

**SR 16 Union Avenue to Jackson Avenue HOV
USACE 200301129, OYB-4-012713 (Modified)**

**SR 16 West Bound Nalley Valley HOV
(SR 16 Tacoma Nature Center) Wetland Mitigation Site
NWP (14) NWS-2008-358**

Olympic Region

2015 MONITORING REPORT

Wetlands Program

Issued March 2016



**Washington State
Department of Transportation**

Environmental Services Office

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**SR 16 Union Avenue to Jackson Avenue HOV 200301129,
 OYB-4-012713 (Modified)
 SR 16 West Bound Nalley Valley HOV(SR 16 Tacoma Nature
 Center) USACE NWP (14) NWS-2008-358**



General Site Information	
USACE NWP Number	200301129, OYB-4-012713 (Modified), NWS-2008-358
Mitigation Location	In the city of Tacoma, adjacent to the Tacoma Nature Center, Pierce County
LLID Number	1224881472405
Construction Date	2009
Monitoring Period	2011-2020 (2025)
Year of Monitoring	5 of 10
Area of Project Impact	5.72
Type of Mitigation	Re-establishment
Area of Mitigation¹	0.42

¹Additional wetland acreage is provided by SR 16 Leach Creek (Appendix 3).

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Summary of Monitoring Results and Management Activities (2015)

Performance Standards	2015 Results ¹	Management Activities
Hydrology present	Present	
Cover of native woody species will be 35 percent in the scrub-shrub wetland	88% cover (CI _{80%} = 81-96%)	
Cover of native herbaceous species will be 40 percent in the emergent community	Qualitative: 90% cover	
Cover of native woody species will be 30 percent in the upland buffer	72% cover (CI _{80%} = 65-78%)	
County-listed Class-A noxious weeds and non-native blackberries (<i>Rubus</i> species), purple loosestrife (<i>Lythrum salicaria</i>), Scot's broom (<i>Cytisus scoparius</i>) and thistles (<i>Cirsium</i> species) will not exceed 25 percent aerial cover in the reestablished wetland. Non-native knotweeds (<i>Polygonum cuspidatum</i> , <i>P. polystachyum</i> , <i>P. sachalinense</i> , and <i>P. bohemicum</i>) will not be present (0 percent aerial cover) in the wetland or the buffer.	No Class A weed observed. All other weeds have less than 5% cover	Weed control occurred on: March 3, June 24, August 19, April 1, June 10, August 5, and October 6 in 2015
Habitat structures as shown on the plans are still present and remain in place.	Present	

Report Introduction

This report summarizes Year-5 monitoring activities at the State Route (SR) 16 Tacoma Nature Center 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 July 29, 2015 and a wetland delineation on May 7, 2014.

¹ Estimated values are presented with their corresponding statistical confidence interval. For example, 88% (CI_{80%} = 81-96% cover) means we are 80% confident that the true cover value is between 81% and 96%.

What is the SR 16 Tacoma Nature Center Mitigation Site?

This mitigation site (Figure 1) is a reestablished wetland constructed adjacent to the Tacoma Nature Center and Snake Lake in the City of Tacoma in Pierce Co. The reestablished wetland is approximately 0.42 acre in size and reconnects two existing (North and South) wetlands (0.25 and 0.15 acre in size). The site also includes approximately 2.18 acres of enhanced upland wetland buffer that was impacted during construction and grading activities. The reestablished wetland on this site partially compensates for 5.66 acres of wetland impacts from two different projects in the SR 16 corridor (summarized in Appendix 3, Table 1).

