habitat for a variety of fish and wildlife species, water quality benefits, and food-chain support functions.

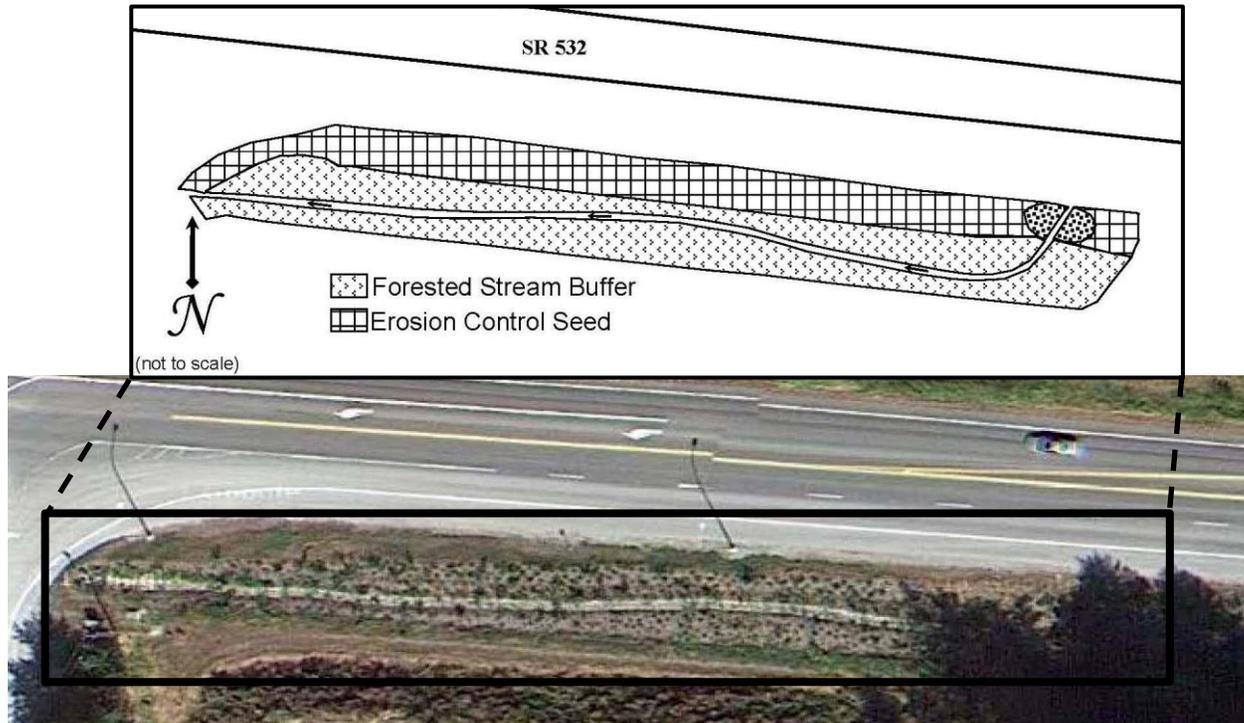


**Figure 1 Site Sketch**

The SR 532 Estuarine Mitigation Site contains an emergent community of native salt tolerant species commonly found in high salt marsh communities. Appendix 1 includes site directions.

## What is the SR 532 Stream 8E Mitigation Site?

This 0.22-acre mitigation site (Figure 2) was created to compensate for the loss of 370 linear feet of stream channel due to the widening of SR 532. The site will provide increased wildlife habitat by improving the quality of the riparian buffer, as well as increasing the area and food resources available for aquatic invertebrates and amphibians.



**Figure 1 Site Sketch**

The SR 532 Stream 8E Mitigation Site consists of 388 linear feet of stream enhancement and 0.22 acre of riparian buffer enhancement along Stream 8E. Appendix 1 includes site directions.

## **What are the performance standards for this site?**

### **Year 5 for SR 532 Estuarine**

#### Performance Standard 1

Conductivity measured at high tide with a refractometer indicates a mixohaline environment. (salinity readings between 0.5 and 30 ppt).

#### Performance Standard 2

The wetland areas will be delineated using current methods. The mitigation site will contain approximately 0.23 acre of re-established estuarine wetland.

#### Performance Standard 3

Native salt marsh species will achieve a minimum 45 percent coverage in the emergent wetland community. Native colonizing vegetation will be included in this coverage calculation.

#### Performance Standard 4

Snohomish County Class A, Class B, Class B Undesignated, and Class C noxious weeds will not exceed 20 percent aerial cover. The presence of cordgrass (*Spartina* spp.) or non-native knotweed (*Polygonum* spp.) will initiate invasive species contingency measures.

### **Year 5/Final year for Stream 8E**

#### Performance Standard 5 (Stream 8E)

Areal coverage of trees and shrubs in the riparian enhancement areas should be a minimum areal coverage of 35 percent.

#### Performance Standard 6 (Stream 8E)

Snohomish County Class A, Class B, Class B Undesignated, and Class C noxious weeds and species listed in Table 18 (See Appendix 3) will not exceed 30 percent cover in the buffer of Stream 8E.

#### Performance Standard 7 (Stream 8E)

Reed canarygrass (*Phalaris arundinacea*) will not exceed 30 percent cover in the buffer of stream 8E.

## **Year 10 for SR 532 Estuarine**

### **Performance Standard 1**

The wetland areas will be delineated using current methods for estuarine systems. The mitigation site will contain approximately 0.23 acre of re-established estuarine intertidal wetland.

### **Performance Standard 2**

Native salt marsh species will achieve a minimum 75 percent aerial coverage in the emergent wetland community. Native colonizing vegetation will be included in this coverage calculation.

### **Performance Standard 3**

Snohomish County Class A, Class B, Class B Undesignated, and Class C noxious weeds will not exceed 20 percent aerial cover. The presence of cordgrass (*Spartina* spp.) or non-native knotweed (*Polygonum* spp.) will initiate invasive species contingency measures.

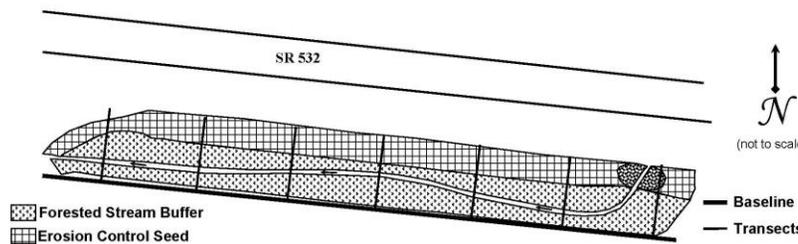
Appendix 1 shows the mitigation site as-built and the stream planting plan (WSDOT 2009, 2011).

## How were the performance standards evaluated?

The salinity of the site was measured in two separate locations, one on each side of the bridge, north and south. A refractometer was used at 8:30 am, just after a high tide of 7.55 feet peaked at 8:00 am (Performance standard 1).

WSDOT staff performed a wetland delineation using methods described in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987), *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (Version 2.0) (USACE 2010) and a Global Positioning System (Trimble Mapping Grade) (Performance Standard 2). See Appendix 4 for the delineation report.

The table below documents the sampling methodology used for all of the performance standards (PS) as required by the mitigation plan. For additional details on the methods see the [WSDOT Wetland Mitigation Site Monitoring Methods Paper](#) (WSDOT 2008).



