Interstate 5 Everett HOV, SR 526 to SR 2 Vicinity Mitigation Site

USACE NWP (18) 200401448

Northwest Region

2018 MONITORING REPORT

Wetlands Program

Issued March 2019
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Interstate 5 Everett HOV, SR 526 to SR 2 Vicinity Mitigation Site
USACE NWP (18) 200401448

<table>
<thead>
<tr>
<th>General Site Information</th>
</tr>
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<tbody>
<tr>
<td>USACE NWP 18</td>
</tr>
<tr>
<td>Mitigation Location</td>
</tr>
<tr>
<td>LLID Number</td>
</tr>
<tr>
<td>Construction Date</td>
</tr>
<tr>
<td>Monitoring Period</td>
</tr>
<tr>
<td>Year of Monitoring</td>
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<tr>
<td>Type of Impact</td>
</tr>
<tr>
<td>Area of Project Impact(^1)</td>
</tr>
<tr>
<td>Type of Mitigation</td>
</tr>
<tr>
<td>Planned Area of Mitigation(^2)</td>
</tr>
</tbody>
</table>

\(^1\) Impact numbers sourced from Gresham (2004).
\(^2\) Mitigation numbers sourced from Gresham (2004).
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### Summary of Monitoring Results and Management Activities (2018)

<table>
<thead>
<tr>
<th>Performance Standards</th>
<th>2018 Results</th>
<th>Management Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wetland hydrology</td>
<td>Present</td>
<td></td>
</tr>
<tr>
<td>The mitigation site will contain 0.08 acre of created wetland in total.</td>
<td>Present</td>
<td></td>
</tr>
<tr>
<td>Native facultative or wetter woody species will achieve a minimum of 50 percent coverage in the forested wetland community</td>
<td>73% cover (CI&lt;sub&gt;80%&lt;/sub&gt; = 58-88%)</td>
<td>300 live stakes planted in 2017</td>
</tr>
<tr>
<td>Native facultative or wetter herbaceous vegetation will achieve 75 percent coverage in the emergent wetland community</td>
<td>66% cover (CI&lt;sub&gt;80%&lt;/sub&gt; = 35-97%)</td>
<td>300 hardstem bulrush (Schoenoplectus acutus) planted in 2016, 250 in 2017</td>
</tr>
<tr>
<td>Snohomish County listed Class A weeds including reed canarygrass, non-native blackberries, and Scot’s broom will not exceed 15 percent coverage in the forested and emergent wetland creation area</td>
<td>5% cover</td>
<td>3 weed control visits occurred in 2016, 2017, and 2018</td>
</tr>
<tr>
<td>Three facultative or wetter native vegetation woody species each will achieve at least 6 percent or greater relative cover in the forested wetland community.</td>
<td>Present</td>
<td></td>
</tr>
<tr>
<td>Native upland buffer woody species will achieve a minimum of 35 percent coverage in the buffer community.</td>
<td>95% cover</td>
<td></td>
</tr>
<tr>
<td>Snohomish County listed Class A weeds including reed canarygrass, non-native blackberries, and Scot’s broom will not exceed 15 percent coverage in the buffer mitigation area.</td>
<td>3% cover</td>
<td>3 weed control visits occurred in 2016, 2017, and 2018</td>
</tr>
<tr>
<td>Three native woody vegetation species each will achieve at least 6 percent relative cover in the buffer community.</td>
<td>Present</td>
<td></td>
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</tbody>
</table>

### Report Introduction
This report summarizes final-year (year-10) monitoring activities at the Interstate (I) 5 Everett HOV Mitigation Site. Included are a site description, the performance standards, an explanation of monitoring methods, and an evaluation of site development. Monitoring activities in 2018 included vegetation surveys, and photo-documentation. Vegetation monitoring took place July 30, 2018.

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3 Estimated values are presented with their corresponding statistical confidence interval. For example, 73% (CI<sub>80%</sub> = 58-88% cover) means we are 80% confident that the true cover value is between 58% and 88%.
What is the I-5 Everett HOV Mitigation Site?

This 1.28-acre mitigation site (Figure 1) consists of 1.2 acres of buffer enhancement and 0.08 acre of newly established wetland between the Burlington Northern/Santa Fe railroad tracks and a pedestrian path in the Lowell Riverfront Park in the city of Everett near the Snohomish River. This site was established to compensate for direct impacts to 0.03 acre of wetlands and 0.01 acre of a drainage ditch (regulated as a Water of the U.S.) due to the creation of a stormwater facility. The seasonally ponded depression and surrounding scrub-shrub/forested area is designed to provide mitigation for lost wetland functions including wildlife habitat, biological support, and stormwater control.

The I-5 Everett HOV Wetland Mitigation Site includes forested and emergent wetlands with an enhanced buffer along trails and around detention ponds.
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% of the growing season.

Performance Standard 2
The wetland area will be delineated using current methodology to assure that the mitigation site contains 0.08 acre of created wetland in total.