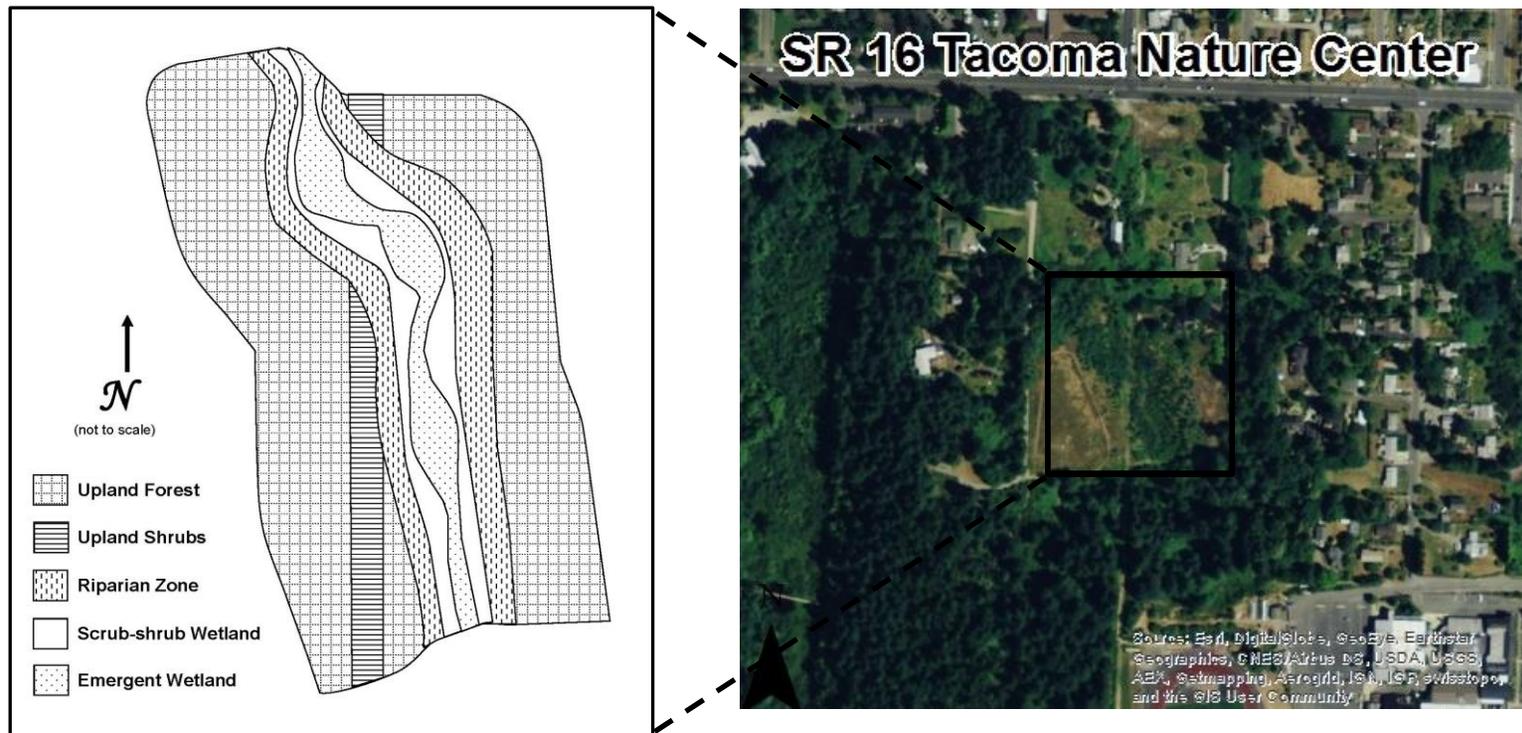


Figure 1 Site Sketch

Areas adjacent to the mitigation site are low density residential housing, school property and Metro Parks property. The mitigation site was constructed on Metro Parks property. It is adjacent to other Metro Parks properties and together they form a contiguous natural area. Appendix 2 includes site directions.

What are the performance standards for this site?

Year 5

Performance Standard 1

The soils in the created wetland will be saturated to the surface, or standing water will be present within 12 inches of the surface for at least four consecutive weeks (10 percent) of the growing season in years when rainfall meets or exceeds the 30-year average.

Performance Standard 2

Aerial cover of native, wetland (facultative and wetter) woody species will be at least 35 percent in the scrub-shrub community of the reestablished wetland.

Performance Standard 3

Aerial cover of native, wetland (facultative and wetter) herbaceous plant species will be at least 40 percent in the emergent community of the reestablished wetland.

Performance Standard 4

Aerial cover of native woody species (planted and volunteer) will be at least 30 percent in the upland buffer.

Performance Standard 5

County-listed Class-A noxious weeds and non-native blackberries, purple loosestrife, Scot's broom, and thistles will not exceed 25 percent aerial cover in the upland buffer or the wetland area. Non-native knotweeds will not be present (0 percent aerial cover) in the upland buffer or the wetland area.

Performance Standard 6

Habitat structures as shown on the plans are still present and remain in place.

Year 10

Performance Standard 1

The wetland area at the TNC mitigation site will be delineated using current methods to assure that the proposed mitigation contains 0.42 acre of reestablished wetland.

Performance Standard 2

Aerial cover of native, wetland (facultative and wetter) woody species will be at least 60 percent in the scrub-shrub community of the reestablished wetland.

Performance Standard 3

Aerial cover of native, wetland (facultative and wetter) herbaceous plant species will be at least 70 percent in the emergent community of the reestablished wetland.

Performance Standard 4

Aerial cover of native woody species (planted and volunteer) will be at least 50 percent in the upland buffer.

Performance Standard 5

County-listed Class-A noxious weeds and non-native blackberries, purple loosestrife, Scot's broom, and thistles will not exceed 25 percent aerial cover in the upland buffer or the wetland area. Non-native knotweeds will not be present (0 percent aerial cover) in the upland buffer or the wetland area.

Performance Standard 6

Wetland and buffer vegetation performance standards in Objectives 2 and 3 apply.

Appendix 1 shows the As Built (GeoEngineers 2008).

How were the performance standards evaluated?

WSDOT staff collected hydrology data and 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 1).

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

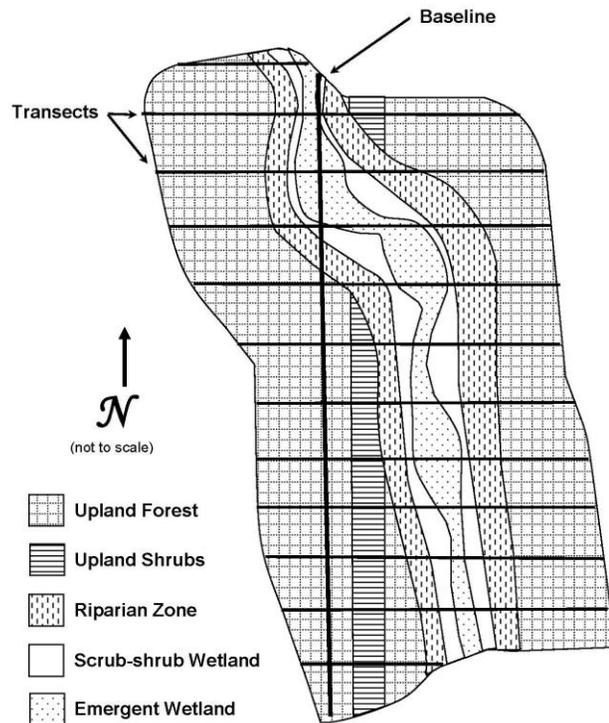


Figure 2 Site Sampling Design (2015)

Placement of Baseline: The 114-meter baseline was placed north to south on the west side of the site along the trail.

	PS 2	PS 3	PS 4	PS 5
Attribute	Cover	Cover	Cover	Cover
Target pop.	Native Woody	Herbaceous	Native Woody	Noxious Weeds/ Invasive sp.
Zone	Scrub-shrub	Emergent	Buffer	Entire site
Sample method	Line Intercept	Qualitative	Line Intercept	Qualitative
SU length	10 meters	N/A	20 meters	N/A
SU width	N/A	N/A	N/A	N/A
Points per SU	N/A	N/A	N/A	N/A
Total # of SU	11	N/A	16	N/A

How is the site developing?

The focus of this site was to mitigate for impacts to wetlands due to nearby HOV highway projects by reestablishing a pre-existing wetland and enhancing the adjacent upland buffer. Currently, this site is in year five of monitoring and is already meeting the final year 10 standards (See Appendix 3, Table 2). A wetland delineation completed in 2014 indicates that the wetland acreage present slightly exceeds the intended acreage (See Appendix 4). The emergent wetland vegetation established quickly, achieving 90 percent cover in the third year of monitoring. The scrub-shrub wetland has developed on either side of the emergent wetland and in some cases, as an overstory, completely shading the emergent swale. The wetland gradually turns into upland buffer as the slope elevation increases. The buffer includes a variety of tree and shrub species that will eventually be indistinguishable from the existing wetland on the northern and southern sides of the mitigation site.