**Figure 2 Site Sampling Design (2015)**

**Placement of Baseline:** The 104 meter baseline was placed parallel to SR 532 on the south side of the riparian area. The interval between transects was seven meters.

	<b>PS 3</b>	<b>PS 4</b>	<b>PS 5</b>	<b>PS 6&amp;7</b>
<b>Attribute</b>	Cover	Cover	Cover	Cover
<b>Target pop.</b>	Herbaceous	Noxious Weeds	Native Woody	Noxious Weeds/ Invasive sp.
<b>Zone</b>	Wetland	Wetland	Riparian	Riparian
<b>Sample method</b>	Qualitative	Qualitative	Line Intercept	Qualitative
<b>SU length</b>	N/A	N/A	4 meters	N/A
<b>SU width</b>	N/A	N/A	N/A	N/A
<b>Points per SU</b>	N/A	N/A	N/A	N/A
<b>Total # of SU</b>	N/A	N/A	7	N/A

## How is the estuarine site developing?

The site has developed more rapidly than anticipated and has been meeting the year-10 final year standards for the emergent wetland and invasive/noxious weed cover for two years. On May 26, 2015, a request to discontinue quantitative sampling for the emergent, wetland cover and invasive species/noxious weed cover was sent to the USACE and the Department of Ecology, this request was accepted by the USACE on May 28, 2015 and the Department of Ecology on June 1, 2015. The final year standards are still currently being met. See Appendix 3, Table 1 for a list of final year standards and the monitoring results from 2013 to 2015.

The herbaceous plantings are established and continue to thrive on the site outside of the drip-line of the bridge as well as directly under the bridge. The site is being tidally inundated and dominant plant species present and salinity measurements indicate a mixohaline environment.

## How is the stream site developing?

The site has developed into a diverse riparian habitat. Survival of the planted native woody species is high across the site and invasive species cover is low.

Due to the development of the woody riparian community it appears that the site is contributing to the screening, shading, organic debris and in time, large woody debris recruitment to the stream (Photo 1). The site has met the final year (Year-5 for the stream) standards.



**Photo 1**  
**Stream 8E woody cover (Sept 2015)**

Results for Performance Standard 1  
(Conductivity measured at high tide):

Salinity measurements were taken at 8:30 am during high tide (Photo 2). Two measurements were taken, one on each side of the bridge. Point 1 was on the south side of the bridge and the result was 15 ppt. Point 2 was on the north side of the bridge and the result was 18 ppt.

Results for Performance Standard 2  
(Wetland Delineation):

The wetland was delineated using current methods. The wetland acreage present exceeds the amount required to meet this performance standard. See Appendix 4 for the delineation report.

Results for Performance Standard 3  
(Native salt marsh species will have 45 percent cover in the emergent wetland):

Native herbaceous cover is estimated at 80 percent in the wetland community (Photo 3). Dominant species include inland saltgrass (*Distichlis spicata*), Lyngbye's sedge (*Carex lyngbyei*), and seacoast bulrush (*Schoenoplectus maritimus*).

Results for Performance Standard 4  
(Snohomish County Class A, Class B, Class B Undesignated, and Class C noxious weeds will not exceed 20 percent cover):

Noxious weeds were not observed on site at the time of monitoring.



**Photo 2**  
**Wetland at high tide (Sept 2015)**



**Photo 3**  
**Emergent cover in the wetland (Sept 2015)**

Results for Performance Standard 5 (Stream 8E)

(Cover of trees and shrubs in the riparian areas will be at least 35 percent):

Cover of trees and shrubs in the riparian area is 87% ( $CI_{80\%} = 78-97\%$ ) (Photo 4). Dominant species present include red elderberry (*Sambucus racemosa*), salmonberry (*Rubus spectabilis*), and Indian plum (*Oemleria cerasiformis*). The planted species have become well established, providing shade and bank stabilization for the stream channel.

Results for Performance Standard 6 and 7 (Stream 8E)

(Snohomish County Class A, Class B, Class B Undesignated, and Class C noxious weeds and species listed in Table 18 will not exceed 30% cover and reed canarygrass will not exceed 30% cover):

No noxious or listed species observed on site at the time of monitoring. Reed canarygrass was present within the stream buffer and channel but made up less than five percent cover.

**What is planned for this site?**

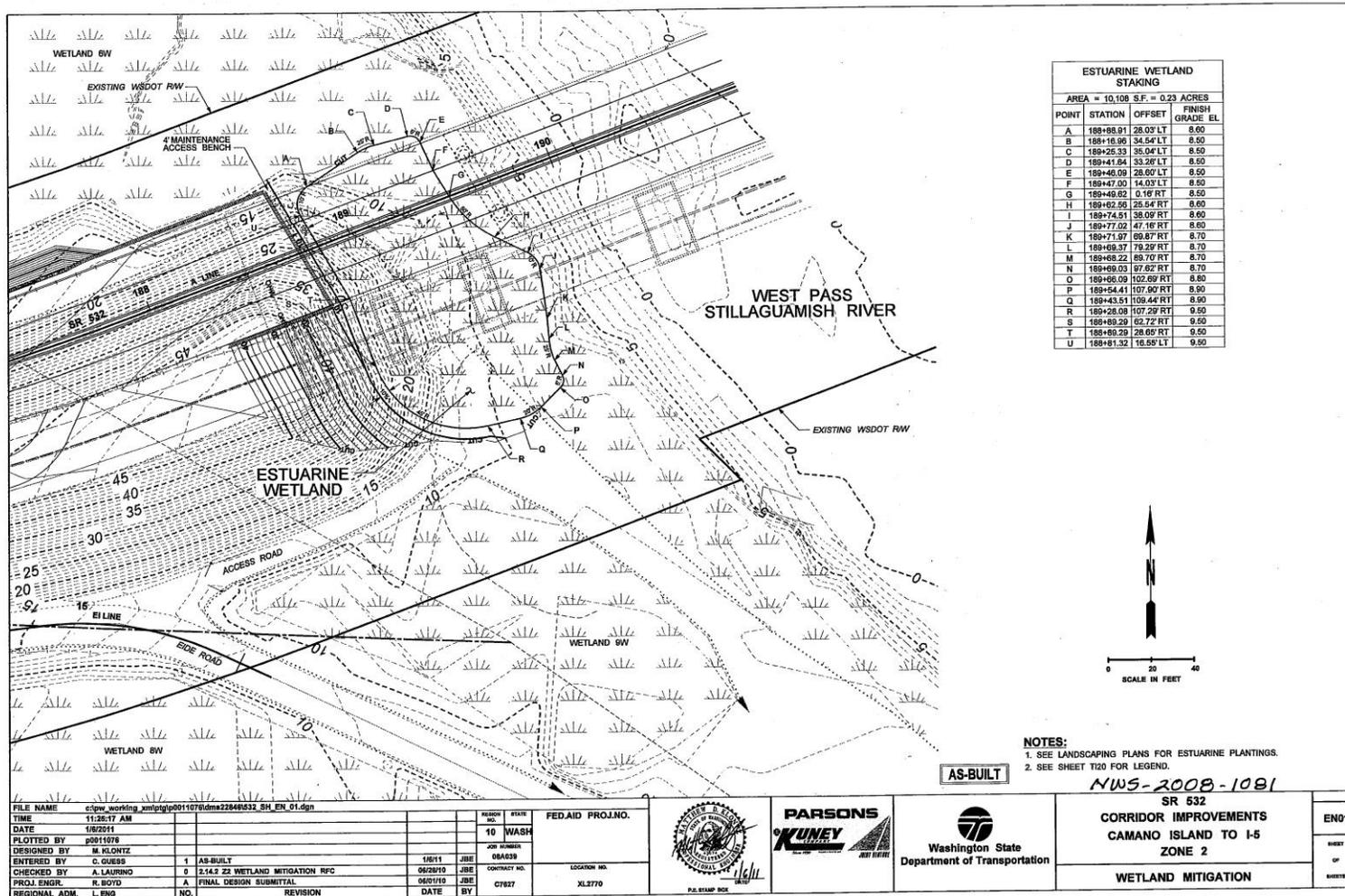
The region has plans to continue weed control as needed.