Performance Standard 3
Native facultative or wetter woody species will achieve a minimum of 75 percent coverage in the forested wetland community. Native colonizing vegetation will be included in this coverage calculation.

Performance Standard 4
Native facultative or wetter herbaceous vegetation will achieve 75 percent coverage in the emergent wetland community. Native colonizing vegetation will be included in this coverage calculation.

Performance Standard 5
Snohomish County listed Class A weeds including reed canarygrass, non-native blackberries, and Scot’s broom will not exceed 15 percent coverage in the forested and emergent wetland creation area.

Performance Standard 6
Three facultative or wetter native vegetation woody species each will achieve at least 8 percent or greater relative cover in the forested wetland community.

Performance Standard 7
Native upland buffer woody species will achieve a minimum of 50 percent coverage in the buffer community. Native colonizing vegetation will be included in this coverage calculation.

Performance Standard 8
Snohomish County listed Class A weeds including reed canarygrass, non-native blackberries, and Scot’s broom will not exceed 15 percent coverage in the buffer mitigation area.

Performance Standard 9
Three native woody vegetation species each will achieve at least 8 percent relative cover in the buffer community.

Appendix 1 shows the as-built planting plan (WSDOT 2007).
How were the performance standards evaluated?

The site was delineated on November 26, 2013 and has met the final-year year ten wetland acreage requirements. On February 20, 2015 a request to discontinue hydrology monitoring was sent to USACE; this request was accepted on February 26, 2015 (Performance Standard 1). The site was delineated again on March 5, 2018 (Performance Standard 2. See Appendix 3 for a complete report.

The table and figure below document the sample methods used for the remaining vegetative performance standards (PS) as required by the mitigation plan and associated permits. For additional details on the methods see the WSDOT Wetland Mitigation Site Monitoring Methods Paper (WSDOT 2008).

**Placement of Baseline:** Both the emergent and native woody baseline was placed on the eastern edge of each respective vegetative zone.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Relative Cover</th>
<th>Cover</th>
<th>PS 4</th>
<th>PS 6 &amp; 7</th>
<th>PS 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS 2 &amp; 5</td>
<td>Native Woody</td>
<td>Noxious Weeds/Invasive sp.</td>
<td>~</td>
<td></td>
<td></td>
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<tr>
<td>PS 3</td>
<td>Herbaceous</td>
<td>Native Woody</td>
<td>~</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PS 4</td>
<td>Wetland</td>
<td>Buffer</td>
<td>~</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PS 6 &amp; 7</td>
<td>Wetland</td>
<td>Buffer</td>
<td>~</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PS 8</td>
<td>Wetland</td>
<td>Buffer</td>
<td>~</td>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Target pop.</th>
<th>Line Intercept</th>
<th>Point Line</th>
<th>Qualitative</th>
<th>Qualitative</th>
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<tr>
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<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>PS 3</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>PS 4</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>PS 6 &amp; 7</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>PS 8</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Sample method</th>
<th>SU length</th>
<th>SU width</th>
<th>Points per SU</th>
<th>Total # of SU</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS 2 &amp; 5</td>
<td>10 m</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>PS 3</td>
<td>2</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>PS 4</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>PS 6 &amp; 7</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>PS 8</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Figure 2 Site Sampling Design (2015)
Is this site a success?

This site is a success in spite of the fact that native cover in both the emergent and scrub/shrub are slightly below the final year performance standard target. The created wetland is extremely small (0.08 acre) but connects two pre-existing wetlands that combined cover approximately 10.5 acres. The area that is lacking native woody and herbaceous cover is covered by moss, not invasive species. During winter, this area holds up to two feet of water with six to eight inches of inundation present in July. This amount of water makes it difficult to establish additional native vegetation. Multiple attempts to establish hardstem bulrush (*Schoenoplectus acutus*) (2016 and 2017) in the emergent zone have been unsuccessful. Cover of native species, both herbaceous and woody, increased by at least fifteen percent in both zones since the last quantitative sample occurred in 2015. The buffer community has developed well with a high species richness. The buffer developed more rapidly and has been meeting the year-10 final year standard for 7 years. On April 23, 2018, a request to discontinue quantitative sampling for the buffer was sent to USACE this request was accepted on May 22, 2014. The final year standards are still being met.

Cover of invasive species remains low and mainly consists of species that are ubiquitous to the area and not of major concern in this context.

The intended functions replaced at the mitigation site are water quality improvement, stormwater control, ground water recharge, and wildlife habitat. The site is providing all of the intended functions evidenced by the amount of water stored over the winter and into the summer. Wildlife observations on-site include Pacific chorus frogs, garter snakes, and evidence of deer, coyote, and beaver. A large variety of birds observed on-site include many wetland-dependent species such as Common Yellowthroat, Willow flycatcher, Yellow Warbler, Canada Goose, Great Blue Heron, Mallard, Marsh Wren, Northern Shoveler, Red-winged Blackbird, and Wilson’s Snipe.
Results for Performance Standard 1
(Wetland hydrology):

The site was delineated on November 26, 2013 and has met the final-year ten wetland acreage requirements. On February 20, 2014 a request to discontinue hydrology monitoring was sent to USACE this request was accepted on February 26, 2014. Fourteen inches of standing water was present during a site visit on March 5, 2018 (Photo 1).

