

**I-5/SR 432 Talley Way Interchange (Carrolls Creek)  
Mitigation Site**

**USACE NWP (23) NWS-2009-444**

**Southwest Region**

**2015 MONITORING REPORT**

**Wetlands Program**

*Issued March 2016*



**Washington State  
Department of Transportation**

Environmental Services Office

**Author:**

Jennie Husby

**Editor:**

Doug Littauer

**Contributors:**

Tatiana Dreisbach

For additional information about this report or the WSDOT Wetlands Program, please contact:

Doug Littauer, Wetlands Program  
WSDOT, Environmental Services Office  
P. O. Box 47332, Olympia, WA 98504  
Phone: 360-570-2579 E-mail: [littaud@wsdot.wa.gov](mailto:littaud@wsdot.wa.gov)

Monitoring reports are published on the web at: <http://www.wsdot.wa.gov/Environment/Wetlands/Monitoring/reports.htm>

# I-5/SR 432 Talley Way Interchange (Carrolls Creek) Mitigation Site

## USACE NWP (23) NWS-2009-444



General Site Information		
<b>USACE NWP 23 #</b>	NWS-2009-444	
<b>Mitigation Location</b>	East of I-5, S. of Rose Valley Rd, just south of the Cowlitz and Columbia River confluence, Cowlitz County	
<b>LLID Number</b>	1228610460737	
<b>Construction Date</b>	2012	
<b>Monitoring Period</b>	2013-2022	
<b>Year of Monitoring</b>	3 of 10	
<b>Type of Project Impact</b>	Permanent Wetland	Permanent Buffer
<b>Area of Project Impact<sup>1</sup></b>	3.38 acres	5.87 acres
<b>Type of Mitigation<sup>2</sup></b>	Wetland Enhancement	Buffer Enhancement
<b>Planned Area of Mitigation</b>	13.36 acres	11.68 acres

<sup>1</sup> Project impacts from USACE Nationwide Permit NWS-2009-444

<sup>2</sup> Impacts for this project are being mitigated at two mitigation sites, Carrolls Creek and Sandy Bend. Sandy Bend includes an additional 4.56 acres wetland establishment, 0.47 acres of wetland enhancement, and 3.37 acres of buffer enhancement.

This Page Intentionally Left Blank

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

Performance Standards	2015 Results <sup>3</sup>	Management Activities
Density of 400 living native trees/acre in the forested wetland	286 trees/acre (CI <sub>80%</sub> = 197-374)	
Density of 4,000 living native shrub/acre in the forested wetland	1,246 shrubs/acre (CI <sub>80%</sub> = 1,007-1,486) in the combined PFO/PSS	
At least two species of native trees and four species of native shrubs in the forested wetland; no single species will provide more than 60% cover	Three tree species and 10 shrub species present in the combined PFO/PSS; none exceed 60% cover	
Density of 4,000 living native shrubs/acre in the scrub-shrub wetland	1,246 shrubs/acre (CI <sub>80%</sub> = 1,007-1,486) in the combined PFO/PSS	
At least four species of native shrubs will be present in the scrub-shrub wetland; no single species will provide more than 60% cover	12 shrub species present in the combined PFO/PSS; none exceed 60% cover	
Density of 400 living native trees/acre in the buffer	1,858 trees/acre (CI <sub>80%</sub> = 1,246-2,469)	
Density of 4,000 living native shrubs/acre in the buffer	5,261 shrubs/acre (CI <sub>80%</sub> = 4,489-6,033)	
At least two species of native trees and four species of native shrubs will be present in the buffer; no single species will provide more than 60% cover	Nine tree species and 10 shrub species present	
No more than 15% cover blackberry species ( <i>Rubus</i> species) and Class A noxious weeds in the combined emergent, scrub-shrub, forest and buffer planting areas	5% cover	Weed control occurred on 4/28, 7/1, 7/24, 8/18, and 10/7 in 2015
Cover of reed canarygrass ( <i>Phalaris arundinacea</i> ) will be managed at a threshold 10% below the existing baseline conditions	80% cover (Baseline 95-100% cover)	

