2019 WETLAND MONITORING REPORT

SR 99 West Fork Hylebos Creek – Fish Passage (West Fork Hylebos Creek) Compensatory Mitigation Site

USACE NWP (27) NWS-2013-1269

Northwest Region

Wetlands Program
Issued March 2020
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## Site Summary

SR 99 West Fork Hylebos Creek Fish Passage (West Fork Hylebos Creek) Compensatory Mitigation Site

**USACE NWP (27) NWS-2013-1269**

<table>
<thead>
<tr>
<th>General Site Information</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>USACE NWP (27) Number</strong></td>
<td>NWS-2013-1269</td>
</tr>
<tr>
<td><strong>Mitigation Location</strong></td>
<td>In Federal Way, at the intersection of West Hylebos Creek and State Route 99</td>
</tr>
<tr>
<td><strong>LLID Number</strong></td>
<td>1223285472729</td>
</tr>
<tr>
<td><strong>Construction Date</strong></td>
<td>2015–2016</td>
</tr>
<tr>
<td><strong>Monitoring Period</strong></td>
<td>2017–2023</td>
</tr>
<tr>
<td><strong>Year of Monitoring</strong></td>
<td>3 of 10</td>
</tr>
<tr>
<td><strong>Type of Impact</strong></td>
<td>Wetland, Stream, Stream Buffer</td>
</tr>
<tr>
<td><strong>Area of Project Impact</strong></td>
<td>0.05 acre, 0.18, 0.17</td>
</tr>
<tr>
<td><strong>Type of Compensation</strong></td>
<td>Streambank Restoration, Stream Buffer Restoration</td>
</tr>
<tr>
<td><strong>Planned Area of Compensation</strong></td>
<td>0.25, 0.82</td>
</tr>
</tbody>
</table>

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1 Impact and compensatory mitigation numbers sourced from the Aquatic Resources Restoration Report (WSDOT 2014)
Table of Contents

Site Summary.................................................................................................i
1. Introduction.............................................................................................1
   1.1. Summary......................................................................................... 1
   1.2. Monitoring Results and Management Activities............................1
2. Site Description .........................................................................................2
   2.1. Location........................................................................................ 2
   2.2. Purpose and Description............................................................... 2
   2.3. Study Area..................................................................................... 3
3. Performance Standards and Methods ....................................................4
   3.1. Performance Standards................................................................. 4
   3.2. Methods........................................................................................ 5
4. Discussion ..................................................................................................6
   4.1. Site Development........................................................................... 6
   4.2. Results.......................................................................................... 7
   4.3. Adaptive Management................................................................. 9
5. References................................................................................................ 10

Figures

Figure 1. Site Sketch.......................................................................................3
Figure 2. Sample Design................................................................................5

Appendices

Appendix A. Planting Plan with Photo Point Locations.. 11
Appendix B. Photo Points ................................................................. 12
Appendix C. Data Tables ........................................................................... 13
1. Introduction

1.1. Summary

This report summarizes third-year (Year-3) monitoring activities at the 099 West Fork Hylebos Creek Compensatory 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, photo-documentation, and assessments of wetland hydrology. Vegetation monitoring was conducted on August 5, 2019 and wetland hydrology observations occurred on April 25, 2019.