Results for Performance Standard 2
(The mitigation site will contain 0.08 acre of created wetland in total):

A re-delineation occurred on March 5, 2018. Inundation up to fourteen inches was present across the entire created wetland and extended beyond the boundary of the site. See Appendix 3 for a discussion of the delineation.

Results for Performance Standard 3 & 6
(Native facultative or wetter woody species will achieve a minimum of 75% coverage in the forested wetland community; three facultative or wetter native vegetation woody species each will achieve at least 8 percent relative cover):

The cover of native woody species is estimated at 73% cover (CI80% = 58-88%) (Photo 2). Scouler's willow (Salix scouleriana), Pacific willow (Salix lasiandra), and redosier dogwood (Cornus alba) achieved the minimum of eight percent relative cover.
Results for Performance Standard 4
(At least 75 percent cover of native FAC or wetter herbs in the emergent wetland):

The cover of native herbaceous vegetation is estimated at 66 percent ($CI_{80\%} = 35-97\%$). This consists almost entirely of slough sedge (*Carex obnupta*) (Photo 3).

Results for Performance Standard 5
(Snohomish County listed Class A weeds including reed canarygrass, non-native blackberries, and Scot’s broom will not exceed 15 percent coverage in the forested and emergent wetland creation area):

The visual cover estimate for invasive species was five percent. This consisted entirely of reed canarygrass (*Phalaris arundinacea*) encroaching from the adjacent wetland off site.

Results for Performance Standard 7 & 9
(Native upland buffer woody species will achieve a minimum of 50 percent coverage in the buffer community; three native woody vegetation species each will achieve at least 8 percent relative cover in the buffer community.):

The cover of native woody species in the buffer is estimated at 95%. Nineteen different species are present in the buffer. At least three met the relative cover performance standard.

**What is planned for this site?**

The region has plans to continue weed control.

Results for Performance Standard 8
(Snohomish County listed Class A weeds including reed canarygrass, non-native blackberries, and Scot’s broom will not exceed 15 percent coverage in the buffer community):

The visual cover estimate for invasive species was 3%. This consisted entirely of reed canarygrass (*Phalaris arundinacea*) and Himalayan blackberry (*Rubus armeniacus*).
Appendix 1 – As-built Wetland Planting Plan
(from WSDOT 2007)
As-built Buffer Planting Plan
Appendix 2 – Photo Points

The photographs below were taken from permanent photo-points on July 30, 2018 and document current site development.

Photo Point 1

Photo Point 2a

Photo Point 1b

Photo Point 2b
The photographs below were taken from permanent photo-points on July 30, 2018 and document current site development.

Photo Point 2c

Photo Point 2d
Appendix 3 – Delineation Report
005 Everett HOV Mitigation Site

Interstate 5 Everett HOV, SR526 to SR 2 Vicinity
USACE NWP (18) 200401448

Snohomish County, Washington

Prepared by:
WSDOT Environmental Services Office
Olympia, Washington

December 2018
Introduction

This report was prepared by the Washington State Department of Transportation (WSDOT) to describe the wetland boundary delineation for the 005 Everett HOV Mitigation Site. Field work was conducted by WSDOT wetland biologists Tatiana Dreisbach and Trace McKellips, on March 5, 2018. The delineation determined that the entire 0.08 acre mitigation site is wetland, with the wetland extending off site primarily to the north and west.

The wetland was previously delineated in November 2013 (WSDOT 2014). The purpose of the 2018 field work was to reevaluate the 2013 wetland boundary and document any wetland boundary modifications if necessary. The 2018 delineation confirmed the wetland boundary remains unchanged from 2013 to 2018.

<table>
<thead>
<tr>
<th>General Information for the 005 Everett HOV mitigation site</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Location:</strong> S32, T29N, R05E. Snohomish County. (Vicinity map, Figure 1)</td>
</tr>
<tr>
<td><strong>USACE NWP Number</strong></td>
</tr>
<tr>
<td><strong>Long./Lat. ID Number</strong></td>
</tr>
<tr>
<td><strong>Land Resource Region (LRR)</strong></td>
</tr>
<tr>
<td><strong>Major Land Resource Area (MLRA)</strong></td>
</tr>
<tr>
<td><strong>Construction Date</strong></td>
</tr>
<tr>
<td><strong>Monitoring Period</strong></td>
</tr>
<tr>
<td><strong>Year of Monitoring</strong></td>
</tr>
<tr>
<td><strong>Area of Project Impact</strong></td>
</tr>
<tr>
<td><strong>Type of Mitigation</strong></td>
</tr>
<tr>
<td><strong>Establishment</strong></td>
</tr>
<tr>
<td><strong>Total Intended Wetland Mitigation Area</strong></td>
</tr>
<tr>
<td><strong>Total Delineated Wetland Area</strong></td>
</tr>
</tbody>
</table>

