

**SR 522 Paradise Lake Road to  
Snohomish River Stage 2 and 4  
(Paradise Lake Road NE Mitigation Site)**

**USACE 2002-01342**

**Northwest Region**

**2014 MONITORING REPORT**

**Wetlands Program**

*Issued March 2015*



**Washington State  
Department of Transportation**

**Environmental Services Office**

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# SR 522 Paradise Lake Road NE USACE 2002-01342



General Site Information			
<b>USACE IP #</b>	2002-01342		
<b>Mitigation Location</b>	North side of SR 522 east of Fales Road, Snohomish County		
<b>LLID Number</b>	1220746478150		
<b>Construction Date</b>	2004		
<b>Monitoring Period</b>	2005-2014		
<b>Year of Monitoring</b>	10 of 10		
<b>Type of Project Impact<sup>1</sup></b>	Wetland		Buffer
<b>Area of Project Impact</b>	2.20 acres		9.49 acres
<b>Type of Mitigation</b>	Wetland Establishment	Wetland Enhancement	Buffer Enhancement
<b>Planned Area of Mitigation<sup>2</sup></b>	1.01 acres	1.10 acres	0.91 acre

<sup>1</sup> Project impact numbers from USACE IP 200201342 (USACE 2002).

<sup>2</sup> Area of mitigation from the Revised Final Wetland Mitigation Plan (WSDOT 2004). Note: SR 522 Paradise Lake Road Northeast mitigation site provides partial compensation for impacts from the SR 522 Road Improvements Paradise Lake Road to Snohomish River Stage 2 – Roadway Widening State 4 – Fales Road Interchange project. The remaining compensation for this project is provided at the SR 522 Paradise Lake Road Northwest mitigation site.

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## Summary of Monitoring Results and Management Activities (2014)

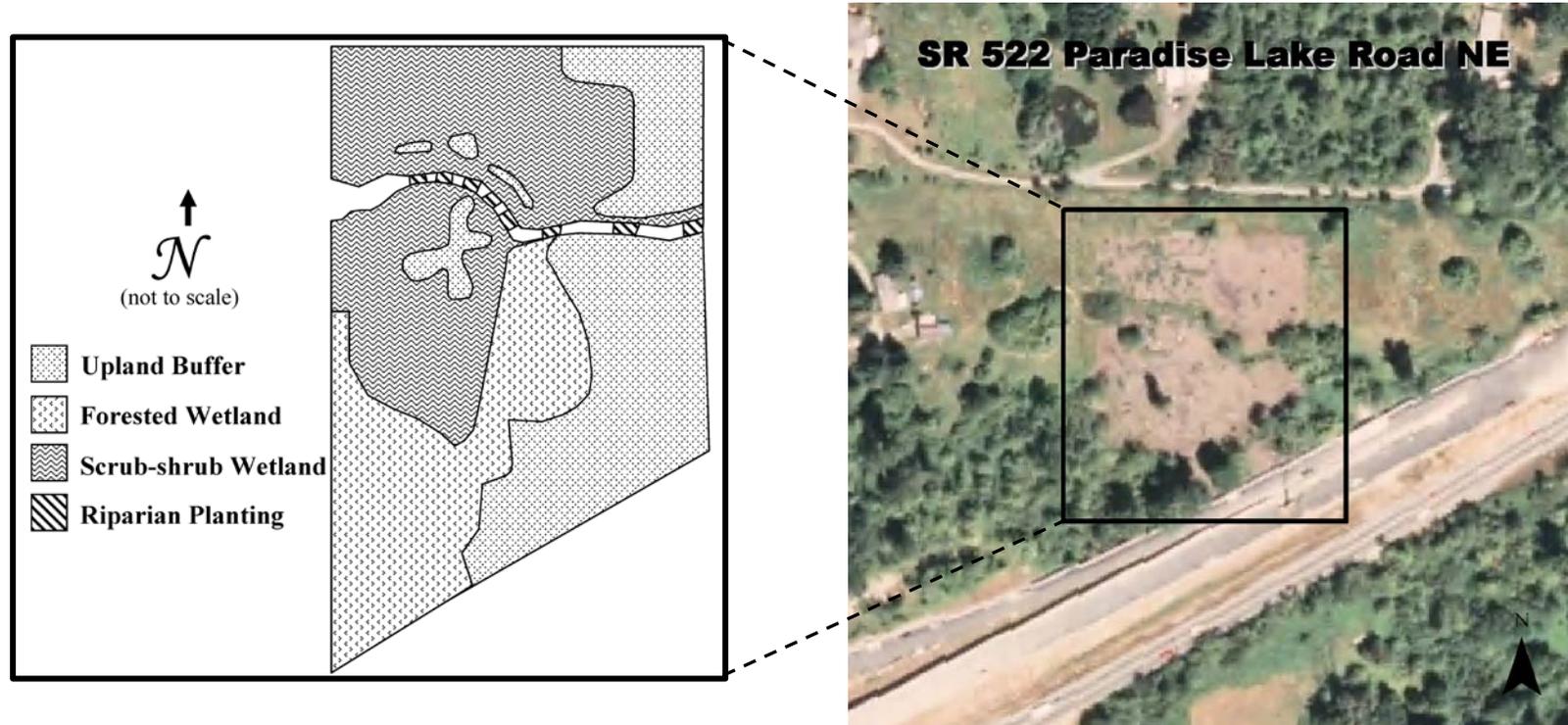
Performance Standards	2014 Results
Soils will be saturated to the surface, or standing water will be present in a monitoring well at 12 in below the surface or less for 12.5 percent of the growing season	Hydrology present (Appendix 2, Table 1)
Wetland areas will be delineated using current methods to assure that this Paradise Lake Rd Northeast site and the Paradise Lake Rd Northwest site combined contain 2.11 acres of new wetland (=1.01 acres established at NE site + 1.10 restored at NW site)	1.01 acres established wetland (NE site) and 2.04 acres restored wetland (NW site) = 3.05 acres total (Appendix 3)
50 percent or more cover native trees and shrub facultative or wetter species in the forested and scrub-shrub wetland	90-95% cover
Less than 10 percent cover non-native invasive species, [such as reed canarygrass ( <i>Phalaris arundinacea</i> ), non-native blackberries ( <i>Rubus</i> species), etc]	< 5% cover
35% or more cover native upland tree and shrub in the buffer communities	95% cover
Less than 10 percent cover non-native invasive species, [such as reed canarygrass, non-native blackberries, etc.] in the buffer	< 5% cover
Fencing and signage as shown on the plans is in place	Present

### Report Introduction

This report summarizes final-year (Year-10) monitoring activities at the State Route (SR) 522 Paradise Lake Road 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 August 5, assessments of wetland hydrology on March 18, April 3, and April 24, and a wetland delineation on June 16.

## What is the SR 522 Paradise Lake Road NE Mitigation Site?

This 3.02-acre mitigation site (Figure 1) is an enhanced wetland, enhanced buffer, and new wetland created on the north side of SR 522, east of Fales Road in Snohomish County. This site was created to compensate for the loss of 2.20 acres of wetland and 9.49 acres of buffer due to widening of SR 522 and construction of the Paradise Lake Road and Fales Road Interchanges. The wetland enhancement, buffer enhancement and created wetland are designed to provide mitigation for lost wetland functions including wildlife habitat, biological support, and flood/storm water control.



**Figure 1 Site Sketch**

The SR 522 Paradise Lake Road NE Mitigation Site contains an enhanced upland buffer area, enhanced and newly created forested and scrub-shrub wetland areas, and riparian plantings along Evans Creek. Appendix 1 includes site directions.

## What are the performance standards for this site?

### Year 10

#### Performance Standard 1

The soils will be saturated to the surface, or standing water will be present in a monitoring well at 12 inches below the surface or less, for a consecutive number of days greater than or equal to 12.5 percent of the growing season, for monitoring years 1-10. Indicators of wetland hydrology, listed in the *Washington State Wetlands Identification and Delineation Manual* (Ecology 1997) on pages 31-34, can be used to determine if this measurement has been achieved.

#### Performance Standard 2

The wetland areas will be delineated using current methods to assure that the Paradise Lake Rd Northeast and Paradise Lake Rd Northwest mitigation sites combined contain 2.11 acres of new wetland. [“new wetland” = 1.01 acres established wetland at the Paradise Lake Rd Northeast site + 1.10 acres restored wetland at the Paradise Lake Rd Northwest mitigation site]

#### Performance Standard 3

The native trees and shrub facultative or wetter species in the forested and scrub-shrub wetland communities will achieve 75 percent coverage.

#### Performance Standard 4

Non-native invasive species, [such as reed canarygrass, non-native blackberries, etc.] will not exceed 10 percent coverage in the Northeast mitigation site.

#### Performance Standard 5

The native upland trees and shrubs in the buffer communities will achieve 50 percent coverage.

#### Performance Standard 6

Non-native invasive species, [such as reed canarygrass, non-native blackberries, etc.] will not exceed 10 percent coverage in the buffer.

#### Performance Standard 7

Fencing and signage as shown on the plans is in place.

Appendix 1 shows the as-built planting plan (WSDOT 2004).

## 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), *the 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 Standards 1 and 2).

Vegetative cover in the forested and scrub-shrub wetlands communities and in the buffer was visually estimated (Performance Standards 3 and 5). Cover of invasive species in the entire site, as well as in just the buffer, was also visually estimated (Performance Standards 4 and 6).

For additional details on the methods, see the [WSDOT Wetland Mitigation Site Monitoring Methods Paper](#) (WSDOT 2008).

## **Is this site a success?**

This site is a success. Vegetative performance standards have been met for the sixth consecutive year in Year-10. This site has high cover of woody species and few invasive species in both the wetland and upland areas. Hydrology standards have also been met.

Intended functions for this site include wildlife habitat, runoff storage, production of organic materials, and infiltration and groundwater support functions. Successful achievement of the performance standards indicate that these functions are being supported on site. Deer and coyote tracks were seen on site.

Results for Performance Standard 1

(Saturation to the surface or standing water within 12 inches of the soil surface for 12.5% of the growing season):

In 2014, water was present within 12 inches of the soil surface in three out of four wells during all spring hydrology visits on March 18, April 3, and April 24 (Appendix 2, Table 1) (Photo 1). Water was present within 12 inches of the soil surface in well 4 on the third visit.

Results for Performance Standard 2

(2.11 acres of new wetland):

A delineation conducted in March 2014 indicated wetland acreage was 1.82 acres at this site, and 1.01 acres of this area was established wetland. The Paradise Lake Road NW site provides the remaining 1.81 acres of compensation included in 2.04 acres of delineated restored wetland. Appendix 3 contains the 2014 Wetland Delineation report for the Paradise Lake Rd Northeast site and the 2012 Wetland Delineation report for the Paradise Lake Rd Northwest site. The Paradise Lake Rd Northwest site is dynamic and changing due to beaver activity. The Paradise Lake Rd Northwest site will be delineated again in 2016.



**Photo 1  
Inundation in the wetland (April 2014)**

Results for Performance Standard 3

(75% or greater cover native trees and shrub facultative or wetter species in the forested and scrub-shrub wetland communities):

Cover remains high in the forested/scrub-shrub wetland, estimated at approximately 90-95 percent (Photo 2). This exceeds the performance standard target. The community is dominated by willows (*Salix* species) with salmonberry (*Rubus spectabilis*), hardhack (*Spiraea douglasii*), and Sitka spruce (*Picea sitchensis*) in the understory.

Results for Performance Standard 4

(Less than 10% cover non-native species in the mitigation site):

Cover is low, visually estimated at less than five percent. This meets the performance standard threshold. The species observed include reed canarygrass on the west side of the site where the creek flows out. Some small sprouts of Himalayan blackberry (*Rubus armeniacus*) were observed intermixed with some plantings.

Results for Performance Standard 5

(50% or more cover native upland trees and shrubs in the buffer communities):

The cover in the buffer is visually estimated at 95% (Photo 3). This exceeds the performance standard target. The overstory consists of red alder (*Alnus rubra*), with an understory of snowberry (*Symphoricarpos albus*), western red cedar (*Thuja plicata*), and tall oregongrape (*Mahonia aquifolium*).



**Photo 2**  
**Cover in the forested wetland (August 2014)**



**Photo 3**  
**Cover in the buffer (August 2014)**

Results for Performance Standard 6

(Less than 10% non-native species in the buffer):

The cover of invasive species in the buffer is low, visually estimated at less than 5%. This value is below the performance standard threshold.