The vegetation communities that have developed on site, along with the initial grading of the site, are providing the intended water quality and water quantity functions. The benches within the emergent wetland provide the capacity for flood flow attenuation and the vegetation community slows the water velocity and allows sediment to settle.

Reestablishing this wetland and providing connectivity between the existing wetlands to the north and south of the site have not only increased the hydrologic and water quality functions, it has connected a previously fractured wildlife corridor and connected it to a larger natural area within an urban landscape. Observations from the last five years of monitoring including several species of birds, bird nests, ungulate browse, and coyote scat as well as a coyote den just off site are indications that this area is heavily used by local wildlife.

Results for Performance Standard 1
(Wetland Hydrology and Delineation):

The site was delineated on May 7, 2014 and has met the final-year (Year 10) wetland acreage requirements (See Appendix 4). On February 26, 2015 a request to discontinue hydrology monitoring was sent to USACE and the Department of Ecology, this request was accepted on April 2, 2015.

Results for Performance Standard 2
(Cover of native woody species will be 35% (60% Year 10) in the scrub-shrub wetland):

The scrub-shrub wetland has 88 percent cover ($CI_{80\%} = 81-96\%$). This exceeds the year ten threshold of 60 percent. This zone has been quick to develop a thick overstory that spans the creek channel in some places. The dominant species include Nootka rose (*Rosa nutkana*) and four different species of willows (*Salix* species) (Photo 1).



Photo 1
Woody cover in the scrub-shrub wetland (July 2015)

Results for Performance Standard 3

(Cover of native herbaceous species will be 40% (70% Year 10) in the emergent community):

The site has developed rapidly and has been meeting the final year standard for the emergent for three years. Cover in this zone is estimated at 90 percent (Photo 2). On May 26, 2015, a request to discontinue quantitative sampling for the emergent was sent to USACE and the Department of Ecology, this request was accepted on July 14, 2015. The final year standards are still currently being met.

Results for Performance Standard 4

(Cover of native woody species will be 30% (50% Year 10) in the upland buffer.):

The upland buffer has 72 percent cover ($CI_{80\%} = 65-78\%$). This zone has been slower to develop than other areas of the mitigation site. The slopes of the buffer as they lead down into the wetland are densely vegetated. The bench areas on each side of the mitigation site tend to be a bit sparser. However, this zone still exceeds the Year 10 threshold of 50 percent. There is a diversity of species in this zone but snowberry (*Symphoricarpos albus*), red alder (*Alnus rubra*), Indian plum (*Oemleria cerasiformis*), and black cottonwood (*Populus balsamifera*) are dominant.

There was some die off of red alder (*Alnus rubra*) in the upper areas of the buffer (Photo 3). This is most likely due to the hot and dry summer experienced in 2015.



Photo 2
Emergent cover in the Wetland (July 2015)



Photo 3
Woody cover in the upland (July 2015)

Results for Performance Standard 5

(County-listed Class-A noxious weeds and non-native blackberries, purple loosestrife, Scot's broom, and thistles will not exceed 25% cover in the upland buffer or the wetland area. Non-native knotweeds will not be present)

No Class A weeds were observed on site at the time of monitoring. Some Himalayan blackberry (*Rubus armeniacus*), bull thistle (*Cirsium vulgare*), and Scotch broom were observed in the buffer and some reed canarygrass (*Phalaris arundinacea*) was observed in the wetland area. Overall, cover across the site is estimated at five percent. Weed control has been effective on this site.

Results for Performance Standard 6

(Habitat structures as shown on the plans are still present and remain in place.):

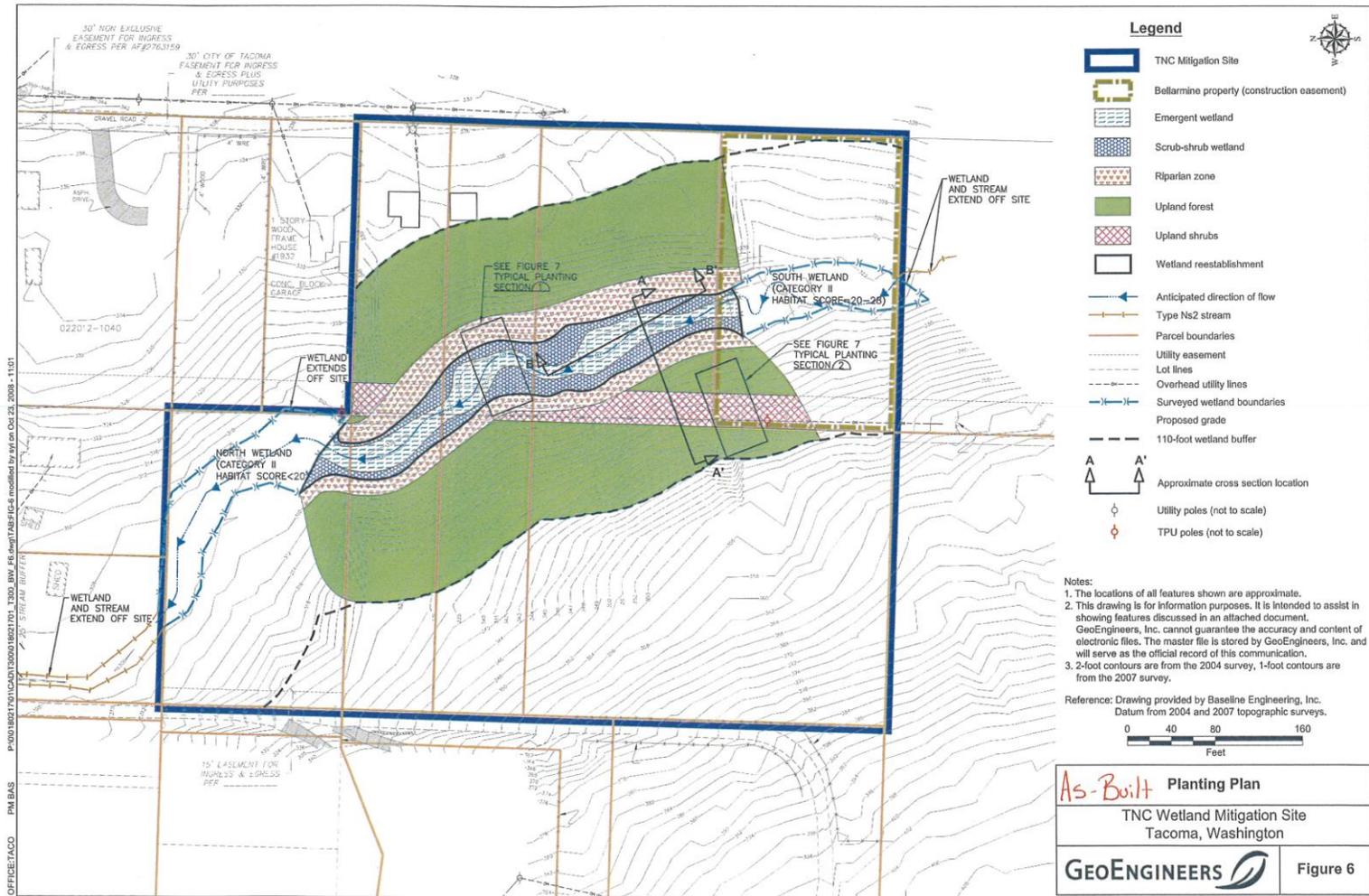
Habitat structures are present and still in place as planned.