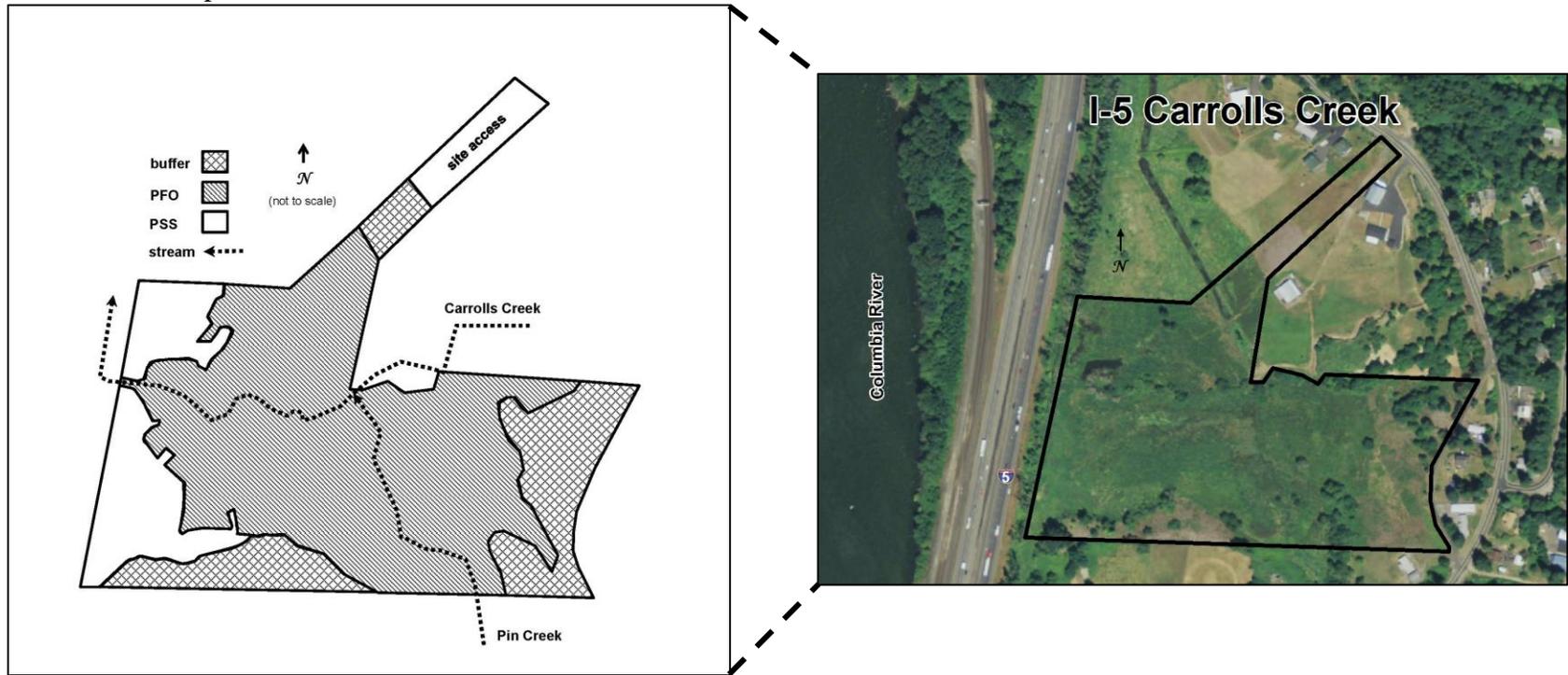
### Report Introduction

This report summarizes third-year (Year-3) monitoring activities at the Interstate (I) 5 Carroll’s Creek 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 27-29, 2015.

<sup>3</sup> Estimated values are presented with their corresponding statistical confidence interval. For example, 286 trees/acre (CI<sub>80%</sub> = 197-374) means we are 80% confident that the true density value is between 197 and 374 trees/acre.

## What is the I-5 Carrolls Creek Mitigation Site?

This 26.7-acre mitigation site (Figure 1) is in Cowlitz County, east of I-5 and south of the confluence of the Cowlitz River with the Columbia River. This site compensates in part for the loss of 3.38 acres of wetlands due to improvements at the I-5 and State Route (SR) 432 Interchange. The site enhances reed canarygrass dominated wetlands by restoring forested wetland vegetation, and increasing hydrologic functions by increased duration of seasonal flooding and providing slough habitat. The mitigation site is intended to improve habitat functions.