Results for Performance Standard 7

(Fencing and signage as shown on the plans is in place):

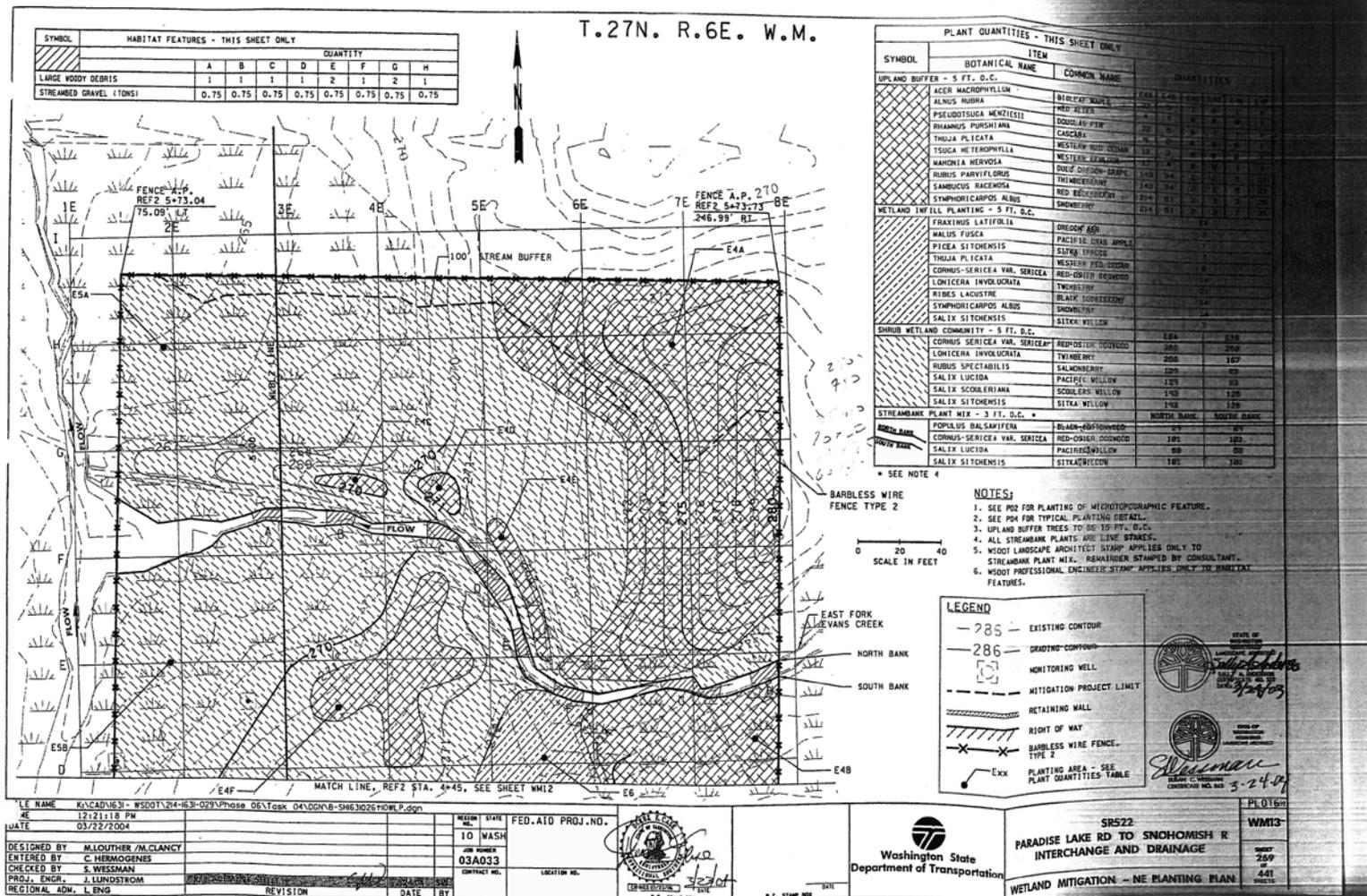
Fencing and signage is present, meeting the performance standard.

**What is planned for this site?**

Continued weed control in 2015.

# Appendix 1 – As-Built Planting Plan and Map of Hydrology Well Locations

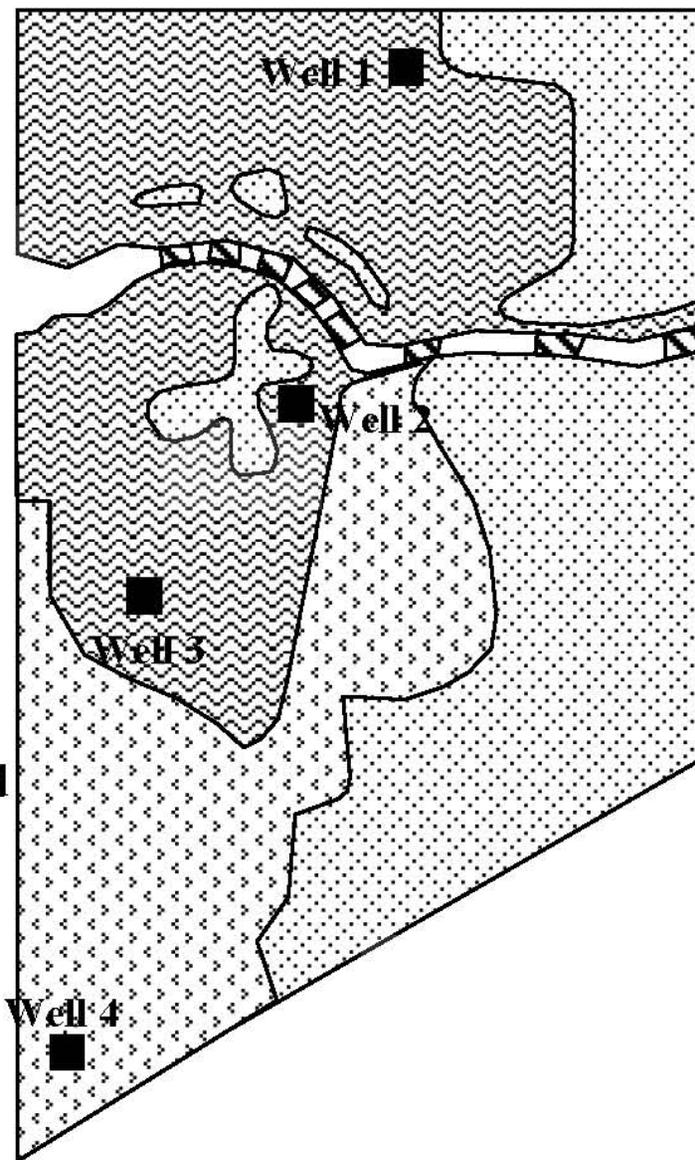
(from WSDOT 2004)





  
(not to scale)

-  Upland Buffer
-  Forested Wetland
-  Scrub-shrub Wetland
-  Riparian Planting



**Driving Directions:**

From I-5 take I-405 to SR 522 east. Exit SR 522 at Fales Road and go north under the overpass. Follow the path just north of the westbound exit ramp, about 200 meters, and the site is located north and east of your location.

## Appendix 2 – Data Table

Table 1 Hydrology Observations

Date	Surface Observations	Well #	Water Level (inches below soil surface unless otherwise noted)
March 18, 2014	All measured wells had water within 12” of the soil surface.	1	5.5
		2	7
		3	3.5
		4	No reading taken.
April 3, 2014	Wells 1-3 had water within 12” of the soil surface. Well 4 did not meet the performance standard during this visit.	1	7
		2	6
		3	<b>13.5</b>
		4	15
April 24, 2014	Site is saturated with small ponds of inundation. All wells had water within 12” of the soil surface.	1	4
		2	4
		3	3
		4	11.5

# Appendix 3 – Wetland Delineation Report

# **WETLAND DELINEATION REPORT**

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## **SR 522 Paradise Lake Road Northeast Mitigation Site**

**SR 522 Road Improvements  
Paradise Lake Road to Snohomish River  
Stage 2 – Roadway Widening  
Stage 4 – Fales Road Interchange**

USACE IP 200201342  
Ecology WQC Order DE 04 SEAHQ-1116

**Snohomish County, Washington**

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

**June 2014**



# Introduction

This report was prepared by the Washington State Department of Transportation (WSDOT) to describe the wetland boundary delineation for the SR 522 Paradise Lake Road Northeast mitigation site. Field work was conducted by WSDOT wetland biologists Tatiana Dreisbach and Tony Bush, on date. The delineation identifies 1.82 acres of wetland within the mitigation site boundaries.

General Information for the SR 522 Paradise Lake Road Northeast mitigation site		
<b>Location:</b>	S20, T27N, R6E. Snohomish County. (Vicinity map, Figure 1)	
	<b>USACE IP Number</b>	200201342
	<b>Long./Lat. ID Number</b>	1220746478150
	<b>Land Resource Region (LRR)</b>	A
	<b>Major Land Resource Area (MLRA)</b>	2
	<b>Construction Date</b>	2004
	<b>Monitoring Period</b>	2005-2014
	<b>Year of Monitoring</b>	10 of 10 (in 2014)
<b>Area of Project Impact<sup>1</sup></b>	2.27 acres	
<b>Type of Mitigation</b>	<b>Intended Area (acres)</b>	
Establishment	1.01 acres	
Enhancement	1.10 acres	
<b>Total Intended Wetland Mitigation Area<sup>2</sup></b>	2.11 acres	
<b>Total Delineated Wetland Area</b>	1.82 acres	

<sup>1</sup> Project impact numbers from USACE IP 200201342 (USACE 2002).

<sup>2</sup> Area of mitigation from the Revised Final Wetland Mitigation Plan (WSDOT 2004).

Note: SR 522 Paradise Lake Road Northeast mitigation site provides partial compensation for impacts from the SR 522 Road Improvements Paradise Lake Road to Snohomish River Stage 2 – Roadway Widening Stage 4 – Fales Road Interchange project. The remaining compensation for this project is provided at the SR 522 Paradise Lake Road Northwest mitigation site.



# Methods

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Wetland boundaries within the SR 522 Paradise Lake Road Northeast mitigation site were delineated using routine methods described in the:

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

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

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

## Wetland Delineation and Study Area

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### Study Area

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

### Wetlands

Delineation data were collected at seven 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. The delineation determined 1.82 acres of wetland were present within the SR 522 Paradise Lake Road Northeast mitigation site.

### 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. The two months prior to field work were wetter than normal, with the third prior month within the normal range (Appendix B-1).

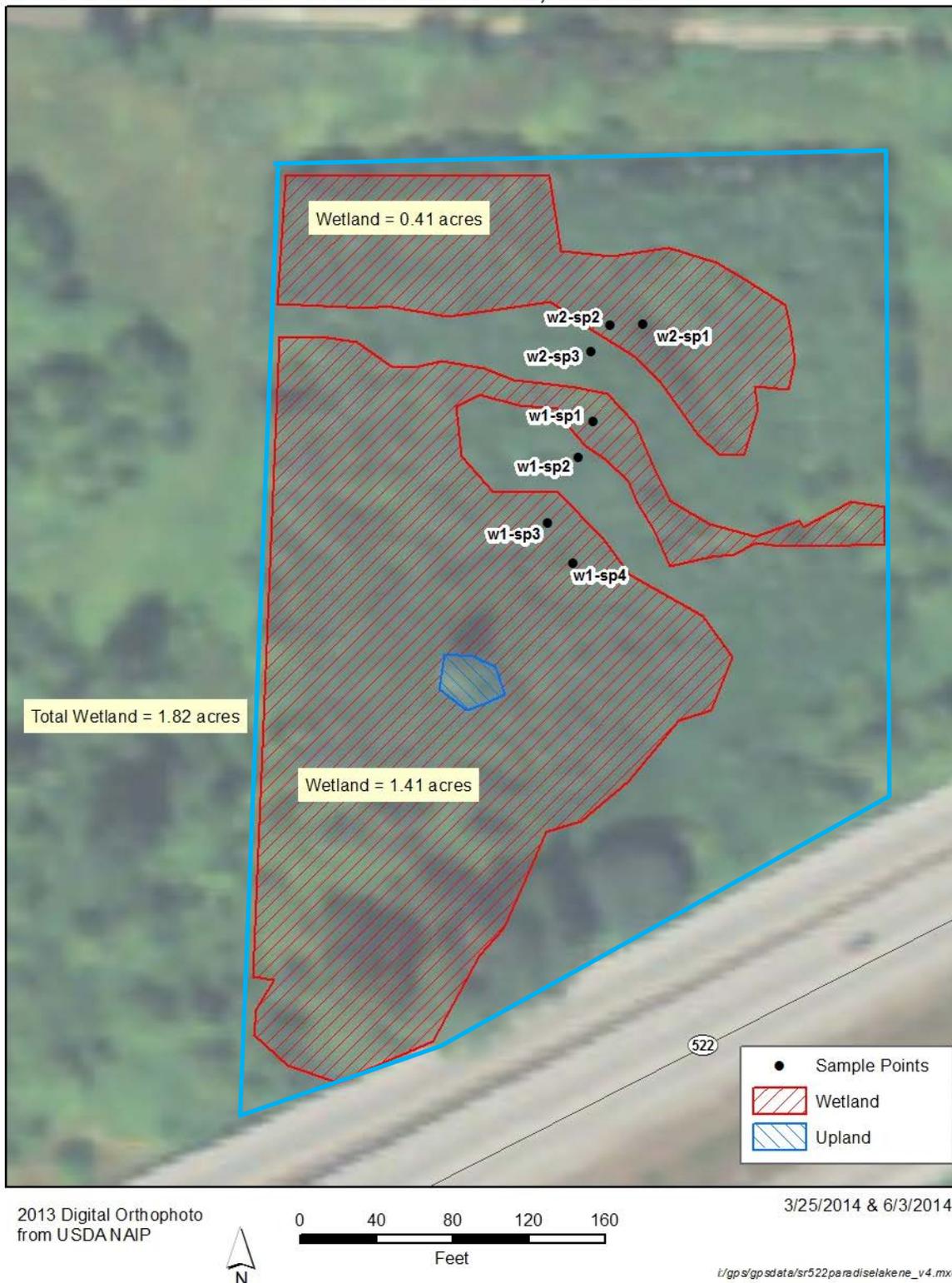
Moderate precipitation was recorded in the ten days preceding field work (Appendix B-2).

