2019 WETLAND MONITORING REPORT

US 101 Matriotti Creek Fish Barrier Removal (Matriotti Creek Culvert) Compensatory Mitigation Site

USACE (14) NWS-2015-161

Olympic Region

Wetlands Program
Issued March 2020
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Site Summary
US 101 Matriotti Creek Fish Barrier Removal (Matriotti Creek Culvert) Compensatory Mitigation Site
USACE (14) NWS-2015-161

<table>
<thead>
<tr>
<th>General Site Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>USACE NWP Number (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 Impact¹</td>
</tr>
<tr>
<td>Type of Compensation</td>
</tr>
<tr>
<td>Planned Area of Compensation²</td>
</tr>
</tbody>
</table>

¹ Impact numbers sourced from WSDOT 2016. Impacts include 266 linear feet (467 cubic yards) of streambed excavation and fill, compensated for by future functional lift in fish habitat.
² Compensation numbers sourced from WSDOT 2016. An additional 0.19 acres of conifer underplantings were installed at the adjacent 1988 compensation site and evaluated using the upland buffer performance standards.
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1. Introduction

1.1. Summary

This report summarizes first year (Year-1) monitoring activities at the 101 Matriotti Creek Culvert 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. Hydrology monitoring occurred on March 19, April 2, and April 17, and vegetation monitoring occurred on August 5 in 2019.

1.2. Monitoring Results and Management Activities

<table>
<thead>
<tr>
<th>Performance Standards</th>
<th>2019 Results(^3)</th>
<th>Management Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wetland hydrology</td>
<td>Not present—see Appendices C and D</td>
<td></td>
</tr>
<tr>
<td>4 plants per 100 square feet in the wetland</td>
<td>8 plants/100ft(^2) (CI(_{80%}) = 6.2-9.7)</td>
<td></td>
</tr>
<tr>
<td>80 conifers per acre in the buffer</td>
<td>218 conifers/acre in riparian buffer(^{3})</td>
<td></td>
</tr>
<tr>
<td></td>
<td>162 conifers/acre in underplanting area(^{3})</td>
<td></td>
</tr>
<tr>
<td>3 plants per 100 square feet in the riparian area</td>
<td>9.4 plants/100ft(^2) (CI(_{80%}) = 8-10.8)</td>
<td></td>
</tr>
<tr>
<td>No class A noxious weeds, Japanese knotweed, or purple loosestrife</td>
<td>None observed</td>
<td>Weed control activities occurred in April, June, August, and September, 2019.</td>
</tr>
<tr>
<td>Washington State and Clallam County class B designates controlled</td>
<td>One butterfly bush (<em>Buddleja davidii</em>) observed and reported to managers</td>
<td></td>
</tr>
<tr>
<td>Washington State listed class C noxious weeds controlled; reed canarygrass and blackberries not to exceed 20% cover</td>
<td>Less than 1% cover</td>
<td></td>
</tr>
</tbody>
</table>

\(^3\) Estimated values are presented with their corresponding statistical confidence interval. For example, 8 plants/100ft\(^2\) (CI\(_{80\%}\) = 6.2-9.7) means we are 80% confident that the true density value is between 6.2 and 9.7.
2. Site Description

2.1. Location
This project is located in Clallam County two miles west of Sequim and 9 miles east of Port Angeles on State Route (SR) 101. See Appendix B for driving directions.

Driving Directions:
From I-5, take US-101 north. Take exit 101 to stay on US-101 north toward Shelton/Port Angeles. Travel on US-101 for approximately 99 miles. The project site will be on the north and south sides of US-101 at the Matriotti Creek crossing about 0.2 mile west of Carlsborg Road.

2.2. Purpose and Description
This site was established to compensate for impacts to wetlands and associated buffers caused by replacing a fish barrier culvert on Matriotti Creek where it flows under US 101 at milepost 260.93. Soil disturbance and vegetation clearing resulted from excavation activities necessary to widen the culvert and lower the streambed. This project is expected to create functional lift through improvements in stream habitat and replacement of wetland and buffer plant communities. Impacts to an adjacent 1988 site have also been compensated with conifer underplanting.
2.3. Study Area

The 101 Matriotti Creek Culvert Compensatory Mitigation Site contains slope wetlands and a riparian buffer along the downstream (north) and upstream (south) sides of the culvert that runs underneath US 101 (Figure 1).