What is planned for this site?

The Region has plans to continue weed control.

Appendix 1 – As-Built

(from GeoEngineers 2008)



COMMUNITY	SYMBOL	COMMON NAME	SCIENTIFIC NAME	FORM	PLANT SPACING (ON-CENTER)	QUANTITY
Emergent		Slough sedge ^a	<i>Carex obnupta</i>	10-in. plugs and bareroot	2 ft.	10,320
		Small-fruited bulrush	<i>Scirpus microcarpus</i>	10-in. plugs	2 ft.	471
Scrub-Shrub		Pacific willow	<i>Salix lasiandra</i>	36-in. cuttings	4 ft.	289
		Sitka willow	<i>Salix sitchensis</i>	36-in. cuttings	4 ft.	128
		Western crabapple	<i>Malus fusca</i>	1-gal. potted	4 ft.	50
		Pacific ninebark	<i>Physocarpus capitatus</i>	1-gal. potted	4 ft.	56
		Hooker willow	<i>Salix hookeriana</i>	36-in. cuttings	4 ft.	117
		Scouler willow	<i>Salix scouleriana</i>	36-in. cuttings	4 ft.	83
Riparian		Nootka rose	<i>Rosa nutkana</i>	1-gal. potted	4 ft.	308
		Beaked hazelnut	<i>Corylus cornuta</i>	1 and 2-gal. potted	4 ft.	285
		Indian plum	<i>Oemleria cerasiformis</i>	1 and 2-gal. potted and br.	4 ft.	347
		Red elderberry	<i>Sambucus racemosa</i>	1 and 2-gal. potted	4 ft.	139
		Scouler willow	<i>Salix scouleriana</i>	36-in. cuttings	4 ft.	530
Forested Buffer		Red alder	<i>Alnus rubra</i>	1 and 2-gal. potted	12 ft.	333
		Baldhip rose	<i>Rosa gymnocarpa</i>	1 and 2-gal. potted	4 ft.	562
		Snowberry	<i>Symphoricarpus alba</i>	1-gal. potted	4 ft.	643
		Beaked hazelnut	<i>Corylus cornuta</i>	1 and 2-gal. potted	4 ft.	1,202
		Indian plum	<i>Oemleria cerasiformis</i>	1 and 2-gal. potted and br.	4 ft.	2,011
		Red elderberry	<i>Sambucus racemosa</i>	1 and 2-gal. potted	4 ft.	605
		Bigleaf maple	<i>Acer macrophyllum</i>	2-gal. potted	12 ft.	166
		Douglas fir ^b	<i>Pseudotsuga menziesii</i>	2-gal. potted	12 ft.	166
Shrub Buffer		Baldhip rose	<i>Rosa gymnocarpa</i>	1 and 2-gal. potted	4 ft.	116
		Snowberry	<i>Symphoricarpus alba</i>	1-gal. potted	4 ft.	120
		Beaked hazelnut	<i>Corylus cornuta</i>	1 and 2-gal. potted	4 ft.	77
		Indian plum	<i>Oemleria cerasiformis</i>	1 and 2-gal. potted and br.	4 ft.	160
		Red elderberry	<i>Sambucus racemosa</i>	1 and 2-gal. potted	4 ft.	159

NOTES:

- a. Slough sedge transplant plugs will be planted in clumps of approximately four plugs within each 2-foot on-center spacing area.
- b. Douglas fir trees will not be sheared.
- c.
- d.
- gal. = gallon
- in. = inch
- ft. = feet
- sq. ft. = square feet
- br. = bareroot
- N/A = not applicable

Planting Materials List	
TNC Wetland Mitigation Site Tacoma, Washington	
AS BUILT	Figure 11

Appendix 2 – Photo Points

The photographs below were taken from permanent photo-points on July 29, 2015 and document current site development.



