I-405 SR 515 Interchange Project
(Thunder Hills Creek Tributary) Mitigation Site

USACE NWP (14) NWS-2007-1788

Northwest Region

2018 MONITORING REPORT

Wetlands Program

Issued March 2019

Washington State
Department of Transportation

Environmental Services Office
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I-405 SR 515 Interchange Project 
(Thunder Hills Creek Tributary) Mitigation Site 

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<table>
<thead>
<tr>
<th>General Site Information</th>
</tr>
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<tbody>
<tr>
<td>USACE NWP 14</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 Impact</td>
</tr>
<tr>
<td>Area of Project Impact</td>
</tr>
<tr>
<td>Type of Mitigation</td>
</tr>
<tr>
<td>Planned Area of Mitigation</td>
</tr>
</tbody>
</table>

1 Impact numbers sourced from (USACE 2007). Wetland impacts of 0.26 acre are being mitigated with a debit of 0.191 credits from the Springbrook Creek Wetland and Habitat Mitigation Bank
2 Mitigation numbers sourced from (WSDOT 2007).
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>Channel stability</td>
<td>Stable (visually inspected)</td>
<td></td>
</tr>
<tr>
<td>50% cover trees and shrubs</td>
<td>61% cover (CI90% = 50-72%)</td>
<td></td>
</tr>
<tr>
<td>Less than 20% cover King County listed Class A weeds, reed canarygrass (<em>Phalaris arundinacea</em>), non-native blackberries (<em>Rubus</em> species), Scotch broom (<em>Cytisus scoparius</em>), Japanese knotweed (<em>Reynoutria japonica</em>), and purple loosestrife (<em>Lythrum salicaria</em>) across the site</td>
<td>&lt;1% cover (qualitative)</td>
<td>Weed control activity occurred on 6/25/2018 and 8/14/2018.</td>
</tr>
</tbody>
</table>

Report Introduction

This report summarizes final-year (Year 7 of 5) monitoring activities at the 515 Thunder Hills Creek Tributary Mitigation Site. Included are a site description, the performance standards, an explanation of monitoring methods, and an evaluation of site success. Monitoring activities included vegetation surveys and photo-documentation on August 27, 2018.

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3 Estimated values are presented with their corresponding statistical confidence interval. For example, 61% cover (CI90% = 50-72% cover) means we are 90% confident that the true cover value is between 50% and 72%.
What is the 515 Thunder Hills Creek Tributary Mitigation Site?

This 0.84-acre stream mitigation site (Figure 1) consists of a relocated stream channel and riparian buffer established just northeast of the I-405 and SR 515 interchange. This site was created to compensate for the loss of 0.79 acre of riparian buffer and 495 ft² of stream channel due to road improvements at the I-405 and SR 515 interchange. The relocated stream channel and the riparian buffer are designed to provide mitigation for lost stream and buffer functions including water quality, biological functions, and provide additional beneficial functions, such as riparian habitat suitability and native plant richness.

The 515 Thunder Hills Tributary Stream Mitigation site contains streambed and upland buffer. Appendix 1 includes site directions.
What are the performance standards for this site?

Year 5

Performance Standard 1
Channel Stability:

- The channel will not show signs of significant head-cutting, avulsion, or subsurface seepage as determined from visual inspection.
- The drop structures and pervious weir will remain intact and properly functioning as determined from visual inspection. The inspection should look for evidence of settling, movement, undercutting, flanking, end running, and subsurface flow.
- The vegetated riprap bank protection will not show signs of significant subsurface seepage or avulsion from the new channel to the old one (as determined from visual inspection) and will grow willows (*Salix* species) stakes in the voids between the rocks in conformance with vegetation performance standards described herein.

Performance Standard 2
Tree and shrub cover >50 percent. Native colonizing vegetation will be counted in this coverage calculation (excludes trees in areas below PSE transmission lines).

Performance Standard 3
King County listed Class A weeds and reed canarygrass, non-native blackberries, Scotch broom, Japanese knotweed, and purple loosestrife will not exceed 20 percent coverage in each forested, scrub-shrub, and emergent wetland and upland buffer community. If coverage by native plant species falls below 80 percent of the success standard, then contingency actions shall be evaluated to determine if additional invasive species should be controlled.

Appendix 1 shows the as-built planting plan (WSDOT 2011).
How were the performance standards evaluated?

The table below documents the sample methods used 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).

<table>
<thead>
<tr>
<th>Attribute</th>
<th>PS 1</th>
<th>PS 2</th>
<th>PS 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Channel stability</td>
<td>Cover</td>
<td>Cover</td>
<td></td>
</tr>
<tr>
<td>Target population</td>
<td></td>
<td>Native woody species</td>
<td>Noxious weeds</td>
</tr>
<tr>
<td>Zone</td>
<td>Stream channel</td>
<td>Entire site</td>
<td>Entire site</td>
</tr>
<tr>
<td>Sample method</td>
<td>Visual inspection</td>
<td>Line-intercept</td>
<td>Qualitative</td>
</tr>
<tr>
<td>SU length</td>
<td>10 m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total # of SU</td>
<td>18</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Placement of Baseline: A two-segmented baseline was placed with one segment along the access trail (a), and the other along the roughly north-south fence line (b).

- a. Length 40m Transects 1-6
- b. Length 86m Transects 7-18

Figure 2  Site Sampling Design (2018)
**Is this site a success?**

This site is now successfully meeting all final-year performance standards. Lost stream and buffer water quality and biological functions have been replaced. The stream bank and channel are stabilized.

Additional plants were installed in 2016, helping to achieve the performance standard target for tree/shrub cover on site that was lacking in Year 5. This increased cover of native woody vegetation provides organic production and export, greater native plant richness, and improved wildlife habitat.
Results for Performance Standard 1
(Channel stability):

The channel didn’t show signs of significant head-cutting, avulsion, or subsurface seepage (Photo 1). The drop structures and pervious weir were observed to be intact and properly functioning. There was only minor undercutting observed at a bend in the channel in the upstream portion of the site.

Results for Performance Standard 2
(50% cover trees and shrubs):

Cover of trees and shrubs across the site is estimated at 61% (CI90%= 50-72%) (Photo 2). This exceeds the performance standard target. Dominant species observed include bigleaf maple (*Acer macrophyllum*), snowberry (*Symphoricarpos albus*), tall oregongrape (*Mahonia aquifolium*), and black cottonwood (*Populus balsamifera*).

Results for Performance Standard 3
(Less than 20% cover King County listed Class A weeds, reed canarygrass, non-native blackberries, Scotch broom, Japanese knotweed, and purple loosestrife across the site):

Cover of Himalayan blackberry (*Rubus armeniacus*) is qualitatively estimated at less than one percent. No Class A noxious weeds, reed canarygrass, Scotch broom, Japanese knotweed, or purple loosestrife observed.

What is planned for this site?

Weed control will continue in 2019.
I believe funding is only available until 6/2019. 1A
Appendix 1 –As-Built with Photo Point Locations
(from WSDOT 2011)
Driving Directions:
From I-5, take Exit 142a in Renton. Merge onto WA-18 East. Take the exit onto WA-167. Turn right onto South Grady Way; continue onto Main Avenue South. Turn right onto South 4th Street. Turn right onto South 3rd Street. Take the first left onto Cedar Avenue South. Park at the top of the hill and walk down the gravel access road.
Appendix 2 – Photo Points
The photographs below were taken from permanent photo-points on August 27, 2018 and document current site development.

Photo Point 1a

Photo Point 1b

Photo Point 1c
Photo Point 4a

Photo Point 4b
Literature Cited


