

# Clear Creek Riverside Wetland and River Mitigation Site

I-5: Portland Avenue to Port Tacoma Road Northbound HOV

NWS-2010-278

NWS-2011-061

I-5 M Street to Portland Avenue HOV

NWS-2011-061

I-5 Tacoma HOV Mitigation

NWS-2009-753

## Olympic Region

### 2015 MONITORING REPORT

#### Wetlands Program

*Issued March 2016*



**Washington State  
Department of Transportation**

Environmental Services Office

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I-5 Tacoma HOV Mitigation NWS-2009-753



General Site Information			
<b>USACE NWP Number</b>	USACE NWS-2009-753, NWS-2010-278, NWS-2011-061		
<b>HPA Permit Number</b>	119199-2		
<b>Mitigation Location</b>	Off of 31 <sup>st</sup> Ave Ct E, Tacoma, Pierce County, WA		
<b>LLID Number</b>	1223860472324		
<b>Construction Date</b>	2011-2012		
<b>Monitoring Period</b>	2013-2022		
<b>Year of Monitoring</b>	3 of 10		
<b>Area of Project Impact</b>	3.63 acres		
<b>Type of Mitigation</b>	Wetland Re- Establishment	Riparian Restoration	Backwater Channel
<b>Planned Area of Mitigation<sup>1</sup></b>	4.65 acres	1.22 acres	0.10 acre

<sup>1</sup> Acreages from the wetland and river mitigation plan addendum (WSDOT 2013).

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

Performance Standards (Year-3)	2015 Results <sup>2</sup>	Management Activities
Hydrology present	Not present in all intended areas (see Appendix 3, Tables 1-3)	
Native wetland (facultative and wetter) woody species (planted and volunteer) will achieve a minimum average density of four plants/100ft <sup>2</sup> .	26.8 plants/100ft <sup>2</sup> (CI <sub>80%</sub> = 21.6-32.1)	Planted 170 Douglas-fir ( <i>Pseudotsuga menziesii</i> )
Native woody species (planted and volunteer) will achieve a minimum average density of four plants/100ft <sup>2</sup> (Buffer).	12.4 plants/100ft <sup>2</sup> (CI <sub>80%</sub> = 10.6-14.2)	
Eradication of Washington State-listed or county-listed Class A weeds and Class B weeds or Pierce County Noxious Weed Control Board.	None observed	
Non-native blackberries ( <i>Rubus armeniacus</i> and <i>R. laciniatus</i> ), purple loosestrife ( <i>Lythrum salicaria</i> ), Scot's broom ( <i>Cytisus scoparius</i> ), and thistles ( <i>Cirsium</i> species) will not exceed 25% cover.	5% cover	Weed control activity occurred on 3/18, 5/26, 6/18, and 8/13 in 2015.
Non-native knotweeds: <i>Polygonum cuspidatum</i> , <i>P. polystachyum</i> , <i>P. sachalinense</i> , and <i>P. bohemicum</i> will have 0% cover.	None observed	
<b>Permit Requirement</b>		
Vegetative cuttings shall be planted at a maximum interval of three feet (on center) and maintained as necessary for three years to ensure 80% survival.	100% survival (CI <sub>80%</sub> = 100-100%)	
<b>Performance Standards (Year-10)</b>		
Cover of native woody species will be at least 70% in the wetland shrub-forest community.	99% cover (CI <sub>80%</sub> = 98-100%)	
Aerial cover of native woody species will be at least 50% in the upland shrub-forest community.	62% cover (CI <sub>80%</sub> = 50-74%)	