![Figure 1. Site Sketch](image)
3. Performance Standards and Methods

3.1. Performance Standards

Year 1

Performance Standard 1
Within all intended wetland areas, the soil will be inundated, or soil saturation or a water table will be present within 12 inches of the soil surface, for at least 30 consecutive days during the growing season in years when rainfall meets or exceeds the 30-year precipitation average.

Performance Standard 2
Native wetland (FAC and wetter) trees and shrubs combined, including both planted and volunteers, will maintain an average density of at least 4 plants per 100 square feet in the wetland.

Performance Standard 3
Native conifers, including both planted and volunteers, will maintain an average density of at least 80 plants per acre in the upland buffer.

Performance Standard 4
Native trees and shrubs combined, including both planted and volunteers, will maintain an average density of at least 3 plants per 100 square feet in the riparian area.

Performance Standard 5
Washington State-listed and Clallam County-listed Class A noxious weeds, and the following Washington State Class B weeds must be eradicated: Japanese knotweed (*Reynoutria japonica*) and purple loosestrife (*Lythrum salicaria*). 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**
Washington State and Clallam County Class B designate weeds will be controlled to reduce competition with, and enhance survival of native woody and herbaceous plantings and volunteers.

**Performance Standard 7**
Washington State listed Class C noxious weeds including but not limited to Himalayan blackberry (*Rubus armeniacus*), thistles (*Cirsium spp.*), and reed canarygrass (*Phalaris arundinacea*) will be controlled to promote survival of native woody and herbaceous plantings and volunteers. Reed canarygrass or blackberries shall not exceed 20 percent cover in both the wetland and upland areas.
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 Standard 1). A Global Positioning System (Trimble Mapping Grade) was used to collect spatial data. Shallow groundwater monitoring wells were installed to evaluate groundwater during the growing season (USACE 2005).

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).

**Figure 2. Sample Design (2019)**

- **Placement of Baseline**: The baseline was placed in three segments: north to south roughly parallel to Matriotti Creek upstream and downstream of the culvert, and east to west along SR 101 at the south east side of the culvert.

- **Segmented Baseline**:
  - Length 64m Transects 1-11
  - Length 13m Transects 12-14
  - Length 10m Transects 15-16

<table>
<thead>
<tr>
<th>Attribute</th>
<th>PS 2</th>
<th>PS 3</th>
<th>PS 4</th>
<th>PS 5-7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target population</td>
<td>Density</td>
<td>Density</td>
<td>Density</td>
<td>Presence/Absence</td>
</tr>
<tr>
<td>Native woody species</td>
<td>UBT</td>
<td>UBT</td>
<td>Total count</td>
<td>Qualitative</td>
</tr>
<tr>
<td>Conifers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Noxious/invasive</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zone</td>
<td>Wetland</td>
<td>Riparian</td>
<td>Buffer</td>
<td>Entire site</td>
</tr>
<tr>
<td>Sample method</td>
<td>UBT</td>
<td>UBT</td>
<td>Total count</td>
<td>Qualitative</td>
</tr>
<tr>
<td>SU length</td>
<td>Varies</td>
<td>Varies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SU width</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total # of SU</td>
<td>14</td>
<td>14</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4. Discussion

4.1. Site development

The site is developing robust vegetation communities and is meeting all performance standard criteria for vegetation in the areas that were planted. Noxious weed cover is low.

Wetland hydrology performance standards were not met. Wetland conditions are present on two small berms directly adjacent to the creek, but wetland hydrology could not be confirmed on the slopes within the area defined as wetland. Precipitation conditions were drier than normal during the month of March, which may have affected observations during late March and early April. However, all four wells were dry on April 17th during a month of wetter than normal conditions. See Appendix C, Tables 2-4 for detailed information on wetland hydrology.