1 Project impact numbers from USACE Nationwide Permit 200401448 with 0.04 acres impacts (USACE 2004).

2 Area of mitigation from the Wetland Mitigation Plan Interstate 5 Everett HOV, SR 526 to SR 2 Vicinity (Gresham 2004)
Location

Figure 1. Vicinity Map
Methods

Wetland boundaries within the 005 Everett HOV 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) equipped Panasonic Toughpad paired with a Trimble R2 Global Navigation Satellite System (GNSS) Receiver mapping grade unit was used to navigate to the 2013 delineation boundary and record 2018 sampling point locations (Figure 2). Boundary line adjustments were not necessary.

Wetland mitigation types were georeferenced by digitizing the mitigation site planting plan in ArcGIS 10.5.1. Inherent in both GPS and georeferencing are minute errors, resulting in slight inaccuracies in both boundary line placement and acreage calculations. These tools represent the best available methods at the time of the study and report preparation.
Wetland Delineation and Study Area

Study Area
The mitigation site boundary was georeferenced and added to the GPS unit prior to the 2018 delineation (Figure 2). The georeferenced site boundary is synonymous with the study area. The wetland is contiguous with pre-existing, off-site wetland areas.

Wetland Changes Since 2013
The 005 Everett HOV Mitigation Site remains in similar condition as documented in 2013. The wetland boundary and acreage remain unchanged. The vegetation community has continued to establish, with palustrine emergent (PEM) and palustrine scrub-shrub (PSS) communities providing increased cover since the last delineation.

Wetland Boundary Verification
The 2018 delineation verification determined 0.08 acre of wetland were present within the 005 Everett HOV mitigation site. Delineation data were collected at three sampling points and recorded on wetland determination data forms (Appendix A). Paired wetland and upland sample points were used to define the wetland edge and document that wetland boundary remains in the same location as was identified in 2013. An additional wetland sample point characterizes additional wetland vegetation communities found in the interior of the wetland. Data recorded on wetland determination data forms characterize typical wetland and upland conditions observed on site. Vegetation, soils, and hydrology were examined in several additional sampling locations to determine the wetland boundary.

Precipitation
The Regional Delineation Supplement Version 2.0 (USACE 2010) recommends using methods described in Chapter 19 in Engineering Field Handbook (NRCS 2015) to determine if precipitation occurring in the three full months prior to the site visit was normal, drier than normal, or wetter than normal. Actual rainfall is compared to the normal range of the 30-year average. When considering the three prior months as a whole, wetter than normal precipitation conditions were present prior to field work. One of the three months prior to field work was within the normal range, with the first two prior months wetter than normal and 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: bud break observed on Sitka willow (Salix sitchensis), redosier dogwood (Cornus alba), and tall oregongrape (Mahonia aquifolium).
Figure 2. 005 Everett HOV 2018 wetland boundary.
005 Everett HOV Mitigation Site – Wetland Delineation Summary

<table>
<thead>
<tr>
<th>Total Delineated Wetland Area</th>
<th>0.08 acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wetland Determination Data Form(s)</td>
<td>Appendix A; Sampling Point W1-SP1 and W1-SP2</td>
</tr>
<tr>
<td>Upland Determination Data Form(s)</td>
<td>Appendix A; Sampling Point W1-SP3</td>
</tr>
<tr>
<td>Delineator(s)</td>
<td>Tatiana Dreisbach, Trace McKellips</td>
</tr>
<tr>
<td>Delineation Date</td>
<td>March 5, 2018</td>
</tr>
</tbody>
</table>

**Vegetation**
- Trees – none
- Shrubs – redosier dogwood (*Cornus alba*), Pacific willow (*Salix lasiandra*), Sitka willow (*Salix sitchensis*)
- Herbs – slough sedge (*Carex obnupta*), broadleaf cattail (*Typha latifolia*)

**Soils**
Soils were not observed during the 2018 delineation because the entire mitigation site was inundated with greater than 14 inches of water. Hydric soils are present because they meet the definition of hydric soil due to prolonged inundation and saturation during the growing season.

**Hydrology**
The entire mitigation site experienced greater than 14 inches of inundation during the 2018 delineation. Groundwater associated with the Snohomish River floodplain appears to be the main source of hydrology. Precipitation also contributes to the hydrologic regime of this wetland. Despite wetter than normal precipitation preceding the 2018 delineation, the 2013 delineation coupled with several other site visits, indicate that wetland hydrology is also present throughout the wetland mitigation site during periods with normal precipitation.