**Photo 4**  
**Woody cover in the riparian buffer (Sept 2015)**

# Appendix 1 – As-Built

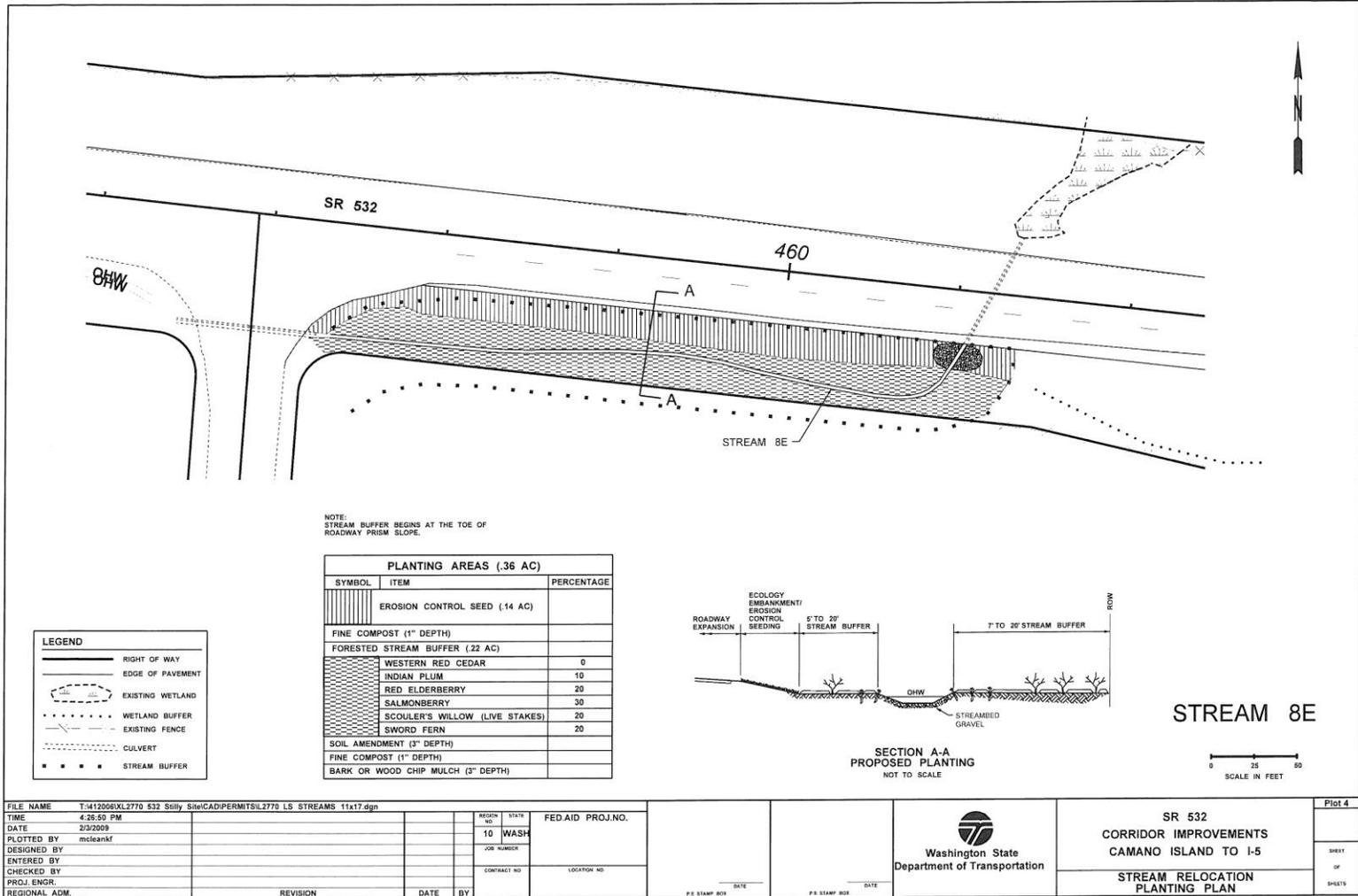
(from WSDOT 2011)



FILE NAME: c:\paw_working_xml\stg\0011076\dm22848532_SH_EN_01.dgn		REGION NO: 10		STATE: WASH		FEDAID PROJ.NO.		AS-BUILT		SR 532		EN01		
TIME: 11:28:17 AM	DATE: 1/8/2011	DESIGNED BY: M. KLONTZ	ENTERED BY: C. GUESB	CHECKED BY: A. LAURINO	PROJ. ENGR: R. BOYD	REGIONAL ADM.: L. ENO	NO.:	REVISION:	DATE:	BY:	CONTRACT NO.: 08A038	LOCATION NO.: XL2770	SR 532	EN01
CORRIDOR IMPROVEMENTS										CAMANO ISLAND TO I-5		ZONE 2		
WETLAND MITIGATION														

# Planting Plan

(From WSDOT 2009)



# Appendix 2 – Photo Points

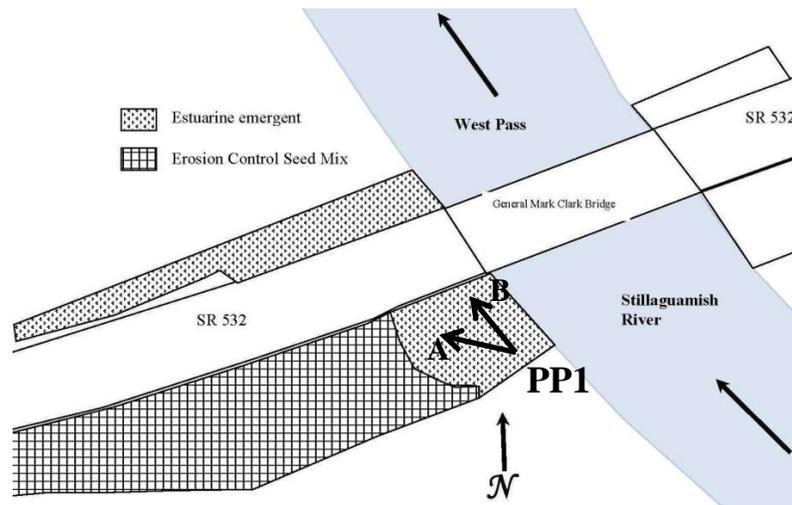
The photographs below were taken from permanent photo-points on September 1, 2015 and document current site development.



Photo Point 1a



Photo Point 1b



**Driving Directions:**

Take I-5 north from Olympia. After driving approximately 100 miles, take exit 212 for SR 532 west. Drive west on SR 532 through Stanwood, approximately seven miles. Once you drive over the Stillaguamish River on the Mark Clark Bridge, take an immediate left onto the dirt access road and park in front of the gate.

