SR 167 North Sumner Interchange Wetland Mitigation Site

USACE IP 1998-4-00422

Olympic Region

2015 MONITORING REPORT

Wetlands Program

Issued March 2016

Washington State Department of Transportation

Environmental Services Office

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SR 167 North Sumner Interchange Wetland Mitigation Site

USACE IP 1998-4-00422

General Site Information			
USACE IP Number	1998-4-00422		
Mitigation Location	West of SR 167 near the West Valley Hwy, 24th ST E exit, east of Soaton Creek, Pierce County		
LLID Number	1222491472284		
Construction Date	2005-2006		
Monitoring Period	2006-2015		
Year of Monitoring	10 of 10		
Area of Project Impact[1]	1.42 acres		
Type of Mitigation[2]	Wetland Establishment	Wetland Enhancement	Riparian Enhancement
Area of Mitigation	1.85 acres	2.38 acres	2.71 acres

[1] Impact acreage sourced from USACE 1998-4-00422, 2003.
[2] Mitigation acreage sourced from Table 3 on Page 9 of the SR 167 North Sumner Interchange Revised Wetland Mitigation Plan, WSDOT 2003.

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Summary of Monitoring Results and Management Activities (2015)

Performance Standards	2015 Results[3]	Management Activities
80% cover of emergent vegetation in the emergent restoration/creation area	Qualitative: 70%	
80% cover of woody species in the scrub-shrub restoration/creation and forested enhancement areas	Forested: Qualitative: 100% cover Scrub-shrub: Qualitative: 90% cover	
80% cover of trees and shrubs in the buffer	Quantitative: 70% ($CI_{80\%}$ = 60-79%).	
35% cover of trees and shrubs in the riparian restoration area <u>or</u> 50% survival	Qualitative: 35% cover	
(USACE Requirement) Invasive plant species cover shall be no more than 10% cover in the creation/restoration areas and no more than 25% in the enhancement forested areas.	Qualitative: Less than 5% across the site 75% in the riparian area	Weed control was conducted: March 18, 2014, March 20, 2015, April 16-17, 2014, June 15, 2015, and August 13, 2015.
The wetland emergent and scrub-shrub creation areas will be periodically saturated to the surface for at least 12.5% of the growing season	Present	
At least 6 snags and 15 loafing logs/downed logs will be present in the mitigation area.	Present	

Report Introduction

This report summarizes final-year (Year-10) monitoring activities at the State Route (SR) 167 North Sumner 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, photo-documentation on August 17, 2015 and assessments of wetland hydrology on March 17, 31, 2015 and April 12, 2015.

[3] Estimated values are presented with their corresponding statistical confidence interval. For example, 70% ($CI_{80\%}$ = 60-79% cover) means we are 80% confident that the true cover value is between 60% and 79%.

What is the SR 167 North Sumner Interchange Mitigation Site?

This 8.6-acre mitigation site (Figure 1) was created to compensate for the loss of 1.42 acres of Category II and III wetlands due to the construction of a new split diamond interchange and road expansions along SR 167. The site consists of wetland establishment, wetland enhancement, riparian enhancement, and buffer. The site is designed to provide lost wetland functions including wildlife habitat, storm and floodwater storage, and water quality improvement.

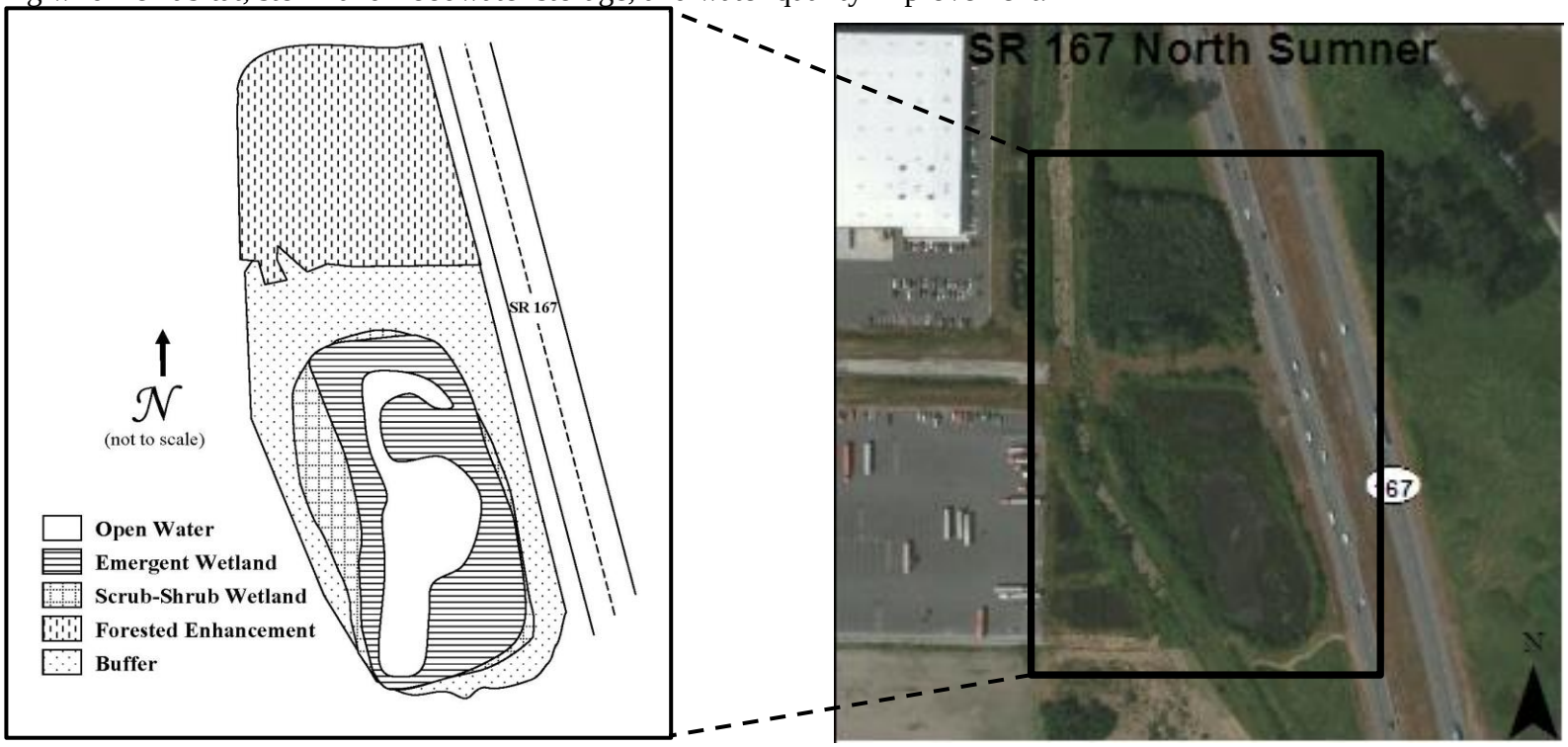


Figure 1 Site Sketch

The SR 167 North Sumner Mitigation Site consists of an established emergent wetland bordered by scrub-shrub wetland and buffer with a connection to Soaton Creek. An emergent wetland north of the established wetland was enhanced with native woody vegetation. The site sketch was altered to reflect the vegetation communities as they have developed. A stream buffer was planted west of the wetland on both sides of Soaton Creek (not visible in sketch). Appendix 2 includes site directions.

What are the performance standards for this site?

Year 10

Performance Standard 1

Total cover of native, facultative or wetter emergent vegetation in the emergent restoration/creation wetland area will be at least 80 percent in Year 10.

Performance Standard 2

Total cover of pioneering and planted trees and shrubs in the scrub-shrub restoration/creation area and forested enhancement area will be 80 percent in Year 10.

Performance Standard 3

Total cover of all pioneering and planted trees and shrubs in the buffer will be at least 80 percent in Year 10.

Performance Standard 4

Total cover of all pioneering and planted trees and shrubs in the riparian restoration area will be at least 35 percent by Year 10, or survival of planted material shall be at least 50 percent by Year 10.

Performance Standard 5

Invasive plant species cover shall be less than 10 percent after Year 1 and less than 25 percent in subsequent years in the wetland restoration/creation and enhancement forested areas. Invasive plant species control in the riparian restoration area will be limited to the area immediately around the installed plants.

Performance Standard 6

Water levels in the mitigation areas will be sufficient to support hydrophytic plantings. The wetland emergent and scrub-shrub creation areas will be periodically saturated to the surface for at least 12.5 percent of the growing season (March 1 to October 31).