The site is already providing habitat. Although there was no surface flow inside the culvert during vegetation monitoring, tree frogs, red-legged frogs, fish fry, crustaceans, and caddisfly larvae were observed using the creek downstream of the culvert. Osprey, bald eagles, and red tailed hawks were observed onsite.
4.2. Results

**Performance Standard 1**
(Wetland Hydrology)

Not present throughout the area defined as wetland. Inundation was observed directly adjacent to the creek (Photo 1). March was drier than normal, which may have affected hydrologic conditions during visits in late March and early April. See Appendix C, Tables 2-4 for a detailed analysis of wetland hydrology. Data loggers were installed in three wells in April, 2019; appendix D shows hydrographs from April through June.

**Performance Standard 2**
(4 plants per 100 square feet in the wetland)

Native wetland tree and shrub density is estimated to be 8 plants/100ft² (CI80% = 6.2-9.7) (Photo 2). Dominant species include salmonberry (*Rubus spectabilis*), Nootka rose (*Rosa nutkana*), twinberry honeysuckle (*Lonicera involucrata*), and red osier dogwood (*Cornus alba*).

**Performance Standard 3**
(80 conifers per acre in the buffer)

Areas defined as upland buffer in the planting plan were not planted; conifers were redistributed to riparian planting areas (Appendix A).

Conifer density in the riparian buffer is estimated at 218 conifers/acre (CI80% = 110-325).

Conifer density in the underplanting area of the 1988 compensation site is estimated at 162 conifers/acre.
Performance Standard 4
(3 plants per 100 square feet in the riparian area)

Woody density in the riparian areas is estimated to be 9.4 plants/100ft² (CI80% = 8-10.8) and is dominated by salmonberry (*Rubus spectabilis*), snowberry (*Symphoricarpos albus*), Nootka rose (*Rosa nutkana*), and red osier dogwood (*Cornus alba*) (Photo 3). The riparian area on the northeast side of the creek is dominated by bitter cherry (*Prunus emarginata*) volunteers.

Performance Standard 5
(No class A noxious weeds, Japanese knotweed, or purple loosestrife)

No class A noxious weeds, Japanese knotweed, or purple loosestrife observed.

Performance Standard 6
(Washington State and Clallam County class B designates controlled)

One butterfly bush (*Buddleja davidii*) was observed in the riparian area at the northeast end of the site and reported to managers.

Performance Standard 7
(Washington State listed class C noxious weeds controlled; reed canarygrass and blackberries not to exceed 20% cover)

Noxious weed cover is estimated to be less than 1% and includes Common St. Johnswort (*Hypericum perforatum*) on the northeast bank of the creek and Canada thistle (*Cirsium arvense*) in the northeast buffer area just north of the 101 barrier. A substantial field of Canada thistle exists just offsite.
4.3. Adaptive Management

Olympic Region and the Headquarters Fish Passage team will coordinate to determine how to address hydrology issues in the new culvert and wetland planting areas. Partial replanting may be necessary after repairs are made.
5. References


Appendix A. As Built Planting Plan

(from WSDOT 2019)
## Appendix B. Data Tables

### Table 1. Hydrology Observations

<table>
<thead>
<tr>
<th>Date</th>
<th>Surface Observations</th>
<th>Well ID #</th>
<th>Water Level (inches below soil surface unless otherwise noted)</th>
</tr>
</thead>
<tbody>
<tr>
<td>March 19, 2019</td>
<td>Inundation present in two small benches near the north end of the site (1-7&quot; depth). Four pits were dug in the intended wetland areas and after 75 minutes all four pits had at least saturation present at 12&quot; below the soil surface or higher.</td>
<td>1</td>
<td>Well locations identified</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>April 2, 2019</td>
<td>Saturation not present in the wells we dug. The steep slopes on have <em>Equisetum</em> sp. growing; some seeps observed on the slopes. Some redox observed in the soil. The creek was flowing.</td>
<td>1</td>
<td>Wells installed during visit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>April 17, 2019</td>
<td>Two small stream benches with shallow inundation. No hydrology indicators observed on slopes. All four wells dry to the bottom.</td>
<td>1</td>
<td>Dry</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>Dry</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>Dry</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>Dry</td>
</tr>
</tbody>
</table>
Table 2. Comparison of Observed and Normal Precipitation (NRCS 2015)