## Appendix 3 – Data Tables

Table 18. Non-native invasive species

Scientific Name	Common Name
<i>Buddleia alternifolia</i>	fountain butterfly bush
<i>Cytisus scoparius</i>	Scot's broom
<i>Geranium robertianum</i>	herb Robert
<i>Hedera helix</i>	English ivy
<i>Ilex aquifolium</i>	English holly
<i>Iris pseudacorus</i>	yellow flag iris
<i>Lythrum salicaria</i>	purple loosestrife
<i>Polygonum cuspidatum</i> (and related species and hybrids)	Japanese knotweed
<i>Prunus laurocerasus</i>	English laurel

Table 1. Year-10 Vegetative Performance Standards

Performance Standards and Permit Requirements	2013 Results	2014 Results	2015 Results
There will be 0.23 acre of re-established estuarine wetland			Present
Native salt marsh species will achieve a minimum of 75 percent aerial coverage in the emergent wetland community.	84% cover (CI <sub>80%</sub> = 75-93%)	Qualitative: 90%	Qualitative: 89%
Snohomish County noxious weeds will not exceed 20 percent cover	None observed	None observed	None observed
<b>Stream 8E:</b> The riparian enhancement areas will have 35 percent cover of native woody vegetation	95% survival	Qualitative: 90%	87% cover (CI <sub>80%</sub> = 78-97%)
<b>Stream 8E:</b> Snohomish County noxious weeds and species listed in Table 18 will not exceed 30 percent cover	Qualitative: ~1%	None observed	No noxious weeds or species listed in Table 18 observed.
<b>Stream 8E:</b> Reed canarygrass will not exceed 30 percent cover in the riparian buffer	Less than 5% cover	Less than 5% cover	Less than 5% cover

# **Appendix 4 – Delineation Report**

# **WETLAND DELINEATION REPORT**

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## **SR 530 Estuarine Mitigation Site**

**SR 532 Corridor Improvements Project (MP 00.0 to 9.89)**  
USACE (NWP 14) NWS-2008-1081  
Ecology WQC Order 6539

**Snohomish County, Washington**

**Prepared by:**  
**Tatiana Dreisbach**  
**WSDOT Environmental Services Office**  
**Olympia, Washington**

**November 2015**



# Introduction

This report was prepared by the Washington State Department of Transportation (WSDOT) to describe the wetland boundary delineation for the SR 532 Estuarine Mitigation Site. Field work was conducted by WSDOT wetland biologists Tatiana Dreisbach and Sean Patrick, on April 14, 2014. The delineation identifies 0.41 acre of wetland within the mitigation site boundaries.

General Information for the SR 532 Estuarine Mitigation Site		
<b>Location:</b>	S23, T32N, R3E. Snohomish County. (Vicinity map, Figure 1)	
	<b>USACE NWP 14 Number</b>	NWS-2008-1081
	<b>Long./Lat. ID Number</b>	1223846482400
	<b>Land Resource Region (LRR)</b>	A
	<b>Major Land Resource Area (MLRA)</b>	2
	<b>Construction Date</b>	2009 - 2010
	<b>Monitoring Period</b>	2011 - 2020
	<b>Year of Monitoring</b>	5 of 10 (in 2015)
<b>Area of Project Impact – Estuarine Wetlands<sup>1</sup></b>	0.01 acre	
<b>Intended Wetland Re-establishment<sup>2</sup></b>	0.23 acre	
<b>Total Delineated Wetland Area</b>	0.41 acre	

<sup>1</sup> Project impact numbers from Revised Addendum to the Final Wetland and Stream Mitigation Report (WSDOT 2009). In addition to the estuarine wetland impacts, the project resulted in an additional 2.27 acres of freshwater wetland impacts. Freshwater wetland impacts and wetland buffer impacts are mitigated at the SR 532 Pilchuck Creek mitigation site.

<sup>2</sup> Wetland re-establishment acreage from revised addendum to the final wetland and stream mitigation report and final critical areas report (WSDOT 2009).

# Location

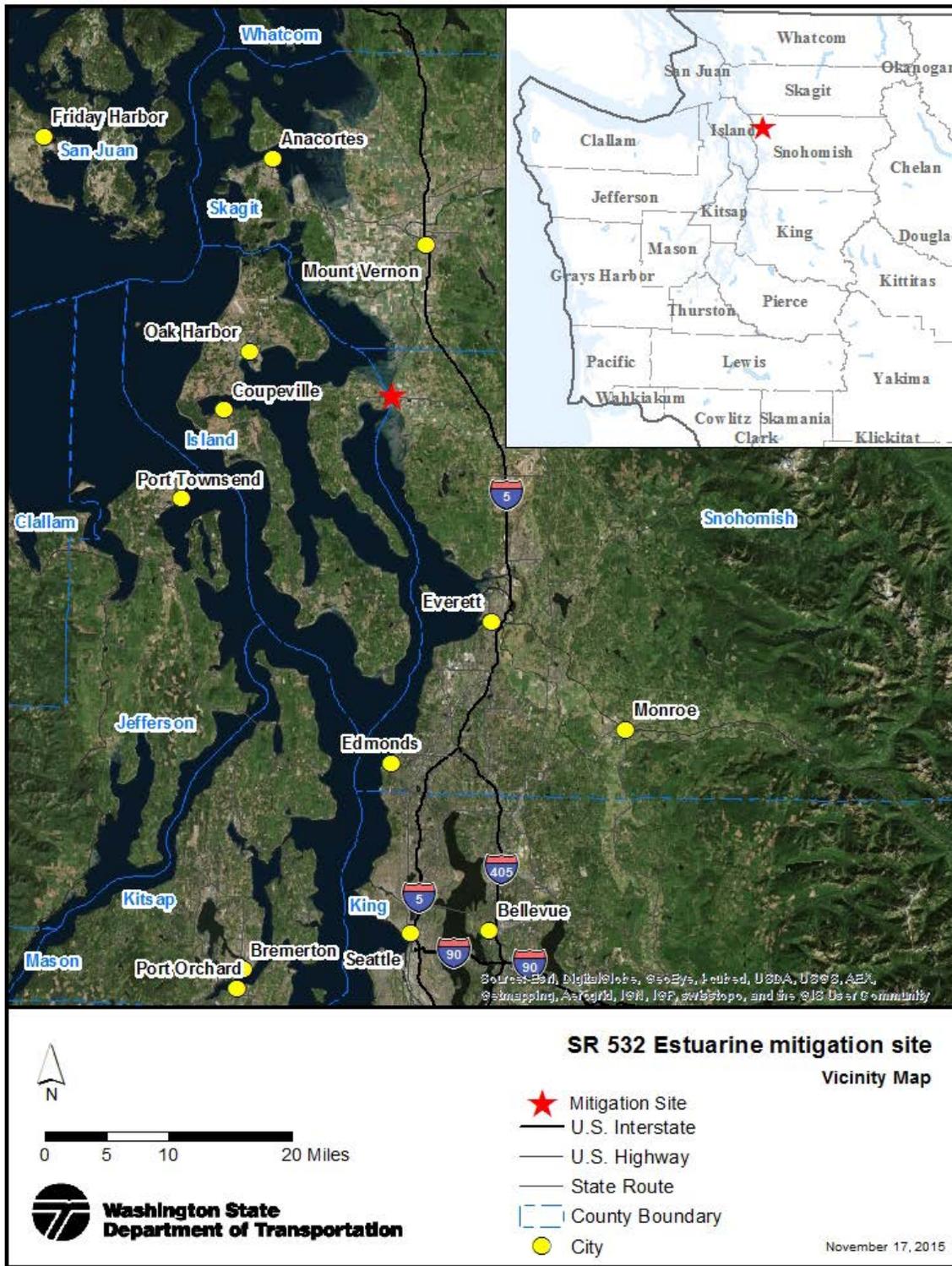


Figure 1. Vicinity Map

# Methods

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Wetland boundaries within the SR 532 Estuarine Mitigation Site were delineated using routine methods described in the:

- Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory 1987),
- Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0) (USACE 2010)

Wetland boundaries were delineated based on on-site observations of hydrology, soils, and plant communities, in conjunction with background information.