1.2. Monitoring Results and Management Activities

<table>
<thead>
<tr>
<th>Performance Standards</th>
<th>2019 Results(^2)</th>
<th>Management Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wetland hydrology</td>
<td>Present</td>
<td></td>
</tr>
<tr>
<td>Density of four plants per 100 square feet in the wetland and riparian buffer</td>
<td>80% cover</td>
<td>Installed 5 cedar, 10 beaked hazelnut, 10 Indian plum, 10 vine maple, 9 snowberry, 9 Oregon ash, 12 dogwood, 12 twinberry, and 12 ninebark in SW section on October 2019.</td>
</tr>
<tr>
<td>restoration area</td>
<td>(CI(_{80%} = 71-88%))(^3)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8 plants/100ft(^2)</td>
<td></td>
</tr>
<tr>
<td>Less than 30 percent cover of reed canarygrass (Phalaris arundinacea)</td>
<td>None observed</td>
<td></td>
</tr>
<tr>
<td>Noxious and non-native species listed in Appendix C Table 1 will not exceed 30 percent cover</td>
<td>3% (qualitative)</td>
<td>Weed control performed in November 2019</td>
</tr>
<tr>
<td>King County noxious weeds and species listed in Appendix C Table 1 will be controlled. Presence of any non-native knotweed will initiate invasive species contingency plans.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^2\) Estimated values are presented with their corresponding statistical confidence interval. For example, 80% cover (CI\(_{80\%} = 71-88\%\)) means we are 80% confident that the true cover value is between 71% and 88%.

\(^3\) Cover was a more appropriate attribute than density due to the high cover and growth habit of twinberry honeysuckle (Lonicera involucrata) on site. Density was qualitatively assessed using five non-random 10ft x 10ft quadrats.
2. Site Description

2.1. Location

The 1.57-acre compensatory mitigation site is located along State Route (SR) 99 from milepost (MP) 6.77 to MP 6.86 in the city limits of Federal Way (Figure 1).

Driving Directions:
From I-5 take Exit 142 B onto SR 18 West/South 348th Street. Turn left onto SR 99/Pacific Hwy South. Travel south for 1.3 miles to the site.

2.2. Purpose and Description

This site was created to restore fish access and habitat in West Fork Hylebos Creek by removing a fish passage barrier underneath SR 99 in Federal Way, Washington. The previous culvert (a 6-foot high concrete box structure) was a barrier because of excessive drop, high velocity at the fish passage design flow, and low flow depths. This culvert was replaced with a larger 20-foot wide by 10-foot high precast concrete box culvert that has an average longitudinal slope of 2.34 percent and was designed using stream simulation methodology. As a result of this project, aquatic species will have improved access to 3,364 meters (2.10 miles) of upstream habitat in the West Fork Hylebos Creek watershed that includes 2,798 square meters of spawning habitat.
2.3. Study Area

The 099 West Fork Hylebos Creek Compensatory Mitigation Site contains a new, larger box culvert under SR 99, a realigned stream channel, and adjacent wetland and stream buffer restoration areas (Figure 1).

Figure 1. Site Sketch
3. Performance Standards and Methods

3.1. Performance Standards

**Year 3**

**Performance Standard 1**
A qualified wetland biologist will conduct a sample plot within the “stream to wetland conversion area” in years 3, 5, and 7 of the monitoring period to verify that the sample plot meets wetland hydrology criteria (USACE 2010).

**Performance Standard 2**
Native woody species will maintain a minimum average density of four plants per 100 square feet wetland and buffer communities. Native colonizing vegetation will be included in this density calculation.

**Performance Standard 3**
Reed canarygrass will have less than 30 percent aerial coverage in emergent plant communities.

**Performance Standard 4**
Noxious and non-native invasive weeds shall be controlled in all monitoring years across the entire site. The non-native invasive species listed in Table 4 on page 23 of the aquatic resources restoration report shall not exceed 30 percent cover with the exception of non-native knotweeds.

**Performance Standard 5**
King County noxious weeds and species listed in Table 4 (Appendix C Table 1) will be controlled. The presence of any non-native knotweeds (*Polygonum cuspidatum*, *P. polystachyum*, *P. sachalinense*, and *P. bohemicum*) will initiate the invasive species contingency measures.

**Year 7**

**Performance Standard 6**
Native woody species will achieve a minimum of 45 percent cover in wetland and buffer communities. Native colonizing vegetation will be included in this coverage calculation.

Appendix A shows the as-built planting plan (WSDOT 2016).
3.2. Methods

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 Standards 1). A Global Positioning System (Trimble Mapping Grade) was used to collect spatial data.