**Figure 1 Site Sketch**

The I-5 Carrolls Creek Mitigation Site provides forested wetland vegetation, and water quality and hydrologic functions that are important the floodplain ecosystem. Pin and Carrolls Creeks converge on site before flowing into Owl Creek. Increased habitat for both aquatic and terrestrial species is intended to be provided by the mitigation site. Appendix 2 includes site directions.

## What are the performance standards for this site?

### Year 3

At monitoring year 3, 5, and 7, there will be a minimum density of native trees, and/or shrubs in forested, scrub-shrub, and buffer areas as follows:

#### Forested wetland:

##### Performance Standard 1

- Minimum density of 400 living native trees per acre

##### Performance Standard 2

- Minimum density of 4,000 living native shrubs per acre

##### Performance Standard 3

- At least two species of native trees and four species of native shrubs will be present in the forested area. No single species will provide more than 60 percent total aerial cover.

#### Scrub-shrub wetland:

##### Performance Standard 4

- Minimum density of 4,000 living native shrubs per acre

##### Performance Standard 5

- At least four species of native shrubs will be present in the scrub-shrub area. No single species will provide more than 60 percent total aerial cover.

#### Buffer:

##### Performance Standard 6

- Minimum density of 400 living native trees per acre

##### Performance Standard 7

- Minimum density of 4,000 living native shrubs per acre

Performance Standard 8

- At least two species of native trees and four species of native shrubs will be present in the forested area [buffer]. No single species will provide more than 60 percent aerial cover.

At monitoring years 1, 3, 5, 7, and 10, invasive species will be managed as follows:

Performance Standard 9

The aerial extent of blackberry species and Class A noxious weeds will not exceed 15 percent in the combined emergent, scrub-shrub, forest, and buffer planting areas at either mitigation site.

Performance Standard 10

The aerial extent of reed canarygrass in the mitigation site will be managed at a threshold 10 percent below the existing baseline conditions.

Appendix 1 shows the planting plan (As Built) (WSDOT 2001).

## How were the performance standards evaluated?

Appendix 3, Table 1 documents the sampling methodology utilized for all of the performance standards (PS) as required by the mitigation plan. For additional details on the methods see the [WSDOT Wetland Mitigation Site Monitoring Methods Paper](#) (WSDOT 2008).

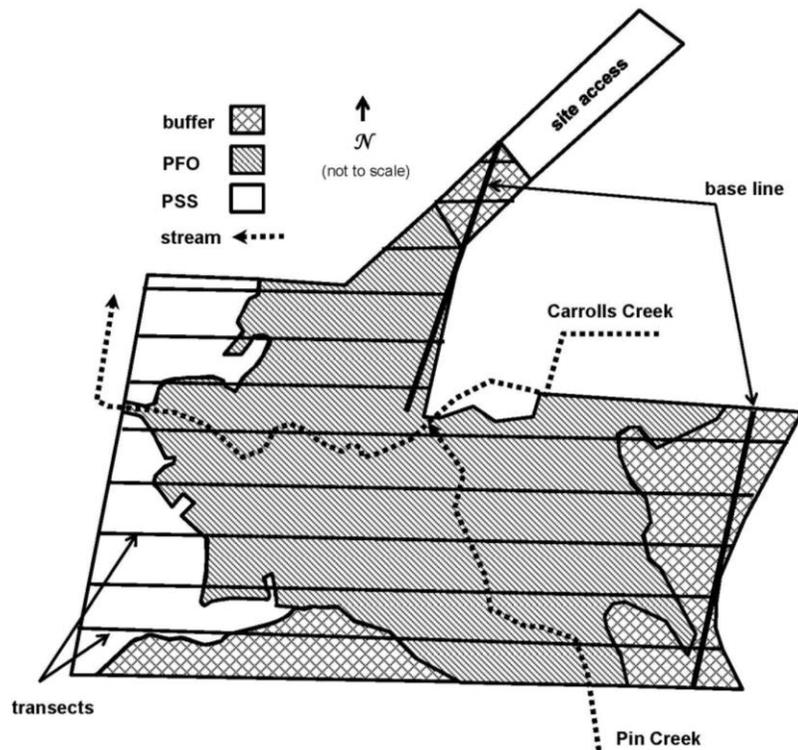


Figure 2 Site Sampling Design (2015)

**Placement of Baseline:** Segment 1 was placed north to south traversing the buffer slope. Segment 2 was placed north to south near the fence line on the northern portion of the site.  
**Segmented 1:** Length 192m Transects 6-10  
**Segmented 2:** Length 173m Transects 1-5

## How is the site developing?

This site is developing well. Woody vegetation is establishing as expected for a Year 3 site with lots of reed canarygrass competition. Reed canarygrass cover is less than the baseline condition and is becoming shaded out in areas where clusters of willows (*Salix* species) are closing the canopy gaps. Cover of other invasive species is low.