### Growing Season

The following evidence of the growing season was observed at the time of the delineation:

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

# GPS Data -SR 522 Paradise Lake NE, 3/24/2014



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

SR 522 Paradise Lake Road Northeast Mitigation Site – Wetland Delineation Summary		
<b>Total Delineated Wetland Area</b>	1.82 acres	
	<b>Wetland Determination Data Form(s)</b>	Appendix A; Sampling Point W1-SP1, W1-SP3, W1-SP4, W2-SP1, and W2-SP2
	<b>Upland Determination Data Form(s)</b>	Appendix A; Sampling Point W1-SP2 and W2-SP3
	<b>Delineator(s)</b>	Tatiana Dreisbach, Tony Bush
	<b>Delineation Date</b>	March 24, 2014
<b>Vegetation</b>	Trees – Pacific willow ( <i>Salix lasiandra</i> ), red alder ( <i>Alnus rubra</i> ) Shrubs – twinberry honeysuckle ( <i>Lonicera involucrata</i> ), Herbs – woolgrass ( <i>Scirpus cyperinus</i> ), slough sedge ( <i>Carex obnupta</i> ), colonial bentgrass ( <i>Agrostis capillaris</i> ), creeping buttercup ( <i>Ranunculus repens</i> ), shortawn foxtail ( <i>Alopecurus aequalis</i> ), largeleaf avens ( <i>Geum macrophyllum</i> )	
<b>Soils</b>	Soils examined to a depth of 16 inches exhibited hydric characteristics. Matrix colors of 10YR 2/1, 2.5Y 5/2, and 2.5Y 4/2 were observed. Redoximorphic concentrations and depletions were observed in some layers. Indicators Depleted Below Dark Surface (A11), Depleted Matrix (F3), and Redox Dark Surface (F6).	
<b>Hydrology</b>	Water in the observation pits ranged from 0 inches (at the soil surface) to 11 inches below the surface. Surface water to greater than 8 inches deep was observed in some areas. A high groundwater table appears to be the main source of hydrology. Precipitation and hydrologic inputs from the small creek also contribute to the hydrologic regime of this wetland.	
<b>Rationale for Delineation</b>	Positive indicators of all three wetland criteria are present. Placement of boundary determined mainly by presence/absence of “Group A hydrology indicators” and hydric soil indicators. Wetter than normal precipitation conditions were present prior to field work (Appendix B-1). Direct observation of water generally correlated with hydric soils. Upland areas directly adjacent to the wetland boundary lacked hydrology indicators and had soils with Chroma 3 (which does not meet an indicator).	

## Limitations

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

# References

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1. Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Vicksburg (MS): US Army Engineer Waterways Experiment Station. Technical Report Y-87-1. Available from: <http://el.ercd.usace.army.mil/elpubs/pdf/wlman87.pdf>
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7. [USACE] US Army Corps of Engineers. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0), ed. Wakeley JS, Lichvar RW, Noble CV, editors. Vicksburg (MS): US Army Engineer Research and Development Center. ERDC/EL TR-10-3. Available at: [http://www.usace.army.mil/Portals/2/docs/civilworks/regulatory/reg\\_supp/west\\_mt\\_finals\\_upp.pdf](http://www.usace.army.mil/Portals/2/docs/civilworks/regulatory/reg_supp/west_mt_finals_upp.pdf)
8. [WSDOT] Washington State Department of Transportation. 2004. Revised Final Wetland Mitigation Plan SR 522 Road Improvements Paradise Lake Road to Snohomish River Stage 2 – Roadway Widening Stage 4 – Fales Road Interchange. Parametrix for Washington State Department of Transportation, Northwest Region. P. 5-5.
9. [WSDOT] Washington State Department of Transportation. 2014. Wetland Delineation and Assessment [Internet]. Olympia (WA): Environmental Services Office. [cited 2014 June 3]. Available at: <http://www.wsdot.wa.gov/Environment/Wetlands/Delineation.htm>

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

Wetland Delineation Data Forms for:

W1-SP1

W1-SP2

W1-SP3

W1-SP4

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 522 Paradise Lake Rd NE City/County: n/a / King Sampling Date: 24-Mar-14  
 Applicant/Owner: WSDOT State: WA Sampling Point: W1-SP1  
 Investigator(s): Tony Bush, Tatiana Dreisbach Section, Township, Range: S 20 T 27N R 6E  
 Landform (hillslope, terrace, etc.): Bench Local relief (concave, convex, none): flat Slope: 2.0 % / 1.1 °  
 Subregion (LRR): LRR A Lat.: 47.816 Long.: -122.074 Datum: NAD83HARN  
 Soil Map Unit Name: Alerwood gravelly sandy loam, 2 to 8 percent slopes 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 <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 precipitation conditions were present prior to field work (Appendix B-1).

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

	Absolute % Cover	Rel.Strat. Cover	Indicator Status	
<b>Tree Stratum</b> (Plot size: 5 x 20 feet )				
1. <u>Salix lasiandra</u>	90	<input checked="" type="checkbox"/> 100.0%	FACW	<b>Dominance Test worksheet:</b> Number of Dominant Species That are OBL, FACW, or FAC: <u>3</u> (A)  Total Number of Dominant Species Across All Strata: <u>3</u> (B)  Percent of dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)
2. _____	0	<input type="checkbox"/> 0.0%		
3. _____	0	<input type="checkbox"/> 0.0%		
4. _____	0	<input type="checkbox"/> 0.0%		
	90	= Total Cover		
<b>Sapling/Shrub Stratum</b> (Plot size: 5 x 15 feet )				
1. _____	0	<input type="checkbox"/> 0.0%		<b>Prevalence Index worksheet:</b> Total % Cover of:      Multiply by: OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>90</u> x 2 = <u>180</u> FAC species <u>40</u> x 3 = <u>120</u> FACU species <u>0</u> x 4 = <u>0</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>130</u> (A) <u>300</u> (B)  Prevalence Index = B/A = <u>2.308</u>
2. _____	0	<input type="checkbox"/> 0.0%		
3. _____	0	<input type="checkbox"/> 0.0%		
4. _____		<input type="checkbox"/> 0.0%		
5. _____		<input type="checkbox"/> 0.0%		
	0	= Total Cover		
<b>Herb Stratum</b> (Plot size: 5 x 5 feet )				
1. <u>Agrostis capillaris</u>	20	<input checked="" type="checkbox"/> 50.0%	FAC	<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> 1 - Rapid Test for Hydrologic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is > 50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 - Wetland Non-Vascular Plants <sup>1</sup> <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)  <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Ranunculus repens</u>	10	<input checked="" type="checkbox"/> 25.0%	FAC	
3. <u>Cardamine oligosperma</u>	5	<input type="checkbox"/> 12.5%	FAC	
4. <u>Geum macrophyllum</u>	5	<input type="checkbox"/> 12.5%	FAC	
5. _____	0	<input type="checkbox"/> 0.0%		
6. _____	0	<input type="checkbox"/> 0.0%		
7. _____	0	<input type="checkbox"/> 0.0%		
8. _____	0	<input type="checkbox"/> 0.0%		
9. _____	0	<input type="checkbox"/> 0.0%		
10. _____	0	<input type="checkbox"/> 0.0%		
11. _____	0	<input type="checkbox"/> 0.0%		
	40	= Total Cover		
<b>Woody Vine Stratum</b> (Plot size: 5 x 5 feet )				
1. _____		<input type="checkbox"/> 0.0%		
2. _____		<input type="checkbox"/> 0.0%		
	0	= Total Cover		
<b>% Bare Ground in Herb Stratum:</b> <u>60</u>				

**Remarks:**

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

**Soil**

Sampling Point: W1-SP1

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

Depth (inches)	Matrix			Redox Features				Texture	Remarks	
	Color (moist)		%	Color (moist)		%	Type <sup>1</sup>			Loc <sup>2</sup>
0-16	2.5Y	2/1	85	7.5YR	4/6	10	C	M	Sandy Loam	Concentration is prominent.
+mottle				10YR	3/1	5	D	M		

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

**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<sup>3</sup>:**

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

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

**Restrictive Layer (if present):**

Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

**Hydric Soil Present?** Yes  No

Remarks:

**Hydrology**

**Wetland Hydrology Indicators:**

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

**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:

Water table would likely rise and equilibrate if more time elapsed between digging the pit and recording the information on the data sheet (observations were recorded within 10 minutes of excavating the pit).

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

Project/Site: SR 522 Paradise Lake Rd NE City/County: n/a / King Sampling Date: 24-Mar-14  
 Applicant/Owner: WSDOT State: WA Sampling Point: W1-SP2  
 Investigator(s): Tony Bush, Tatiana Dreisbach Section, Township, Range: S 20 T 27N R 6E  
 Landform (hillslope, terrace, etc.): Hillside Local relief (concave, convex, none): convex Slope: 5.0 % / 2.9 °  
 Subregion (LRR): LRR A Lat.: 47.816 Long.: -122.074 Datum: NAD83HARN

Soil Map Unit Name: Alerwood gravelly sandy loam, 2 to 8 percent slopes 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"/>
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**Remarks:**  
 Wetter than normal precipitation conditions were present prior to field work (Appendix B-1).

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

	Absolute % Cover	Rel.Strat. Cover	Indicator Status	
<b>Tree Stratum</b> (Plot size: <u>5 x 20 feet</u> )				
1. <u>Alnus rubra</u>	70	<input checked="" type="checkbox"/> 100.0%	FAC	<b>Dominance Test worksheet:</b> Number of Dominant Species That are OBL, FACW, or FAC: <u>3</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>75.0%</u> (A/B)
2. _____	0	<input type="checkbox"/> 0.0%		
3. _____	0	<input type="checkbox"/> 0.0%		
4. _____	0	<input type="checkbox"/> 0.0%		
	70	<b>= Total Cover</b>		
<b>Sapling/Shrub Stratum</b> (Plot size: <u>5 x 15 feet</u> )				
1. <u>Alnus rubra</u>	40	<input checked="" type="checkbox"/> 55.6%	FAC	<b>Prevalence Index worksheet:</b> Total % Cover of:      Multiply by: OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>145</u> x 3 = <u>435</u> FACU species <u>27</u> x 4 = <u>108</u> UPL species <u>0</u> x 5 = <u>0</u> Column Total s: <u>172</u> (A) <u>543</u> (B)  Prevalence Index = B/A = <u>3.157</u>
2. <u>Symphoricarpos albus</u>	25	<input checked="" type="checkbox"/> 34.7%	FACU	
3. <u>Rubus spectabilis</u>	5	<input type="checkbox"/> 6.9%	FAC	
4. <u>Rubus armeniacus</u>	2	<input type="checkbox"/> 2.8%	FACU	
5. _____	0	<input type="checkbox"/> 0.0%		
	72	<b>= Total Cover</b>		
<b>Herb Stratum</b> (Plot size: <u>5 x 5 feet</u> )				
1. <u>Ranunculus repens</u>	30	<input checked="" type="checkbox"/> 100.0%	FAC	<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> 1 - Rapid Test for Hydrologic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is > 50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 - Wetland Non-Vascular Plants <sup>1</sup> <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)  <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. _____	0	<input type="checkbox"/> 0.0%		
3. _____	0	<input type="checkbox"/> 0.0%		
4. _____	0	<input type="checkbox"/> 0.0%		
5. _____	0	<input type="checkbox"/> 0.0%		
6. _____	0	<input type="checkbox"/> 0.0%		
7. _____	0	<input type="checkbox"/> 0.0%		
8. _____	0	<input type="checkbox"/> 0.0%		
9. _____	0	<input type="checkbox"/> 0.0%		
10. _____	0	<input type="checkbox"/> 0.0%		
11. _____	0	<input type="checkbox"/> 0.0%		
	30	<b>= Total Cover</b>		
<b>Woody Vine Stratum</b> (Plot size: <u>5 x 5 feet</u> )				
1. _____		<input type="checkbox"/> 0.0%		<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="radio"/> No <input type="radio"/>
2. _____		<input type="checkbox"/> 0.0%		
	0	<b>= Total Cover</b>		
<b>% Bare Ground in Herb Stratum:</b> <u>70</u>				

**Remarks:**

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

**Soil**

Sampling Point: W1-SP2

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

Depth (inches)	Matrix			Redox Features				Texture	Remarks
	Color (moist)	%	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-1	10YR	2/2	100					Silt Loam	
1-16	10YR	4/3	80	2.5Y	6/2	10	D	M	Silt Loam
+mottle				10YR	5/6	10	C	M	Concentration is distinct

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

<b>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</b>		<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b>
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 2 cm Muck (A10)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except in MLRA 1)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input 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)	

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

**Restrictive Layer (if present):**  
 Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

**Hydric Soil Present?**    Yes     No

Remarks:  
 Matrix color in the second layer is too bright to meet an indicator.

**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 type="checkbox"/> FAC-neutral Test (D5)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost Heave Hummocks (D7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		

**Field Observations:**

Surface Water Present?	Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches): <input type="text"/>	<b>Wetland Hydrology Present?</b> Yes <input 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:  
 \_\_\_\_\_  
 \_\_\_\_\_

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

Project/Site: SR 522 Paradise Lake Rd NE City/County: n/a / King Sampling Date: 24-Mar-14  
 Applicant/Owner: WSDOT State: WA Sampling Point: W1-SP3  
 Investigator(s): Tony Bush, Tatiana Dreisbach Section, Township, Range: S 20 T 27N R 6E  
 Landform (hillslope, terrace, etc.): Hillside Local relief (concave, convex, none): concave Slope: 5.0 % / 2.9 °  
 Subregion (LRR): LRR A Lat.: 47.816 Long.: -122.074 Datum: NAD83HARN  
 Soil Map Unit Name: Alerwood gravelly sandy loam, 2 to 8 percent slopes 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 <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 precipitation conditions were present prior to field work (Appendix B-1).