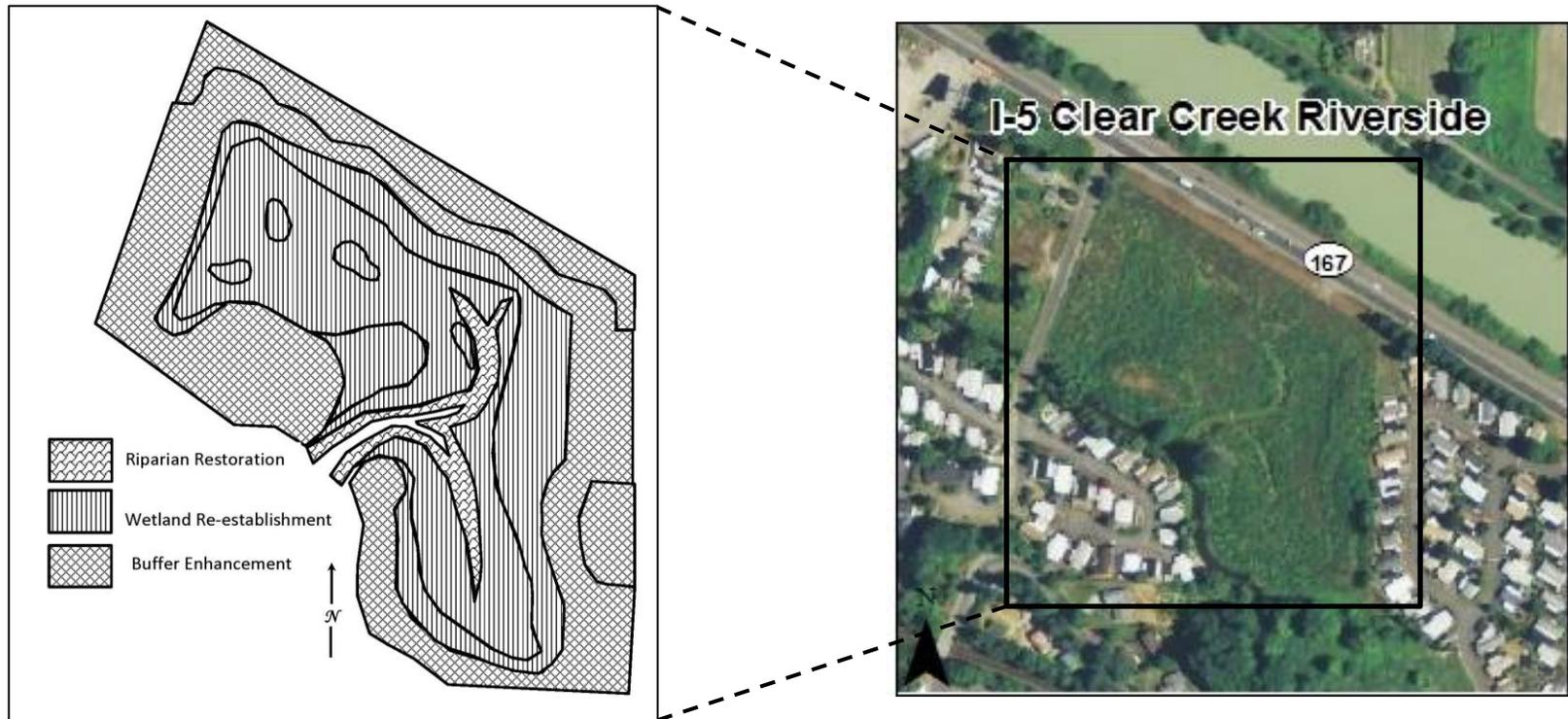
## Report Introduction

This report summarizes third-year (Year-3) monitoring activities at the Interstate (I) 5 Clear Creek Riverside Mitigation Site. Included are a site description, the performance standards, an explanation of monitoring methods, and an evaluation of site development. Monitoring activities included vegetation surveys and photo-documentation on July 6-8, 2015, and assessments of wetland hydrology on March 17 and 31, and April 20, 2015.

<sup>2</sup> Estimated values are presented with their corresponding statistical confidence interval. For example, 26.8 plants/100ft<sup>2</sup> (CI<sub>80%</sub> = 21.6-32.1) means we are 80% confident that the true density value is between 21.6 and 32.1 plants/100ft<sup>2</sup>.