**Rationale for Delineation**
Positive indicators of all three wetland criteria are present. Placement of boundary determined by extent of inundation on the southern wetland boundary. All other directions of the wetland were inaccessible due to inundation.

## 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


Appendix A — Wetland Determination Data Form

Wetland Delineation Data Forms for:
W1-SP1
W1-SP2
W1-SP3

Wetland polygons, sampling point locations, and wetland names shown in Figure 2.
**VEGETATION – Use scientific names of plants.**

<table>
<thead>
<tr>
<th>Tree Stratum (Plot size: 15ft x 15ft)</th>
<th>Absolute % Cover</th>
<th>Dom. Sp.?</th>
<th>Relative % Cover</th>
<th>Indicator Status</th>
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<tbody>
<tr>
<td>1.</td>
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<td>2.</td>
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<td>3.</td>
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<td>5.</td>
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</tr>
</tbody>
</table>

**Sapling/Shrub Stratum (Plot size: 15ft x 15ft)**

| 1.                                  |                  |           |                  |                  |
| 2.                                  |                  |           |                  |                  |
| 3.                                  |                  |           |                  |                  |
| 4.                                  |                  |           |                  |                  |
| 5.                                  |                  |           |                  |                  |

**Herb Stratum (Plot size: 5ft x 5ft)**

| 1. Carex obnupta | 90 | Y | 98.9 | OBL |
| 2. Typha latifolia | 1 | N | 1.1 | OBL |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |

**Woody Vine Stratum (Plot size: 5ft x 5ft)**

| 1. |                  |           |                  |                  |
| 2. |                  |           |                  |                  |

% Bare Ground in Herb Stratum | 10 |

**Remarks:**

**Hydrophytic Vegetation Indicators:**

- 1 - Rapid Test for Hydrophytic Vegetation
- 2 - Dominance Test is >50%
- 3 - Prevalence Index is ≤3.0¹
- 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
- 5 - Wetland Non-Vascular Plants¹
- Problematic Hydrophytic Vegetation¹ (Explain)

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

**Hydrophytic Vegetation Present?** Yes No

Is the Sampled Area within a Wetland? Yes No

**Hydric Soil Present?** Yes No

**Wetland Hydrology Present?** Yes No

**Remarks:**

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

**Hydrophytic Vegetation Present?** Yes No

**Hydric Soil Present?** Yes No

**Wetland Hydrology Present?** Yes No

**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.)

**Remarks:**

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

**Prevalence Index worksheet:**

<table>
<thead>
<tr>
<th>Total % Cover of:</th>
<th>Multiply by:</th>
</tr>
</thead>
<tbody>
<tr>
<td>OBL species</td>
<td>91 x 1 = 91</td>
</tr>
<tr>
<td>FACW species</td>
<td>0 x 2 = 0</td>
</tr>
<tr>
<td>FAC species</td>
<td>0 x 3 = 0</td>
</tr>
<tr>
<td>FACU species</td>
<td>0 x 4 = 0</td>
</tr>
<tr>
<td>UPL species</td>
<td>0 x 5 = 0</td>
</tr>
<tr>
<td>Column Totals:</td>
<td>91 x 1 = 91(B)</td>
</tr>
</tbody>
</table>

Prevalence Index = B/A = 1.000

**Hydrophytic Vegetation Indicators:**

- 1 - Rapid Test for Hydrophytic Vegetation
- 2 - Dominance Test is >50%
- 3 - Prevalence Index is ≤3.0¹
- 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
- 5 - Wetland Non-Vascular Plants¹
- Problematic Hydrophytic Vegetation¹ (Explain)

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

**Hydrophytic Vegetation Present?** Yes No

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

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>Matrix</th>
<th>Redox Features</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Color (moist)</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

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

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Loamy Mucky Mineral (F1) (except MLRA 1)
- Loamy Gleyed Matrix (F2)
- Redeposited Matrix (F3)
- Redox Dark Surface (F6)
- Redox Depressions (F8)
- 2 cm Muck (A10)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

**Restrictive Layer (if present):**
Type: ____________________________
Depth (inches): __________________

**Hydric Soil Present?**
☐ Yes  ☐ No

**Remarks:**
A soil pit was not excavated due to the presence of water (see hydrology section below). This soil meets the definition of a hydric soil due to the presence of inundation, saturation, or a high water table for extended periods during the growing season.