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

Stratum	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	Dominance Test worksheet:
<b>Tree Stratum</b> (Plot size: <u>15 x 15 feet</u> )				Number of Dominant Species That are OBL, FACW, or FAC: <u>3</u> (A)  Total Number of Dominant Species Across All Strata: <u>3</u> (B)  Percent of dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)
1. <u>Alnus rubra</u>	70	<input checked="" type="checkbox"/> 100.0%	FAC	
2. _____		<input type="checkbox"/> 0.0%		
3. _____		<input type="checkbox"/> 0.0%		
4. _____		<input type="checkbox"/> 0.0%		
	70	<b>= Total Cover</b>		
<b>Sapling/Shrub Stratum</b> (Plot size: <u>5 x 15 feet</u> )				<b>Prevalence Index worksheet:</b> Total % Cover of:      Multiply by: OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>100</u> x 3 = <u>300</u> FACU species <u>0</u> x 4 = <u>0</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>100</u> (A) <u>300</u> (B) Prevalence Index = B/A = <u>3.000</u>
1. <u>Lonicera involucrata</u>	20	<input checked="" type="checkbox"/> 66.7%	FAC	
2. <u>Alnus rubra</u>	10	<input checked="" type="checkbox"/> 33.3%	FAC	
3. _____		<input type="checkbox"/> 0.0%		
4. _____		<input type="checkbox"/> 0.0%		
5. _____		<input type="checkbox"/> 0.0%		
	30	<b>= Total Cover</b>		
<b>Herb Stratum</b> (Plot size: <u>5 x 5 feet</u> )				
1. _____		<input type="checkbox"/> 0.0%		
2. _____		<input type="checkbox"/> 0.0%		
3. _____		<input type="checkbox"/> 0.0%		
4. _____		<input type="checkbox"/> 0.0%		
5. _____		<input type="checkbox"/> 0.0%		
6. _____		<input type="checkbox"/> 0.0%		
7. _____		<input type="checkbox"/> 0.0%		
8. _____		<input type="checkbox"/> 0.0%		
9. _____		<input type="checkbox"/> 0.0%		
10. _____		<input type="checkbox"/> 0.0%		
11. _____		<input type="checkbox"/> 0.0%		
	0	<b>= Total Cover</b>		
<b>Woody Vine Stratum</b> (Plot size: <u>5 x 5 feet</u> )				
1. _____		<input type="checkbox"/> 0.0%		
2. _____		<input type="checkbox"/> 0.0%		
	0	<b>= Total Cover</b>		
<b>% Bare Ground in Herb Stratum:</b> <u>100</u>				

**Hydrophytic Vegetation Indicators:**  
 1 - Rapid Test for Hydrologic Vegetation  
 2 - Dominance Test is > 50%  
 3 - Prevalence Index is ≤ 3.0<sup>1</sup>  
 4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 5 - Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup> 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			Redox Features				Texture	Remarks
	Color (moist)		%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-3	10YR	2/1	100					Sandy Loam	
3-16	2.5Y	5/2	60	2.5Y	7/1	20	D	Sandy Loam	
+mottle				7.5YR	5/8	20	C	M	Concentration is prominent

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

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

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b>
<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 checked="" type="checkbox"/> Depleted Below Dark Surface (A11)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Sandy Muck Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox depressions (F8)	

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

**Restrictive Layer (if present):**  
 Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

**Hydric Soil Present?**    Yes     No

Remarks:

**Hydrology**

**Wetland Hydrology Indicators:**

<b>Primary Indicators (minimum of one required; check all that apply)</b>		<b>Secondary Indicators (minimum of two required)</b>
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
<input 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 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 type="checkbox"/> FAC-neutral Test (D5)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost Heave Hummocks (D7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		

**Field Observations:**

Surface Water Present?	Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches):	<input type="text"/>	<b>Wetland Hydrology Present?</b> Yes <input checked="" type="radio"/> No <input type="radio"/>
Water Table Present?	Yes <input checked="" type="radio"/> No <input type="radio"/>	Depth (inches):	<input type="text" value="3"/>	
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:  
 Water table would likely rise and equilibrate if more time elapsed between digging the pit and recording the information on the data sheet (observations were recorded within 10 minutes of excavating the pit).

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

Project/Site: SR 522 Paradise Lake Rd NE City/County: n/a / King Sampling Date: 24-Mar-14  
 Applicant/Owner: WSDOT State: WA Sampling Point: W1-SP4  
 Investigator(s): Tony Bush, Tatiana Dreisbach Section, Township, Range: S 20 T 27N R 6E  
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): concave Slope: 2.0 % / 1.1 °  
 Subregion (LRR): LRR A Lat.: 47.816 Long.: -122.074 Datum: NAD83HARN  
 Soil Map Unit Name: Alerwood gravelly sandy loam, 2 to 8 percent slopes 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 <input checked="" type="radio"/> No <input type="radio"/>	Is the Sampled Area within a Wetland? 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"/>	

**Remarks:**  
 Wetter than normal precipitation conditions were present prior to field work (Appendix B-1). This sample point characterizes the small, deeper, Carex obnupta depressions within Wetland 1.

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

Tree Stratum (Plot size: 5 x 15 ft)	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	Dominance Test worksheet:
1. <u>Alnus rubra</u>	80	<input checked="" type="checkbox"/> 100.0%	FAC	Number of Dominant Species That are OBL, FACW, or FAC: <u>3</u> (A)
2. _____	0	<input type="checkbox"/> 0.0%		Total Number of Dominant Species Across All Strata: <u>3</u> (B)
3. _____	0	<input type="checkbox"/> 0.0%		Percent of dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)
4. _____	0	<input type="checkbox"/> 0.0%		
	80	<b>= Total Cover</b>		
Sapling/Shrub Stratum (Plot size: 5 x 15 feet)	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	Prevalence Index worksheet:
1. <u>Lonicera involucrata</u>	15	<input checked="" type="checkbox"/> 100.0%	FAC	Total % Cover of: Multiply by:
2. _____	0	<input type="checkbox"/> 0.0%		OBL species <u>70</u> x 1 = <u>70</u>
3. _____	0	<input type="checkbox"/> 0.0%		FACW species <u>0</u> x 2 = <u>0</u>
4. _____	0	<input type="checkbox"/> 0.0%		FAC species <u>95</u> x 3 = <u>285</u>
5. _____	0	<input type="checkbox"/> 0.0%		FACU species <u>0</u> x 4 = <u>0</u>
	15	<b>= Total Cover</b>		UPL species <u>0</u> x 5 = <u>0</u>
Herb Stratum (Plot size: 5 x 5 ft)	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	Column Totals: <u>165</u> (A) <u>355</u> (B)
1. <u>Carex obnupta</u>	70	<input checked="" type="checkbox"/> 100.0%	OBL	Prevalence Index = B/A = <u>2.152</u>
2. _____	0	<input type="checkbox"/> 0.0%		
3. _____	0	<input type="checkbox"/> 0.0%		
4. _____	0	<input type="checkbox"/> 0.0%		
5. _____	0	<input type="checkbox"/> 0.0%		
6. _____	0	<input type="checkbox"/> 0.0%		
7. _____	0	<input type="checkbox"/> 0.0%		
8. _____	0	<input type="checkbox"/> 0.0%		
9. _____	0	<input type="checkbox"/> 0.0%		
10. _____	0	<input type="checkbox"/> 0.0%		
11. _____	0	<input type="checkbox"/> 0.0%		
	70	<b>= Total Cover</b>		
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	Hydrophytic Vegetation Indicators:
1. _____	0	<input type="checkbox"/> 0.0%		<input type="checkbox"/> 1 - Rapid Test for Hydrologic Vegetation
2. _____	0	<input type="checkbox"/> 0.0%		<input checked="" type="checkbox"/> 2 - Dominance Test is > 50%
	0	<b>= Total Cover</b>		<input checked="" type="checkbox"/> 3 - Prevalence Index is ≤ 3.0 <sup>1</sup>
				<input type="checkbox"/> 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
				<input type="checkbox"/> 5 - Wetland Non-Vascular Plants <sup>1</sup>
				<input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
				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-SP4

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		

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

<b>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</b>		<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b>
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 2 cm Muck (A10)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except in MLRA 1)	<input checked="" 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)	

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

**Restrictive Layer (if present):**  
 Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

**Hydric Soil Present?**    Yes     No

Remarks:  
 Soil pit not excavated due to inundation. Soils meet the definition of a hydric soil due to prolonged inundation during the growing season.

**Hydrology**

**Wetland Hydrology Indicators:**

<b>Primary Indicators (minimum of one required; check all that apply)</b>		<b>Secondary Indicators (minimum of two required)</b>
<input 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 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="8"/>	<b>Wetland Hydrology Present?</b> 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 522 Paradise Lake Rd NE City/County: n/a / King Sampling Date: 24-Mar-14  
 Applicant/Owner: WSDOT State: WA Sampling Point: W2-SP1  
 Investigator(s): Tony Bush, Tatiana Dreisbach Section, Township, Range: S 20 T 27N R 6E  
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): concave Slope: 3.0 % / 1.7 °  
 Subregion (LRR): LRR A Lat.: 47.816 Long.: -122.074 Datum: NAD83HARN  
 Soil Map Unit Name: Alerwood gravelly sandy loam, 2 to 8 percent slopes 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 precipitation conditions were present prior to field work (Appendix B-1). ALAQ is assumed based on vegetation habit and vegetation. No inflorescence available for identification.

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

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	
<b>Tree Stratum</b> (Plot size: <u>15 x 15 ft</u> )				<b>Dominance Test worksheet:</b> Number of Dominant Species That are OBL, FACW, or FAC: <u>3</u> (A)  Total Number of Dominant Species Across All Strata: <u>3</u> (B)  Percent of dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)
1. _____	0	<input type="checkbox"/> 0.0%	_____	
2. _____	0	<input type="checkbox"/> 0.0%	_____	
3. _____	0	<input type="checkbox"/> 0.0%	_____	
4. _____	0	<input type="checkbox"/> 0.0%	_____	
0 = Total Cover				
<b>Sapling/Shrub Stratum</b> (Plot size: <u>15 x 15ft</u> )				<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species <u>5</u> x 1 = <u>5</u> FACW species <u>60</u> x 2 = <u>120</u> FAC species <u>7</u> x 3 = <u>21</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>72</u> (A) <u>146</u> (B)  Prevalence Index = B/A = <u>2.028</u>
1. <u>Salix lasiandra</u>	60	<input checked="" type="checkbox"/> 100.0%	FACW	
2. _____	0	<input type="checkbox"/> 0.0%	_____	
3. _____	0	<input type="checkbox"/> 0.0%	_____	
4. _____	0	<input type="checkbox"/> 0.0%	_____	
5. _____	0	<input type="checkbox"/> 0.0%	_____	
60 = Total Cover				
<b>Herb Stratum</b> (Plot size: <u>5 x 5 ft</u> )				<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> 1 - Rapid Test for Hydrologic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is > 50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 - Wetland Non-Vascular Plants <sup>1</sup> <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)  <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Ranunculus repens</u>	7	<input checked="" type="checkbox"/> 58.3%	FAC	
2. <u>Alopecurus aequalis</u>	5	<input checked="" type="checkbox"/> 41.7%	OBL	
3. _____	0	<input type="checkbox"/> 0.0%	_____	
4. _____	0	<input type="checkbox"/> 0.0%	_____	
5. _____	0	<input type="checkbox"/> 0.0%	_____	
6. _____	0	<input type="checkbox"/> 0.0%	_____	
7. _____	0	<input type="checkbox"/> 0.0%	_____	
8. _____	0	<input type="checkbox"/> 0.0%	_____	
9. _____	0	<input type="checkbox"/> 0.0%	_____	
10. _____	0	<input type="checkbox"/> 0.0%	_____	
11. _____	0	<input type="checkbox"/> 0.0%	_____	
12 = Total Cover				
<b>Woody Vine Stratum</b> (Plot size: _____)				
1. _____		<input type="checkbox"/> 0.0%	_____	
2. _____		<input type="checkbox"/> 0.0%	_____	
0 = Total Cover				
<b>% Bare Ground in Herb Stratum:</b> <u>0</u>				

**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		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		

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

<b>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</b>		<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b>
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 2 cm Muck (A10)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except in MLRA 1)	<input checked="" 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)	

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

**Restrictive Layer (if present):**  
 Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

**Hydric Soil Present?**    Yes     No

Remarks:  
 Soil pit not excavated due to inundation. Soils meet the definition of a hydric soil due to prolonged inundation during the growing season.