## What is the I-5 Clear Creek Riverside Mitigation Site?

This 9.91-acre mitigation site (Figure 1) is re-established wetland near the border of the City of Tacoma and the City of Fife, south of the Puyallup River. This site was created as advance mitigation to compensate for losses associated with the Tacoma/Peirce County High Occupancy Vehicle HOV Program (HOV Program) projects. The re-established ponded depressions, back channel habitat, and riparian restoration are designed to provide mitigation for lost wetland acreage and function.



**Figure 1 Site Sketch**

The I-5 Clear Creek Riverside Mitigation Site contains an established back channel off of Clear Creek. Emergent and scrub-shrub areas flank the back channel which is surrounded by scrub-shrub wetlands. Appendix 2 includes site directions.

## What are the performance standards for this site?

### Year 3

#### Performance Standard 1

In Years 1, 3, 5, and 7, the soils in the re-established wetland will be inundated, saturated to the surface, or groundwater will be present within 12 inches of the surface for at least four consecutive weeks (10 percent) of the growing season in years when rainfall meets or exceeds the 30-year average.

#### Performance Standard 2

In Years 1 and 3, native wetland (facultative and wetter) woody species (planted and volunteer) will achieve a minimum average density of four plants per 100 square feet in the wetland shrub-forest community

#### Performance Standard 3

In Years 1 and 3, native woody species (planted and volunteer) will achieve a minimum average density of four plants per 100 square feet in the upland shrub-forest community.

#### Performance Standard 4

In all years, Washington State-listed or county-listed Class A weeds and Class B weeds designated for control by the Washington State Noxious Weed Control Board (2009) or the Pierce County Noxious Weed Control Board must be eradicated, according to state law.

#### Performance Standard 5

In all years, Non-native blackberries, purple loosestrife, Scot's broom, and thistles will not exceed 25 percent cover in the re-established and rehabilitated/enhanced wetlands, and enhanced uplands.

#### Performance Standard 6

In all years, a zero tolerance (0 percent cover) will be established onsite for the following non-native knotweeds: *Polygonum cuspidatum*, *P. polystachyum*, *P. sachalinense*, and *P. bohemicum*.

#### Permit Requirement 1 –HPA 119199-2

Vegetative cuttings shall be planted at a maximum interval of three feet (on center) and maintained as necessary for three years to ensure 80 percent survival.

## **Year 10**

### **Performance Standard 1**

In Year 10, cover of native woody species will be at least 70 percent in the wetland shrub-forest community.

### **Performance Standard 2**

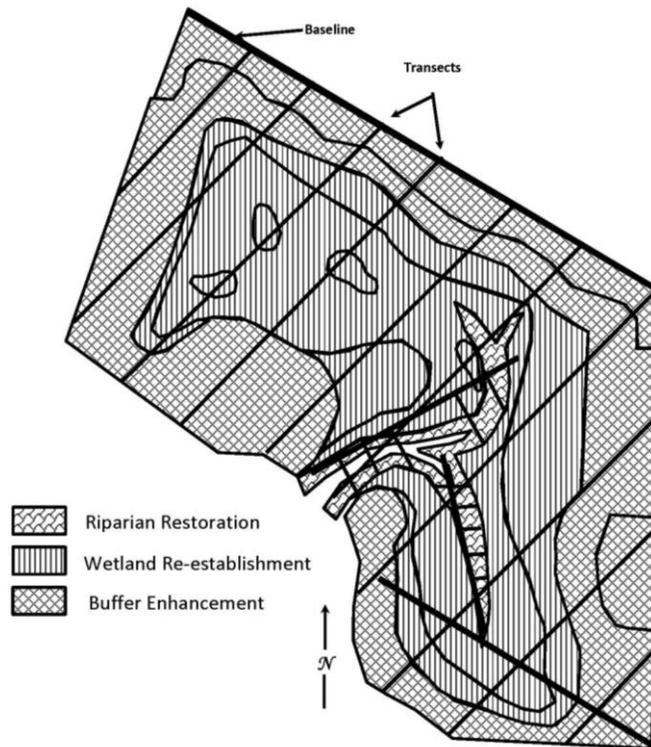
In Year 10, aerial cover of native woody species will be at least 50 percent in the upland shrub-forest community.

