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

USACE NWP (23) NWS-2009-444

Southwest Region

2017 MONITORING REPORT

Wetlands Program

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USACE NWP (23) NWS-2009-444

<table>
<thead>
<tr>
<th>General Site Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>USACE NWP 23 #</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>
</tr>
<tr>
<td>Type of Project Impact</td>
</tr>
<tr>
<td>Area of Project Impact&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>Type of Mitigation&lt;sup&gt;2&lt;/sup&gt;</td>
</tr>
<tr>
<td>Planned Area of Mitigation</td>
</tr>
</tbody>
</table>

<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.
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Summary of Monitoring Results and Management Activities (2017)

<table>
<thead>
<tr>
<th>Performance Standards</th>
<th>2017 Results³</th>
<th>Management Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>35% cover of native woody vegetation in the scrub-shrub and forested communities</td>
<td>66% cover (CI_{80%} = 58-73%)</td>
<td>An additional 11,500 plants are planned to be planted in the 2018-2019 planting season</td>
</tr>
<tr>
<td>At least two species of native trees and four species of native shrubs will each provide at least 5% relative cover in the forested and scrub-shrub areas</td>
<td>One tree and four shrubs with 5% relative cover</td>
<td></td>
</tr>
<tr>
<td>35% cover of native woody vegetation in the upland buffer</td>
<td>80% cover</td>
<td></td>
</tr>
<tr>
<td>At least two species of native trees and four species of native shrubs will each provide at least 5% relative cover in the upland buffer</td>
<td>Two trees and four shrubs with 5% relative cover</td>
<td></td>
</tr>
<tr>
<td>Washington State-listed or county-listed Class A weeds, Japanese knotweed (Reynoutria japonica), and purple loosestrife (Lythrum salicaria) observed in any area of the mitigation site must be eradicated</td>
<td>Japanese knotweed present and being controlled</td>
<td></td>
</tr>
<tr>
<td>Cowlitz County designated Class B or C weeds will be controlled in any area of the mitigation site</td>
<td>paleyellow iris (Iris pseudacorus) Canada thistle (Cirsium arvense) present and being controlled</td>
<td>Five weed control visits occurred in 2016 and three weed control visits occurred in 2017</td>
</tr>
<tr>
<td>Less than 20% cover non-native blackberry (Rubus) species in the combined emergent, scrub-shrub, forested or buffer planting areas of the mitigation site</td>
<td>2% cover</td>
<td></td>
</tr>
<tr>
<td>Cover of reed canarygrass (Phalaris arundinacea) will be managed at a threshold 10% below baseline conditions of 95% cover</td>
<td>75% cover</td>
<td></td>
</tr>
</tbody>
</table>

Report Introduction

This report summarizes Year 5 monitoring activities at the Carrols 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 July17-19, 2017.

³ Estimated values are presented with their corresponding statistical confidence interval. For example, 66% cover (CI_{80\%} =58-73\% cover) means we are 80% confident that the true cover value is between 58% and 73%.
What is the 005 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 and Columbia Rivers. 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. Pin and Carrolls Creeks converge on site before flowing into Owl Creek.

The 005 Carrolls Creek Mitigation Site contains restored forested and scrub-shrub wetland vegetation. The restoration efforts at this site are intended to provide water quality, wildlife habitat and hydrologic functions that are important to the floodplain ecosystem. Appendix 2 includes site directions.
What are the performance standards for this site?

Year 5

Performance Standard 1
Cover of native wetland trees and shrubs combined (planted and volunteer) will be at least 35 percent in the combined scrub-shrub and forested communities.

Performance Standard 2
At least two species of native trees and four species of native shrubs will each provide at least five percent relative cover in the forested and scrub-shrub areas.

Performance Standard 3
Cover of native plant species (planted and volunteer) will be at least 35 percent in the upland buffer.

Performance Standard 4
At least two species of native trees and four species of native shrubs will each provide at least five percent relative cover in the upland buffer areas.

Performance Standard 5
Washington State-listed or county-listed Class A weeds, Japanese knotweed, and purple loosestrife observed in any area of the mitigation site must be eradicated. All occurrences shall be immediately reported to the site manager and an eradication program will be initiated within 30 days of the report.

Performance Standard 6
Cowlitz County designated Class B or C weeds will be controlled in any area of the mitigation site.

Performance Standard 7
Non-native blackberry species will not exceed 20 percent in the combined emergent, scrub-shrub, forested or buffer planting areas of the mitigation site.

Performance Standard 8
Cover of reed canarygrass will be managed at a threshold 10 percent below baseline conditions of 95 percent cover.

Appendix 1 shows the planting plan (WSDOT 2012).
How were the performance standards evaluated?