The site is providing diversity of hydroperiods with permanently ponded areas present on the west side of the site, in the slough, and in some creek channel areas. Areas with long-duration seasonal ponding and saturation are present in the center portion of the site. The hydrologic regimes combined with the vegetation structure that is forming are anticipated to provide the hydrologic, water quality, and habitat functions intended for this site.

Mice, birds, and chorus frogs were observed at the time of monitoring along with large mammal scat, beaver chew marks, bird nests, and muskrat remains also present.

Results for Performance Standard 1

(Density of 400 trees/acre in the forested wetland):

Density of native trees in the forested wetland is estimated at 286 trees/acre (CI<sub>80%</sub>= 197-374). This value is below the performance standard target. Many willows reported as shrubs for this data set may be considered trees using the Cowardin classification system when they reach 20 feet or higher as the site develops, so this standard may not be met until then. (Photo 1)

Results for Performance Standard 2

(Density of 4,000 shrubs/acre in the forested wetland):

Density of native shrubs in the combined forested and scrub-shrub wetlands is estimated at 1,246 shrubs/acre (CI<sub>80%</sub>= 1,007-1,486). This value is below the performance standard target. (Photo 1)

Results for Performance Standard 3

(At least two species native trees and four species native shrubs in the forested wetland; no species will provide more than 60% total cover):

Three native tree species and 10 native shrub species were present in the combined forested and scrub-shrub wetlands. No single species exceeded 60 percent cover. Species present include Oregon ash (*Fraxinus latifolia*), black cottonwood (*Populus balsamifera*), black hawthorn (*Crataegus douglasii*), redosier dogwood (*Cornus alba*), Scouler's willow (*Salix scouleriana*), Sitka willow (*Salix sitchensis*), Nootka rose (*Rosa nutkana*), Pacific willow (*Salix lasiandra*), Hooker's willow (*Salix hookeriana*), cluster rose (*Rosa pisocarpa*), baldhip rose

(*Rosa gymnocarpa*), Pacific ninebark (*Physocarpus capitatus*), and Columbia river willow (*Salix fluviatilis*). (Photo 1)



**Photo 1**  
**Density of native woody plants in the forested wetland (July 2015)**

Results for Performance Standard 4

(Density of 4,000 shrubs/acre in the scrub-shrub wetland):

See results for performance standard 2.

Results for Performance Standard 5

(At least four species native shrubs in the scrub-shrub wetland; no species will provide more than 60% total cover):

See results for performance standard 3.

Results for Performance Standard 6

(Density of 400 trees/acre in the buffer):

Density of native trees in the buffer is estimated at 1,858 trees/acre (CI<sub>80%</sub>= 1,246-2,469). This value exceeds the performance standard target. Cover of native trees and shrubs together in the buffer is estimated at 73% (CI<sub>80%</sub>= 64-81%). (Photo 2)

Results for Performance Standard 7

(Density of 4,000 shrubs/acre in the buffer):

Density of native shrubs in the buffer is estimated at 5,261 shrubs/acre (CI<sub>80%</sub>= 4,489-6,033). This value exceeds the performance standard target. (Photo 2)

Results for Performance Standard 8

(At least two species native trees and four species native shrubs in the buffer; no species will provide more than 60% total cover):

Nine native tree species and 10 native shrub species were present in the buffer. No single species exceeded 60 percent cover. Species present include bigleaf maple (*Acer macrophyllum*), western red cedar (*Thuja plicata*), Oregon ash, black hawthorn, Douglas-fir (*Pseudotsuga menziesii*), Oregon white oak (*Quercus garryana*), red alder (*Alnus rubra*), black cottonwood, Pacific crabapple (*Malus fusca*), snowberry (*Symphoricarpos albus*), western serviceberry (*Amelanchier alnifolia*), beaked hazelnut (*Corylus cornuta*), tall oregongrape (*Mahonia aquifolium*), Indian plum (*Oemleria cerasiformis*), oceanspray (*Holodiscus discolor*), Nootka rose, roses (*Rosa* species), Pacific ninebark, and redosier dogwood.