Appendix 1 shows the as-built planting plan (WSDOT 2011).

## How were the performance standards evaluated?

WSDOT staff collected hydrology data using methods described in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987), *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (Version 2.0) (USACE 2010) (Performance Standard 1).

Table 4 (Appendix 3) documents the sampling methodology utilized for all of the remaining performance standards (PS) and permit requirement (PR) as required by the mitigation plan or permits. For additional details on the methods see the [WSDOT Wetland Mitigation Site Monitoring Methods Paper](#) (WSDOT 2008).



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

**Placement of Wetland and Buffer Baseline:** Segment 1 was placed along the north fence line. Segment 2 was placed off the southeast corner of the fence at the same angle as baseline segment 1.

**Segment 1:** Length 211m Transects 4-8

**Segment 2:** Length 109m Transects 1-3

**Placement of Riparian Baseline:** Segment 1 was placed at 88 degrees along the north side of the backwater channel. Segment 2 was placed at 160 degrees along the southern branch of the backwater channel.

**Segment 1:** Length 120m Transects 1-4

**Segment 2:** Length 59m Transects 5-6

## How is the site developing?

This site is achieving all Year 3 and Year 10 vegetation performance standards. The buffer and wetland communities are both developing a multi-layered canopy structure and provide significant cover. The emergent area in the backwater channel remains dominated by a native herbaceous community. Some weeds are established on the edges of the site with only a sparse scattering of individuals in the interior.

Because the site has achieved Year 10 cover standards in both the wetland and buffer for multiple years, the headquarters wetland program will pursue approval from regulatory agencies to reduce all future monitoring efforts to qualitative data collection, unless a decline in cover or other indicators is observed.

Not all of the ground monitoring wells exhibited signs of hydrology during each of the visits. The antecedent weather was normal in 2015. On March 17 all the wells exhibited positive indicators of wetland hydrology. There were heavy rains in the ten days prior to this visit. In the ten days prior to the last two visits, precipitation levels dropped. Rainfall may be a main source of hydrology and the site may only exhibit indicators of wetland hydrology in all of the intended areas when precipitation is high.

The site was designed to improve wetland hydrologic functions by increasing wetland area and flood storage capacity, extending wetland hydro-period, increasing the connectivity of wetlands to Clear Creek, and increasing cover of woody vegetation. A number of these functions have been provided by the excavation of the back water channel. The rapid growth of native woody species is providing water quality and habitat functions on a timeline much earlier than expected.

Results for Performance Standard 1  
(Hydrology present):

Hydrology was not present at all of the well locations on the second and third visits, but was present on the first visit (Appendix 3, Tables 1-3). Records indicate heavier precipitation in the 10 days prior to the first visit than the others. (Photo 1)

Results for Performance Standard 2  
(Native wetland (facultative and wetter) woody species (planted and volunteer) will achieve a minimum average density of four plants/100ft<sup>2</sup>):

Density of native facultative or wetter woody species in the scrub-shrub and forested wetland is estimated at 26.8 plants/100ft<sup>2</sup> (CI<sub>80%</sub> = 21.6-32.1). Black cottonwood (*Populus balsamifera*) volunteers were included. This value exceeds the performance standard target. Dominant species include black cottonwood, Sitka willow (*Salix sitchensis*), Pacific ninebark (*Physocarpus capitatus*), red alder (*Alnus rubra*), and thimbleberry (*Rubus parviflorus*). (Photo 2)



**Photo 1**  
**Inundation in the backwater channel (March 2015)**



**Photo 2**  
**Native woody density in the wetland (July 2015)**

Results for Performance Standard 3

(Native woody species (planted and volunteer) will achieve a minimum average density of four plants/100ft<sup>2</sup> (Buffer)):