The tables below document sample methods used for all of the remaining performance standards (PS) required by the mitigation plan or permits. Additional details on our methods are located here: WSDOT Wetland Mitigation Site Monitoring Methods Paper (WSDOT 2008).

**Placement of Baseline:** A 248-meter long baseline was placed in four segments running roughly parallel to the creek. One segment was placed on each side of the creek and on each side of the culvert.

**Segmented Baseline:**
- Length 90m Transects 1-3
- Length 116 Transects 4-8
- Length 26 Transects 9
- Length 75 Transects 10-13

<table>
<thead>
<tr>
<th>Attribute</th>
<th>PS 2</th>
<th>PS 2</th>
<th>PS 3</th>
<th>PS 4&amp;5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cover</td>
<td>Native woody species</td>
<td>Native woody species</td>
<td>Reed canarygrass</td>
<td>Noxious weeds</td>
</tr>
<tr>
<td>Density</td>
<td>Entire site</td>
<td>Entire site</td>
<td>Entire site</td>
<td>Entire site</td>
</tr>
<tr>
<td>Presence/Absence</td>
<td>Line Intercept Quadrats</td>
<td>Qualitative (Quadrats)</td>
<td>Qualitative</td>
<td>Qualitative</td>
</tr>
<tr>
<td>SU length</td>
<td>10</td>
<td>10ft x 10ft</td>
<td>13</td>
<td>5</td>
</tr>
<tr>
<td>Total # of SU</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 2. Sample Design
4. Discussion

4.1. Site Development

Vegetation on this site continues to develop quickly, especially in the southeast section. In general, twinberry honeysuckle and redosier dogwood (*Cornus alba*) provide most of the cover throughout the site. Sitka willow (*Salix sitchensis*) is dominant along the creek banks, making it difficult to access and sample. Sparse patches of vegetation are present in the northeast and southwest sections of the site. Spotted touch-me-not (*Impatiens capensis*) was dominant in these bare areas. Overall, the cover was quantitatively estimated at 80 percent, easily exceeding its final-year performance standard (45 percent native woody cover for Year 7).

In general, noxious weed cover is very low, however, problematic species are surrounding the edges of the site. For example, a large patch of knotweed was found just off-site adjacent to the highway in the northeast section. Also, a large patch of Himalayan blackberry (*Rubus armeniacus*) was observed off-site along the entire southern border on the western side of the culvert. Reed canarygrass was not observed in the accessible areas of this site. Due to a homeless encampment in the eastern edge of the southeast side, woody and noxious vegetation were neither sampled nor observed. Vegetation sampling will be re-evaluated in 2020 for this section.

At some point in the summer of 2017, the brush pile habitat structure in the southwest end of the site caught on fire. Some plantings in the immediate vicinity of the brush pile were damaged. A large bigleaf maple (*Acer macrophyllum*) tree and some vine maple (*Acer circinatum*) shrubs were most significantly damaged. In 2019, many new and promising bigleaf maple saplings were observed growing around the burned brush pile.
4.2. Results

**Performance Standard 1**
(Wetland Hydrology)

Wetland compensatory mitigation sites are recognized as difficult wetland situations in the regional supplement and may have problematic hydric soils (USACE 2010). No primary hydric soil indicators were present in the sample plot within the “stream to wetland conversion area.” However, the old stream bed with sandy soils is likely still developing redoximorphic features because it is a recently developed wetland. The presence of secondary hydrology indicators B10 (drainage patterns) and D5 (FAC-Neutral test) is sufficient evidence to conclude that wetland hydrology is present and will continue to develop on this site.

**Performance Standard 2 and 6**
(Density of four plants per 100 square feet in restoration area in year 3 and 45% native woody cover in year 7)

Due to the high cover and growth habit of twinberry honeysuckle, cover was a more appropriate measure than density. The cover of native woody species is estimated at 80% (CI80% = 71-88%) (Photo 1 and 2). This exceeds the final-year target (45 percent native woody cover for Year 7).