Performance Standard 7

At least six snags and fifteen loafing logs/downed logs will be present in the mitigation area in each year of the ten year monitoring period.

Appendix 1 shows the As Built planting plan (WSDOT 2006).

How were the performance standards evaluated?

The table below documents the sampling methods used for all of the performance standards (PS) as required by the mitigation plan and permits. For additional details on the quantitative methods see the WSDOT Wetland Mitigation Site Monitoring Methods Paper (WSDOT 2008). The performance standards addressed this year were monitored qualitatively with the exception of Performance Standard 3.

Herbaceous cover in the emergent area (Performance Standard 1) was monitored qualitatively due to deep water. The area has a large section of open water and the substrate is deep silt, making it difficult to access any more than the perimeter of the emergent zone.

Woody cover in the scrub-shrub restoration and the forested enhancement areas (Performance Standard 2) was monitored qualitatively due to its continued achievement of the final year performance standard. On April 30, 2013, a request to discontinue quantitative sampling for the scrub-shrub and forested wetland woody cover was sent to USACE and the Department of Ecology, this request was accepted on May 9, 2013 and June 24, 2013. The final year standards are still currently being exceeded.

The riparian area was monitored qualitatively for cover (Performance Standard 4) as well. The Soaton creek riparian corridor is a flashy system with large mats of reed canarygrass (*Phalaris arundinacea*), throughout. Scour during flood events has created a deep channel through the middle of the corridor that is not passable on foot. The reed canarygrass also has created extensive thatch that floats, allowing it to conceal deep holes as well as old willow stakes making walking through the corridor a safety hazard.

The cover of invasive plant species (Performance Standard 5) was addressed qualitatively in the main mitigation site due to the fact that it obviously met the performance standard, well under the 25 percent threshold. The invasive species in the riparian area were addressed qualitatively due to the same safety concerns as discussed above.

WSDOT staff collected hydrology data 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) (Performance Standard 6). Four permanent hydrology ground water monitoring wells were established and recorded on a map (Appendix 2). During each monitoring visit, visual observations are made to determine the extent of inundation and surface saturation. At each well location, in the absence of inundation or surface saturation, subsurface observations are made. Logs and snags were observed during vegetation monitoring (Performance Standard 7).

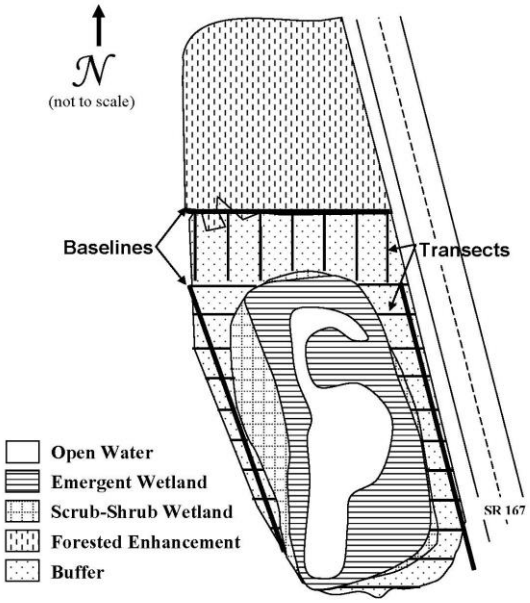


Figure 2 Site Sampling Design (2015)

Placement of Baseline: The 230-meter long baseline was placed in segments within the buffer zone as it surrounds the emergent area.

	PS 1	PS 2	PS 3	PS 4	PS 5
Attribute	Cover	Cover	Cover	Cover	Cover
Target pop.	Herbaceous	Native Woody	Native Woody	Native Woody	Invasive sp.
Zone	Emergent	SS/PFO	Buffer	Riparian	Entire site
Sample method	Qualitative	Qualitative	Line Intercept	Qualitative	Qualitative
SU length	N/A	N/A	6 meters	N/A	N/A
SU width	N/A	N/A	N/A	N/A	N/A
Points per SU	N/A	N/A	N/A	N/A	N/A
Total # of SU	N/A	N/A	20	N/A	N/A

Is this site a success?

The performance standards do not specifically require acreages in the final year. However, Objectives 2 and 3 in the Mitigation Plan require establishing 1.85 acres of emergent, scrub-shrub, and forested wetland habitat and enhancing 2.38 acres of wetland and 2.71 acres of riparian habitat. A wetland delineation was conducted in 2014 and 2015. The results have been compiled in a report located in Appendix 4.

The hydrology on this site has been highly influenced by the presence of beaver in the creek. This has caused the water level to increase in the emergent area, creating an open water component. It has also limited our access to the area, resulting in qualitative cover estimates to address the performance standards. This is also the case with the riparian corridor adjacent to the site.

The buffer zone on this site did not meet the final performance standard of 80 percent cover although it came close with a Year-10 quantitative result of 70 percent cover. It appears that there was mortality of some of the plantings, most likely due to the hot and dry weather experienced in the summer of 2015. This zone continues to develop.

The site was intended to provide increased biological habitat functions, storm and floodwater storage, and water quality improvement and it appears that these functions are supported. Many species of birds were observed during the 10-year monitoring period. Small mammals have been observed on the site, and rodents and birds have been observed using the habitat structures. Of course, beaver and beaver sign have been observed throughout the monitoring period as well as snakes, amphibians, and coyote scat. The emergent area is deep and has the potential and opportunity to store the flood waters of the Soaton creek. It is also clear from the drift deposits and other signs that the forested wetland receives flood waters during the wet season.

Remedial efforts have been completed over the course of the monitoring period and include soil amendment, mulch rings, and additional plantings in the buffer. Replanting of willow stakes and aggressive weed control has been completed repeatedly in the riparian buffer area.

Results for Performance Standard 1
(80% cover of emergent vegetation in the emergent restoration/creation area):

Cover of all emergent species in this zone is estimated at 65 to 70 percent (Photo 1). All typha species were included in this estimate; broadleaf cattail (*Typha latifolia*), narrowleaf cattail (*Typha angustifolia*), as well as the hybid, *typha x glauca*.
It is difficult to distinguish between each species in the field and measuring every individual is not practical. Based on several random measurements of leaf width and inflorescence length of several individuals present, it appears that the zone is dominated by the hybrid or the native broadleaf cattail with less of the narrowleaf cattail present. Other species present include hardstem bulrush (*Schoenoplectus acutus*), common spikerush (*Eleocharis palustris*), and woolgrass (*Scirpus cyperinus*).

Results for Performance Standard 2
(80% cover of woody species in the scrub-shrub restoration/creation and forested enhancement areas):

The forested area continues to have 100 percent cover. The dominant species in this area include red alder (*Alnus rubra*) and black cottonwood (*Populus balsamifera*). The understory consists primarily of western red cedar (*Thuja plicata*) and Sitka spruce (*Picea sitchensis*). The scrub shrub wetland is estimated to have 90 percent cover. This zone is doing well despite continued inundation (Photo 2). The dominant species in this area include willows (*Salix spp.*) with sub dominant species to include Pacific ninebark (*Physocarpus capitatus*), redosier dogwood (*Cornus alba*), and black cottonwood (*Populus balsamifera*).

Photo 1
Herb cover in the emergent wetland (Aug 2015)

Photo 2
Woody cover in the scrub-shrub (Aug 2015)

Results for Performance Standard 3
(80% cover of trees and shrubs in the buffer):

Cover in the buffer is 70% ($CI_{80\%}$ = 60-79%) (Photo 3). Dominant species in this area include snowberry (*Symphoricarpos albus*), Douglas-fir (*Pseudotsuga menziesii*) and Oregon ash (*Fraxinus latifolia*). The buffer has been slow to develop but is currently close to the final year standard of 80 percent.

Results for Performance Standard 4
(35% cover of trees and shrubs in the riparian restoration area or 50% survival):

Cover in the riparian area is estimated at 35 percent.The willows on the upper edges of the riparian zone are surviving and still present. There is a wide swath of reed canarygrass (*Phalaris arundinacea*) in the middle of the riparian area that is maintained by seasonal flooding and scour (Photo 4).

Results for Performance Standard 5
(Invasive plant species cover shall be no more than 10% cover in the creation/restoration areas and no more than 25% in the enhancement forested areas.):

Invasive species observed include reed canarygrass (*Phalaris arundinacea*), bull thistle (*Cirsium vulgare*), and Himalayan blackberry (*Rubus armeniacus*). Cover is estimated at less than five percent across the site. Most invasive species are concentrated in the buffer. The reed canarygrass (*Phalaris arundinacea*) in the riparian zone is estimated at 80 percent cover. The cover of narrowleaf cattail (*Typha angustifolia*) and the hybrid in the emergent zone are not included in this invasive species cover estimate.