Density of native woody species in the buffer is estimated at 12.4 plants/100ft<sup>2</sup> (CI<sub>80%</sub> = 10.6-14.2). This value exceeds the performance standard target. Dominate species include black cottonwood, thimbleberry, and Indian plum (*Oemleria cerasiformis*). (Photo 3)

Results for Performance Standard 4

(Eradication of Washington State-listed or county-listed Class A weeds and Class B weeds or Pierce County Noxious Weed Control Board):

No Washington State-listed weeds, or county-listed Class A and Class B weeds designated for control by the Washington State Noxious Weed Control Board (2009) or the Pierce County Noxious Weed Control Board were observed at the time of monitoring. All of the non-native species observed on site were Washington State Class C weeds and non-regulated Pierce County weeds including reed canarygrass (*Phalaris arundinacea*), and common St. Johnswort (*Hypericum perforatum*).

Results for Performance Standard 5

(Non-native blackberries, purple loosestrife, Scot’s broom, and thistles, will not exceed 25% cover):

Cover of these species is qualitatively estimated at five percent. This value is below the performance standard threshold. The majority of the cover is established along the south and southeast edges of the site. Species observed include Himalayan blackberry (*Rubus armeniacus*) and bull thistle (*Cirsium vulgare*).



**Photo 3**  
**Native woody density in the buffer (July 2015)**

Results for Performance Standard 6

(A zero tolerance (0 percent cover) will be established onsite for non-native knotweeds):

No non-native knotweeds were observed at the time of monitoring.

Results for HPA Permit Requirement 1

(Vegetative cuttings shall be planted at a maximum interval of three feet (on center) and maintained as necessary for three years to ensure 80 percent survival):

Survival of vegetative cuttings is estimated at 100 percent ( $CI_{80\%} = 100-100\%$ ) in the stream mix B section of the site. This value exceeds the permit requirement target. (Photo 4)



**Photo 4**  
**Survival of vegetative cuttings in the riparian area (July 2015)**

**Year-10**

Results for Performance Standard 1

(Cover of native woody species will be 70 percent in the wetland shrub-forest community):

Cover of native woody species in the scrub-shrub and forested wetland is estimated at 99 percent ( $CI_{80\%} = 98-100\%$ ). This value exceeds the performance standard target.

Results for Performance Standard 2

(Cover of native woody species will be 50 percent in the upland shrub-forest community (buffer)):