**Hydrology**

**Wetland Hydrology Indicators:**

<b>Primary Indicators (minimum of one required; check all that apply)</b>		<b>Secondary Indicators (minimum of two required)</b>
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)	<input checked="" 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 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 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="4"/>	<b>Wetland Hydrology Present?</b> 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 522 Paradise Lake Rd NE City/County: n/a / King Sampling Date: 24-Mar-14  
 Applicant/Owner: WSDOT State: WA Sampling Point: W2-SP2  
 Investigator(s): Tony Bush, Tatiana Dreisbach Section, Township, Range: S 20 T 27N R 6E  
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): concave Slope: 5.0 % / 2.9 °  
 Subregion (LRR): LRR A Lat.: 47.816 Long.: -122.074 Datum: NAD83HARN  
 Soil Map Unit Name: Alerwood gravelly sandy loam, 2 to 8 percent slopes 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 <input checked="" type="radio"/> No <input type="radio"/> Hydric Soil Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="radio"/> No <input type="radio"/>
---	---

**Remarks:**  
 Wetter than normal precipitation conditions were present prior to field work (Appendix B-1).

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

	Absolute % Cover	Rel.Strat. Cover	Indicator Status	
<b>Tree Stratum</b> (Plot size: 5 x 20 feet )				
1. <u>Alnus rubra</u>	35	<input checked="" type="checkbox"/> 100.0%	FAC	<b>Dominance Test worksheet:</b> 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. _____	0	<input type="checkbox"/> 0.0%		
3. _____	0	<input type="checkbox"/> 0.0%		
4. _____	0	<input type="checkbox"/> 0.0%		
	35	<b>= Total Cover</b>		
<b>Sapling/Shrub Stratum</b> (Plot size: 5 x 15 feet )				
1. <u>Lonicera involucrata</u>	10	<input type="checkbox"/> 15.4%	FAC	<b>Prevalence Index worksheet:</b> Total % Cover of:      Multiply by: <b>OBL species</b> <u>0</u> x 1 = <u>0</u> <b>FACW species</b> <u>15</u> x 2 = <u>30</u> <b>FAC species</b> <u>132</u> x 3 = <u>396</u> <b>FACU species</b> <u>0</u> x 4 = <u>0</u> <b>UPL species</b> <u>0</u> x 5 = <u>0</u> <b>Column Totals:</b> <u>147</u> (A) <u>426</u> (B)  Prevalence Index = B/A = <u>2.898</u>
2. <u>Alnus rubra</u>	40	<input checked="" type="checkbox"/> 61.5%	FAC	
3. <u>Salix lasiandra</u>	15	<input checked="" type="checkbox"/> 23.1%	FACW	
4. _____	0	<input type="checkbox"/> 0.0%		
5. _____	0	<input type="checkbox"/> 0.0%		
	65	<b>= Total Cover</b>		
<b>Herb Stratum</b> (Plot size: 5 x 5 feet )				
1. <u>Agrostis capillaris</u>	40	<input checked="" type="checkbox"/> 85.1%	FAC	<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> 1 - Rapid Test for Hydrologic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is > 50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 - Wetland Non-Vascular Plants <sup>1</sup> <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)  <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Geum macrophyllum</u>	2	<input type="checkbox"/> 4.3%	FAC	
3. <u>Ranunculus repens</u>	5	<input type="checkbox"/> 10.6%	FAC	
4. _____	0	<input type="checkbox"/> 0.0%		
5. _____	0	<input type="checkbox"/> 0.0%		
6. _____	0	<input type="checkbox"/> 0.0%		
7. _____	0	<input type="checkbox"/> 0.0%		
8. _____	0	<input type="checkbox"/> 0.0%		
9. _____	0	<input type="checkbox"/> 0.0%		
10. _____	0	<input type="checkbox"/> 0.0%		
11. _____	0	<input type="checkbox"/> 0.0%		
	47	<b>= Total Cover</b>		
<b>Woody Vine Stratum</b> (Plot size: 5 x 5 feet )				
1. _____		<input type="checkbox"/> 0.0%		<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="radio"/> No <input type="radio"/>
2. _____		<input type="checkbox"/> 0.0%		
	0	<b>= Total Cover</b>		
<b>% Bare Ground in Herb Stratum:</b> <u>53</u>				

**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			Redox Features					Texture	Remarks
	Color (moist)		%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>			
0-3	2.5Y	2/1	100						Silt Loam	
3-9	2.5Y	4/2	75	7.5YR	5/8	20	C	M	Silt Loam	Concentration is prominent
+mottle				2.5Y	5/1	5	D	M		

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

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

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

**Restrictive Layer (if present):**  
 Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

**Hydric Soil Present?** Yes  No

Remarks:

**Hydrology**

**Wetland Hydrology Indicators:**

<b>Primary Indicators (minimum of one required; check all that apply)</b>		<b>Secondary Indicators (minimum of two required)</b>
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)	<input checked="" 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 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 type="checkbox"/> FAC-neutral Test (D5)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost Heave Hummocks (D7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		

**Field Observations:**

Surface Water Present?	Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches): <input type="text"/>	<b>Wetland Hydrology Present?</b> Yes <input checked="" type="radio"/> No <input type="radio"/>
Water Table Present?	Yes <input checked="" type="radio"/> No <input type="radio"/>	Depth (inches): <input type="text" value="3"/>	
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:  
 Shallow roots on alders.

Remarks:  
 Water table would likely rise and equilibrate if more time elapsed between digging the pit and recording the information on the data sheet (observations were recorded within 10 minutes of excavating the pit).

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

Project/Site: SR 522 Paradise Lake Rd NE City/County: n/a / King Sampling Date: 24-Mar-14  
 Applicant/Owner: WSDOT State: WA Sampling Point: W2-SP3  
 Investigator(s): Tony Bush, Tatiana Dreisbach Section, Township, Range: S 20 T 27N R 6E  
 Landform (hillslope, terrace, etc.): Slope Local relief (concave, convex, none): convex Slope: 20.0 % / 11.3 °  
 Subregion (LRR): LRR A Lat.: 47.816 Long.: -122.074 Datum: NAD83HARN

Soil Map Unit Name: Alerwood gravelly sandy loam, 2 to 8 percent slopes 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"/>
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**Remarks:**  
 Wetter than normal precipitation conditions were present prior to field work (Appendix B-1).

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

Stratum	Absolute % Cover	Rel.Strat. Cover	Indicator Status	Dominance Test worksheet:
<b>Tree Stratum</b> (Plot size: 5 x 20 feet )				Number of Dominant Species That are OBL, FACW, or FAC: <u>3</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>75.0%</u> (A/B)
1. <u>Alnus rubra</u>	20	<input checked="" type="checkbox"/> 100.0%	FAC	
2. _____	0	<input type="checkbox"/> 0.0%	_____	
3. _____	0	<input type="checkbox"/> 0.0%	_____	
4. _____	0	<input type="checkbox"/> 0.0%	_____	
<b>= Total Cover</b>				
<b>Sapling/Shrub Stratum</b> (Plot size: 5 x 15 feet )				<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>60</u> x 3 = <u>180</u> FACU species <u>25</u> x 4 = <u>100</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>85</u> (A) <u>280</u> (B)  Prevalence Index = B/A = <u>3.294</u>
1. <u>Symphoricarpos albus</u>	20	<input checked="" type="checkbox"/> 30.8%	FACU	
2. <u>Alnus rubra</u>	20	<input checked="" type="checkbox"/> 30.8%	FAC	
3. <u>Lonicera involucrata</u>	20	<input checked="" type="checkbox"/> 30.8%	FAC	
4. <u>Pseudotsuga menziesii</u>	5	<input type="checkbox"/> 7.7%	FACU	
5. _____	0	<input type="checkbox"/> 0.0%	_____	
<b>= Total Cover</b>				
<b>Herb Stratum</b> (Plot size: 5 x 5 feet )				
1. _____	0	<input type="checkbox"/> 0.0%	_____	
2. _____	0	<input type="checkbox"/> 0.0%	_____	
3. _____	0	<input type="checkbox"/> 0.0%	_____	
4. _____	0	<input type="checkbox"/> 0.0%	_____	
5. _____	0	<input type="checkbox"/> 0.0%	_____	
6. _____	0	<input type="checkbox"/> 0.0%	_____	
7. _____	0	<input type="checkbox"/> 0.0%	_____	
8. _____	0	<input type="checkbox"/> 0.0%	_____	
9. _____	0	<input type="checkbox"/> 0.0%	_____	
10. _____	0	<input type="checkbox"/> 0.0%	_____	
11. _____	0	<input type="checkbox"/> 0.0%	_____	
<b>= Total Cover</b>				
<b>Woody Vine Stratum</b> (Plot size: 5 x 5 feet )				
1. _____	_____	<input type="checkbox"/> 0.0%	_____	
2. _____	_____	<input type="checkbox"/> 0.0%	_____	
<b>= Total Cover</b>				
<b>% Bare Ground in Herb Stratum:</b> <u>100</u>				

**Hydrophytic Vegetation Indicators:**  
 1 - Rapid Test for Hydrologic Vegetation  
 2 - Dominance Test is > 50%  
 3 - Prevalence Index is ≤3.0<sup>1</sup>  
 4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 5 - Wetland Non-Vascular Plants<sup>1</sup>  
 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes  No

**Remarks:**

**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			Redox Features				Texture	Remarks
	Color (moist)		%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-3	10YR	2/1	100					Silt Loam	
3-12	10YR	4/3	95	10YR	5/8	5	C	M	Concentration is prominent

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

<b>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</b>		<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b>
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 2 cm Muck (A10)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except in MLRA 1)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input 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)	

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

**Restrictive Layer (if present):**  
 Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

**Hydric Soil Present?**    Yes     No

Remarks:  
 Matrix color in the second layer is too bright to meet an indicator.

**Hydrology**

**Wetland Hydrology Indicators:**

<b>Primary Indicators (minimum of one required; check all that apply)</b>		<b>Secondary Indicators (minimum of two required)</b>
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)
<input 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 type="checkbox"/> FAC-neutral Test (D5)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost Heave Hummocks (D7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		

**Field Observations:**

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

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

Remarks:  
 \_\_\_\_\_

# Appendix B — Precipitation Data

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

Monthly precipitation data for Monroe, Washington.

		Long-term rainfall records <sup>a</sup>							
	Month	3 yrs. in 10 less than	Average	3 yrs. in 10 more than	Rain fall <sup>a</sup>	Condition dry, wet, normal <sup>b</sup>	Condition Value	Month weight value	Product of previous two columns
1 <sup>st</sup> prior month	Mar	3.93	5.09	5.90	10.09	W	3	3	9
2 <sup>nd</sup> prior month	Feb	3.26	4.50	5.31	5.73	W	3	2	6
3 <sup>rd</sup> prior month	Jan	4.24	6.05	7.18	4.30	N	2	1	2
								<b>Sum</b>	<b>17</b>

<sup>a</sup>NRCS 2014

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

Note: If sum is

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

Condition value:

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

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

**Appendix B-2. Daily Precipitation 10 days preceding field work,  
Monroe, Washington**

<b>Date (2014)</b>	<b>Daily Precipitation (inches)<sup>a</sup></b>
March 23	0.00
March 22	0.00
March 21	0.04
March 20	0.00
March 19	0.57
March 18	0.00
March 17	0.41
March 16	1.83
March 15	0.13
March 14	0.83

<sup>a</sup>NOAA 2014

# **WETLAND DELINEATION REPORT**

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## **SR 522 Road Improvements Paradise Lake Road to Snohomish River Stage 2 – Roadway Widening Stage 4 - Fales Road Interchange**

### **Paradise Lake Road Northwest Mitigation Site**

**Snohomish County, Washington**

USACE IP 200201342

ECY WQC Permit Number - DE 04 SEAHQ-1116

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

**January 2013**



**Washington State  
Department of Transportation**

# Introduction

This report was prepared by the Washington State Department of Transportation (WSDOT) to document the wetland boundary delineation by WSDOT biologists for the SR 522 Paradise Lake Road Northwest mitigation site. Field work was conducted by Tatiana Dreisbach and Kristen Andrews on March 19, 2012. The delineation identifies 2.83 acres of wetland within the boundaries of the mitigation site.

General Information for the SR 522 Paradise Lake Road Northwest mitigation site		
<b>Location:</b>	S19, T27N, R06E. Snohomish County. (Vicinity map, Figure 1)	
	<b>USACE IP Number</b>	200201342
	<b>Ecology Permit</b>	DE 04 SEAHQ-1116
	<b>Long./Lat. ID Number</b>	1220773478142
	<b>Land Resource Region (LRR)</b>	A
	<b>Major Land Resource Area (MLRA)</b>	2
	<b>Construction Date</b>	2005
	<b>Monitoring Period</b>	2007-2016
	<b>Year of Monitoring</b>	6 of 10 in 2012
<b>Area of Project Impact</b>	2.27 acres	
<b>Type of Mitigation</b>	<b>Intended Area (acres)</b>	
Restoration	1.81 acres	
Enhancement	0.91 acre	
<b>Total Intended Wetland Mitigation Area</b>	2.72 acres <sup>1</sup>	
<b>Total Delineated Wetland Area</b>	2.83 acres	

<sup>1</sup> SR 522 Paradise Lake Road Northwest mitigation site provides partial compensation for impacts from the SR 522 Road Improvements Paradise Lake Road to Snohomish River Stage 2 – Roadway Widening Stage 4 – Fales Road Interchange project. The remaining compensation for this project is provided at the SR 522 Paradise Lake Road Northeast mitigation site.