Photo 3
Woody cover in the buffer (Aug 2015)

Photo 4
Woody cover in the riparian area (Aug 2015)

Results for Performance Standard 6
(Wetland Hydrology):

Wetland hydrology is present in the wetland and is currently supporting hydrophytic vegetation. All the hydrology wells were inundated at the time of monitoring (Photo 5). See Appendix 2 for a map of the hydrology wells and Appendix 3, Table 3 for results from each well for all three spring 2015 site visits. Antecedent weather conditions were normal for this area. Rainfall for this area (WETS Station: McMillin RSVR, WA 455224) was 3.91 inches in February, 2015. The 30-year average is 4.68 inches with a range of 3.06 to 5.63 inches.

Results for Performance Standard 7
(At least 6 snags and 15 loafing logs/downed logs will be present in the mitigation area):

The snags and logs were not all located due to a high level of water in the emergent area. However, it appears that most are present in the locations where they were placed during construction.

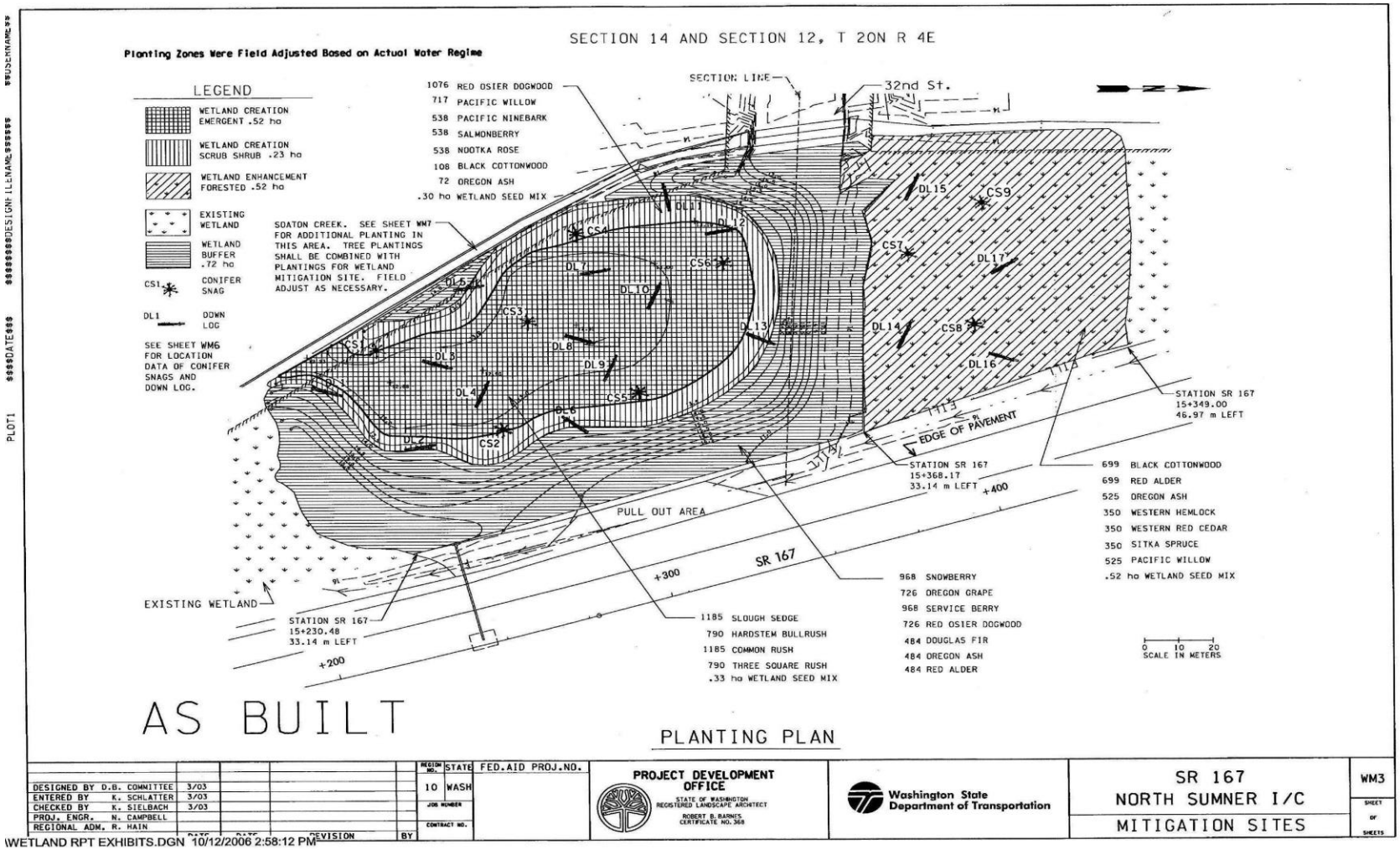
Photo 5
Inundation near well three (March 2015)

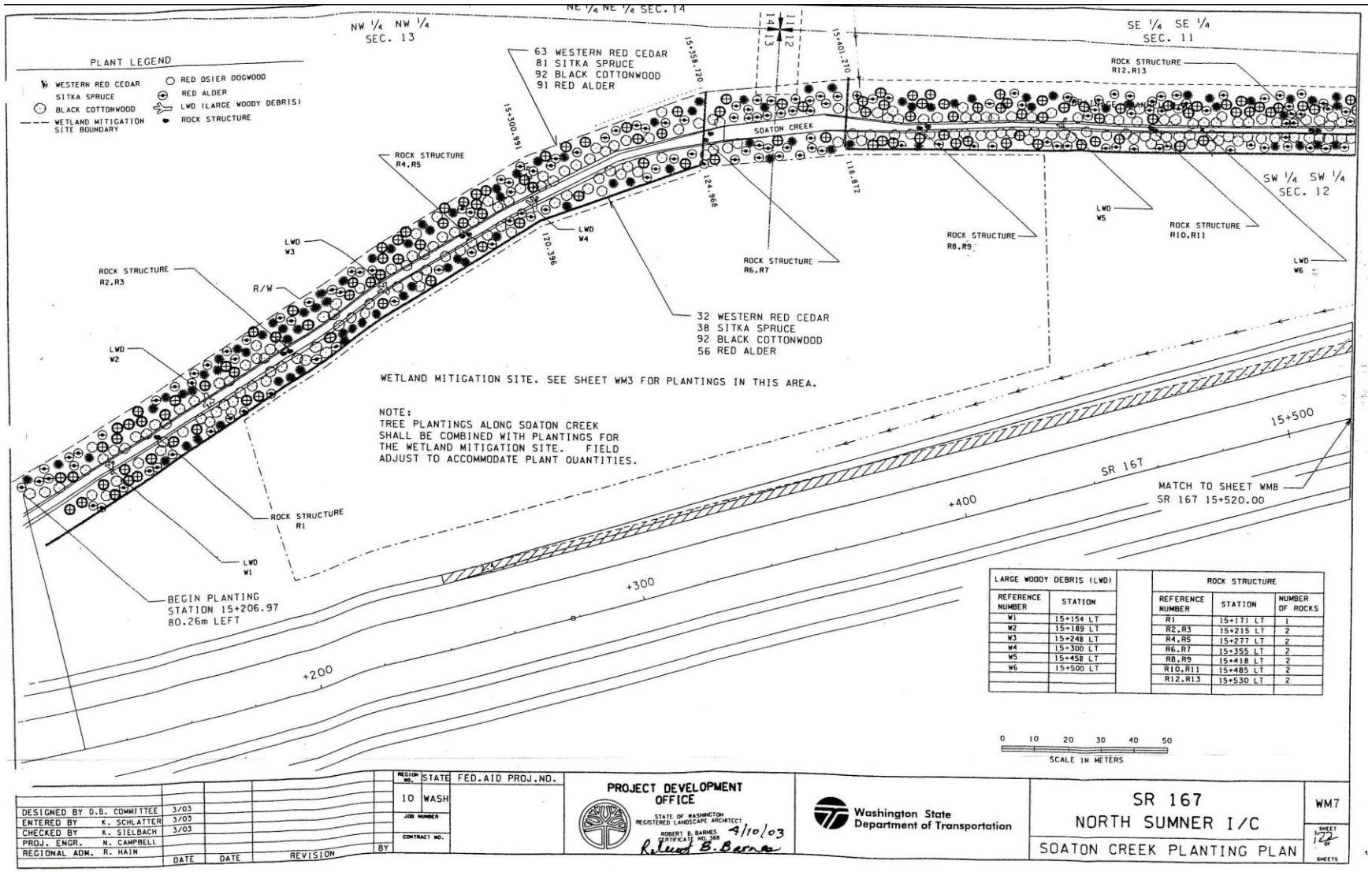
What is planned for this site?