**HYDROLOGY**

**Wetland Hydrology Indicators:**

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

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

Secondary Indicators (2 or more required)

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

**Field Observations:**

- Surface Water Present?  ☑ Yes  ☐ No  Depth (inches): 14
- Water Table Present?  ☑ Yes  ☐ No  Depth (inches): 0
- Saturation Present?  ☑ Yes  ☐ No  Depth (inches): 0

**Wetland Hydrology Present?**
☐ Yes  ☐ No

**Remarks:**

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: 005 Everett HOV
City/County: Everett/Snohomish
Sampling Date: 3/5/2018
Applicant/Owner: WSDOT
State: WA
Sampling Point: W1-SP2
Investigator(s): Tatiana Dreisbach, Trace McKellips
Section, Township, Range: S32, T29N, R5E
Landform (hillslope, terrace, etc.): depression
Local relief (concave, convex, none): concave
Slope (%): 5
Subregion (LRR): A
Lat: 47.953
Long: -122.192
Datum: NAD83HARN
Soil Map Unit Name; urban land
W1-SP2
SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

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

Remarks:
Active beaver chews observed on woody species.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 15ft x 15ft)
1. ____________
2. ____________
3. ____________
4. ____________

Absolute % Cover ____________
Dom. Sp.? ____________
Relative % Cover ____________
Indicator Status ____________

= Total Cover

Sapling/Shrub Stratum (Plot size: 15ft x 15ft)
1. Cornus alba 40 Y 56.3 FACW
2. Salix lasiandra 25 Y 35.2 FACW
3. Salix sitchensis 5 N 7.0 FACW
4. Typha latifolia 1 N 1.4 OBL

= Total Cover

Herb Stratum (Plot size: 5ft x 5ft)
1. ____________
2. ____________
3. ____________
4. ____________
5. ____________

= Total Cover

Woody Vine Stratum (Plot size: 5ft x 5ft)
1. ____________
2. ____________

= Total Cover

% Bare Ground in Herb Stratum 100

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:
Total % Cover of: Multiply by:
OBL species 1 x 1 = 1
FACW species 70 x 2 = 140
FAC species 0 x 3 = 0
FACU species 0 x 4 = 0
UPL species 0 x 5 = 0
Column Totals: 71 (A) 141 (B)
Prevalence Index = B/A = 1.986

Hydrophytic Vegetation Indicators:
☐ 1 - Rapid Test for Hydrophytic Vegetation
☐ 2 - Dominance Test is >50%
☐ 3 - Prevalence Index is ≤3.0¹
☐ 4 - Morphological Adaptations² (Provide supporting data in Remarks or on a separate sheet)
☐ 5 - Wetland Non-Vascular Plants¹
☐ Problematic Hydrophytic Vegetation¹ (Explain)

Hydrophytic Vegetation Present? ☐ Yes ☐ No

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

Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

1. ____________
2. ____________
3. ____________
4. ____________
5. ____________
6. ____________
7. ____________
8. ____________
9. ____________
10. ____________
11. ____________

= Total Cover

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

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>Matrix</th>
<th>Redox Features</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

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

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Type¹</th>
<th>Location²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Histosol (A1)</td>
<td>Sandy Redox (S5)</td>
<td>PL</td>
</tr>
<tr>
<td>Histic Epipedon (A2)</td>
<td>Stripped Matrix (S6)</td>
<td>PL</td>
</tr>
<tr>
<td>Black Histic (A3)</td>
<td>Loamy Mucky Mineral (F1) (except MLRA 1)</td>
<td>PL</td>
</tr>
<tr>
<td>Hydrogen Sulfide (A4)</td>
<td>Loamy Gleyed Matrix (F2)</td>
<td>PL</td>
</tr>
<tr>
<td>Depleted Below Dark Surface (A11)</td>
<td>Depleted Matrix (F3)</td>
<td>PL</td>
</tr>
<tr>
<td>Thick Dark Surface (A12)</td>
<td>Redox Dark Surface (F6)</td>
<td>PL</td>
</tr>
<tr>
<td>Sandy Mucky Mineral (S1)</td>
<td>Depleted Dark Surface (F7)</td>
<td>PL</td>
</tr>
<tr>
<td>Sandy Gleyed Matrix (S4)</td>
<td>Redox Depressions (F8)</td>
<td>PL</td>
</tr>
</tbody>
</table>

### Restrictive Layer (if present):

<table>
<thead>
<tr>
<th>Type</th>
<th>Depth (inches)</th>
</tr>
</thead>
</table>

Hydric Soil Present? Yes ☐ No ☐

Remarks:
A soil pit was not excavated due to the presence of water (see hydrology section below). This soil meets the definition of a hydric soil due to the presence of inundation, saturation, or a high water table for extended periods during the growing season.