# Location

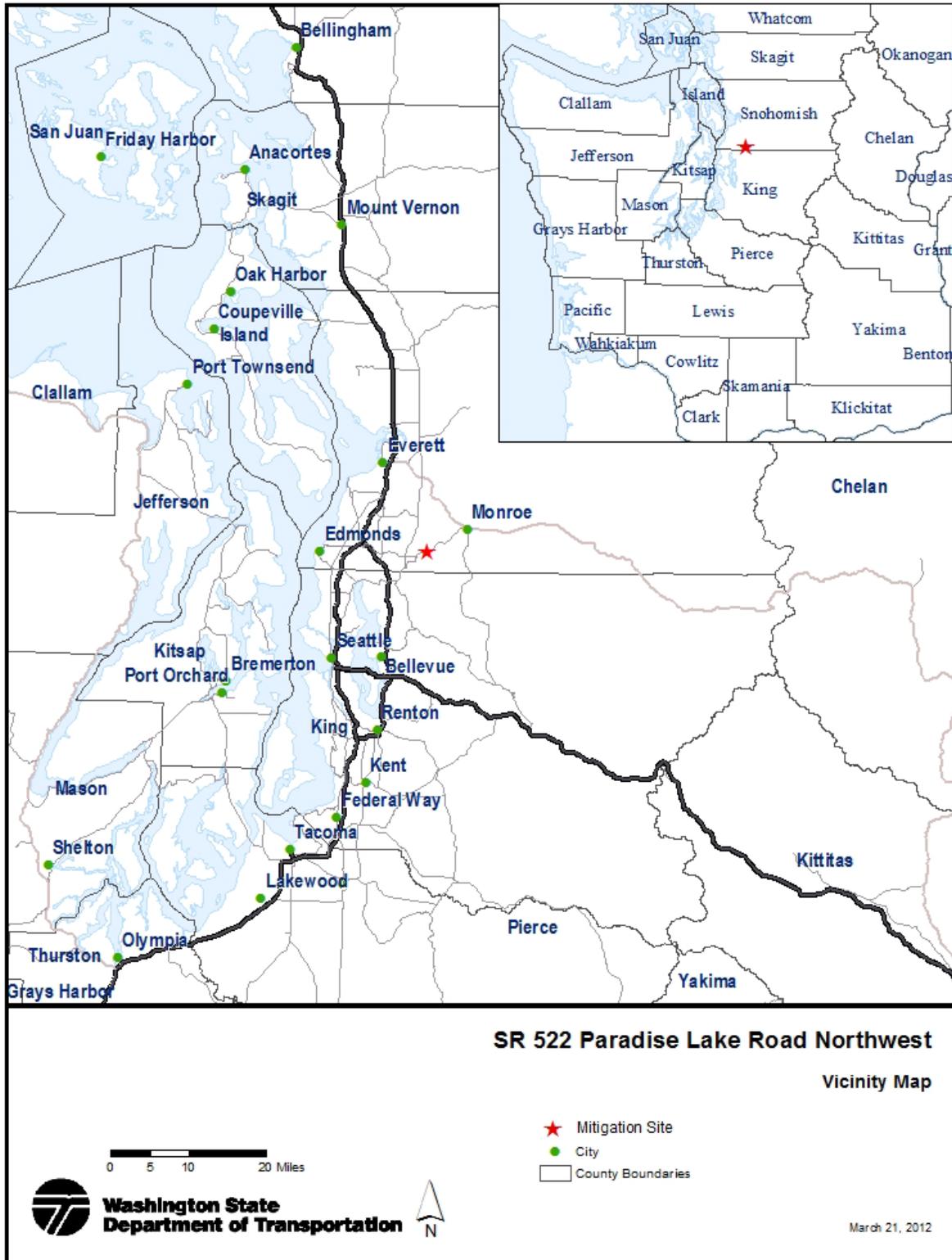


Figure 1. Vicinity Map

# Methods

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Wetland boundaries within the SR 522 Paradise Lake Road NW 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.

Mitigation sites are recognized as difficult wetland situations in the regional supplements and may have problematic hydric soils or lack one of the other factors (USACE 2008). Wetland determination data forms provide a rationale for the delineated boundary when difficult situations occur (Appendix A, W1-SP2).

A Global Positioning System (GPS) Trimble GeoXT 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.

The mitigation type areas and wetland boundary prior to mitigation site construction were established using Arc GIS and geo-referencing the mitigation planting plan (Figure 2). Minor inaccuracies are possible when using this method.

## Wetland Delineation and Study Area

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### Study Area

Wetlands described in this report were assessed only within the SR 522 Paradise Lake Northwest mitigation site boundary (Figure 2).

### Wetlands

Delineation data were collected at five 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 in Appendix A 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. The delineation determined 2.83 acres of wetland are present within the study area at the SR 522 Paradise Lake Road NW mitigation site.

### Precipitation

The Regional Delineation Supplement Version 2.0 (USACE 2010) recommends using methods described in Chapter 19 in *Engineering Field Handbook* (NRCS1997) 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. The month prior to field work was drier than normal, the second prior month was wetter than normal, and the third month was within the normal range. Based on the information presented in Appendix B-1, normal precipitation conditions were present prior to field work.

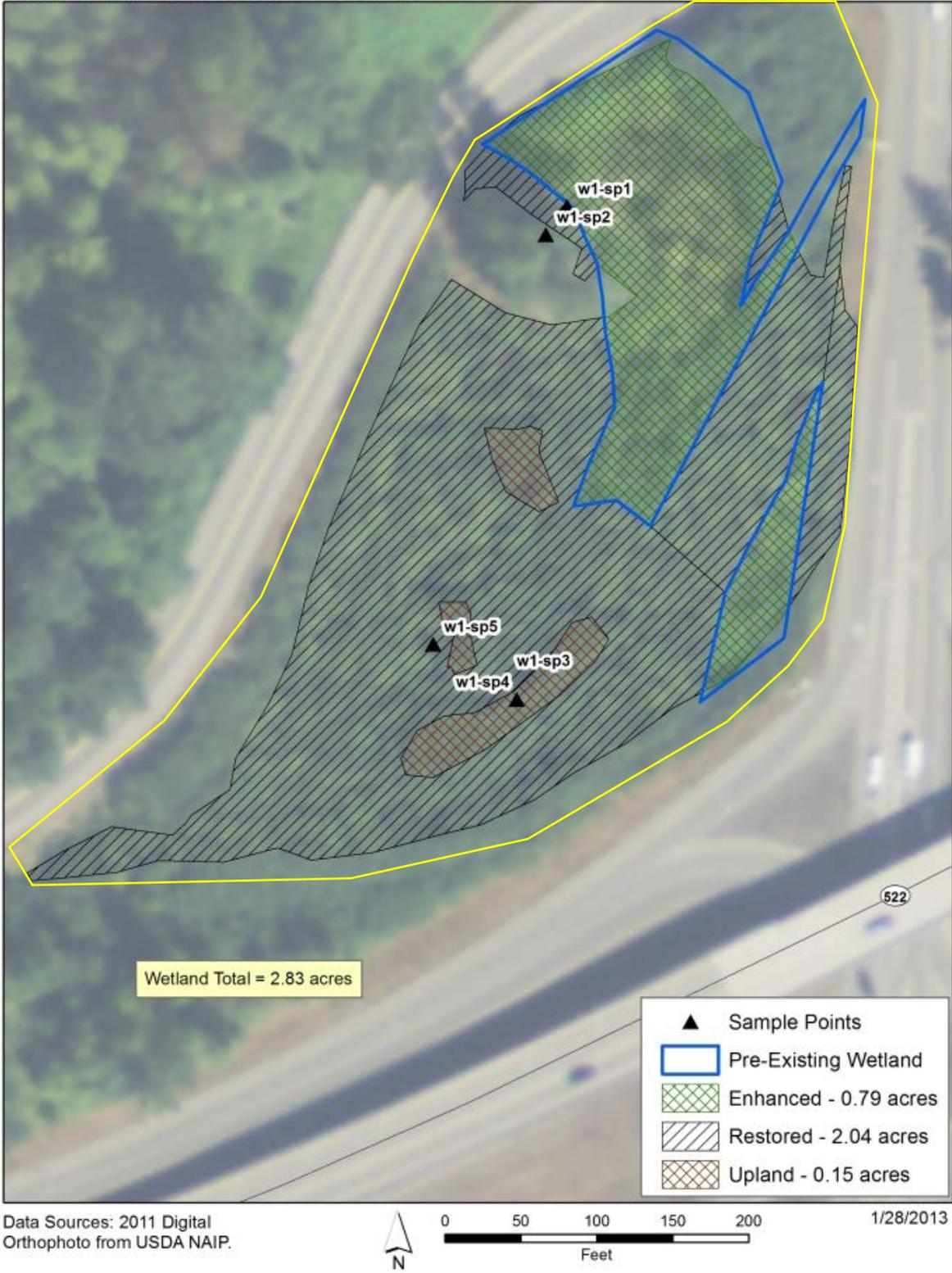
Appendix B-2 includes recorded precipitation in the ten days preceding field work.

### Growing Season

The following evidence of the growing season was observed at the time of the delineation:

- Leaves on twinberry honeysuckle (*Lonicera involucrata*) were emerging
- Buds on black cottonwood (*Populus balsamifera* ssp. *trichocarpa*) were breaking

SR 522 Paradise Lake Road NW



**Figure 2. Study area in yellow, 2012 wetland delineation in green and black. Blue polygon shows wetland boundary identified prior to mitigation site construction.**

SR 522 Paradise Lake Road NW Mitigation Site – Wetland Delineation Summary		
<b>Total Delineated Wetland Area</b>	2.83 acres	
	<b>Wetland Determination Data Form(s)</b>	Appendix A; Sampling Point W1-SP1, W1-SP3, W1-SP5
	<b>Upland Determination Data Form(s)</b>	Appendix A; Sampling Point W1-SP2 and W1-SP4
	<b>Delineator(s)</b>	Tatiana Dreisbach and Kristen Andrews
	<b>Delineation Date</b>	March 19, 2012
<b>Vegetation</b>	<p>Trees – Vegetation generally did not meet the three-inch diameter-at-breast-height (DBH) requirement for trees for the delineation or 20 feet or greater for Cowardin classification (Cowardin, Carter, Golet and others 1979).</p> <p>Shrubs – red alder (<i>Alnus rubra</i>) and willows (<i>Salix</i> spp.)</p> <p>Herbs – slough sedge (<i>Carex obnupta</i>), soft-stem bulrush (<i>Schoenoplectus tabernaemontani</i>), small-fruited bulrush (<i>Scirpus microcarpus</i>)</p>	
<b>Soils</b>	<p>Soils examined to a depth of 17 inches exhibited hydric characteristics. Matrix colors of 10YR 2/1 and 2.5Y 4/1 were observed. Redoximorphic concentrations were observed in some layers. Indicator A11 and F3 met. In many areas near the wetland boundary, indicator A12 would have been met due to a dark layer above from soil amendments and a layer with a depleted matrix below 12 inches but hydrology indicators were lacking in these areas.</p>	
<b>Hydrology</b>	<p>Water in the observation pits ranged from 6 inches to 10 inches below the soil surface. Surface water too deep to walk through was observed in some areas. Groundwater appears to be the main source of hydrology. Water also flows in through a culvert on the west side of the site. Precipitation and snow melt contribute to the hydrologic regime of this wetland as well.</p>	
<b>Rationale for Delineation</b>	<p>Positive indicators of all three wetland criteria are present. Placement of boundary determined primarily by hydrology and topographic break. Soils on the wetland boundary were not a good indicator due to the presence of soil amendments. Distinct topographic break present in most areas.</p>	

## Limitations

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

# References

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

Wetland Delineation Data Forms for:

W1-SP1

W1-SP2

W1-SP3

W1-SP4

W1-SP5

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 522 Paradise Lake Road Northwest City/County: Duval/Snohomish Sampling Date: 3-19-2012  
 Applicant/Owner: Washington State Department of Transportation State: WA Sampling Point: W1-SP1  
 Investigator(s): Tatiana Dreisbach, Kristen Andrews Section, Township, Range: 19, 27N, 6E  
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): concave Slope (%): 5  
 Subregion (LRR): A Lat: 47.814 Long: -122.077 Datum: NAD1983HARN  
 Soil Map Unit Name: Alderwood Gravelly Sandy Loam, 2 to 8 percent slopes 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="checkbox"/>	No <input type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>		Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>		Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Remarks:					

**VEGETATION – Use scientific names of plants**

Tree Stratum (Plot size: 10x10 feet)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:																
1. _____	_____	_____	_____	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</u> (A/B)																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
50% = _____, 20% = _____	<u>0</u>	= Total Cover		<b>Prevalence Index worksheet:</b> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; text-align: center;"><u>Total % Cover of:</u></td> <td style="width: 50%; text-align: center;"><u>Multiply by:</u></td> </tr> <tr> <td>OBL species _____</td> <td>x1 = _____</td> </tr> <tr> <td>FACW species _____</td> <td>x2 = _____</td> </tr> <tr> <td>FAC species _____</td> <td>x3 = _____</td> </tr> <tr> <td>FACU species _____</td> <td>x4 = _____</td> </tr> <tr> <td>UPL species _____</td> <td>x5 = _____</td> </tr> <tr> <td>Column Totals: _____ (A)</td> <td>_____ (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = _____</td> </tr> </table>	<u>Total % Cover of:</u>	<u>Multiply by:</u>	OBL species _____	x1 = _____	FACW species _____	x2 = _____	FAC species _____	x3 = _____	FACU species _____	x4 = _____	UPL species _____	x5 = _____	Column Totals: _____ (A)	_____ (B)	Prevalence Index = B/A = _____	
<u>Total % Cover of:</u>	<u>Multiply by:</u>																			
OBL species _____	x1 = _____																			
FACW species _____	x2 = _____																			
FAC species _____	x3 = _____																			
FACU species _____	x4 = _____																			
UPL species _____	x5 = _____																			
Column Totals: _____ (A)	_____ (B)																			
Prevalence Index = B/A = _____																				
<b>Sapling/Shrub Stratum (Plot size: 10x10 feet)</b>																				
1. <u>Alnus rubra</u>	<u>40</u>	<u>yes</u>	<u>FAC</u>																	
2. <u>Salix sitchensis</u>	<u>50</u>	<u>yes</u>	<u>FACW</u>																	
3. <u>Cornus sericea</u>	<u>5</u>	<u>no</u>	<u>FACW</u>																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
50% = <u>47.5</u> , 20% = <u>19</u>	<u>95</u>	= Total Cover																		
<b>Herb Stratum (Plot size: 10x10 feet)</b>																				
1. <u>Scirpus microcarpus</u>	<u>30</u>	<u>yes</u>	<u>OBL</u>																	
2. <u>Carex obnupta</u>	<u>20</u>	<u>yes</u>	<u>OBL</u>																	
3. <u>Typha latifolia</u>	<u>10</u>	<u>no</u>	<u>OBL</u>																	
4. <u>Juncus effusus</u>	<u>2</u>	<u>no</u>	<u>FACW</u>																	
5. <u>Scirpus tabernaemontani</u>	<u>2</u>	<u>no</u>	<u>OBL</u>																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
50% = <u>32</u> , 20% = <u>12.8</u>	<u>64</u>	= Total Cover																		
<b>Woody Vine Stratum (Plot size: 5x5 feet)</b>																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
50% = _____, 20% = _____	<u>0</u>	= Total Cover																		
% Bare Ground in Herb Stratum <u>36</u>																				
<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> 1 – Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 - Wetland Non-Vascular Plants <sup>1</sup> <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)																				
<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																				
<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>																				
Remarks:																				