Weed control will continue in 2016.

Appendix 1 – As Built

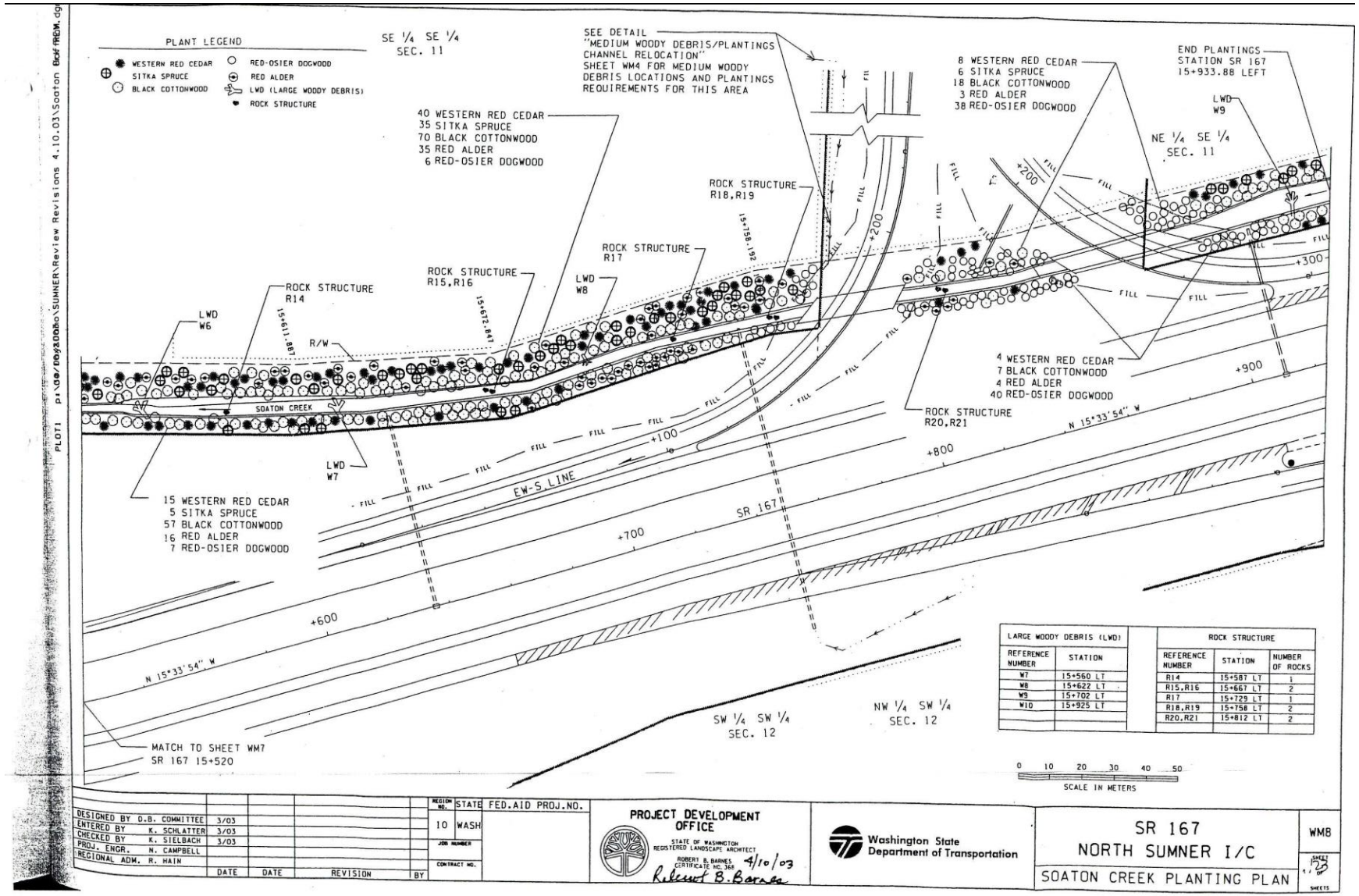
(from WSDOT 2006)





LARGE WOODY DEBRIS (LWD)	
REFERENCE NUMBER	STATION
W1	15+154 LT
W2	15+189 LT
W3	15+248 LT
W4	15+300 LT
W5	15+458 LT
W6	15+500 LT

ROCK STRUCTURE		
REFERENCE NUMBER	STATION	NUMBER OF ROCKS
R1	15+171 LT	1
R2,R3	15+215 LT	2
R4,R5	15+277 LT	2
R6,R7	15+355 LT	2
R8,R9	15+418 LT	2
R10,R11	15+485 LT	2
R12,R13	15+530 LT	2



LARGE WOODY DEBRIS (LWD)	
REFERENCE NUMBER	STATION
W7	15+560 LT
W8	15+622 LT
W9	15+702 LT
W10	15+925 LT

ROCK STRUCTURE		
REFERENCE NUMBER	STATION	NUMBER OF ROCKS
R14	15+587 LT	1
R15,R16	15+667 LT	2
R17	15+729 LT	1
R18,R19	15+758 LT	2
R20,R21	15+812 LT	2

		DATE	DATE	REVISION	BY
DESIGNED BY	D.B. COMMITTEE	3/03			
ENTERED BY	K. SCHLATTER	3/03			
CHECKED BY	K. SIELBACH	3/03			
PROJ. ENGR.	N. CAMPBELL				
REGIONAL ADM.	R. HAIN				

REGION NO. 10 | STATE WASH | FED.AID PROJ.NO.
JOB NUMBER
CONTRACT NO.

PROJECT DEVELOPMENT OFFICE
STATE OF WASHINGTON REGISTERED LANDSCAPE ARCHITECT
ROBERT B. BARNES CERTIFICATE NO. 368
4/10/03
Robert B. Barnes

Washington State Department of Transportation

SR 167
NORTH SUMNER I/C
SOATON CREEK PLANTING PLAN

WM8
SHEET 23 OF 1 SHEETS

Appendix 2 – Photo Points and Map

The photographs below were taken from permanent photo-points on August 17, 2015 and document current site development.