A Global Positioning System (GPS) Trimble GeoXT mapping grade unit was used to record the wetland boundaries and sampling point locations (Figure 2). Wetland boundary points were recorded at regular intervals and at any change in direction along the boundary.

## Wetland Delineation and Study Area

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### Study Area

Wetlands described in this report were assessed only within the wetland mitigation site boundary (Figure 2). The entire mitigation site meets wetland criteria; therefore the study area, mitigation site boundary, and wetland boundary are synonymous. The wetland mitigation area is contiguous with off-site estuarine wetlands. Wetland areas beyond the mitigation site boundary are not included in this report.

### Wetlands

The SR 532 Estuarine Mitigation Site is a tidally-influenced, estuarine emergent wetland contiguous with a much larger estuarine wetland associated with the mouth of the West Pass Stillaguamish River. The hydrology in this wetland is not directly influenced by a dike, allowing tidal flows to have an unobstructed daily influence on the hydrology of the site.

The delineation determined 0.41 acre of wetland were present within the SR 532 Estuarine Mitigation Site. Delineation data were collected at three sampling points and recorded on wetland determination data forms (Appendix A). Paired wetland and upland sample points were used to define the wetland edge. Additional wetland sample points characterize various wetland vegetation communities. Data recorded on wetland determination data forms characterize typical wetland and upland conditions observed on site. Vegetation, soils, and hydrology were examined in many additional sampling locations to determine the wetland boundary.

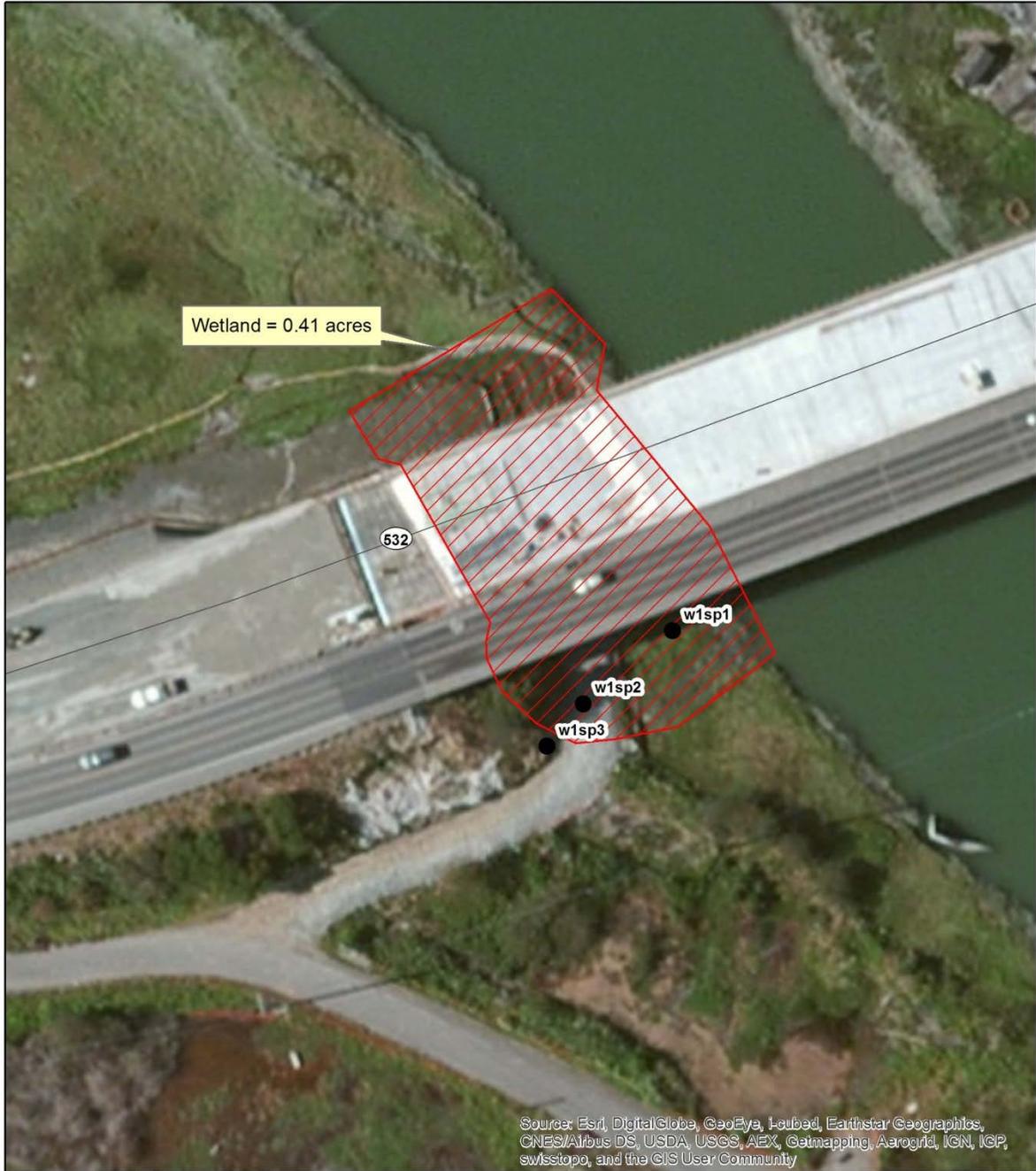
### Precipitation

The Regional Delineation Supplement Version 2.0 (USACE 2010) recommends using methods described in Chapter 19 in *Engineering Field Handbook* (NRCS 1997) to determine if precipitation occurring in the three full months prior to the site visit was normal, drier than normal, or wetter than normal. Actual rainfall is compared to the normal range of the 30-year average. When considering the three prior months as a whole, wetter than normal precipitation conditions were present prior to field work. The first prior month was within the normal range and the second and third months were each wetter than normal (Appendix B-1).

Light to moderate precipitation was recorded in the ten days preceding field work (Appendix B-2).

### Growing Season

The following evidence of the growing season was observed at the time of the delineation: New vegetative growth was present on many herbaceous plants.