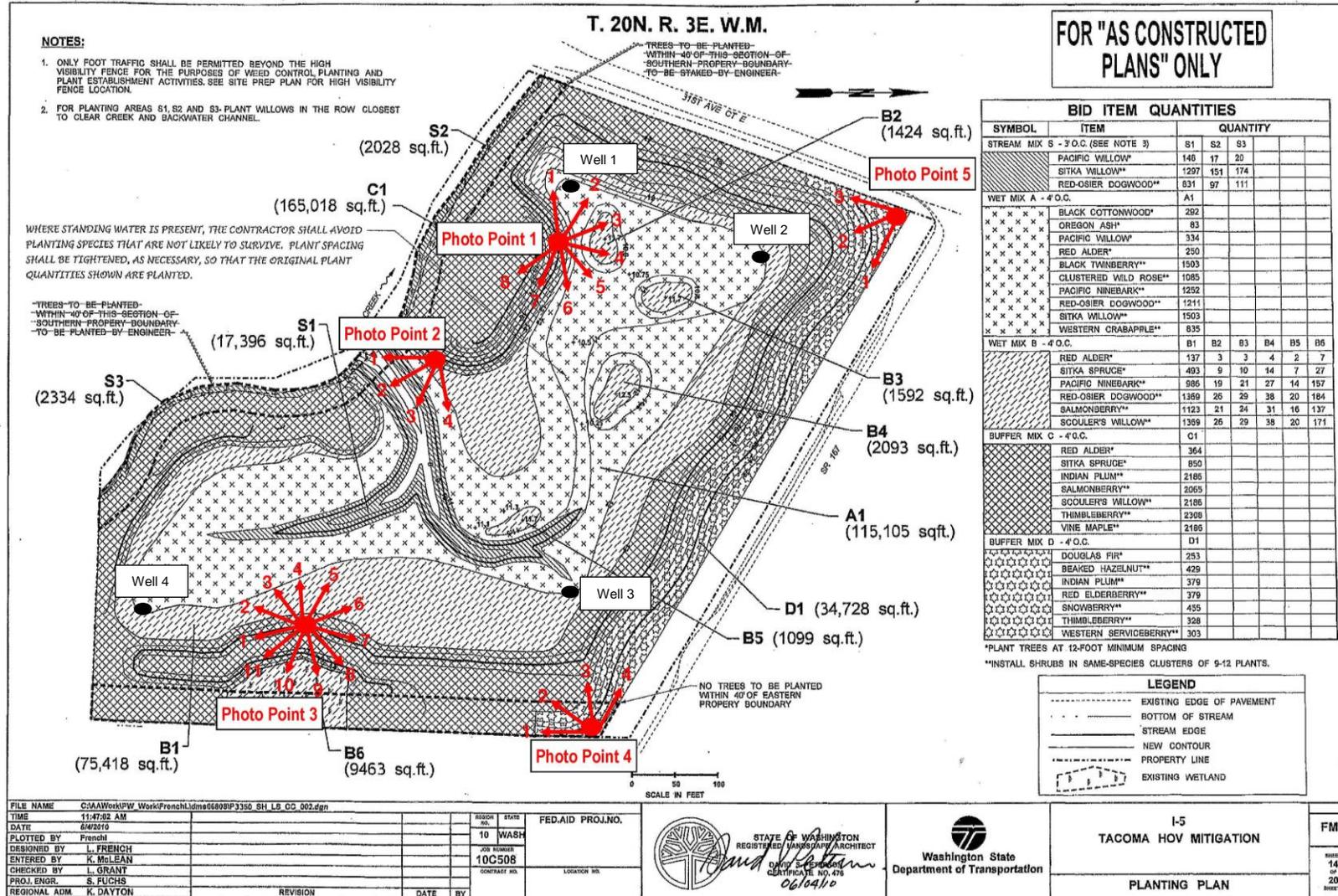
Cover of native woody species in the buffer is estimated at 62 percent ( $CI_{80\%} = 50-74\%$ ). This value exceeds the performance standard target.

**What is planned for this site?**

Weed control will continue, especially on the edges of the site where invasive species are creeping in from adjacent properties along the south and southeast borders. Hand-pulling vetches (*Vicia* species) and common bedstraw (*Galium aparine*) off woody plantings in the northwest and northeast buffer areas will be considered.

# Appendix 1 – As-Built Planting Plan with Photo Point Locations and Well Locations

(from WSDOT 2011)



## Appendix 2 – Photo Points

The photographs below were taken from permanent photo-points on July 6, 2015 and document current site development.



**Photo Point 1-1**



**Photo Point 1-2&3**



**Photo Point 1-4&5**



**Photo Point 1-6**



**Photo Point 1-7&8**



**Photo Point 2-1**



**Photo Point 2-2**



**Photo Point 2-3**



**Photo Point 2-4**



**Photo Point 3-1&2**



**Photo Point 3-3&4**



**Photo Point 3-5&6**



**Photo Point 3-7**



**Photo Point 3-8**



**Photo Point 3-9**



**Photo Point 4-1**



**Photo Point 4-2**



**Photo Point 4-3**



**Photo Point 4-4**



**Photo Point 5-1**



**Photo Point 5-2**



**Photo Point 5-3**

**Driving Directions:**

From I-5 take Exit 135. Travel north on SR 167 for about 0.5 miles. Keep straight onto WA-167/Pioneer Way for 0.7 miles. Turn right onto 31<sup>st</sup> Avenue Court East. Pull off side of road near bridge over Clear Creek.