Photo Point 1a



Photo Point 1b



Photo Point 2



Photo Point 3a



Photo Point 3b



Photo Point 4a



Photo Point 4b



Photo Point 5a



Photo Point 5b



Photo Point 6a



Photo Point 6b



Photo Point 7a



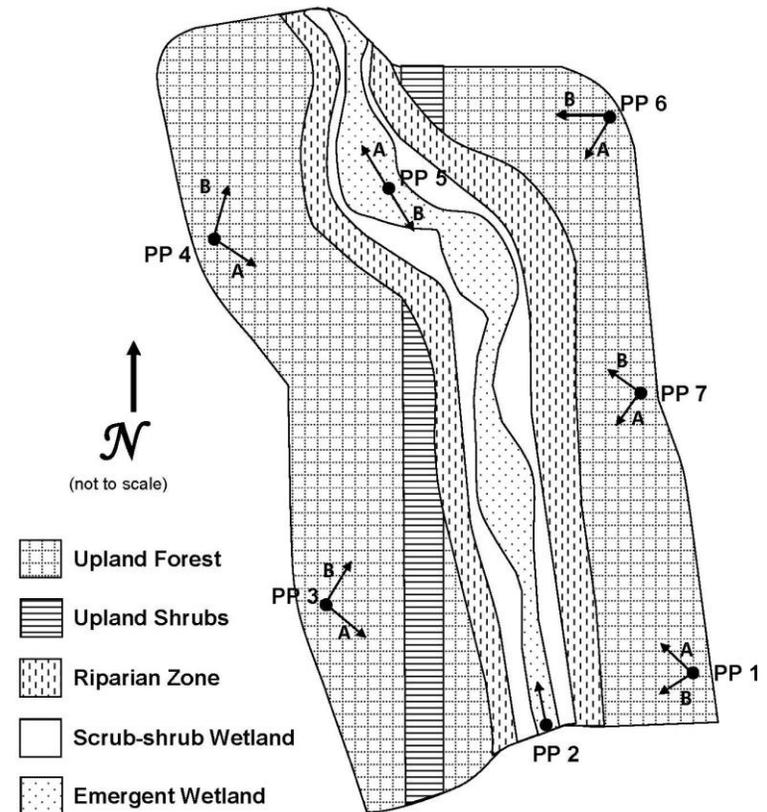
Photo Point 7b

Driving Directions:

From I-5 take Exit 132 for S 38th Street. Stay in the left lanes and merge onto SR 16 W. Take exit 2A (19th street east) off of SR 16. Turn right onto S. 19th. Pass the Tacoma Nature Center on your right and take a right turn on Durango Street (gravel road). Drive to the end of the road to the gate. The gate is locked, but you can walk around it.

SR 16 Tacoma Nature Center Wetland Mitigation Site

Photo Point Map



Appendix 3 – Data Tables

Table 1. Mitigation sites that compensate for impacts incurred during construction of the SR 16 Union Avenue to Jackson Avenue HOV project and SR 16 West Bound Nalley Valley HOV .

Mitigation Site	Wetland Impact (acre)	Type of Impact	Mitigation (acre)	Type of Mitigation
Leach Creek	4.34 ¹	Permanent, Stormwater designation	26.80 ¹	Preservation and Enhancement
Snake Lake	0.82 ¹	Temporary	0.9 ¹	Re-vegetation
Tacoma Nature Center	0.07 ²	Permanent	0.42 ³	Re-establishment
	0.007 ⁴	Permanent		
	0.49 ⁴	Shading		
Total Impacts	5.72			

¹Acres from WSDOT (2008). ²Acres from USACE Permit # NWP (14) 2008-358. ³Acres from GeoEngineers (2008). ⁴Acres from USACE Permit # 200301129

Table 2.

Year 10 Performance Standards	2014 Results	2015 Results
The mitigation will contain 0.42 acres of reestablished wetland	0.46 acres present	0.46 acres present
Cover of native woody species will be 60 percent in the scrub-shrub wetland	Qualitative: 90% cover	88% cover (CI _{80%} = 81-96%)
Cover of native herbaceous species will be 70 percent in the emergent community	Qualitative: 95% cover	Qualitative: 90% cover
Cover of native woody species will be 50 percent in the upland buffer	Qualitative: 70% cover	72% cover (CI _{80%} = 65-78%)
County-listed Class-A noxious weeds and non-native blackberries (<i>Rubus</i> spp.), purple loosestrife (<i>Lythrum salicaria</i>), Scot’s broom (<i>Cytisus scoparius</i>) and thistles (<i>Cirsium</i> spp.) will not exceed 25 percent aerial cover in the reestablished wetland. Non-native knotweeds (<i>Polygonum cuspidatum</i> , <i>P. polystachyum</i> , <i>P. sachalinense</i> , and <i>P. bohemicum</i>) will not be present (0 percent aerial cover) in the wetland or the buffer.	No Class A weed observed. All other weeds have less than 5% cover	No Class A weed observed. All other weeds have less than 5% cover
Habitat structures as shown on the plans are still present and remain in place.	Present	Present

Appendix 4 – Wetland Delineation

WETLAND DELINEATION REPORT

SR 16 Tacoma Nature Center Mitigation Site

SR 16 Union Avenue to Jackson Avenue HOV Project
USACE (NWP 14) 2003-01129

SR 16 West Bound Nalley Valley HOV Project
USACE (NWP 14) NWS-2008-358

Pierce County, Washington

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

November 2014



Introduction

This report was prepared by the Washington State Department of Transportation (WSDOT) to describe the wetland boundary delineation for the SR 16 Tacoma Nature Center mitigation site. Field work was conducted by WSDOT wetland biologists Tatiana Dreisbach and Tom Mohagen, on May 7, 2014. The delineation identifies 0.46 acre of wetland within the mitigation site boundaries.

General Information for the SR 16 Tacoma Nature Center Mitigation Site		
Location:	S12, T20N, R2E. Pierce County. (Vicinity map, Figure 1)	
	USACE NWP 14 Number	NWS-2008-358
	USACE NWP 14 Number	2003-01129
	Long./Lat. ID Number	1224881472405
	Land Resource Region (LRR)	A
	Major Land Resource Area (MLRA)	2
	Construction Date	2009
	Monitoring Period	2011 - 2020 (2025)
Year of Monitoring	4 of 10 (in 2014)	
Area of Project Impact¹	0.08 acres	
Total Delineated Wetland Area	0.46 acres	

¹ Project impact numbers from USACE 2003-01129, 0.01 acre impact for the Snake Lake stormwater area (USACE 2004), and USACE NWS-2008-358 with 0.07 acre impact (USACE 2006). Additional wetland mitigation for USACE 2003-01129 is provided at SR 16 Leach Creek Mitigation Site.