<table>
<thead>
<tr>
<th>Month</th>
<th>3 yrs. in 10 less than</th>
<th>Average</th>
<th>3 yrs. in 10 more than</th>
<th>Rainfall&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Condition dry, wet, normal&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Condition Value</th>
<th>Month weight value</th>
<th>Product of previous two columns</th>
</tr>
</thead>
<tbody>
<tr>
<td>1&lt;sup&gt;st&lt;/sup&gt; prior month</td>
<td>Feb</td>
<td>0.87</td>
<td>1.4</td>
<td>1.69</td>
<td>2.71</td>
<td>W</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Mar</td>
<td>0.92</td>
<td>1.2</td>
<td>1.4</td>
<td>0.27</td>
<td>D</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3&lt;sup&gt;rd&lt;/sup&gt; prior month</td>
<td>Apr</td>
<td>0.73</td>
<td>1.02</td>
<td>1.21</td>
<td>1.79&lt;sup&gt;c&lt;/sup&gt;</td>
<td>W</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Sum</td>
</tr>
</tbody>
</table>

<sup>a</sup> NRCS 2019  
<sup>b</sup> Conditions are considered normal if they fall within the low and high range around the average.  
<sup>c</sup> Two dates in April were missing rainfall data: total rainfall in April was at least 1.79 inches.

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

Conclusion: Precipitation conditions were normal during the three month period prior to hydrology monitoring. However, March was drier than normal, which may have affected hydrologic conditions during visits on March 19 and April 2.
Table 3. Daily Precipitation 10 days preceding field work, Kent, Washington

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>March 5</td>
<td>0</td>
<td>April 1</td>
<td>0</td>
<td>April 16</td>
<td>0</td>
</tr>
<tr>
<td>March 4</td>
<td>0</td>
<td>March 31</td>
<td>0</td>
<td>April 15</td>
<td>0</td>
</tr>
<tr>
<td>March 3</td>
<td>0</td>
<td>March 30</td>
<td>0</td>
<td>April 14</td>
<td>0.34</td>
</tr>
<tr>
<td>March 2</td>
<td>0</td>
<td>March 29</td>
<td>0</td>
<td>April 13</td>
<td>M</td>
</tr>
<tr>
<td>March 1</td>
<td>0</td>
<td>March 28</td>
<td>0</td>
<td>April 12</td>
<td>0.15</td>
</tr>
<tr>
<td>February 28</td>
<td>0</td>
<td>March 27</td>
<td>0</td>
<td>April 11</td>
<td>0.20</td>
</tr>
<tr>
<td>February 27</td>
<td>0</td>
<td>March 26</td>
<td>0</td>
<td>April 10</td>
<td>0.21</td>
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<td>February 26</td>
<td>0</td>
<td>March 25</td>
<td>0.06</td>
<td>April 9</td>
<td>0.09</td>
</tr>
<tr>
<td>February 25</td>
<td>0.03</td>
<td>March 24</td>
<td>0</td>
<td>April 8</td>
<td>0.27</td>
</tr>
<tr>
<td>February 24</td>
<td>0.24</td>
<td>March 23</td>
<td>0</td>
<td>April 7</td>
<td>0.01</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>0.27</strong></td>
<td><strong>Total:</strong></td>
<td><strong>0.06</strong></td>
<td><strong>Total:</strong></td>
<td><strong>1.27</strong></td>
</tr>
</tbody>
</table>

\(^a\)NRCS 2018

"S" This data value failed one of NCDC’s quality control tests.
"T" values indicate a TRACE value was recorded.
"M" values indicate missing data.
"A" values indicate a multiday total, accumulated since the last measurement.
Appendix C. Hydrographs

Well 1 Water Levels April-June, 2019

Water Level (Inches)

Soil Surface

Well 2 Water Levels April-June, 2019

Water Level (Inches)

Calculated Water Levels

Soil Surface