Photo Point 1a

Photo Point 1b

Photo Point 1c

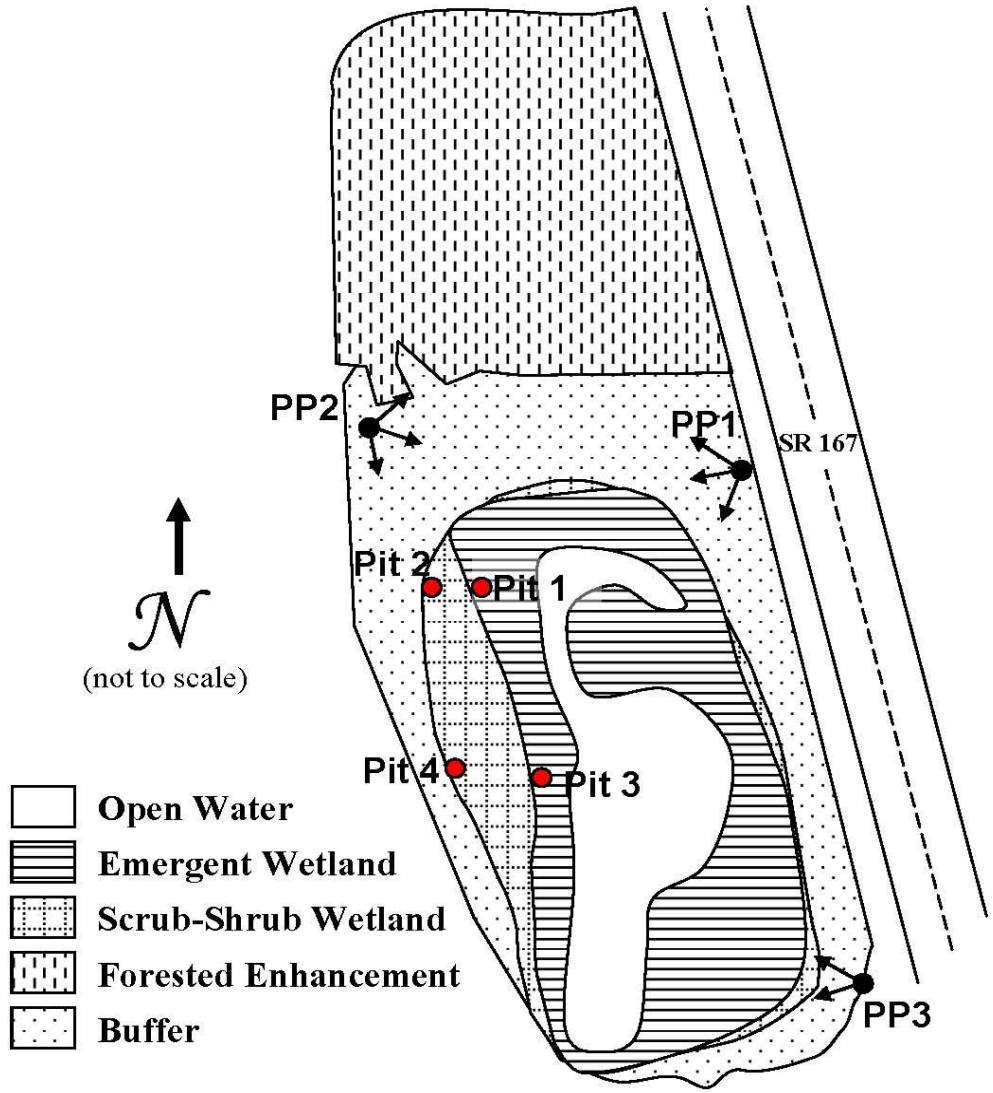
Photo Point 2a

Photo Point 2b

Photo Point 2c

Photo Point 3a

Photo Point 3b


PP2
PP1
SR 167
Pit 2
Pit 1
Pit 4
Pit 3
PP3
N
(not to scale)
Open Water
Emergent Wetland
Scrub-Shrub Wetland
Forested Enhancement
Buffer

Driving Directions:
From I-5 take SR 167 toward Puyallup at Exit 135. Follow SR 167 north to the 24th Street Exit. Turn around and go southbound on SR 167 at the West Valley/24th Street southbound on-ramp. The parking area for the site is off the right shoulder at the end of the on-ramp.

Appendix 3 – Data Tables and Ground Monitoring Well Map

Table 3 Hydrology Observations

Date	Surface Observations	Subsurface Observations	
March 17, 2015	Entire wetland establishment area inundated. About 80% of wetland enhancement area inundated. Wells 1 and 3 were inaccessible due to deep inundation.	Well 1	Inundated too deep to access
		Well 2	Inundated to 18 inches
		Well 3	Inundated too deep to access
		Well 4	Inundated to 20 inches
March 31, 2015	Entire wetland area inundated. Wells 1 and 3 inaccessible due to high water.	Well 1	Inundated too deep to access
		Well 2	Inundated to 17 inches
		Well 3	Inundated too deep to access
		Well 4	Inundated to 17 inches
April 14, 2015	All wells inundated.	Well 1	Inundated
		Well 2	Inundated
		Well 3	Inundated
		Well 4	Inundated

Appendix 4 – Delineation Report

WETLAND DELINEATION REPORT

SR 167 North Sumner Mitigation Site

State Route 167 North Sumner Interchange
USACE IP 1998-4-00422

Pierce County, Washington

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

February 2016

Washington State
Department of Transportation

Introduction

This report was prepared by the Washington State Department of Transportation (WSDOT) to describe the wetland boundary delineation for the SR 167 North Sumner Mitigation Site. Field work was conducted by WSDOT wetland biologists Tony Bush and Tom Mohagen, on April 1, 2014, with a follow up visit on March 24, 2015 by Tatiana Dreisbach and Tony Bush. The combined 2014 and 2015 delineation identifies 3.47 acres of wetland with an additional 0.40 acre of palustrine open water (POW) in wetland creation areas and approximately 2.13 acres of palustrine emergent (PEM) wetland associated with Soaton Creek within the mitigation site boundaries.

General Information for the SR 167 North Sumner Mitigation Site			
Location:	S12 & S 13, T20N, R4E. Pierce County. (Vicinity map, Figure 1)		
		USACE IP Number	1998-4-00422
		Long./Lat. ID Number	1222491472284
		Land Resource Region (LRR)	A
		Major Land Resource Area (MLRA)	2
		Construction Date	2005-2006
		Monitoring Period	2006-2015
		Year of Monitoring	10 of 10 (in 2015)
Area of Project Impact[1]	1.42 acres		
Type of Mitigation	**Required Acreage**[2]	**2014/2015 Delineated Acreage**	
Creation/Restoration	1.85 acres	2.07 acres PEM/PSS 0.40 acre POW	
Wetland and Riparian Enhancement[3]	2.38 acres	1.40 acres PFO 2.13 acres PEM along Soaton Creek	
Totals	4.23 acres	6.00 acres	

[1] Project impact numbers from USACE Individual Permit 1998-4-00422 (USACE 2003).
[2] Required mitigation acreages from Table 3, Page 9 from the revised wetland mitigation plan (WSDOT 2003).
[3] Table 3 on page 9 on the revised mitigation plan (WSDOT 2003) also has 2.71 acres of additional riparian enhancement as part of the proposed mitigation area. Part of this area delineated as wetland and is included in the wetland enhancement area along Soaton Creek.

Location

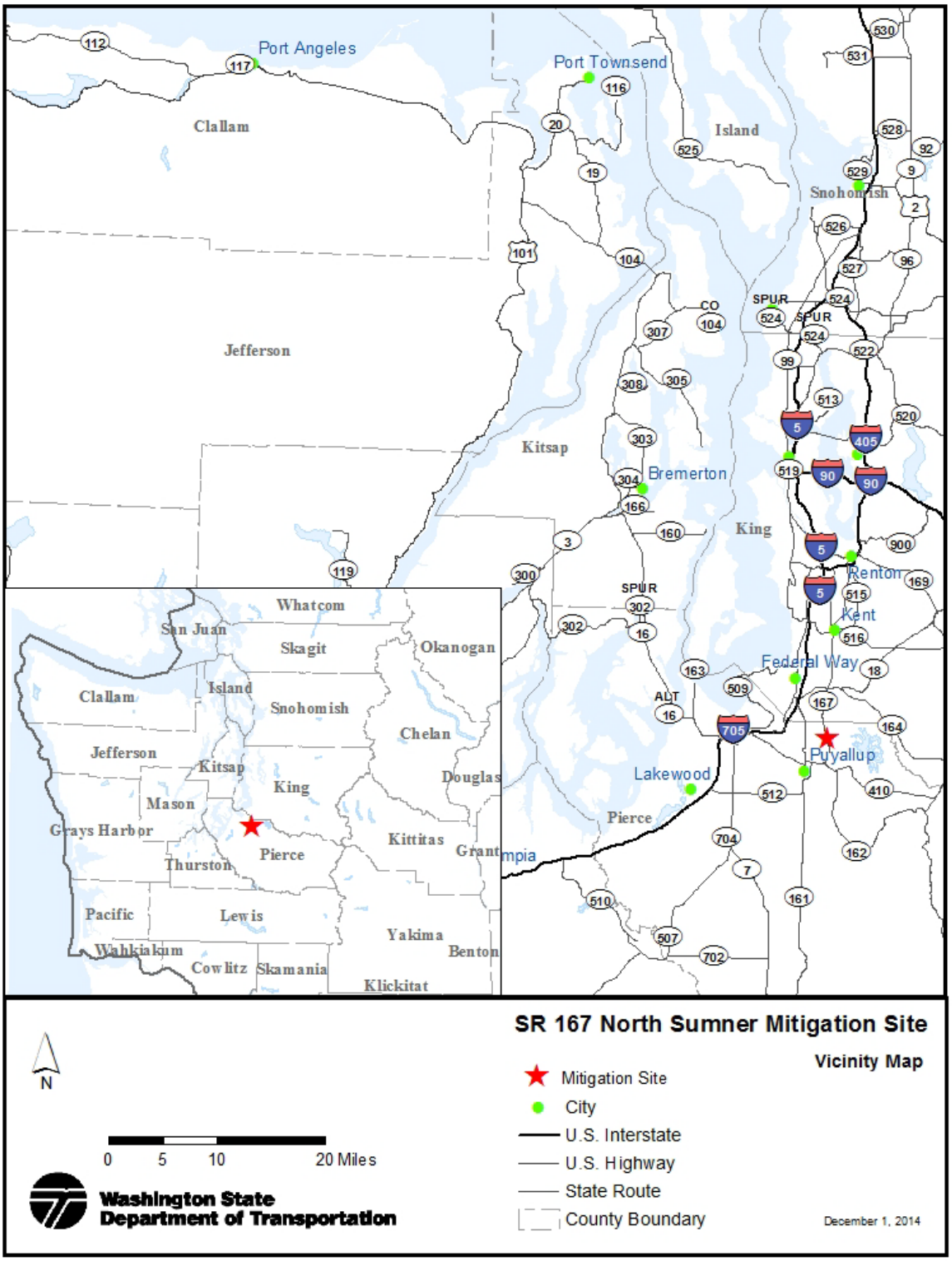


Figure 1. Vicinity Map

Methods

Two different methods were applied to two distinct areas of the mitigation site: wetland delineation and wetland reconnaissance (recon).