Location

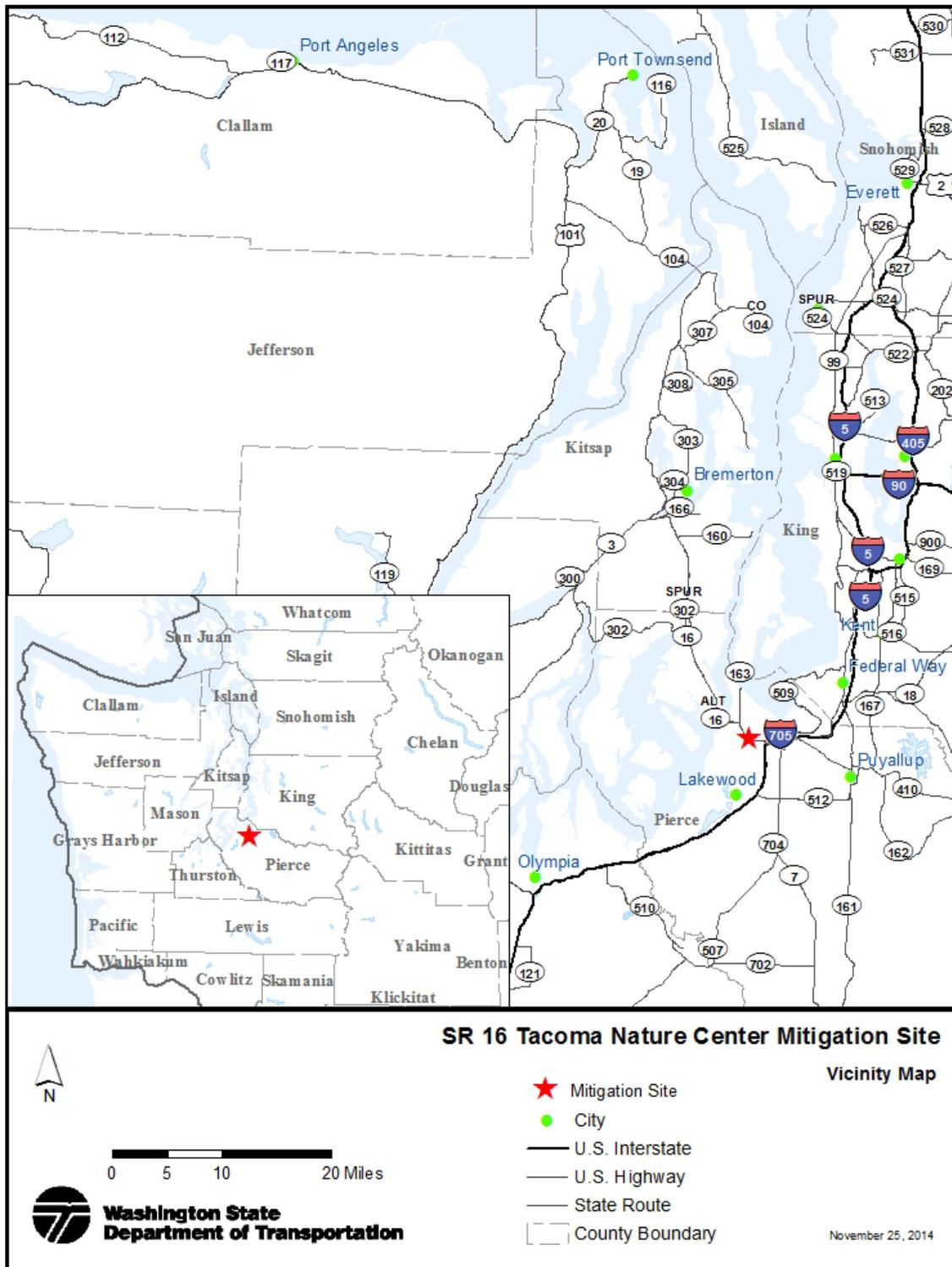


Figure 1. Vicinity Map

Methods

Wetland boundaries within the SR 16 Tacoma Nature Center 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

Study Area

Wetlands described in this report were assessed only within the wetland mitigation site boundary (Figure 2).

Wetlands

The SR 16 Tacoma Nature Center mitigation site has reestablished depressional and slope wetland areas connecting two preexisting off site wetlands to the north and south. Shallow depressional areas are present with a gradual overall slope from south to west, conveying shallow, slow-moving seasonal flows through vegetated palustrine emergent (PEM) and palustrine scrub-shrub (PSS) areas.

The delineation determined 0.46 acre of wetland were present within the SR 16 Tacoma Nature Center 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. An additional wetland sample point characterized the wetland vegetation community. 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 whole, wetter than normal precipitation conditions were present prior to field work, with each of the three months prior to field work were wetter than normal (Appendix B-1).

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 herbaceous plants.
- The leaves on most woody species were fully emerged.

GPS Data - SR 16 Tacoma Nature Center, 5/7/2014



Figure 2. Study area in blue, wetland boundary in red, and sampling point locations in black.

SR 16 Tacoma Nature Center Mitigation Site – Wetland Delineation Summary		
Total Delineated Wetland Area	0.46 acres	
	Wetland Determination Data Forms	Appendix A; Sampling Point W1-SP1 and W1-SP2
	Upland Determination Data Form	Appendix A; Sampling Point W1-SP3
	Delineators	Tatiana Dreisbach, Tom Mohagen
	Delineation Date	May 7, 2014
Vegetation	Trees – none Shrubs – Pacific willow (<i>Salix lasiandra</i>), Sitka willow (<i>Salix sitchensis</i>), redosier dogwood (<i>Cornus alba</i>), Pacific crabapple (<i>Malus fusca</i>) Herbs – slough sedge (<i>Carex obnupta</i>), small-fruited bulrush (<i>Scirpus microcarpus</i>), fringed willowherb (<i>Epilobium ciliatum</i>), oval sedge (<i>Carex leporina</i>).	
Soils	Soils examined to a depth of 10 inches exhibited hydric characteristics. Matrix colors of 2.5Y 3/2 were observed. Redoximorphic concentrations and depletions were observed throughout this layer. Below 10 inches was a compacted layer. Indicator Redox Dark Surface (F6) met.	
Hydrology	The main source of wetland hydrology is an offsite wetland upslope and to the south of the site. Water flows surface and subsurface depending on the time of year from the south through the broad wetland swale on site. Shallow vegetated depressions hold back water. The hydrology generally flows through the site, exiting the site to the north, draining to another adjacent preexisting wetland. Precipitation also contributes to the hydrologic regime of this wetland. Surface water was observed to depth of 2 inches in shallow depressional areas of the wetland. Water in the observation pits ranged from 0 inches (at the soil surface) to 6 inches below the surface.	
Rationale for Delineation	Positive indicators of all three wetland criteria are present. Placement of boundary determined mainly by vegetation, presence/absence of hydrology indicators, and topography.	