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

Project Site: SR 522 Paradise Lake Road Northwest City/County: Duval/Snohomish Sampling Date: 3-19-2012  
 Applicant/Owner: Washington State Department of Transportation State: WA Sampling Point: W1-SP2  
 Investigator(s): Tatiana Dreisbach, Kristen Andrews Section, Township, Range: 19, 27N, 6E  
 Landform (hillslope, terrace, etc.): Slope Local relief (concave, convex, none): concave Slope (%): 15  
 Subregion (LRR): A Lat: 47.814 Long: -122.077 Datum: NAD1983HARN  
 Soil Map Unit Name: Alderwood Gravelly Sandy Loam, 2 to 8 percent slopes NWI classification: UPL  
 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 type="checkbox"/>	No <input checked="" type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b>		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>				
Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>				
Remarks: The significantly disturbed box is checked for soils because soils in this area were disturbed during grading for mitigation site construction. Hydric soils may be present in the upland in this location because the site was graded lower around the preserve potentially exposing hydric soils characteristics that were previously in lower layers. The upland data point is also very close to the wetland data point in order to document the differences between the wetland and upland.						

**VEGETATION – Use scientific names of plants**

Tree Stratum (Plot size: 10x10 feet)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:																
1. <u>Populus balsamifera</u>	<u>80</u>	<u>yes</u>	<u>FAC</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A)  Total Number of Dominant Species Across All Strata: <u>5</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>40</u> (A/B)																
2. <u>Prunus sp.</u>	<u>10</u>	<u>no</u>	<u>-</u>																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
50% = <u>45</u> , 20% = <u>18</u>	<u>90</u>	= Total Cover																		
<u>Sapling/Shrub Stratum (Plot size: 10x10 feet)</u>				<b>Prevalence Index worksheet:</b>  <table style="width: 100%; border: none;"> <tr> <td style="text-align: right;">Total % Cover of:</td> <td style="text-align: right;">Multiply by:</td> </tr> <tr> <td>OBL species _____</td> <td>x1 = _____</td> </tr> <tr> <td>FACW species _____</td> <td>x2 = _____</td> </tr> <tr> <td>FAC species _____</td> <td>x3 = _____</td> </tr> <tr> <td>FACU species _____</td> <td>x4 = _____</td> </tr> <tr> <td>UPL species _____</td> <td>x5 = _____</td> </tr> <tr> <td>Column Totals: _____ (A)</td> <td>_____ (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = _____</td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species _____	x1 = _____	FACW species _____	x2 = _____	FAC species _____	x3 = _____	FACU species _____	x4 = _____	UPL species _____	x5 = _____	Column Totals: _____ (A)	_____ (B)	Prevalence Index = B/A = _____	
Total % Cover of:	Multiply by:																			
OBL species _____	x1 = _____																			
FACW species _____	x2 = _____																			
FAC species _____	x3 = _____																			
FACU species _____	x4 = _____																			
UPL species _____	x5 = _____																			
Column Totals: _____ (A)	_____ (B)																			
Prevalence Index = B/A = _____																				
1. <u>Oemleria cerasiformis</u>	<u>30</u>	<u>yes</u>	<u>FACU</u>																	
2. <u>Populus basamifera</u>	<u>10</u>	<u>yes</u>	<u>FAC</u>																	
3. <u>Corylus cornuta</u>	<u>5</u>	<u>no</u>	<u>FACU</u>																	
4. <u>Rubus armeniacus</u>	<u>1</u>	<u>no</u>	<u>FACU</u>																	
5. <u>Rubus laciniatus</u>	<u>1</u>	<u>no</u>	<u>FACU</u>																	
50% = <u>23.5</u> , 20% = <u>9.4</u>	<u>47</u>	= Total Cover																		
<u>Herb Stratum (Plot size: 5x5 feet)</u>																				
1. <u>Pteridium aquilinum</u>	<u>30</u>	<u>yes</u>	<u>FACU</u>																	
2. <u>Rubus ursinus</u>	<u>10</u>	<u>yes</u>	<u>FACU</u>																	
3. <u>Ranunculus repens</u>	<u>2</u>	<u>no</u>	<u>FACW</u>																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
50% = <u>21</u> , 20% = <u>8.4</u>	<u>42</u>	= Total Cover																		
<u>Woody Vine Stratum (Plot size: 5x5 feet)</u>																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
50% = _____, 20% = _____	<u>0</u>	= Total Cover																		
% Bare Ground in Herb Stratum <u>58</u>																				
<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> 1 – Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is $\leq 3.0^1$ <input type="checkbox"/> 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 - Wetland Non-Vascular Plants <sup>1</sup> <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)																				
<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																				
<b>Hydrophytic Vegetation Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>																				

Remarks: - in the Indicator Status column indicates the species is unknown.

**SOIL**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-6	10YR 2/1	100					Sandy Loam	
6-12+	10YR 3/2	93	10YR 5/6	5	C	M	Sandy Loam	Concentration is prominent
			2.5Y 6/4	2	D	M		

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)				Indicators for Problematic Hydric Soils <sup>3</sup> :	
<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 MLRA 1)	<input type="checkbox"/>	Very Shallow Dark Surface (TF12)
<input type="checkbox"/>	Hydrogen Sulfide (A4)	<input type="checkbox"/>	Loamy Gleyed Matrix (F2)	<input type="checkbox"/>	Other (Explain in Remarks)
<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 Mucky Mineral (S1)	<input type="checkbox"/>	Depleted Dark Surface (F7)		
<input type="checkbox"/>	Sandy Gleyed Matrix (S4)	<input type="checkbox"/>	Redox Depressions (F8)		

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

<b>Restrictive Layer (if present):</b>		<b>Hydric Soils Present?</b>	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>
Type: _____						
Depth (inches): _____						

Remarks: See remarks in first remarks box to explain why a hydric soil may be present in the current upland.

**HYDROLOGY**

Wetland Hydrology Indicators:			
Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)	
<input type="checkbox"/>	Surface Water (A1)	<input type="checkbox"/>	Water-Stained Leaves (B9)
<input type="checkbox"/>	High Water Table (A2)	<input type="checkbox"/>	(except MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/>	Saturation (A3)	<input type="checkbox"/>	Salt Crust (B11)
<input type="checkbox"/>	Water Marks (B1)	<input type="checkbox"/>	Aquatic Invertebrates (B13)
<input type="checkbox"/>	Sediment Deposits (B2)	<input type="checkbox"/>	Hydrogen Sulfide Odor (C1)
<input type="checkbox"/>	Drift Deposits (B3)	<input type="checkbox"/>	Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/>	Algal Mat or Crust (B4)	<input type="checkbox"/>	Presence of Reduced Iron (C4)
<input type="checkbox"/>	Iron Deposits (B5)	<input type="checkbox"/>	Recent Iron Reduction in Tilled Soils (C6)
<input type="checkbox"/>	Surface Soil Cracks (B6)	<input type="checkbox"/>	Stunted or Stresses Plants (D1) (LRR A)
<input type="checkbox"/>	Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/>	Other (Explain in Remarks)
<input type="checkbox"/>	Sparsely Vegetated Concave Surface (B8)		

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

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

Remarks:

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

Project Site: SR 522 Paradise Lake Road Northwest City/County: Duval/Snohomish Sampling Date: 3-19-2012  
 Applicant/Owner: Washington State Department of Transportation State: WA Sampling Point: W1-SP3  
 Investigator(s): Tatiana Dreisbach, Kristen Andrews Section, Township, Range: 19, 27N, 6E  
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): concave Slope (%): 2  
 Subregion (LRR): A Lat: 47.814 Long: -122.077 Datum: NAD1983HARN  
 Soil Map Unit Name: Alderwood Gravelly Sandy Loam, 2 to 8 percent slopes 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="checkbox"/>	No <input type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>		Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>		Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Remarks:					

**VEGETATION – Use scientific names of plants**

Tree Stratum (Plot size: <u>15x10 feet</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:																
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <span style="float: right;">1 (A)</span>  Total Number of Dominant Species Across All Strata: <span style="float: right;">1 (B)</span>  Percent of Dominant Species That Are OBL, FACW, or FAC: <span style="float: right;">100 (A/B)</span>																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
50% = _____, 20% = _____	<u>0</u>	= Total Cover		<b>Prevalence Index worksheet:</b> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;">Total % Cover of:</th> <th style="width: 40%;">Multiply by:</th> </tr> </thead> <tbody> <tr> <td>OBL species _____</td> <td>x1 = _____</td> </tr> <tr> <td>FACW species _____</td> <td>x2 = _____</td> </tr> <tr> <td>FAC species _____</td> <td>x3 = _____</td> </tr> <tr> <td>FACU species _____</td> <td>x4 = _____</td> </tr> <tr> <td>UPL species _____</td> <td>x5 = _____</td> </tr> <tr> <td>Column Totals: _____ (A)</td> <td>_____ (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = _____</td> </tr> </tbody> </table>	Total % Cover of:	Multiply by:	OBL species _____	x1 = _____	FACW species _____	x2 = _____	FAC species _____	x3 = _____	FACU species _____	x4 = _____	UPL species _____	x5 = _____	Column Totals: _____ (A)	_____ (B)	Prevalence Index = B/A = _____	
Total % Cover of:	Multiply by:																			
OBL species _____	x1 = _____																			
FACW species _____	x2 = _____																			
FAC species _____	x3 = _____																			
FACU species _____	x4 = _____																			
UPL species _____	x5 = _____																			
Column Totals: _____ (A)	_____ (B)																			
Prevalence Index = B/A = _____																				
<b>Sapling/Shrub Stratum (Plot size: <u>15x10 feet</u>)</b>																				
1. <u>Alnus rubra</u>	<u>70</u>	<u>yes</u>	<u>FAC</u>	<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> 1 – Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is $\leq 3.0^1$ <input type="checkbox"/> 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 - Wetland Non-Vascular Plants <sup>1</sup> <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)  <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																
2. <u>Ribes lacustre</u>	<u>5</u>	<u>no</u>	<u>FAC</u>																	
3. <u>Picea sitchensis</u>	<u>5</u>	<u>no</u>	<u>FAC</u>																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
50% = <u>40</u> , 20% = <u>16</u>	<u>80</u>	= Total Cover																		
<b>Herb Stratum (Plot size: <u>5x5 feet</u>)</b>																				
1. <u>none</u>	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
50% = _____, 20% = _____	<u>0</u>	= Total Cover																		
<b>Woody Vine Stratum (Plot size: <u>5x5 feet</u>)</b>																				
1. _____	_____	_____	_____	<b>Hydrophytic Vegetation Present?</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Yes</td> <td style="width: 10%; text-align: center;"><input checked="" type="checkbox"/></td> <td style="width: 30%;">No</td> <td style="width: 30%; text-align: center;"><input type="checkbox"/></td> </tr> </table>	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>												
Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>																	
2. _____	_____	_____	_____																	
50% = _____, 20% = _____	<u>0</u>	= Total Cover																		
% Bare Ground in Herb Stratum <u>100</u>																				

Remarks:

**SOIL**

<b>Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)</b>								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-3	<u>10YR 2/1</u>	<u>100</u>	_____	_____	_____	_____	<u>Sandy Loam</u>	_____
3-17+	<u>2.5Y 4/1</u>	<u>93</u>	<u>10YR 3/4</u>	<u>5</u>	<u>C</u>	<u>M</u>	<u>Sandy Loam</u>	<u>Very sandy. Concentration is prominent</u>
_____	<u>10YR 2/1</u>	<u>2</u>	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____

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

<b>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</b>			<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b>		
<input type="checkbox"/>	Histosol (A1)	<input type="checkbox"/>	Sandy Redox (S5)	<input type="checkbox"/>	2 cm Muck (A10)
<input type="checkbox"/>	Histic Epipedon (A2)	<input type="checkbox"/>	Stripped Matrix (S6)	<input type="checkbox"/>	Red Parent Material (TF2)
<input type="checkbox"/>	Black Histic (A3)	<input type="checkbox"/>	Loamy Mucky Mineral (F1) <b>(except MLRA 1)</b>	<input type="checkbox"/>	Very Shallow Dark Surface (TF12)
<input type="checkbox"/>	Hydrogen Sulfide (A4)	<input type="checkbox"/>	Loamy Gleyed Matrix (F2)	<input type="checkbox"/>	Other (Explain in Remarks)
<input checked="" type="checkbox"/>	Depleted Below Dark Surface (A44)	<input checked="" type="checkbox"/>	Depleted Matrix (F3)		
<input type="checkbox"/>	Thick Dark Surface (A12)	<input type="checkbox"/>	Redox Dark Surface (F6)		
<input type="checkbox"/>	Sandy Mucky Mineral (S1)	<input type="checkbox"/>	Depleted Dark Surface (F7)		
<input type="checkbox"/>	Sandy Gleyed Matrix (S4)	<input type="checkbox"/>	Redox Depressions (F8)		

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

<b>Restrictive Layer (if present):</b> Type: _____ Depth (inches): _____	<b>Hydric Soils Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
--	--

Remarks:      Soil starting at 3 inches below surface is very sandy but not a true sand.