The figure and table below document the sampling methodology utilized for the performance standards (PS) as required by the mitigation plan or permits. Points were randomly selected using ArcGIS for the placement of sample units (Figure 2). For additional details on the methods see the [WSDOT Wetland Mitigation Site Monitoring Methods Paper](https://www.wsdot.wa.gov/environment/wetlands/publications/wp10000/344101_A_0009.pdf) (WSDOT 2008).

![Figure 2 Site Sampling Design (2017)](image_url)

<table>
<thead>
<tr>
<th>Attribute</th>
<th>PS 1 &amp; 2</th>
<th>PS 3 &amp; 4</th>
<th>PS 5 &amp; 6</th>
<th>PS 7 &amp; 8</th>
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</thead>
<tbody>
<tr>
<td>Target population</td>
<td>Cover/Relative cover</td>
<td>Cover/Relative cover</td>
<td>Presence/Absence</td>
<td>Cover</td>
</tr>
<tr>
<td>Zone</td>
<td>Native woody species</td>
<td>Native woody species</td>
<td>Noxious weeds</td>
<td>Invasive species</td>
</tr>
<tr>
<td>Sample method</td>
<td>Quadrat Qualitative</td>
<td>Qualitative</td>
<td>Qualitative</td>
<td>Qualitative</td>
</tr>
<tr>
<td>SU length</td>
<td>20 m</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SU width</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total # of SU</td>
<td>33</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
How is the site developing?

The site continues to develop along a positive trajectory. Cover of native woody species in the buffer continues to exceed the final-year performance standard. Cover of native woody species in the forested/scrub-shrub wetland will most likely meet the final-year performance standard by next year. As the cover of native woody species has increased over the monitoring period, there has been a proportional decrease in the overall cover of reed canarygrass.

The site is providing a diversity of habitats for wildlife with multiple small creeks and areas with long-duration seasonal ponding and saturation are present in the center portion of the site. Over 16 species of songbirds, two amphibian species, large mammal scat, small mammals, and a newly constructed beaver dam were observed on site this summer.
Results for Performance Standard 1
(35% cover of woody vegetation in the forested and scrub-shrub communities):

The cover of native woody species is estimated at 66% (CI80% = 58-73%) (Photo 1). This exceeds the performance standard target.

Results for Performance Standard 2
(5% cover of two trees and four shrubs in the forested and scrub-shrub communities):

Oregon ash (*Fraxinus latifolia*), has at least five percent relative cover in the tree category. Black cottonwood (*Populus balsamifera*) is near the threshold with three percent relative cover. Sitka willow (*Salix sitchensis*), Hooker's willow (*Salix hookeriana*), Pacific willow (*Salix lasiandra*), and redosier dogwood (*Cornus alba*) all have at least five percent relative cover within the shrub category.
Results for Performance Standard 3
(35% cover of woody vegetation in the upland buffer):

The estimate of native woody cover in the buffer is 80 percent (Photo 2). This exceeds the performance standard target. Two canopy layers are beginning to develop within the buffer as the trees are beginning to overtop the shrub layer by one to three meters.

Results for Performance Standard 4
(5% cover of two trees and four shrubs in upland buffer):

Bigleaf maple (*Acer macrophyllum*) and Douglas fir (*Pseudotsuga menziesii*) each provide at least five percent cover in the tree category. In the shrub category snowberry (*Symphoricarpos albus*), oceanspray (*Holodiscus discolor*), tall oregongrape (*Mahonia aquifolium*), and beaked hazelnut (*Corylus cornuta*) each provide at least five percent cover.

Results for Performance Standard 5
(Observed WA listed or county listed Class A weeds, Japanese knotweed, and purple loosestrife will be eradicated):

Japanese knotweed was observed in the north central and northwest portion of the site near the site boundary at the time of monitoring.
Results for Performance Standard 6
(Cowlitz County designated Class B or C weeds will be controlled):

Canada thistle and pale yellow iris were observed on site at the time of monitoring and have been controlled on multiple site visits.

Results for Performance Standard 7
(Less than 20% non-native blackberry species across the site):

Himalayan blackberry (*Rubus armeniacus*) cover across the entire site is estimated at two percent. Himalayan blackberry did not dominate any areas and existed as thin shoots throughout the site.

Results for Performance Standard 8
(Cover of reed canarygrass will be managed at a threshold 10% below baseline conditions of 95% cover):

Reed canarygrass cover over the entire site is estimated at 75 percent. Reed canarygrass has lower cover to no cover underneath willow thickets in forested and scrub-shrub communities, where it is beginning to be shaded out (Photo 3).

**What is planned for this site?**

Weed control will continue in 2018.
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 19, 2017 and document current site development.

Photo Point 1a

Photo Point 1b

Photo Point 1c

Photo Point 1d
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.
Literature Cited