Wetland boundaries within the SR 167 North Sumner 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 areas surrounding Soaton Creek were not safely accessible. These areas were reconnoitered. The reconnaissance was based on field observations from the main mitigation area, from SR 167, and aerial photographs accessed from WSDOT's GIS Workbench using ArcGIS 10.2.2. Acreages assigned to the recon areas represent the best professional judgment of the biologists and do not indicate a precise acreage or boundary location.

Wetland Delineation and Study Area

Study Area

Delineated wetlands described in this report were assessed only within a portion of the wetland mitigation site (main mitigation area) (Figure 2). Additional wetland areas bordering Soaton Creek directly west and north of the main mitigation area are also part of the mitigation site. Wetland areas bordering the creek were reconnoitered.

Wetlands

The delineation determined 3.47 acres of wetland with an additional 0.40 acre of POW were present within two separate wetland areas at the SR 167 North Sumner Mitigation Site. In addition, approximately 2.13 acres of reconnoitered wetlands were identified adjacent to Soaton Creek.

The main mitigation area (Figure 2, red polygons) has depressional and riverine wetland areas with a variety of Cowardin classes. The depressional palustrine forested (PFO) community on the north end of the main mitigation area in Wetland 2 (W2) has developed a canopy structure with three distinct strata including a dense overstory of trees, with scattered shrubs and saplings in the understory. Patches of herbaceous vegetation are also established. Wetter areas of the wetland, on the southern portion of the site, in Wetland 1 (W1) are riverine flow through and depressional systems dominated by POW and palustrine emergent (PEM) communities ringed by a band of palustrine scrub-shrub (PSS) vegetation. Beaver activity along Soaton Creek appears to have created an inlet along the northwest edge of W1 and an outlet along the southwest edge.

Delineation data were collected at eight 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.

Wetland recon areas surrounding Soaton Creek include a mostly vegetated creek channel dominated by dense reed canarygrass (*Phalaris arundinacea*), with a few scattered native willows (*Salix spp.*) and redosier dogwood (*Cornus alba*).

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 whole, wetter than normal precipitation conditions were present prior to the 2014 field work and normal precipitation conditions preceded the 2015 delineation (Appendix B-1).

Moderate precipitation was recorded in the ten days preceding 2014 field work and heavy precipitation preceded the ten days prior to the 2015 delineation with one day receiving over two inches of rain (Appendix B-2).

Growing Season

The following evidence of the growing season was observed at the time of both the 2014 and 2015 delineations:

- New vegetative growth was present on some herbaceous plants.
- The leaves on many woody species were newly emerging.

Figure 2. Study area and wetland boundary in red (main mitigation area), wetland recon area in yellow, and sampling point locations in black.

SR 167 North Sumner Mitigation Site – Wetland Delineation Summary			
Total Delineated Wetland Area	3.47 acres of wetland, with an additional 0.40 acre of POW and, approx. 2.13 acres of recon wetland around Soaton Creek		
	Wetland Determination Data Forms	Appendix A; Sampling Point W1-SP1, W1-SP2, W2-SP1, W2-SP2	
	Upland Determination Data Forms	Appendix A; Sampling Point W1-SP3, W2-SP3	
	Delineators & Date	Tony Bush, Tom Mohagen	April 1, 2014
	Delineators & Date	Tony Bush, Tatiana Dreisbach	March 24, 2015
Vegetation	Trees – Pacific willow (*Salix lasiandra*), black cottonwood (*Populus balsamifera*), western red cedar (*Thuja plicata*), Sitka spruce (*Picea sitchensis*) Shrubs – Sitka willow (*Salix sitchensis*), red alder (*Alnus rubra*), black cottonwood, redosier dogwood (*Cornus alba*), salmonberry (*Rubus spectabilis*), Sitka spruce, snowberry (*Symphoricarpos albus*) Herbs – broadleaf cattail (*Typha latifolia*), reed canarygrass (*Phalaris arundinacea*), soft rush (*Juncus effusus*), slough sedge (*Carex obnupta*), little western bittercress (*Cardamine oligosperma*)		
Soils	Soils examined to a depth of 20 inches exhibited hydric characteristics. Matrix colors of 10YR 2/1, 10YR 2/2, 10YR 3/1,10YR 3/2, 10YR 4/1, and 2.5Y 5/1 were observed. Redoximorphic concentrations and depletions were observed in some layers. Indicator Depleted Below Dark Surface (A11), Depleted Matrix (F3), and Redox Dark Surface (F6) met.		
Hydrology	A high groundwater table associated with the White River, its tributaries, and the surrounding flat valley bottom topography appears to be the main source of hydrology. Soaton Creek, directly adjacent to the site, provides overbank flooding into W1, with an inlet and outlet managed by beaver activity. Precipitation and runoff from impervious surfaces and development in the valley also contribute to the hydrologic regime of these wetlands and the adjacent creek. Water in the observation pits ranged from 3 inches to12 inches below the surface. Surface water to greater than two feet deep was observed in W1. Shallow inundation to 3 inches was present is small depressions in W2.		
Rationale for Delineation	Positive indicators of all three wetland criteria are present. Placement of boundary determined by all three factors. Topography in W1 was also an influencing factor in placement of the wetland boundary. Placement of the wetland boundary in W2 focused on presence/absence of wetland hydrology and soils indicators.		

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.

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Appendix A —Wetland Determination Data Forms

Wetland Delineation Data Forms for:

W1-SP1

W1-SP2

W1-SP3

W2-SP1

W2-SP2

W2-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 167 North Sumner **City/County:** Sumner/Pierce **Sampling Date:** 01-Apr-14

Applicant/Owner: WSDOT **State:** WA **Sampling Point:** **w1-sp1**

Investigator(s): Tony Bush, Tom Mohagen **Section, Township, Range:** **S** 13 **T** 20N **R** 4E

Landform (hillslope, terrace, etc.): Lowland **Local relief (concave, convex, none):** concave **Slope:** 3.0 % / 1.7 °

Subregion (LRR): LRR A **Lat.:** 47.228 **Long.:** -122.25 **Datum:** NAD83HARN

Soil Map Unit Name: Semiamoo muck **NWI classification:** PEM

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 ◉	No ○
Hydric Soil Present?	Yes ◉	No ○
Wetland Hydrology Present?	Yes ◉	No ○

Is the Sampled Area within a Wetland? Yes ◉ No ○

Remarks:
Wetter than normal precipitation conditions characterize the three month period prior to field work (Appendix B-1).

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 10 x 10 feet)	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
1.		☐ 0.0%	
2.		☐ 0.0%	
3.		☐ 0.0%	
4.		☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 10 x 10 feet)			
1. Salix lasiandra	15	☑ 100.0%	FACW
2.		☐ 0.0%	
3.		☐ 0.0%	
4.		☐ 0.0%	
5.		☐ 0.0%	
	15	= Total Cover	
Herb Stratum (Plot size: 5 x 5 feet)			
1. Typha latifolia	70	☑ 90.9%	OBL
2. Phalaris arundinacea	3	☐ 3.9%	FACW
3. Juncus effusus	2	☐ 2.6%	FACW
4.	2	☐ 2.6%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	77	= Total Cover	
Woody Vine Stratum (Plot size: 5 x 5 feet)			
1.		☐ 0.0%	
2.		☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 10

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:	100.0%	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	70	x 1 =	70
FACW species	20	x 2 =	40
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	90 (A)		110 (B)

Prevalence Index = B/A = 1.222

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrologic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(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 ○

Remarks:
The cover of shrubs is too low to meet Cowardin PSS.

*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 Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks

[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 in 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 ○

Remarks:

Inundation. Soils meet definition of a hydric soil due to prolonged inundation during the growing season.