The density of native woody species was qualitatively estimated at 8 plants per 100 square feet using five non-random quadrats.

Photo 1. Woody cover in restoration area (August 2019)

Photo 2. Dense woody cover in restoration area (August 2019)
Performance Standard 3
(Less than 30 percent cover of reed canarygrass)
None observed at the time of monitoring.

Performance Standard 4
(Noxious and non-native species listed in Appendix C Table 1 will not exceed 30 percent cover)

The noxious weed cover is qualitatively estimated at 3%. Spotted jewelweed (Photo 3), climbing nightshade (*Solanum dulcamara*), and Himalayan blackberry were the only weed species observed on site.

Performance Standard 5
(King County noxious weeds and species listed in Appendix C Table 1 will be controlled. Presence of any non-native knotweed will initiate invasive species contingency plans)

Non-native knotweed was not observed on-site.

Photo 3. Spotted jewelweed forming dense clusters on the edges of the creek (August 2019)
4.3. Adaptive Management

The region replanted sparse patches in the southwest portions of this site in October of 2019 to deter the establishment of noxious weeds or invasive species. Subsequent activities include weed control to target thistles, herb Robert, blackberry, vetch, and ivy throughout 2020 along with any necessary plant replacements to meet performance standards.

While there are no immediate plans to remove the knotweed offsite, the adjacent landowner did receive a brochure with information on knotweed and King County’s knotweed stem injector loan-out program. In the meantime, the monitoring and restoration crew will note the progression of the knotweed in site observations and reports.

There has been a homeless encampment south of the site, which the region is monitoring for safety. The landowner has been contacted via email and by letter to make them aware of the encampment with the hope they can address it, but no response has been received to date. Over this past year the campers have formed a trail along the south edge of the site to access their camp causing negligible impact to the plantings.
5. References


Appendix A. Planting Plan with Photo Point Locations

(from WSDOT 2016)
Appendix B.    Photo Points

The photographs below were taken from permanent photo-points on August 5, 2019 and document current site development.

Photo Point 1

Photo Point 2a

Photo Point 2b

Photo Point 3
### Appendix C. Data Tables

#### Table 1. Non-native Invasive species

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Common Name</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Buddleia alternifolia</em></td>
<td>fountain butterfly bush</td>
</tr>
<tr>
<td><em>Cirsium arvense</em></td>
<td>Canadian thistle</td>
</tr>
<tr>
<td><em>Cirsium vulgare</em></td>
<td>Bull thistle</td>
</tr>
<tr>
<td><em>Cytisus scoparius</em></td>
<td>Scot’s broom</td>
</tr>
<tr>
<td><em>Hedera helix</em></td>
<td>English ivy</td>
</tr>
<tr>
<td><em>Ilex aquifolium</em></td>
<td>English holly</td>
</tr>
<tr>
<td><em>Phalaris arundinacea</em></td>
<td>Reed canarygrass</td>
</tr>
<tr>
<td><em>Polygonum cuspidatum (and related species and hybrids)</em></td>
<td>Japanese knotweed</td>
</tr>
<tr>
<td><em>Prunus laurocerasus</em></td>
<td>English laurel</td>
</tr>
<tr>
<td><em>Rubus laciniatus</em></td>
<td>evergreen blackberry</td>
</tr>
<tr>
<td><em>Rubus armeniacus (discolor)</em></td>
<td>Himalaya or Armenian blackberry</td>
</tr>
</tbody>
</table>
Table 2. Year 7 performance standards met in Years 2 and 3 at 099 West Fork Hylebos

<table>
<thead>
<tr>
<th>Performance Standards (Year-7)</th>
<th>Year 2 (2018) Qualitative Results</th>
<th>Year 3 (2019) Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Native woody species will achieve a minimum of 45 percent cover in wetland and buffer communities. Native colonizing vegetation will be included in this coverage calculation.</td>
<td>70% cover (qualitative)</td>
<td>80% (CI_{80%} = 71-88%)</td>
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