# Appendix 3 – Data Tables

Table 1. Hydrology Observations.

Date	Surface Observations	Well ID #	Water Level (inches below soil surface unless otherwise noted)
March 17, 2015	Backwater channels inundated. Scattered surface saturation and shallow inundation over about 15 percent of the wetland area.	1	6
		2	4
		3	6
		4	3.5
March 31, 2015	Surface hydrology primarily present in the backwater channels and in small depressions.	1	<b>Dry to bottom</b>
		2	<b>Dry to bottom</b>
		3	<b>Dry to bottom</b>
		4	5.5
April 20, 2015	Backwater channels on site saturated farther into the site. Only inundation observed is near the outlet to the creek. The rest of the site is dry.	1	<b>Dry to bottom</b>
		2	<b>16</b>
		3	<b>14</b>
		4	<b>Dry to bottom</b>

Table 2. Comparison of Observed and Normal Precipitation (NRCS 1997)

Monthly precipitation data for Tacoma, 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	March	3.22	4.18	4.85	4.08	N	2	3	6
2 <sup>nd</sup> prior month	Feb.	2.87	4.44	5.34	4.61	N	2	2	4
3 <sup>rd</sup> prior month	Jan.	3.51	5.38	6.46	3.98	N	2	1	2
								<b>Sum</b>	<b>12</b>

<sup>a</sup> NRCS 2015

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

Note: If sum is

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

Condition value:

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

Conclusions: Normal precipitation conditions were present prior to the field visit on April 20, 2015.

Table 3. Daily Precipitation 10 Days Preceding Field Work, Tacoma, Washington

Prior to March 17 visit		Prior to March 31 visit		Prior to April 20 visit	
Date (2015)	Daily Precipitation (inches) <sup>a</sup>	Date (2015)	Daily Precipitation (inches) <sup>a</sup>	Date (2015)	Daily Precipitation (inches) <sup>a</sup>
March 16	0.04	March 30	0.00	April 19	0.00
March 15	1.67	March 29	0.00	April 18	0.00
March 14	0.67	March 28	0.13	April 17	0.00
March 13	0.00	March 27	0.00	April 16	0.00
March 12	0.06	March 26	0.00	April 15	0.08
March 11	0.12	March 25	0.18	April 14	0.24
March 10	0.00	March 24	0.43	April 13	0.13
March 9	0.00	March 23	0.08	April 12	0.00
March 8	0.00	March 22	0.20	April 11	0.35
March 7	0.00	March 21	0.30	April 10	0.05
<b>Total:</b>	<b>2.56</b>	<b>Total:</b>	<b>1.32</b>	<b>Total:</b>	<b>0.85</b>

<sup>a</sup>NRCS 2015

Table 4. Sampling Methodology

	<b>PS 2</b>	<b>PS 3</b>	<b>PS 4</b>	<b>PS 5</b>	<b>PS 6</b>	<b>PR 1</b>	<b>Year 10 PS 1</b>	<b>Year 10 PS 2</b>
<b>Attribute</b>	Density	Density	Presence	Cover	Cover	Survival	Cover	Cover
<b>Target pop.</b>	Native Woody	Native Woody	Invasive Species	Invasive Species	Invasive Species	Native Woody	Native Woody	Native Woody
<b>Zone</b>	Wetland	Buffer	Entire Site	Entire Site	Entire Site	Riparian	Wetland	Buffer
<b>Sample method</b>	Quadrat	Quadrat	Qualitative	Qualitative	Qualitative	Quadrat	Line-intercept	Line-intercept
<b>SU length</b>	20m	10m	NA	NA	NA	4m	20m	10m
<b>SU width</b>	1m	1m	NA	NA	NA	1m	NA	NA
<b>Points per SU</b>	NA	NA	NA	NA	NA	NA	NA	NA
<b>Total # of SU</b>	7	9	NA	NA	NA	6	7	9

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