US 2 Tumwater Canyon Bridge Replacement 
(Tumwater Canyon Bridges) Mitigation Site

USACE NWS-2010-1255

North Central Region

2017 MONITORING REPORT

Wetlands Program

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# US 2 Tumwater Canyon Bridge Replacement (Tumwater Canyon Bridges) Mitigation Site

## USACE NWS-2010-1255

<table>
<thead>
<tr>
<th>General Site Information</th>
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<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>Area of Project Impact¹</td>
</tr>
<tr>
<td>Type of Mitigation</td>
</tr>
<tr>
<td>Planned Area of Mitigation²</td>
</tr>
</tbody>
</table>

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¹ Impact numbers sourced from USACE 2011.
² Mitigation numbers sourced from WSDOT 2011.
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Summary of Monitoring Results and Management Activities (2017)

<table>
<thead>
<tr>
<th>Performance Standards</th>
<th>2017 Results(^3)</th>
<th>Management Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wetland hydrology present</td>
<td>Present</td>
<td></td>
</tr>
<tr>
<td>Density of four plants/100ft(^2) in the scrub-shrub and forested wetland</td>
<td>10.3 plants/100ft(^2) (CI(_{80%}) = 8.9-11.7)</td>
<td></td>
</tr>
<tr>
<td>Reed canarygrass (Phalaris arundinacea), thistles (Cirsium arvense, C. vulgare, Carduus acanthoides, C. nutans, and Onopordum acanthium), common reed (Phragmites australis), and other invasive species controlled</td>
<td>2% cover (qualitative)</td>
<td>A few Scotch broom (Cytisus scoparius) were hand pulled</td>
</tr>
</tbody>
</table>

Report Introduction

This report summarizes third-year (Year-3) monitoring activities at the 002 Tumwater Canyon Bridges 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 October 2, and a qualitative assessment of wetland hydrology on June 1, in 2017.

\(^3\) Estimated values are presented with their corresponding statistical confidence interval. For example, 10.3 plants/100ft\(^2\) (CI\(_{80\%}\) = 8.9-11.7) means we are 80% confident that the true density value is between 8.9 and 11.7 plants/100ft\(^2\).
What is the 002 Tumwater Canyon Bridges Mitigation Site?

This mitigation site (Figure 1) includes 0.62 acres of re-established wetland in Tumwater Canyon, northwest of Leavenworth. This site was created to compensate for the loss of 0.0489 acre of wetlands due to bridge replacements along US 2 over the Wenatchee River, Drury Creek, and Chiwaukum Creek, as well as the realignment of portions of US 2 between mileposts 89.14 and 93.38. This riparian wetland is designed to provide mitigation for lost wetland functions including production and export of organic matter, flood flow alteration, and wildlife habitat.

![Site Sketch](image)

**Figure 1  Site Sketch**

The US 2 Tumwater Canyon Bridges Mitigation Site is built on an abandoned section of US 2, following realignment of the roadway as part of the project. The site reconnects two larger wetlands that were previously bisected by the old section of highway. A section of Skinney Creek, previously a linear ditch alongside the old section of US 2, was realigned as a meandering channel through the center of the mitigation site. Appendix 2 includes site directions.
What are the performance standards for this site?

**Year 3**

**Performance Standard 1**
In the intended wetland area, the soils will be saturated to the surface, or standing water will be present within 12 inches of the soil surface for at least two consecutive weeks of the growing season in years when rainfall meets or exceeds the 30-year average.

**Performance Standard 2**
Planted and volunteering native woody species will maintain a density of four plants per 100 square feet in scrub-shrub (PSS) and forested (PFO) wetland.

**Performance Standard 3**
Reed canarygrass, thistles, common reed, and any other species that competes with desirable vegetation will be controlled across the mitigation site until Year 10 performance standards have been achieved.

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

WSDOT staff collected hydrology data qualitatively by examining the soil surface for signs of saturation and inundation. (Performance Standard 1).

The figure and table below document the sampling methodology utilized for all of the remaining 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 (2017)
Placement of Baseline: A 196-meter-long baseline was placed roughly north-south in three segments, with one segment in each fenced-off area of forested/scrub-shrub wetland.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>PS 2</th>
<th>PS 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target pop. Zone</td>
<td>Density</td>
<td>Cover</td>
</tr>
<tr>
<td>Native woody</td>
<td>PSS/PFO</td>
<td>Invasive species</td>
</tr>
<tr>
<td>Sample method</td>
<td>UBT</td>
<td>Entire site</td>
</tr>
<tr>
<td>SU width</td>
<td>1 m</td>
<td>Qualitative</td>
</tr>
<tr>
<td>Total # of SU</td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>
How is the site developing?

The site is developing well and is meeting all Year 3 performance standards. Cover of native woody species is high (~40-50%) and cover of invasive species is low. The site is providing diverse wildlife habitat with two separate canopies beginning to develop. Streamside vegetation already provides shade to the stream channel and helps stabilize the banks of Skinney Creek.
Results for Performance Standard 1
(Wetland hydrology present):

During an informal site visit in the late spring, areas of surface saturation were observed across much of the intended wetland enhancement areas. Sources of hydrology include small tributaries to the east and west, an existing wetland to the north, and Skinney Creek. Formal hydrology monitoring will occur in the spring of 2018.

Results for Performance Standard 2
(Density of four native woody plants/100ft² in the PSS/PFO):

Density of native woody species is estimated at 10.3 plants/100ft² (CI₈₀%= 8.9-11.7) (Photo 1). This exceeds the performance standard target. Dominant species include Nootka rose (*Rosa nutkana*), thimbleberry (*Rubus parviflorus*), Sitka alder (*Alnus viridis*), and hardhack (*Spiraea douglasii*).

Results for Performance Standard 3
(Invasive species controlled):

Cover of invasive species across the site is qualitatively estimated at two percent. A few scattered reed canarygrass, poison hemlock (*Conium maculatum*), Canada thistle (*Cirsium arvense*) were observed at the time of monitoring. A single Scotch broom (*Cytisus scoparius*) was pulled during the site visit.

What is planned for this site?
Routine weed control will continue in 2018.
Appendix 1 – Planting Plan with Photo Point Locations
(from WSDOT 2011)
Appendix 2 – Photo Points
The photographs below were taken from permanent photo-points on October 2, 2017 and document current site development.

Photo Point 1

Photo Point 2

Photo Point 3

Photo Point 4
Driving Directions:
Contact WSDOT North Central Region environmental staff to confirm whether a gate key will be necessary to access the site. From Leavenworth, drive 10 miles west on US 2. Turn right onto a dirt road (NF-7906) with a gate (this is where a key may be necessary). In 0.5 mile, pull over to the right. Walk about 200 feet to the southwest to find the mitigation site.
Literature Cited