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☑ 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 on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two 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):	17
Water Table Present?	Yes ◉	No ○	Depth (inches):	0
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches):	0

Wetland Hydrology Present? Yes ◉ No ○

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 167 North Sumner **City/County:** Sumner/Pierce **Sampling Date:** 01-Apr-14

Applicant/Owner: WSDOT **State:** WA **Sampling Point:** **w1-sp2**

Investigator(s): Tony Bush, Tom Mohagen **Section, Township, Range:** **S** 13 **T** 20N **R** 4E

Landform (hillslope, terrace, etc.): Lowland **Local relief (concave, convex, none):** concave **Slope:** 3.0 % / 1.7 °

Subregion (LRR): LRR A **Lat.:** 47.228 **Long.:** -122.25 **Datum:** NAD83HARN

Soil Map Unit Name: Semiamoo muck **NWI classification:** PSS

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 ◉	No ○
Hydric Soil Present?	Yes ◉	No ○
Wetland Hydrology Present?	Yes ◉	No ○

Is the Sampled Area within a Wetland? Yes ◉ No ○

Remarks:
Wetter than normal precipitation conditions characterize the three month period prior to field work (Appendix B-1).

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 10 x 10 feet)	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
1.		☐ 0.0%	
2.		☐ 0.0%	
3.		☐ 0.0%	
4.		☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 10 x 10 feet)			
1. Alnus rubra	85	☑ 70.8%	FAC
2. Populus balsamifera	15	☐ 12.5%	FAC
3. Cornus alba	10	☐ 8.3%	FACW
4. Salix lasiandra	10	☐ 8.3%	FACW
5.	0	☐ 0.0%	
	120	= Total Cover	
Herb Stratum (Plot size: 5 x 5 feet)			
1. Carex obnupta	20	☑ 66.7%	OBL
2. Juncus effusus	7	☑ 23.3%	FACW
3. Phalaris arundinacea	3	☐ 10.0%	FACW
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	30	= Total Cover	
Woody Vine Stratum (Plot size: 5 x 5 feet)			
1.		☐ 0.0%	
2.		☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 70

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:	100.0%	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	20	x 1 =	20
FACW species	30	x 2 =	60
FAC species	100	x 3 =	300
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	150 (A)		380 (B)

Prevalence Index = B/A = 2.533

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrologic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(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 ○

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 Color (moist)		Matrix %	Redox Features Color (moist)		Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR	3/2	100						Sandy Loam	
4-17	2.5Y	5/1	90	10YR	5/6	10	C	M	Sandy Loam	Concentration is prominent

[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 in 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 ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ 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 on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two 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):	12
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches):	3

Wetland Hydrology Present? Yes ◉ No ○

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 167 North Sumner **City/County:** Sumner/Pierce **Sampling Date:** 01-Apr-14

Applicant/Owner: WSDOT **State:** WA **Sampling Point:** **w1-sp3**

Investigator(s): Tony Bush, Tom Mohagen **Section, Township, Range:** **S** 13 **T** 20N **R** 4E

Landform (hillslope, terrace, etc.): Shoulder slope **Local relief (concave, convex, none):** none **Slope:** 10.0 % / 5.7 °

Subregion (LRR): LRR A **Lat.:** 47.228 **Long.:** -122.25 **Datum:** NAD83HARN

Soil Map Unit Name: Semiamoo muck **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 ◉	No ○
Hydric Soil Present?	Yes ○	No ◉
Wetland Hydrology Present?	Yes ○	No ◉

Is the Sampled Area within a Wetland? Yes ○ No ◉

Remarks:
Wetter than normal precipitation conditions characterize the three month period prior to field work (Appendix B-1).

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 10 x 10 feet)	Absolute % Cover	Dominant Species?	Rel.Strat. Cover	Indicator Status
1.		☐	0.0%	
2.		☐	0.0%	
3.		☐	0.0%	
4.		☐	0.0%	
	0		= Total Cover	
Sapling/Shrub Stratum (Plot size: 10 x 10 feet)				
1. Rosa nutkana	25	☑	62.5%	FAC
2. Symphoricarpos albus	5	☐	12.5%	FACU
3. Ribes sanguineum	5	☐	12.5%	UPL
4. Picea sitchensis	3	☐	7.5%	FAC
5. Mahonia aquifolium	2	☐	5.0%	FACU
	40		= Total Cover	
Herb Stratum (Plot size: 5 x 5 feet)				
1. Holcus lanatus	90	☑	97.8%	FAC
2. Vicia spp.	2	☐	2.2%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
11.	0	☐	0.0%	
	92		= Total Cover	
Woody Vine Stratum (Plot size: 5 x 5 feet)				
1.		☐	0.0%	
2.		☐	0.0%	
	0		= Total Cover	

% Bare Ground in Herb Stratum: 8

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:	100.0%	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	118	x 3 =	354
FACU species	7	x 4 =	28
UPL species	5	x 5 =	25
Column Totals:	130 (A)		407 (B)

Prevalence Index = B/A = 3.131

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrologic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☐ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(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 ○

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 Color (moist)		Matrix %	Redox Features Color (moist)		Redox %	Type[1]	Loc[2]	Texture	Remarks
0-2										Duff layer
2-20	2.5Y	4/2	100						Sandy Loam	

[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 in 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 ◉

Remarks:

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ 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 on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two 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 ◉

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

Remarks:

No hydrology present to 20 inches.

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

Project/Site: SR 167 North Sumner **City/County:** Sumner/Pierce **Sampling Date:** 07-Apr-15

Applicant/Owner: WSDOT **State:** WA **Sampling Point:** **w2-sp1**

Investigator(s): Tatiana Dreisbach, Tony Bush **Section, Township, Range:** **S** 12 **T** 20N **R** 4E

Landform (hillslope, terrace, etc.): berm **Local relief (concave, convex, none):** convex **Slope:** 5.0 % / 2.9 °

Subregion (LRR): LRR A **Lat.:** 47.229 **Long.:** -122.25 **Datum:** NAD83HARN

Soil Map Unit Name: Semiahmoo muck **NWI classification:** PFO

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 ◉ No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present?	Yes ◉ No ○	
Wetland Hydrology Present?	Yes ◉ No ○	

Remarks:

Growing season: twinberry honeysuckle (Lonicera involucrata), Sitka willow (Salix sitchensis) leaves have emerged, redosier dogwood (Cornus alba) red-flowering currant (Ribes sanguineum) flowering, new vegetative growth on reed canarygrass (Phalaris arundinacea). Delineation informed mainly

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 5 x 20 feet)	Absolute % Cover	Dominant Species?	Rel.Strat. Cover	Indicator Status
1. Populus balsamifera	80	☑	100.0%	FAC
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
	80	**= Total Cover**		
Sapling/Shrub Stratum (Plot size: 5 x 15 eet)				
1. Thuja plicata	30	☑	66.7%	FAC
2. Picea sitchensis	10	☑	22.2%	FAC
3. Sambucus racemosa	5	☐	11.1%	FACU
4.	0	☐	0.0%	
5.	0	☐	0.0%	
	45	**= Total Cover**		
Herb Stratum (Plot size: 5 x 5 feet)				
1. Phalaris arundinacea	10	☑	62.5%	FACW
2. Epilobium ciliatum	2	☐	12.5%	FACW
3. Cardamine oligosperma	2	☐	12.5%	FAC
4. Galium aparine	2	☐	12.5%	FACU
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
11.	0	☐	0.0%	
	16	**= Total Cover**		
Woody Vine Stratum (Plot size: 5 x 5 feet)				
1.		☐	0.0%	
2.		☐	0.0%	
	0	**= Total Cover**		

% Bare Ground in Herb Stratum: 84

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC:	4	(A)
Total Number of Dominant Species Across All Strata:	4	(B)
Percent of dominant Species That Are OBL, FACW, or FAC:	100.0%	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	12	x 2 =	24
FAC species	122	x 3 =	366
FACU species	7	x 4 =	28
UPL species	0	x 5 =	0
Column Totals:	141 (A)		418 (B)

Prevalence Index = B/A = 2.965

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrologic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(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 ○

Remarks:

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

Soil

Sampling Point: w2-sp1

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

Depth (inches)	Matrix Color (moist)		Matrix %	Redox Features Color (moist)		Redox %	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR	3/2	90	10YR	5/1	5	D	M	Silt Loam	
				7.5YR	5/6	5	C	M\PL		concentration is prominent
7-8	10YR	4/1	90	10YR	5/6	10	C	M	Sandy Loam	concentration is prominent
8-18	10YR	2/1		5YR	4/6	2	C	M	Silt Loam	concentration is prominent

[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 in 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 ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ 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 on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two 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):	10
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches):	7

Wetland Hydrology Present? Yes ◉ No ○

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: 167 North Sumner **City/County:** Sumner/Pierce **Sampling Date:** 07-Apr-15