**Photo 2**  
**Density of native woody plants in the buffer**  
**(July 2015)**

### Results for Performance Standard 9

(No more than 15% cover blackberry species and Class A noxious weeds on the entire site):

Cover of non-native blackberry species across the site is qualitatively estimated at five percent. Class A noxious weeds were not observed at the time of monitoring.

### Results for Performance Standard 10

(Cover of reed canarygrass in the mitigation site will be less than 10% below the existing baseline conditions):

Cover of reed canarygrass is qualitatively estimated at 80 percent across the entire site. This value is more than 10 percent below the baseline conditions that are assumed to be 95 to 100 percent cover. The reed canarygrass is intermixed with the native woody plantings and other herbaceous plants.

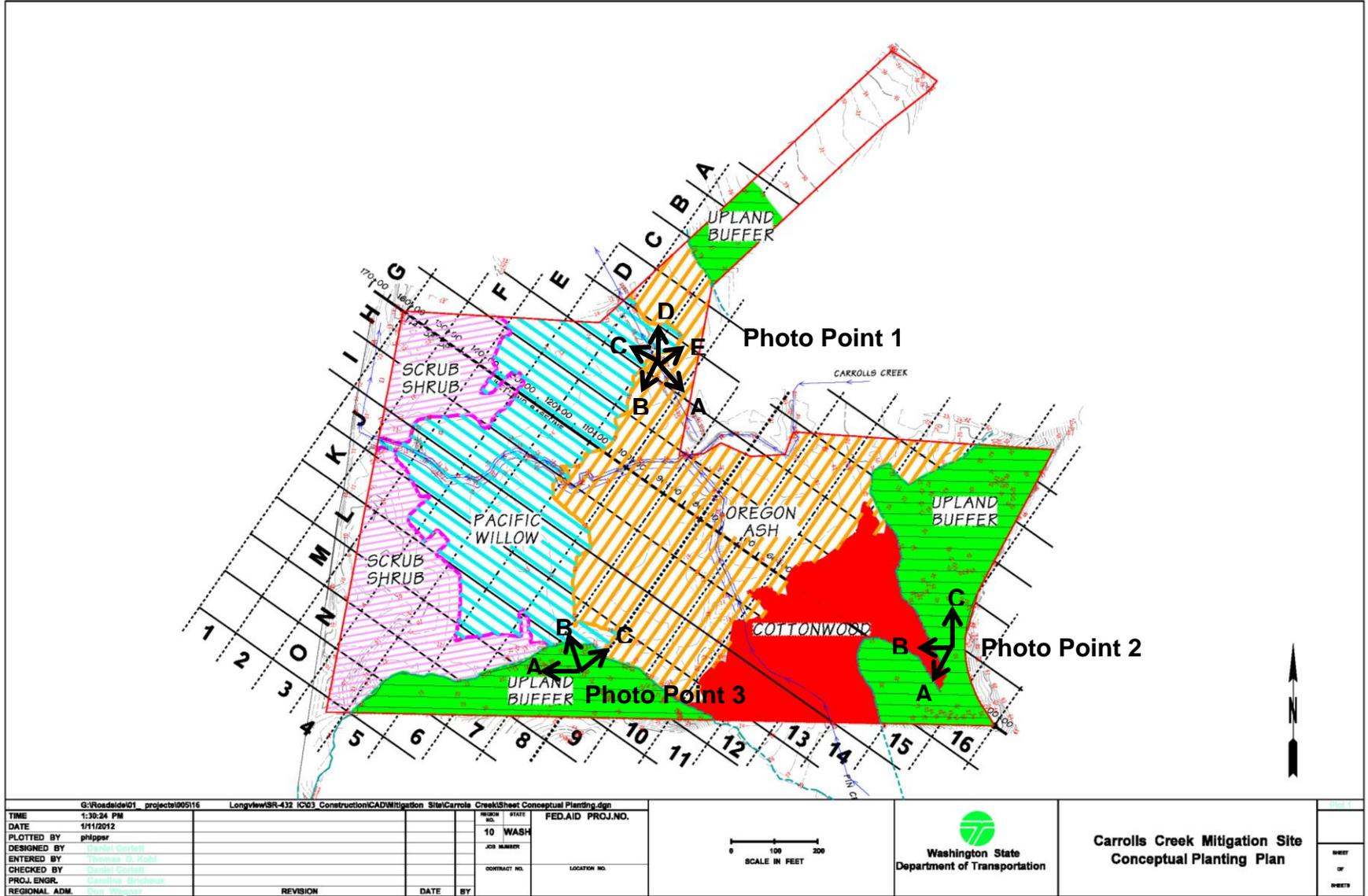
In the buffer, cover of all invasive species is estimated at 2% ( $CI_{80\%} = 1-3\%$ ) including reed canarygrass and Himalayan blackberry. In the wetland, cover of invasive species is estimated at 84% ( $CI_{80\%} = 79-90\%$ ). Reed canarygrass provides 96 percent of the relative cover in the wetland, and scattered individuals of Himalayan blackberry, climbing nightshade (*Solanum dulcamara*), Canada thistle (*Cirsium arvense*), bull thistle (*Cirsium vulgare*), and paleyellow iris (*Iris pseudacorus*) were also observed.