4/16/2015



I:\GPS\GPSData\GPS2015\wetland\wetland15\_08\_04

**Figure 2. Wetland boundary in red and sampling point locations in black. Study area is synonymous with the wetland boundary.**

SR 532 Estuarine Mitigation Site – Wetland Delineation Summary		
<b>Total Delineated Wetland Area</b>	0.41 acre	
	<b>Wetland Determination Data Forms</b>	Appendix A; Sampling Points W1-SP1 and W1-SP2
	<b>Upland Determination Data Form</b>	Appendix A; Sampling Point W1-SP3
	<b>Delineators</b>	Tatiana Dreisbach Sean Patrick
	<b>Delineation Date</b>	April 14, 2015
<b>Vegetation</b>	Trees – none Shrubs – none Herbs – Lyngbye's sedge ( <i>Carex lyngbyei</i> ), seacoast bulrush ( <i>Schoenoplectus maritimus</i> ), seaside arrow-grass ( <i>Triglochin maritima</i> ), inland saltgrass ( <i>Distichlis spicata</i> ), spike bentgrass ( <i>Agrostis exarata</i> ), and silverweed ( <i>Potentilla anserina</i> )	
<b>Soils</b>	Soils examined to a depth of 16 inches exhibited hydric characteristics. Matrix colors of 5Y 5/2 were observed. Redoximorphic concentrations and depletions were also present. Indicator Depleted Matrix (F3) met.	
<b>Hydrology</b>	Tidal water and subsurface hyporheic flow from the Stillaguamish River are the primary source of hydrology. Precipitation also contributes to the hydrologic regime of this wetland. Soils were saturated to the surface throughout much of the wetland mitigation site. Sediment deposits on soil and vegetative portions of plants were also observed as well as algal mats and drift deposits in some locations.	
<b>Rationale for Delineation</b>	Positive indicators of all three wetland criteria are present. The delineation boundary (Figure 2) identifies the wetland within the mitigation site. The wetland on the mitigation site is contiguous with a much larger estuarine wetland.	

## Limitations

This wetland delineation report documents the investigation, best professional judgment and conclusions of WSDOT based on the site conditions encountered at the time of this study. The wetland delineation was performed in compliance with accepted standards for professional wetland biologists and applicable federal, state, and local ordinances. It is correct and complete to the best of our knowledge. It should be considered a preliminary jurisdictional determination of wetlands and other waters until it has been reviewed and approved in writing by the appropriate jurisdictional authorities.

# References

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# **Appendix A —Wetland Determination Data Forms**

Wetland Delineation Data Forms for:

W1-SP1

W1-SP2

W1-SP3

Wetland polygons, sampling point locations, and wetland names shown in Figure 2.

**WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region**

Project/Site: SR 532 Estuarine City/County: n/a / Snohomish Sampling Date: 14-Apr-15  
 Applicant/Owner: WSDOT State: WA Sampling Point: W1-SP1  
 Investigator(s): Tatiana Dreisbach, Sean Patrick Section, Township, Range: S 23 T 32N R 3E  
 Landform (hillslope, terrace, etc.): tide flat Local relief (concave, convex, none): none Slope: 2.0 % / 1.1 °  
 Subregion (LRR): LRR A Lat.: 48.24 Long.: -122.384 Datum: NAD83HARN  
 Soil Map Unit Name: Fluvaquents, tidal NWI classification: EEM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology  significantly disturbed? Are "Normal Circumstances" present? Yes  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 <input checked="" type="radio"/> No <input type="radio"/> Hydric Soil Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="radio"/> No <input type="radio"/>
Remarks:	

**VEGETATION - Use scientific names of plants.**

	Absolute % Cover	Rel.Strat. Cover	Indicator Status	Dominance Test worksheet:
<b>Tree Stratum</b> (Plot size: <u>10 x 10 feet</u> )				Number of Dominant Species That are OBL, FACW, or FAC: <u>1</u> (A)  Total Number of Dominant Species Across All Strata: <u>1</u> (B)  Percent of dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)
1. _____	_____	<input type="checkbox"/> 0.0%	_____	
2. _____	_____	<input type="checkbox"/> 0.0%	_____	
3. _____	_____	<input type="checkbox"/> 0.0%	_____	
4. _____	_____	<input type="checkbox"/> 0.0%	_____	
	0	<b>= Total Cover</b>		<b>Prevalence Index worksheet:</b> Total % Cover of:      Multiply by: OBL species <u>95</u> x 1 = <u>95</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>0</u> x 3 = <u>0</u> FACU species <u>0</u> x 4 = <u>0</u> UPL species <u>0</u> x 5 = <u>0</u> Column Total s: <u>95</u> (A) <u>95</u> (B)  Prevalence Index = B/A = <u>1.000</u>
<b>Sapling/Shrub Stratum</b> (Plot size: <u>10 x 10 feet</u> )				
1. _____	_____	<input type="checkbox"/> 0.0%	_____	
2. _____	_____	<input type="checkbox"/> 0.0%	_____	
3. _____	_____	<input type="checkbox"/> 0.0%	_____	
4. _____	_____	<input type="checkbox"/> 0.0%	_____	
5. _____	_____	<input type="checkbox"/> 0.0%	_____	
	0	<b>= Total Cover</b>		
<b>Herb Stratum</b> (Plot size: <u>10 x 10 feet</u> )				<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> 1 - Rapid Test for Hydrologic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is > 50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 - Wetland Non-Vascular Plants <sup>1</sup> <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)  <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Carex lyngbyei</u>	80	<input checked="" type="checkbox"/> 84.2%	OBL	
2. <u>Schoenoplectus maritimus</u>	10	<input type="checkbox"/> 10.5%	OBL	
3. <u>Triglochin maritima</u>	5	<input type="checkbox"/> 5.3%	OBL	
4. _____	0	<input type="checkbox"/> 0.0%	_____	
5. _____	0	<input type="checkbox"/> 0.0%	_____	
6. _____	0	<input type="checkbox"/> 0.0%	_____	
7. _____	0	<input type="checkbox"/> 0.0%	_____	
8. _____	0	<input type="checkbox"/> 0.0%	_____	
9. _____	0	<input type="checkbox"/> 0.0%	_____	
10. _____	0	<input type="checkbox"/> 0.0%	_____	
11. _____	0	<input type="checkbox"/> 0.0%	_____	
	95	<b>= Total Cover</b>		
<b>Woody Vine Stratum</b> (Plot size: <u>10 x 10 feet</u> )				<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="radio"/> No <input type="radio"/>
1. _____	_____	<input type="checkbox"/> 0.0%	_____	
2. _____	_____	<input type="checkbox"/> 0.0%	_____	
	0	<b>= Total Cover</b>		
<b>% Bare Ground in Herb Stratum:</b> <u>5</u>				
Remarks:				

\*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

**Soil**

Sampling Point: W1-SP1

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

Depth (inches)	Matrix			Redox Features					Texture	Remarks
	Color (moist)		%	Color (moist)		%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-18	10Y	5/1	70	7.5YR	4/4	20	C	M/PL	Silt Loam	concentration is prominent
				5YR	5/8	10	C	M/PL		concentration is prominent

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

<b>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</b>		<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b>
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 2 cm Muck (A10)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except in MLRA 1)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input checked="" type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Sandy Muck Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox depressions (F8)	

<sup>3</sup>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

Remarks:

**Hydrology**

**Wetland Hydrology Indicators:**

<b>Primary Indicators (minimum of one required: check all that apply)</b>		<b>Secondary Indicators (minimum of two required)</b>
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input checked="" type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input checked="" type="checkbox"/> Drift deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input checked="" type="checkbox"/> FAC-neutral Test (D5)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost Heave Hummocks (D7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		

**Field Observations:**

Surface Water Present?	Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches): <input type="text"/>	<b>Wetland Hydrology Present?</b> Yes <input checked="" type="radio"/> No <input type="radio"/>
Water Table Present?	Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches): <input type="text"/>	
Saturation Present? (includes capillary fringe)	Yes <input checked="" type="radio"/> No <input type="radio"/>	Depth (inches): <input type="text" value="0"/>	

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

Remarks:  
 episaturated conditions due to tidal surface flows.

**WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region**

Project/Site: SR 532 Estuarine City/County: n/a / Snohomish Sampling Date: 14-Apr-15  
 Applicant/Owner: WSDOT State: WA Sampling Point: W1-SP2  
 Investigator(s): Tatiana Dreisbach, Sean Patrick Section, Township, Range: S 23 T 32N R 3E  
 Landform (hillslope, terrace, etc.): tide flat Local relief (concave, convex, none): none Slope: 2.0 % / 1.1 °  
 Subregion (LRR): LRR A Lat.: 48.24 Long.: -122.384 Datum: NAD83HARN  
 Soil Map Unit Name: Fluvaquents, tidal NWI classification: EEM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology  significantly disturbed? Are "Normal Circumstances" present? Yes  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 <input checked="" type="radio"/> No <input type="radio"/> Hydric Soil Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="radio"/> No <input type="radio"/>
Remarks:	

**VEGETATION - Use scientific names of plants.**

	Absolute % Cover	Rel.Strat. Cover	Indicator Status	Dominance Test worksheet:
<b>Tree Stratum</b> (Plot size: <u>10 x 10 feet</u> )				Number of Dominant Species That are OBL, FACW, or FAC: <u>2</u> (A)  Total Number of Dominant Species Across All Strata: <u>2</u> (B)  Percent of dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)
1. _____	_____	<input type="checkbox"/> 0.0%	_____	
2. _____	_____	<input type="checkbox"/> 0.0%	_____	
3. _____	_____	<input type="checkbox"/> 0.0%	_____	
4. _____	_____	<input type="checkbox"/> 0.0%	_____	
	0	<b>= Total Cover</b>		
<b>Sapling/Shrub Stratum</b> (Plot size: <u>10 x 10 feet</u> )				<b>Prevalence Index worksheet:</b> Total % Cover of:      Multiply by: OBL species <u>20</u> x 1 = <u>20</u> FACW species <u>70</u> x 2 = <u>140</u> FAC species <u>0</u> x 3 = <u>0</u> FACU species <u>0</u> x 4 = <u>0</u> UPL species <u>0</u> x 5 = <u>0</u> Column Total s: <u>90</u> (A) <u>160</u> (B)  Prevalence Index = B/A = <u>1.778</u>
1. _____	_____	<input type="checkbox"/> 0.0%	_____	
2. _____	_____	<input type="checkbox"/> 0.0%	_____	
3. _____	_____	<input type="checkbox"/> 0.0%	_____	
4. _____	_____	<input type="checkbox"/> 0.0%	_____	
5. _____	_____	<input type="checkbox"/> 0.0%	_____	
	0	<b>= Total Cover</b>		
<b>Herb Stratum</b> (Plot size: <u>10 x 10 feet</u> )				<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> 1 - Rapid Test for Hydrologic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is > 50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 - Wetland Non-Vascular Plants <sup>1</sup> <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)  <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Distichlis spicata</u>	40	<input checked="" type="checkbox"/> 44.4%	FACW	
2. <u>Agrostis exarata</u>	30	<input checked="" type="checkbox"/> 33.3%	FACW	
3. <u>Argentina anserina</u>	10	<input type="checkbox"/> 11.1%	OBL	
4. <u>Carex lyngbyei</u>	10	<input type="checkbox"/> 11.1%	OBL	
5. _____	0	<input type="checkbox"/> 0.0%	_____	
6. _____	0	<input type="checkbox"/> 0.0%	_____	
7. _____	0	<input type="checkbox"/> 0.0%	_____	
8. _____	0	<input type="checkbox"/> 0.0%	_____	
9. _____	0	<input type="checkbox"/> 0.0%	_____	
10. _____	0	<input type="checkbox"/> 0.0%	_____	
11. _____	0	<input type="checkbox"/> 0.0%	_____	
	90	<b>= Total Cover</b>		
<b>Woody Vine Stratum</b> (Plot size: <u>10 x 10 feet</u> )				<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="radio"/> No <input type="radio"/>
1. _____	_____	<input type="checkbox"/> 0.0%	_____	
2. _____	_____	<input type="checkbox"/> 0.0%	_____	
	0	<b>= Total Cover</b>		
<b>% Bare Ground in Herb Stratum:</b> <u>10</u>				
Remarks:				

\*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

**Soil**

Sampling Point: W1-SP2

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks		
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>				
0-16	5Y	5/2	85	10YR	5/6	10	C	M	Sandy Clay Loam	concentration is prominent
				5Y	6/2	5	D	M		

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

<b>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</b> <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Muck Mineral (S1) <input type="checkbox"/> Sandy Gleyed Matrix (S4)		<input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) (except in MLRA 1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input checked="" type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox depressions (F8)	<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b> <input type="checkbox"/> 2 cm Muck (A10) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Other (Explain in Remarks)
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<sup>3</sup>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

Remarks:

**Hydrology**

**Wetland Hydrology Indicators:**

<b>Primary Indicators (minimum of one required: check all that apply)</b> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input checked="" type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift deposits (B3) <input checked="" type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B) <input type="checkbox"/> Salt Crust (B11) <input type="checkbox"/> Aquatic Invertebrates (B13) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A) <input type="checkbox"/> Other (Explain in Remarks)	<b>Secondary Indicators (minimum of two required)</b> <input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Dry Season Water Table (C2) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input checked="" type="checkbox"/> FAC-neutral Test (D5) <input type="checkbox"/> Raised Ant Mounds (D6) (LRR A) <input type="checkbox"/> Frost Heave Hummocks (D7)
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**Field Observations:**

Surface Water Present?	Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches): <input type="text"/>	<b>Wetland Hydrology Present?</b> Yes <input checked="" type="radio"/> No <input type="radio"/>
Water Table Present?	Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches): <input type="text"/>	
Saturation Present? (includes capillary fringe)	Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches): <input type="text"/>	

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

Remarks:

**WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region**

Project/Site: SR 532 Estuarine City/County: n/a / Snohomish Sampling Date: 14-Apr-15  
 Applicant/Owner: WSDOT State: WA Sampling Point: W1-SP3  
 Investigator(s): Tatiana Dreisbach, Sean Patrick Section, Township, Range: S 23 T 32N R 3E  
 Landform (hillslope, terrace, etc.): fill slope Local relief (concave, convex, none): none Slope: 20.0 % / 11.3 °  
 Subregion (LRR): LRR A Lat.: 48.24 Long.: -122.384 Datum: NAD83HARN

Soil Map Unit Name: Fluvaquents, tidal NWI classification: Upland

Are climatic/hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology  significantly disturbed? Are "Normal Circumstances" present? Yes  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 <input checked="" type="radio"/> No <input type="radio"/> Hydric Soil Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	Is the Sampled Area within a Wetland? Yes <input type="radio"/> No <input checked="" type="radio"/>
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Remarks:  
 drastic topo and veg community change in upland.