Applicant/Owner: WSDOT **State:** WA **Sampling Point:** **w2-sp2**

Investigator(s): Tatiana Dreisbach, Tony Bush **Section, Township, Range:** **S** 12 **T** 20N **R** 4E

Landform (hillslope, terrace, etc.): depression **Local relief (concave, convex, none):** convex **Slope:** 5.0 % / 2.9 °

Subregion (LRR): LRR A **Lat.:** 47.229 **Long.:** -122.249 **Datum:** NAD83HARN

Soil Map Unit Name: Semiahmoo muck **NWI classification:** PFO

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 ◉ No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present?	Yes ◉ No ○	
Wetland Hydrology Present?	Yes ◉ No ○	

Remarks:

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 20 x 20 feet)	Absolute % Cover	Dominant Species?	Rel.Strat. Cover	Indicator Status
1. Populus balsamifera	90	☑	90.0%	FAC
2. Salix sitchensis	10	☐	10.0%	FACW
3.	0	☐	0.0%	
4.	0	☐	0.0%	
	100	**= Total Cover**		

Sapling/Shrub Stratum (Plot size: 15 x 15 feet)	Absolute % Cover	Dominant Species?	Rel.Strat. Cover	Indicator Status
1. Symphoricarpos albus	40	☑	100.0%	FACU
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
	40	**= Total Cover**		

Herb Stratum (Plot size: 5x5 feet)	Absolute % Cover	Dominant Species?	Rel.Strat. Cover	Indicator Status
1. Phalaris arundinacea	20	☑	62.5%	FACW
2. Cardamine oligosperma	10	☑	31.3%	FAC
3. Athyrium filix-femina	2	☐	6.3%	FAC
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
11.	0	☐	0.0%	
	32	**= Total Cover**		

Woody Vine Stratum (Plot size: 5 x 5 feet)				
1.		☐	0.0%	
2.		☐	0.0%	
	0	**= Total Cover**		

% Bare Ground in Herb Stratum: 68

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:	75.0%	(A/B)

Prevalence Index worksheet:

	Total % Cover of:		Multiply by:
OBL species	0	x 1 =	0
FACW species	30	x 2 =	60
FAC species	102	x 3 =	306
FACU species	40	x 4 =	160
UPL species	0	x 5 =	0
Column Totals:	172	(A)	526 (B)

Prevalence Index = B/A = 3.059

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrologic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☐ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(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 ○

Remarks:

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

Soil

Sampling Point: w2-sp2

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

Depth (inches)	Matrix Color (moist)		Matrix %	Redox Features Color (moist)		Redox %	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR	2/2	95	7.5YR	3/4	5	C	M	Silt Loam	concentration is distinct
7-16	10YR	3/1	93	2.5Y	5/2	2	D	M	Silt Loam	
				5YR	4/6	5	C	PL		concentration is prominent

[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 in 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 ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ 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 on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two 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):	11
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches):	7

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

Due to recent rain, upper 0-3 inches of soil episaturated. So saturation form 0-3, Dry 3-7, then saturated from 7-11 where a water table was encountered.

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

Project/Site: 167 North Sumner **City/County:** Sumner/Pierce **Sampling Date:** 07-Apr-15

Applicant/Owner: WSDOT **State:** WA **Sampling Point:** **w2-sp3**

Investigator(s): Tatiana Dreisbach, Tony Bush **Section, Township, Range:** **S** 12 **T** 20N **R** 4E

Landform (hillslope, terrace, etc.): slope of depression **Local relief (concave, convex, none):** convex **Slope:** 5.0 % / 2.9 °

Subregion (LRR): LRR A **Lat.:** 47.229 **Long.:** -122.249 **Datum:** NAD83HARN

Soil Map Unit Name: Semiahmoo muck **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 ○	No ◉
Hydric Soil Present?	Yes ○	No ◉
Wetland Hydrology Present?	Yes ○	No ◉

Is the Sampled Area within a Wetland? Yes ○ No ◉

Remarks:

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 20 x 20 feet)	Absolute % Cover	Dominant Species?	Rel.Strat. Cover	Indicator Status
1. Populus balsamifera	40	☑	80.0%	FAC
2. Pseudotsuga menziesii	10	☑	20.0%	FACU
3.	0	☐	0.0%	
4.	0	☐	0.0%	
	50		**= Total Cover**	
Sapling/Shrub Stratum (Plot size: 15 x 15 feet)				
1. Symphoricarpos albus	40	☑	53.3%	FACU
2. Mahonia aquifolium	10	☐	13.3%	FACU
3. Amelanchier alnifolia	20	☑	26.7%	FACU
4. Pseudotsuga menziesii	5	☐	6.7%	FACU
5.	0	☐	0.0%	
	75		**= Total Cover**	
Herb Stratum (Plot size: 5x5 feet)				
1. Agrostis capillaris	50	☑	71.4%	FAC
2. Holcus lanatus	5	☐	7.1%	FAC
3. Phalaris arundinacea	15	☑	21.4%	FACW
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
11.	0	☐	0.0%	
	70		**= Total Cover**	
Woody Vine Stratum (Plot size: 5 x 5 feet)				
1.		☐	0.0%	
2.		☐	0.0%	
	0		**= Total Cover**	

% Bare Ground in Herb Stratum: 30

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC:	3	(A)
Total Number of Dominant Species Across All Strata:	6	(B)
Percent of dominant Species That Are OBL, FACW, or FAC:	50.0%	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	15	x 2 =	30
FAC species	95	x 3 =	285
FACU species	85	x 4 =	340
UPL species	0	x 5 =	0
Column Totals:	195 (A)		655 (B)

Prevalence Index = B/A = 3.359

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrologic Vegetation**
- ☐ **2 - Dominance Test is > 50%**
- ☐ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(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 ◉

Remarks:

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

Soil

Sampling Point: w2-sp3

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

Depth (inches)	Matrix Color (moist)		Matrix %	Redox Features Color (moist)		Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR	3/2	100						Silt Loam	
3+										cobbles and 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 in 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: cobbley fill

Depth (inches): 3

Hydric Soil Present? Yes ○ No ◉

Remarks:

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ 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 on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two 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 ◉

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

Remarks:

Appendix B — Precipitation Data

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

Monthly precipitation data for McMillin Reservoir, Pierce County, Washington for the April 1, 2014 delineation.

		Long-term rainfall records[a]							
	Month	**3 yrs. in 10 less than**	**Average**	**3 yrs. in 10 more than**	**Rain fall[a]**	**Condition dry, wet, normal[b]**	**Condition Value**	**Month weight value**	**Product of previous two columns**
1st prior month	Mar	3.49	4.38	5.02	9.81	W	3	3	9
2nd prior month	Feb	3.06	4.68	5.63	6.75	W	3	2	6
3rd prior month	Jan	3.67	5.54	6.65	4.52	N	2	1	2
								Sum	**17**

[a]NRCS 2014
[b] 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.

Monthly precipitation data for McMillin Reservoir, Pierce County, Washington for the March 24, 2015 delineation.

		Long-term rainfall records[a]							
	Month	**3 yrs. in 10 less than**	**Average**	**3 yrs. in 10 more than**	**Rain fall[a]**	**Condition dry, wet, normal[b]**	**Condition Value**	**Month weight value**	**Product of previous two columns**
1st prior month	Mar	3.49	4.38	5.02	4.15	N	2	3	6
2nd prior month	Feb	3.06	4.68	5.63	3.91	N	2	2	4
3rd prior month	Jan	3.67	5.54	6.65	4.28	N	2	1	2
								Sum	**12**

[a] NRCS 2016
[b] 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: Normal precipitation conditions were present prior to the field visit.

Appendix B-2.

Daily Precipitation 10 days preceding field work April 1, 2014, McMillin Reservoir, Pierce County, Washington

Date (2014)	Daily Precipitation (inches)[a]
March 31	0.70
March 30	M[b]
March 29	M
March 28	0.57
March 27	0.16
March 26	0.15
March 25	T[c]
March 24	0.00
March 23	M
March 22	M

[a] NOAA 2014
[b] "M" indicates data is missing for that day
[c] "T" indicates trace amount of precipitation recorded for that day

Daily Precipitation 10 days preceding field work March 24, 2015, McMillin Reservoir, Pierce County, Washington

Date (2015)	Daily Precipitation (inches)[a]
March 23	1.16
March 22	M[b]
March 20	0.05
March 19	0.02
March 18	0.05
March 17	T
March 16	2.06
March 15	M[c]
March 14	M
March 13	0.00

[a] NOAA 2016
[b] "M" indicates data is missing for that day
[c] "T" indicates trace amount of precipitation recorded for that day

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