### **What is planned for this site?**

Replanting in the scrub-shrub wetland will be considered if woody plant development is inadequate. Intensive reed canarygrass management will occur throughout the growing season to keep cover in check, and allow for replanting efforts of wetland trees and shrubs during the 2016 planting season. On-going weed control will occur across site throughout the growing season.

# Appendix 1 – Planting Plan with Photo Point Locations

(from WSDOT 2012)



## Appendix 2 – Photo Points

The photographs below were taken from permanent photo-points on July 28, 2015 and document current site development.



**Photo Point 1a**



**Photo Point 1b**



**Photo Point 1c**



**Photo Point 1d**



**Photo Point 1e**



**Photo Point 2a**



**Photo Point 2b**



**Photo Point 2c**



**Photo Point 3a**



**Photo Point 3b**



**Photo Point 3c**

**Driving Directions:**

From I-5, take the Talley Way Exit, just south of Kelso. Follow signs to Carrolls. Take Old Pacific Highway south. The north side access point to the mitigation site is located across from 3645 Old Pacific Highway, Kelso, WA, 98626. The east side access point is located along Maples Drive.

# Appendix 3 – Data Table

Table 1. Sampling Methodology

	PS 1	PS 2	PS 3	PS 4	PS 5	PS 6	PS 7	PS 8	PS 9	PS 10
<b>Attribute</b>	Density	Density	Species List	Density	Species List	Density	Density	Species List	Cover	Cover
<b>Target pop.</b>	Native Trees	Native Shrubs	Trees and Shrubs	Native Shrubs	Native Shrubs	Native Trees	Native Shrubs	Trees and Shrubs	All Invasive Species	All Invasive Species
<b>Zone</b>	Forested Wetland	Forested Wetland	Forested Wetland	Scrub-Shrub Wetland	Scrub-Shrub Wetland	Buffer	Buffer	Buffer	Entire Site	Entire Site
<b>Sample method</b>	Quadrat	Quadrat	Species List	Quadrat	Species List	Quadrat	Quadrat	Species List	Point-Intercept	Point-Intercept
<b>SU length</b>	30m	30m	NA	30m	NA	30m	30m	NA	30m	30m
<b>SU width</b>	1m	1m	NA	1m	NA	1m	1m	NA	NA	NA
<b>Points per SU</b>	NA	NA	NA	NA	NA	NA	NA	NA	30	30
<b>Total # of SU</b>	25	25	NA	25	NA	11	11	NA	36	36

## Literature Cited

1. [USACE] US Army Corps of Engineers. 2009. Department of the Army Nationwide 23 Permit Number NWS-2009-444.
2. [WSDOT] Washington State Department of Transportation. 2009. I-5/SR432 Talley Way Interchange Mitigation Plan. Vancouver (WA): Washington State Department of Transportation, Southwest Region.
3. [WSDOT] Washington State Department of Transportation. 2012. I-5/SR432 Talley Way Interchange Mitigation Plan Conceptual Planting Plan.
4. [WSDOT] Washington State Department of Transportation. 2008. WSDOT Wetland Mitigation Site Monitoring Methods. <http://www.wsdot.wa.gov/NR/rdonlyres/C211AB59-D5A2-4AA2-8A76-3D9A77E01203/0/MethodsWhitePaper052004.pdf>