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

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 16 Tacoma Nature Center City/County: Tacoma/Pierce Sampling Date: 06-May-14
 Applicant/Owner: WSDOT State: WA Sampling Point: w1-sp1
 Investigator(s): Tatiana Dreisbach, Tom Mohagen Section, Township, Range: S 12 T 20N R 2E
 Landform (hillslope, terrace, etc.): Swale Local relief (concave, convex, none): concave Slope: 5.0 % / 2.9 °
 Subregion (LRR): LRR A Lat.: 47.241 Long.: -122.489 Datum: NAD83HARN
 Soil Map Unit Name: unmapped soils, site occurs in City of Tacoma 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 <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"/>
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Remarks:
 Wetter than normal conditions characterize the three month period prior to field work (Appendix B-1).

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Rel.Strat. Cover	Indicator Status	
Tree Stratum (Plot size: <u>15 x 15 feet</u>)				
1. _____	_____	<input type="checkbox"/> 0.0%	_____	Dominance Test worksheet: 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)
2. _____	_____	<input type="checkbox"/> 0.0%	_____	
3. _____	_____	<input type="checkbox"/> 0.0%	_____	
4. _____	_____	<input type="checkbox"/> 0.0%	_____	
0 = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15 x 15 feet</u>)				
1. _____	_____	<input type="checkbox"/> 0.0%	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>75</u> x 1 = <u>75</u> FACW species <u>4</u> x 2 = <u>8</u> FAC species <u>2</u> x 3 = <u>6</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>81</u> (A) <u>89</u> (B) Prevalence Index = B/A = <u>1.099</u>
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 = Total Cover				
Herb Stratum (Plot size: <u>5 x 5 feet</u>)				
1. <u>Carex obnupta</u>	60	<input checked="" type="checkbox"/> 74.1%	OBL	Hydrophytic Vegetation Indicators: <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 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 - Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Scirpus microcarpus</u>	15	<input type="checkbox"/> 18.5%	OBL	
3. <u>Epilobium ciliatum</u>	2	<input type="checkbox"/> 2.5%	FACW	
4. <u>Rumex crispus</u>	2	<input type="checkbox"/> 2.5%	FAC	
5. <u>Carex leporina</u>	2	<input type="checkbox"/> 2.5%	FACW	
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%	_____	
81 = Total Cover				
Woody Vine Stratum (Plot size: <u>5 x 5 feet</u>)				
1. _____	_____	<input type="checkbox"/> 0.0%	_____	
2. _____	_____	<input type="checkbox"/> 0.0%	_____	
0 = Total Cover				
% Bare Ground in Herb Stratum: <u>19</u>				

Remarks:

¹Indicator 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 ¹	Loc ²		

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

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

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	Indicators for Problematic Hydric Soils³:
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except in MLRA 1)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input 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)	

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

³Indicators 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:
 Soils meet the definition of hydric soil due to prolonged inundation during the growing season. See hydrology section below.

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (minimum of two required)
<input checked="" 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 checked="" 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 type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input 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 checked="" type="radio"/> No <input type="radio"/>	Depth (inches):	<input type="text" value="2"/>	Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>
Water Table Present?	Yes <input checked="" type="radio"/> No <input type="radio"/>	Depth (inches):	<input type="text" value="0"/>	
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:

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

Project/Site: SR 16 Tacoma Nature Center City/County: Tacoma/Pierce Sampling Date: 06-May-14
 Applicant/Owner: WSDOT State: WA Sampling Point: w1-sp2
 Investigator(s): Tatiana Dreisbach, Tom Mohagen Section, Township, Range: S 12 T 20N R 2E
 Landform (hillslope, terrace, etc.): Swale Local relief (concave, convex, none): concave Slope: 5.0 % / 2.9 °
 Subregion (LRR): LRR A Lat.: 47.241 Long.: -122.489 Datum: NAD83HARN
 Soil Map Unit Name: unmapped soils, site occurs in City of Tacoma 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 <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"/>
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Remarks:
 Wetter than normal conditions characterize the three month period prior to field work (Appendix B-1).

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Rel.Strat. Cover	Indicator Status		
Tree Stratum (Plot size: <u>10 x 15 feet</u>)					
1. _____	_____	<input type="checkbox"/> 0.0%	_____	Dominance Test worksheet: Number of Dominant Species That are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)	
2. _____	_____	<input type="checkbox"/> 0.0%	_____		
3. _____	_____	<input type="checkbox"/> 0.0%	_____		
4. _____	_____	<input type="checkbox"/> 0.0%	_____		
= Total Cover					
0					
Sapling/Shrub Stratum (Plot size: <u>10 x 15 feet</u>)					
1. <u>Salix lasiandra</u>	70	<input checked="" type="checkbox"/> 77.8%	FACW	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>35</u> x 1 = <u>35</u> FACW species <u>95</u> x 2 = <u>190</u> FAC species <u>20</u> x 3 = <u>60</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>150</u> (A) <u>285</u> (B) Prevalence Index = B/A = <u>1.900</u>	
2. <u>Salix sitchensis</u>	10	<input type="checkbox"/> 11.1%	FACW		
3. <u>Cornus alba</u>	5	<input type="checkbox"/> 5.6%	FACW		
4. <u>Malus fusca</u>	5	<input type="checkbox"/> 5.6%	FACW		
5. _____	0	<input type="checkbox"/> 0.0%	_____		
= Total Cover					
90					
Herb Stratum (Plot size: <u>5 x 5 feet</u>)					
1. <u>Holcus lanatus</u>	20	<input checked="" type="checkbox"/> 32.3%	FAC		
2. <u>Carex obnupta</u>	20	<input checked="" type="checkbox"/> 32.3%	OBL		
3. <u>Scirpus microcarpus</u>	15	<input checked="" type="checkbox"/> 24.2%	OBL		
4. <u>Epilobium ciliatum</u>	5	<input type="checkbox"/> 8.1%	FACW		
5. <u>Veronica spp.</u>	2	<input type="checkbox"/> 3.2%	_____		
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%	_____		
= Total Cover					
62					
Woody Vine Stratum (Plot size: <u>5 x 5 feet</u>)					
1. _____	_____	<input type="checkbox"/> 0.0%	_____		
2. _____	_____	<input type="checkbox"/> 0.0%	_____		
= Total Cover					
0					
% Bare Ground in Herb Stratum: <u>38</u>					