### HYDROLOGY

#### Wetland Hydrology Indicators:

<table>
<thead>
<tr>
<th>Primary Indicators (minimum of one required; check all that apply)</th>
<th>Secondary Indicators (2 or more required)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface Water (A1)</td>
<td>Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)</td>
</tr>
<tr>
<td>High Water Table (A2)</td>
<td>Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)</td>
</tr>
<tr>
<td>Saturation (A3)</td>
<td>Drainage Patterns (B10)</td>
</tr>
<tr>
<td>Water Marks (B1)</td>
<td>Dry-Season Water Table (C2)</td>
</tr>
<tr>
<td>Sediment Deposits (B2)</td>
<td>Saturation Visible on Aerial Imagery (C9)</td>
</tr>
<tr>
<td>Drift Deposits (B3)</td>
<td>Geomorphic Position (D2)</td>
</tr>
<tr>
<td>Algal Mat or Crust (B4)</td>
<td>Shallow Aquitard (D3)</td>
</tr>
<tr>
<td>Iron Deposits (B5)</td>
<td>FAC-Neutral Test (D5)</td>
</tr>
<tr>
<td>Surface Soil Cracks (B6)</td>
<td>Raised Ant Mounds (D6) (LRR A)</td>
</tr>
<tr>
<td>Inundation Visible on Aerial Imagery (B7)</td>
<td>Frost-Heave Hummocks (D7)</td>
</tr>
<tr>
<td>Sparsely Vegetated Concave Surface (B8)</td>
<td>Other (Explain in Remarks)</td>
</tr>
</tbody>
</table>

#### Field Observations:

| Surface Water Present? | Yes ☐ No ☐ Depth (inches): 14 |
| Water Table Present? | Yes ☐ No ☐ Depth (inches): 0 |
| Saturation Present? (includes capillary fringe) | Yes ☐ No ☐ Depth (inches): 0 |

Wetland Hydrology Present? Yes ☐ No ☐

Remarks:

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
### VEGETATION – Use scientific names of plants.

#### Tree Stratum (Plot size: 5ft x 5ft)

<table>
<thead>
<tr>
<th>Species</th>
<th>Absolute % Cover</th>
<th>Relative % Cover</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Physocarpus capitatus</td>
<td>60 Y 73.2</td>
<td>FACW</td>
<td></td>
</tr>
<tr>
<td>2. Alnus rubra</td>
<td>2 N 2.4</td>
<td>FAC</td>
<td></td>
</tr>
<tr>
<td>3. Symphoricarpus albus</td>
<td>10 N 12.2</td>
<td>FACU</td>
<td></td>
</tr>
<tr>
<td>4. Gaultheria shallon</td>
<td>5 N 6.1</td>
<td>FACU</td>
<td></td>
</tr>
<tr>
<td>5. Mahonia aquifolium</td>
<td>5 N 6.1</td>
<td>FACU</td>
<td></td>
</tr>
</tbody>
</table>

#### Sapling/Shrub Stratum (Plot size: 5ft x 15 ft)

<table>
<thead>
<tr>
<th>Species</th>
<th>Absolute % Cover</th>
<th>Relative % Cover</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Physocarpus capitatus</td>
<td>60</td>
<td>Y 73.2</td>
<td>FACW</td>
</tr>
<tr>
<td>2. Alnus rubra</td>
<td>2</td>
<td>N 2.4</td>
<td>FAC</td>
</tr>
<tr>
<td>3. Symphoricarpus albus</td>
<td>10</td>
<td>N 12.2</td>
<td>FACU</td>
</tr>
<tr>
<td>4. Gaultheria shallon</td>
<td>5</td>
<td>N 6.1</td>
<td>FACU</td>
</tr>
<tr>
<td>5. Mahonia aquifolium</td>
<td>5</td>
<td>N 6.1</td>
<td>FACU</td>
</tr>
</tbody>
</table>

#### Herb Stratum (Plot size: 5ft x 5ft)

<table>
<thead>
<tr>
<th>Species</th>
<th>Absolute % Cover</th>
<th>Relative % Cover</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Agrostis capillaris</td>
<td>5 Y 83.3</td>
<td>83.3 FAC</td>
<td></td>
</tr>
<tr>
<td>2. Galium aparine</td>
<td>1 N 16.7</td>
<td>16.7 FACU</td>
<td></td>
</tr>
</tbody>
</table>

#### Woody Vine Stratum (Plot size: 5ft x 5ft)

<table>
<thead>
<tr>
<th>Species</th>
<th>Absolute % Cover</th>
<th>Relative % Cover</th>
<th>Indicator Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Galium aparine</td>
<td>1 N 16.7</td>
<td>FACU</td>
<td></td>
</tr>
<tr>
<td>2. Agrostis capillaris</td>
<td>5 Y 83.3</td>
<td>FAC</td>
<td></td>
</tr>
</tbody>
</table>

#### Remarks:

- **Hydrophytic Vegetation Present?**  Yes
- **Hydric Soil Present?**  Yes
- **Wetland Hydrology Present?**  Yes
- **Are the Climatic/hydrologic conditions on the site typical for this time of year?**  Yes
- **Are Vegetation, Soil, or Hydrology significantly disturbed?**  Yes
- **Are Vegetation, Soil, or Hydrology naturally problematic?**  Yes
- **Are “Normal Circumstances” present?**  Yes
- **Hydrophytic Vegetation Indicators:**
  - Rapid Test for Hydrophytic Vegetation
  - Dominance Test is >50%
  - Prevalence Index is ≤3.0
  - Morphological Adaptations
  - Wetland Non-Vascular Plants
  - Problematic Hydrophytic Vegetation (Explain)