**HYDROLOGY**

<b>Wetland Hydrology Indicators:</b>			
Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)	
<input type="checkbox"/>	Surface Water (A1)	<input type="checkbox"/>	Water-Stained Leaves (B9)
<input checked="" type="checkbox"/>	High Water Table (A2)	<input checked="" type="checkbox"/>	<b>(except MLRA 1, 2, 4A, and 4B)</b>
<input checked="" type="checkbox"/>	Saturation (A3)	<input type="checkbox"/>	Salt Crust (B11)
<input type="checkbox"/>	Water Marks (B1)	<input type="checkbox"/>	Aquatic Invertebrates (B13)
<input type="checkbox"/>	Sediment Deposits (B2)	<input type="checkbox"/>	Hydrogen Sulfide Odor (C1)
<input type="checkbox"/>	Drift Deposits (B3)	<input type="checkbox"/>	Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/>	Algal Mat or Crust (B4)	<input type="checkbox"/>	Presence of Reduced Iron (C4)
<input type="checkbox"/>	Iron Deposits (B5)	<input type="checkbox"/>	Recent Iron Reduction in Tilled Soils (C6)
<input type="checkbox"/>	Surface Soil Cracks (B6)	<input type="checkbox"/>	Stunted or Stresses Plants (D1) <b>(LRR A)</b>
<input type="checkbox"/>	Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/>	Other (Explain in Remarks)
<input type="checkbox"/>	Sparsely Vegetated Concave Surface (B8)		

<b>Field Observations:</b> Surface Water Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present?      Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>10</u> Saturation Present? (includes capillary fringe)    Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>0</u>	<b>Wetland Hydrology Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
--	---

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

Remarks:      Standing water to 2 inches in channel approximately two feet away from sample point location.

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

Project Site: SR 522 Paradise Lake Road Northwest City/County: Duval/Snohomish Sampling Date: 3-19-2012  
 Applicant/Owner: Washington State Department of Transportation State: WA Sampling Point: W1-SP4  
 Investigator(s): Tatiana Dreisbach, Kristen Andrews Section, Township, Range: 19, 27N, 6E  
 Landform (hillslope, terrace, etc.): Slope Local relief (concave, convex, none): concave Slope (%): 20  
 Subregion (LRR): A Lat: 47.814 Long: -122.077 Datum: NAD1983HARN  
 Soil Map Unit Name: Alderwood Gravelly Sandy Loam, 2 to 8 percent slopes NWI classification: UPL  
 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="checkbox"/>	No <input type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Remarks:					

**VEGETATION – Use scientific names of plants**

Tree Stratum (Plot size: 5x15 feet)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:																
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <span style="float: right;">1 (A)</span>  Total Number of Dominant Species Across All Strata: <span style="float: right;">1 (B)</span>  Percent of Dominant Species That Are OBL, FACW, or FAC: <span style="float: right;">100 (A/B)</span>																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
50% = _____, 20% = _____	<u>0</u>	= Total Cover		<b>Prevalence Index worksheet:</b> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; text-align: center;"><u>Total % Cover of:</u></td> <td style="width: 50%; text-align: center;"><u>Multiply by:</u></td> </tr> <tr> <td>OBL species _____</td> <td>x1 = _____</td> </tr> <tr> <td>FACW species _____</td> <td>x2 = _____</td> </tr> <tr> <td>FAC species _____</td> <td>x3 = _____</td> </tr> <tr> <td>FACU species _____</td> <td>x4 = _____</td> </tr> <tr> <td>UPL species _____</td> <td>x5 = _____</td> </tr> <tr> <td>Column Totals: _____ (A)</td> <td>_____ (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = _____</td> </tr> </table>	<u>Total % Cover of:</u>	<u>Multiply by:</u>	OBL species _____	x1 = _____	FACW species _____	x2 = _____	FAC species _____	x3 = _____	FACU species _____	x4 = _____	UPL species _____	x5 = _____	Column Totals: _____ (A)	_____ (B)	Prevalence Index = B/A = _____	
<u>Total % Cover of:</u>	<u>Multiply by:</u>																			
OBL species _____	x1 = _____																			
FACW species _____	x2 = _____																			
FAC species _____	x3 = _____																			
FACU species _____	x4 = _____																			
UPL species _____	x5 = _____																			
Column Totals: _____ (A)	_____ (B)																			
Prevalence Index = B/A = _____																				
<b>Sapling/Shrub Stratum (Plot size: 5x15 feet)</b>																				
1. <u>Alnus rubra</u>	<u>75</u>	<u>yes</u>	<u>FAC</u>	<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> 1 – Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 - Wetland Non-Vascular Plants <sup>1</sup> <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)  <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																
2. <u>Symphoricarpos albus</u>	<u>10</u>	<u>no</u>	<u>FACU</u>																	
3. <u>Picea sitchensis</u>	<u>2</u>	<u>no</u>	<u>FAC</u>																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
50% = <u>43.5</u> , 20% = <u>17.4</u>	<u>87</u>	= Total Cover																		
<b>Herb Stratum (Plot size: 5x5 feet)</b>																				
1. <u>none</u>	_____	_____	_____	<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
50% = _____, 20% = _____	<u>0</u>	= Total Cover																		
<b>Woody Vine Stratum (Plot size: 5x5 feet)</b>																				
1. _____	_____	_____	_____	<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>																
2. _____	_____	_____	_____																	
50% = _____, 20% = _____	<u>0</u>	= Total Cover																		
% Bare Ground in Herb Stratum <u>100</u>																				

Remarks: The red alder and Sitka spruce are not big enough (< 3 inches DBH) to be included in the tree stratum and were lumped into the shrub layer.

**SOIL**

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-5	10YR 2/1	100					Sandy Loam	High organic content
5-15	7.5YR 4/4	55	7.5YR 4/6	10	C	M	Sandy Loam	Fine sand granules
	10YR 4/3	30	10YR 2/1	5	C	M		

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)				Indicators for Problematic Hydric Soils <sup>3</sup> :	
<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 MLRA 1)	<input type="checkbox"/>	Very Shallow Dark Surface (TF12)
<input type="checkbox"/>	Hydrogen Sulfide (A4)	<input type="checkbox"/>	Loamy Gleyed Matrix (F2)	<input type="checkbox"/>	Other (Explain in Remarks)
<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 Mucky Mineral (S1)	<input type="checkbox"/>	Depleted Dark Surface (F7)		
<input type="checkbox"/>	Sandy Gleyed Matrix (S4)	<input type="checkbox"/>	Redox Depressions (F8)		

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

**Restrictive Layer (if present):**

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

**Hydric Soils Present?** Yes  No

Remarks: Soils profile does not meet any of the hydric soil indicators. In addition wetland hydrology indicators were also lacking.

**HYDROLOGY**

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)	
Primary Indicators (minimum of one required; check all that apply)			
<input type="checkbox"/>	Surface Water (A1)	<input type="checkbox"/>	Water-Stained Leaves (B9)
<input type="checkbox"/>	High Water Table (A2)	<input type="checkbox"/>	(except MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/>	Saturation (A3)	<input type="checkbox"/>	Salt Crust (B11)
<input type="checkbox"/>	Water Marks (B1)	<input type="checkbox"/>	Aquatic Invertebrates (B13)
<input type="checkbox"/>	Sediment Deposits (B2)	<input type="checkbox"/>	Hydrogen Sulfide Odor (C1)
<input type="checkbox"/>	Drift Deposits (B3)	<input type="checkbox"/>	Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/>	Algal Mat or Crust (B4)	<input type="checkbox"/>	Presence of Reduced Iron (C4)
<input type="checkbox"/>	Iron Deposits (B5)	<input type="checkbox"/>	Recent Iron Reduction in Tilled Soils (C6)
<input type="checkbox"/>	Surface Soil Cracks (B6)	<input type="checkbox"/>	Stunted or Stresses Plants (D1) (LRR A)
<input type="checkbox"/>	Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/>	Other (Explain in Remarks)
<input type="checkbox"/>	Sparsely Vegetated Concave Surface (B8)		

**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, monitoring well, aerial photos, previous inspections), if available:

Remarks:

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

Project Site: SR 522 Paradise Lake Road Northwest City/County: Duval/Snohomish Sampling Date: 3-19-2012  
 Applicant/Owner: Washington State Department of Transportation State: WA Sampling Point: W1-SP5  
 Investigator(s): Tatiana Dreisbach, Kristen Andrews Section, Township, Range: 19, 27N, 6E  
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): concave Slope (%): 5  
 Subregion (LRR): A Lat: 47.814 Long: -122.077 Datum: NAD1983HARN  
 Soil Map Unit Name: Alderwood Gravelly Sandy Loam, 2 to 8 percent slopes 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="checkbox"/>	No <input type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>		Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>		Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Remarks:					

**VEGETATION – Use scientific names of plants**

Tree Stratum (Plot size: 10x10 feet)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:																
1. <u>none</u>	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)  Total Number of Dominant Species Across All Strata: _____ (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
50% = _____, 20% = _____	<u>0</u>	= Total Cover																		
<u>Sapling/Shrub Stratum (Plot size: 10x10 feet)</u>				<b>Prevalence Index worksheet:</b>  <table style="width: 100%; border: none;"> <tr> <td style="text-align: center;"><u>Total % Cover of:</u></td> <td style="text-align: center;"><u>Multiply by:</u></td> </tr> <tr> <td>OBL species _____</td> <td>x1 = _____</td> </tr> <tr> <td>FACW species _____</td> <td>x2 = _____</td> </tr> <tr> <td>FAC species _____</td> <td>x3 = _____</td> </tr> <tr> <td>FACU species _____</td> <td>x4 = _____</td> </tr> <tr> <td>UPL species _____</td> <td>x5 = _____</td> </tr> <tr> <td>Column Totals: _____ (A)</td> <td>_____ (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = _____</td> </tr> </table>	<u>Total % Cover of:</u>	<u>Multiply by:</u>	OBL species _____	x1 = _____	FACW species _____	x2 = _____	FAC species _____	x3 = _____	FACU species _____	x4 = _____	UPL species _____	x5 = _____	Column Totals: _____ (A)	_____ (B)	Prevalence Index = B/A = _____	
<u>Total % Cover of:</u>	<u>Multiply by:</u>																			
OBL species _____	x1 = _____																			
FACW species _____	x2 = _____																			
FAC species _____	x3 = _____																			
FACU species _____	x4 = _____																			
UPL species _____	x5 = _____																			
Column Totals: _____ (A)	_____ (B)																			
Prevalence Index = B/A = _____																				
1. <u>none</u>	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
50% = _____, 20% = _____	<u>0</u>	= Total Cover																		
<u>Herb Stratum (Plot size: 10x10 feet)</u>																				
1. <u>Scirpus tabernaemontani</u>	<u>60</u>	<u>yes</u>	<u>OBL</u>																	
2. <u>Carex obnupta</u>	<u>25</u>	<u>yes</u>	<u>OBL</u>																	
3. <u>Scirpus microcarpus</u>	<u>5</u>	<u>no</u>	<u>OBL</u>																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
50% = <u>45</u> , 20% = <u>18</u>	<u>90</u>	= Total Cover																		
<u>Woody Vine Stratum (Plot size: 5x5 feet)</u>																				
1. <u>none</u>	_____	_____	_____																	
2. _____	_____	_____	_____																	
50% = _____, 20% = _____	<u>0</u>	= Total Cover																		
% Bare Ground in Herb Stratum <u>10</u>																				
<b>Hydrophytic Vegetation Indicators:</b> <input checked="" type="checkbox"/> 1 – Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 - Wetland Non-Vascular Plants <sup>1</sup> <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)																				
<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																				
<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>																				
Remarks:																				



# Appendix B — Precipitation Data

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

Monthly precipitation data for Monroe, Washington.

		Long-term rainfall records <sup>a</sup>			Rain fall <sup>b</sup>	Condition dry, wet, normal <sup>c</sup>	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 <sup>st</sup> prior month	March	3.99	5.09	5.87	3.33	D	1	3	3
2 <sup>nd</sup> prior month	February	3.42	4.59	5.37	6.53	W	3	2	6
3 <sup>rd</sup> prior month	January	4.35	6.14	7.28	4.42	N	2	1	2
<b>Sum</b>									<b>11</b>

<sup>a</sup> NRCS 2002

<sup>b</sup> NOAA 2012

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

Note: If sum is

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

Condition value:

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

Conclusions: Normal precipitation conditions were present prior to the field visit.

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

Date (2012)	Daily Precipitation (inches) <sup>a</sup>
March 18	0.0
March 17	0.0
March 16	0.0
March 15	0.0
March 14	0.01
March 13	0.0
March 12	0.0
March 11	0.0
March 10	0.01
March 09	0.02

<sup>a</sup> Weather Underground 2012

## Literature Cited

1. [Ecology] Washington State Department of Ecology. 1997. Washington State Wetland Identification and Delineation Manual, Publication #96-94. Olympia, Washington.
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