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrologic Vegetation
 2 - Dominance Test is > 50%
 3 - Prevalence Index is ≤ 3.0¹
 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 5 - Wetland Non-Vascular Plants¹
 Problematic Hydrophytic Vegetation¹ (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		Redox Features				Texture	Remarks		
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²				
0-10	2.5Y	3/2	92	2.5Y	5/6	5	C	M	Sandy Loam	concentration is prominent
				2.5Y	4/1	3%	D	M		

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

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

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	Indicators for Problematic Hydric Soils³:
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except in MLRA 1)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input checked="" 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)	

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

Restrictive Layer (if present):
 Type: compacted disturbed soil
 Depth (inches): 10

Hydric Soil Present? Yes No

Remarks:

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (minimum of two required)
<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 checked="" 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 type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input 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"/>	Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>
Water Table Present?	Yes <input checked="" type="radio"/> No <input type="radio"/>	Depth (inches): <input type="text" value="6"/>	
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:
 Adventitious roots observed on Salix sp.

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

Project/Site: SR 16 Tacoma Nature Center City/County: Tacoma/Pierce Sampling Date: 06-May-14
 Applicant/Owner: WSDOT State: WA Sampling Point: w1-sp3
 Investigator(s): Tatiana Dreisbach, Tom Mohagen Section, Township, Range: S 12 T 20N R 2E
 Landform (hillslope, terrace, etc.): slope of swale Local relief (concave, convex, none): concave Slope: 20.0 % / 11.3 °
 Subregion (LRR): LRR A Lat.: 47.241 Long.: -122.489 Datum: NAD83HARN
 Soil Map Unit Name: unmapped soils, site occurs in City of Tacoma 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 type="radio"/> No <input checked="" 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"/>
---	---

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

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	
Tree Stratum (Plot size: <u>15 x 15 feet</u>)				Dominance Test worksheet: Number of Dominant Species That are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</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 = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15 x 15 feet</u>)				
1. <u>Physocarpus capitatus</u>	35	<input checked="" type="checkbox"/> 52.2%	FACW	
2. <u>Rosa nutkana</u>	15	<input checked="" type="checkbox"/> 22.4%	FAC	
3. <u>Salix sitchensis</u>	10	<input type="checkbox"/> 14.9%	FACW	
4. <u>Corylus cornuta</u>	2	<input type="checkbox"/> 3.0%	FACU	
5. <u>Populus balsamifera</u>	5	<input type="checkbox"/> 7.5%	FAC	
67 = Total Cover				
Herb Stratum (Plot size: <u>5 x 5 feet</u>)				
1. <u>Holcus lanatus</u>	10	<input checked="" type="checkbox"/> 25.6%	FAC	
2. <u>Epilobium ciliatum</u>	10	<input checked="" type="checkbox"/> 25.6%	FACW	
3. <u>Taraxacum officinale</u>	5	<input type="checkbox"/> 12.8%	FACU	
4. <u>Geranium molle</u>	5	<input type="checkbox"/> 12.8%	UPL	
5. <u>Cardamine oligosperma</u>	5	<input type="checkbox"/> 12.8%	FAC	
6. <u>Sonchus asper</u>	2	<input type="checkbox"/> 5.1%	FACU	
7. <u>Hypericum perforatum</u>	2	<input type="checkbox"/> 5.1%	FACU	
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%	_____	
39 = Total Cover				
Woody Vine Stratum (Plot size: <u>5 x 5 feet</u>)				
1. _____	_____	<input type="checkbox"/> 0.0%	_____	
2. _____	_____	<input type="checkbox"/> 0.0%	_____	
0 = Total Cover				
% Bare Ground in Herb Stratum: <u>0</u>				
Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>55</u> x 2 = <u>110</u> FAC species <u>35</u> x 3 = <u>105</u> FACU species <u>11</u> x 4 = <u>44</u> UPL species <u>5</u> x 5 = <u>25</u> Column Totals: <u>106</u> (A) <u>284</u> (B) Prevalence Index = B/A = <u>2.679</u>				
Hydrophytic Vegetation Indicators: <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 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 - Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)				
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.				
Hydrophytic Vegetation Present? 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 ¹	Loc ²			
0-7	10YR	2/1	100						Sandy Loam	
7-16	2.5Y	3/2	99	2.5Y	5/4	1	C	M	Sandy Gravelly Loam	disturbed, compacted layer, concentration

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)		Indicators for Problematic Hydric Soils³:
<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 type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input 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)	

³Indicators 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:
 not enough concentrations to meet F6.

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (minimum of two required)
<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 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 type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Geomorphic Position (D2)
<input 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"/>	Wetland Hydrology Present? 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

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

Monthly precipitation data for McMillin Reservoir, Washington.

		Long-term rainfall records ^a			Rain fall ^a	Condition dry, wet, normal ^b	Condition Value	Month weight value	Product of previous two columns
Month	3 yrs. in 10 less than	Average	3 yrs. in 10 more than						
1 st prior month	Apr	2.47	3.45	4.08	4.54	W	3	3	9
2 nd prior month	Mar	3.49	4.38	5.02	9.81	W	3	2	6
3 rd prior month	Feb	3.06	4.68	5.63	6.75	W	3	1	3
								Sum	18

^aNRCS 2014

^bConditions 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, McMillin Reservoir, Washington

Date (2014)	Daily Precipitation (inches) ^a
May 6	0.12
May 5	1.03
May 4	M ^b
May 3	M
May 2	0.00
May 1	0.00
Apr 30	0.00
Apr 29	0.00
Apr 28	0.64
Apr 27	M

^aNOAA 2014

^b"M" indicates data is missing for that day

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