#### Prevalence Index worksheet:

<table>
<thead>
<tr>
<th>OBL species</th>
<th>Multiply by</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>FACW species</td>
<td>120</td>
</tr>
<tr>
<td>FAC species</td>
<td>21</td>
</tr>
<tr>
<td>UPL species</td>
<td>0</td>
</tr>
</tbody>
</table>

**Prevalence Index = B/A = 2.557**

#### Hydrophytic Vegetation Indicators:

- Yes
- No

#### Remarks:

- Remarks:
## SOIL

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

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>Color (moist)</th>
<th>%</th>
<th>Redox Features</th>
<th>Type¹</th>
<th>Loc²</th>
<th>Texture</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-6</td>
<td>10YR</td>
<td>4/1</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6-8</td>
<td>2.5Y</td>
<td>4/1</td>
<td>90</td>
<td>2.5Y</td>
<td>D</td>
<td>M</td>
<td>Sandy Loam</td>
</tr>
<tr>
<td>8-14</td>
<td>10YR</td>
<td>3/2</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

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

<table>
<thead>
<tr>
<th>Restrictive Layer (if present):</th>
<th>Hydric Soil Present?</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depth (inches):</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Remarks:
brick particles were observed in all soil layers.

### HYDROLOGY

#### Wetland Hydrology Indicators:

- Primary Indicators (minimum of one required; check all that apply)
  - Surface Water (A1)
  - High Water Table (A2)
  - Saturation (A3)
  - Water Marks (B1)
  - Sediment Deposits (B2)
  - Drift Deposits (B3)
  - Algal Mat or Crust (B4)
  - Iron Deposits (B5)
  - Surface Soil Cracks (B6)
  - Inundation Visible on Aerial Imagery (B7)
  - Sparsely Vegetated Concave Surface (B8)

- Secondary Indicators (2 or more required)
  - Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
  - Salt Crust (B11)
  - Aquatic Invertebrates (B13)
  - Hydrogen Sulfide Odor (C1)
  - Oxidized Rhizospheres along Living Roots (C3)
  - Presence of Reduced Iron (C4)
  - Recent Iron Reduction in Tilled Soils (C6)
  - Stunted or Stressed Plants (D1) (LRR A)
  - Other (Explain in Remarks)

- Field Observations:
  - Surface Water Present? Yes | No
  - Water Table Present? Yes | No
  - Saturation Present? Yes | No

- Wetland Hydrology Present? Yes | No

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

Remarks:
Appendix B — Precipitation Data

Appendix B-1. Comparison of Observed and Normal Precipitation (NRCS 2015)


<table>
<thead>
<tr>
<th>Long-term rainfall records(^a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Month</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>1st prior month</td>
</tr>
<tr>
<td>2nd prior month</td>
</tr>
<tr>
<td>3rd prior month</td>
</tr>
<tr>
<td>Sum</td>
</tr>
</tbody>
</table>

\(^{a}\)NRCS 2018
\(^{b}\)Conditions are considered normal if they fall within the low and high range around the average.

Note: If sum is
- 6 - 9 then prior period has been drier than normal
- 10 - 14 then period has been normal
- 15 - 18 then period has been wetter than normal

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

Conclusions: Wetter than normal precipitation conditions were present prior to the field visit.
Appendix B-2. Daily Precipitation 10 days preceding field work, Arlington, Washington

<table>
<thead>
<tr>
<th>Date (2018)</th>
<th>Daily Precipitation (inches)¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mar 4</td>
<td>0.10</td>
</tr>
<tr>
<td>Mar 3</td>
<td>0.00</td>
</tr>
<tr>
<td>Mar 2</td>
<td>0.00</td>
</tr>
<tr>
<td>Mar 1</td>
<td>0.10</td>
</tr>
<tr>
<td>Feb 28</td>
<td>0.33</td>
</tr>
<tr>
<td>Feb 27</td>
<td>0.05</td>
</tr>
<tr>
<td>Feb 26</td>
<td>0.00</td>
</tr>
<tr>
<td>Feb 25</td>
<td>0.62</td>
</tr>
<tr>
<td>Feb 24</td>
<td>0.20</td>
</tr>
<tr>
<td>Feb 23</td>
<td>0.39</td>
</tr>
<tr>
<td><strong>Sum</strong></td>
<td><strong>1.79</strong></td>
</tr>
</tbody>
</table>

¹ NRCS 2018

Conclusions: Moderate precipitation was recorded in the ten days preceding field work.
**Driving Directions:**
From I-5 take exit 192 for 41st St. Turn east onto 41st St. Turn right onto S 3rd Ave. Turn left onto Junction Ave. Continue onto S 2nd Ave. Turn left onto Lenora St. Turn left into the parking lot just after crossing the train tracks. The mitigation areas are north of the parking lot adjacent to the stormwater ponds.
Literature Cited