**VEGETATION - Use scientific names of plants.**

Stratum	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	Dominance Test worksheet:
<b>Tree Stratum</b> (Plot size: <u>10 x 10 feet</u> )				Number of Dominant Species That are OBL, FACW, or FAC: <u>1</u> (A)
1. _____	_____	<input type="checkbox"/> 0.0%	_____	Total Number of Dominant Species Across All Strata: <u>1</u> (B)
2. _____	_____	<input type="checkbox"/> 0.0%	_____	Percent of dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)
3. _____	_____	<input type="checkbox"/> 0.0%	_____	
4. _____	_____	<input type="checkbox"/> 0.0%	_____	
	<u>0</u>	<b>= Total Cover</b>		
<b>Sapling/Shrub Stratum</b> (Plot size: <u>10 x 10 feet</u> )				<b>Prevalence Index worksheet:</b>
1. _____	_____	<input type="checkbox"/> 0.0%	_____	Total % Cover of: _____ Multiply by: _____
2. _____	_____	<input type="checkbox"/> 0.0%	_____	OBL species <u>0</u> x 1 = <u>0</u>
3. _____	_____	<input type="checkbox"/> 0.0%	_____	FACW species <u>0</u> x 2 = <u>0</u>
4. _____	_____	<input type="checkbox"/> 0.0%	_____	FAC species <u>84</u> x 3 = <u>252</u>
5. _____	_____	<input type="checkbox"/> 0.0%	_____	FACU species <u>3</u> x 4 = <u>12</u>
	<u>0</u>	<b>= Total Cover</b>		UPL species <u>0</u> x 5 = <u>0</u>
<b>Herb Stratum</b> (Plot size: <u>10 x 10 feet</u> )				Column Total s: <u>87</u> (A) <u>264</u> (B)
1. <u>Agrostis capillaris</u>	<u>80</u>	<input checked="" type="checkbox"/> <u>82.5%</u>	<u>FAC</u>	Prevalence Index = B/A = <u>3.034</u>
2. <u>Vicia spp.</u>	<u>10</u>	<input type="checkbox"/> <u>10.3%</u>	_____	
3. <u>Trifolium repens</u>	<u>2</u>	<input type="checkbox"/> <u>2.1%</u>	<u>FAC</u>	
4. <u>Holcus lanatus</u>	<u>2</u>	<input type="checkbox"/> <u>2.1%</u>	<u>FAC</u>	
5. <u>Dactylis glomerata</u>	<u>2</u>	<input type="checkbox"/> <u>2.1%</u>	<u>FACU</u>	
6. <u>Taraxacum officinale</u>	<u>1</u>	<input type="checkbox"/> <u>1.0%</u>	<u>FACU</u>	
7. _____	<u>0</u>	<input type="checkbox"/> <u>0.0%</u>	_____	
8. _____	<u>0</u>	<input type="checkbox"/> <u>0.0%</u>	_____	
9. _____	<u>0</u>	<input type="checkbox"/> <u>0.0%</u>	_____	
10. _____	<u>0</u>	<input type="checkbox"/> <u>0.0%</u>	_____	
11. _____	<u>0</u>	<input type="checkbox"/> <u>0.0%</u>	_____	
	<u>97</u>	<b>= Total Cover</b>		
<b>Woody Vine Stratum</b> (Plot size: <u>10 x 10 feet</u> )				<b>Hydrophytic Vegetation Indicators:</b>
1. _____	_____	<input type="checkbox"/> 0.0%	_____	<input type="checkbox"/> 1 - Rapid Test for Hydrologic Vegetation
2. _____	_____	<input type="checkbox"/> 0.0%	_____	<input checked="" type="checkbox"/> 2 - Dominance Test is > 50%
	<u>0</u>	<b>= Total Cover</b>		<input type="checkbox"/> 3 - Prevalence Index is ≤ 3.0 <sup>1</sup>
<b>% Bare Ground in Herb Stratum:</b> <u>3</u>				<input type="checkbox"/> 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
				<input type="checkbox"/> 5 - Wetland Non-Vascular Plants <sup>1</sup>
				<input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
				<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="radio"/> No <input type="radio"/>

Remarks:

\*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

**Soil**

Sampling Point: W1-SP3

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

Depth (inches)	Matrix			Redox Features				Texture	Remarks	
	Color (moist)		%	Color (moist)		%	Type <sup>1</sup>			Loc <sup>2</sup>
0-16	5Y	5/1	95	7.5YR	4/4	5	C	M	Sandy Clay Loam	concentration is prominent

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

<b>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</b> <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Muck Mineral (S1) <input type="checkbox"/> Sandy Gleyed Matrix (S4)		<input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) (except in MLRA 1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input checked="" type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox depressions (F8)		<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b> <input type="checkbox"/> 2 cm Muck (A10) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Other (Explain in Remarks)
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<sup>3</sup>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

Remarks:

**Hydrology**

**Wetland Hydrology Indicators:**

<b>Primary Indicators (minimum of one required: check all that apply)</b> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B) <input type="checkbox"/> Salt Crust (B11) <input type="checkbox"/> Aquatic Invertebrates (B13) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A) <input type="checkbox"/> Other (Explain in Remarks)		<b>Secondary Indicators (minimum of two required)</b> <input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Dry Season Water Table (C2) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> FAC-neutral Test (D5) <input type="checkbox"/> Raised Ant Mounds (D6) (LRR A) <input type="checkbox"/> Frost Heave Hummocks (D7)
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**Field Observations:**

Surface Water Present?	Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches): <input type="text"/>	<b>Wetland Hydrology Present?</b> Yes <input type="radio"/> No <input checked="" type="radio"/>
Water Table Present?	Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches): <input type="text"/>	
Saturation Present? (includes capillary fringe)	Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches): <input type="text"/>	

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

Remarks:

# Appendix B — Precipitation Data

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## Appendix B-1. Comparison of Observed and Normal Precipitation (NRCS 1997)

Monthly precipitation data for Everett, Washington.

		Long-term rainfall records <sup>a</sup>							
	Month	3 yrs. in 10 less than	Average	3 yrs. in 10 more than	Rain fall <sup>a</sup>	Condition dry, wet, normal <sup>b</sup>	Condition Value	Month weight value	Product of previous two columns
1 <sup>st</sup> prior month	Mar	2.89	3.86	4.51	3.37	N	2	3	6
2 <sup>nd</sup> prior month	Feb	2.34	3.41	4.07	5.40	W	3	2	6
3 <sup>rd</sup> prior month	Jan	3.00	4.37	5.21	7.15	W	3	1	3
<b>Sum</b>								<b>15</b>	

<sup>a</sup>NRCS 2015

<sup>b</sup> Conditions are considered normal if they fall within the low and high range around the average.

Note: If sum is

- 6 - 9 then prior period has been drier than normal
- 10 - 14 then period has been normal
- 15 - 18 then period has been wetter than normal

Condition value:

- Dry (D) =1
- Normal (N) =2
- Wet (W) =3

Conclusions: Wetter than normal precipitation conditions were present prior to the field visit.

## Appendix B-2. Daily Precipitation 10 days preceding field work, Everett, Washington

Date (2015)	Daily Precipitation (inches) <sup>a</sup>
April 13	0.01
April 12	0.26
April 11	0.15
April 10	0.00
April 9	0.00
April 8	0.00
April 7	0.02
April 6	0.23
April 5	M <sup>b</sup>
April 4	M

<sup>a</sup> NRCS 2015

<sup>b</sup> "M" indicates data is missing for this day

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