

US 2 Tumwater Canyon Bridge Replacement Mitigation Site

USACE NWP (23) NWS-2010-1255

North Central Region

2015 MONITORING REPORT

Wetlands Program

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General Site Information	
USACE NWP 23 Number	NWS-2010-1255
Mitigation Location	About seven miles northwest of Leavenworth, WA
LLID Number	1207351476876
Construction Date	2011–2014
Monitoring Period	2015–2024
Year of Monitoring	1 of 10
Area of Project Impact¹	0.05 acre
Type of Mitigation	Wetland Re-establishment
Planned Area of Mitigation²	0.62 acre

¹ The area of project impact was referenced from the USACE permit NWS-2010-1255 (USACE 2011).

² The planned area of mitigation was referenced from the mitigation report (WSDOT 2011).

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Summary of Monitoring Results and Management Activities (2015)

Performance Standards	2015 Results ³
Presence of wetland hydrology	Present
Minimum density of four plants/100 ft ² in the scrub-shrub and forested wetland.	9.6 plants/100ft ² (CI _{80%} = 7.7-11.5)
Invasive plant species will be controlled across the mitigation site until Year 10 performance standards have been achieved.	Less than 5% cover of invasive species across the site

Report Introduction

This report summarizes first-year (Year-1) monitoring activities at the United States Route 2 (US 2) Tumwater Canyon Bridge Replacement Mitigation Site. Included are a site description, the performance standards, an explanation of monitoring methods, and an evaluation of site development. Monitoring activities in 2015 included vegetation surveys, photo-documentation, and assessments of wetland hydrology. Hydrology visits occurred on April 22 and May 7. Vegetation monitoring was conducted July 20 to 21.

³ Estimated values are presented with their corresponding statistical confidence interval. For example, 9.6 plants/100ft² (CI_{80%} = 7.7-11.5) means we are 80% confident that the true density value is between 7.7 and 11.5 plants per 100 square feet.

What is the US 2 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.

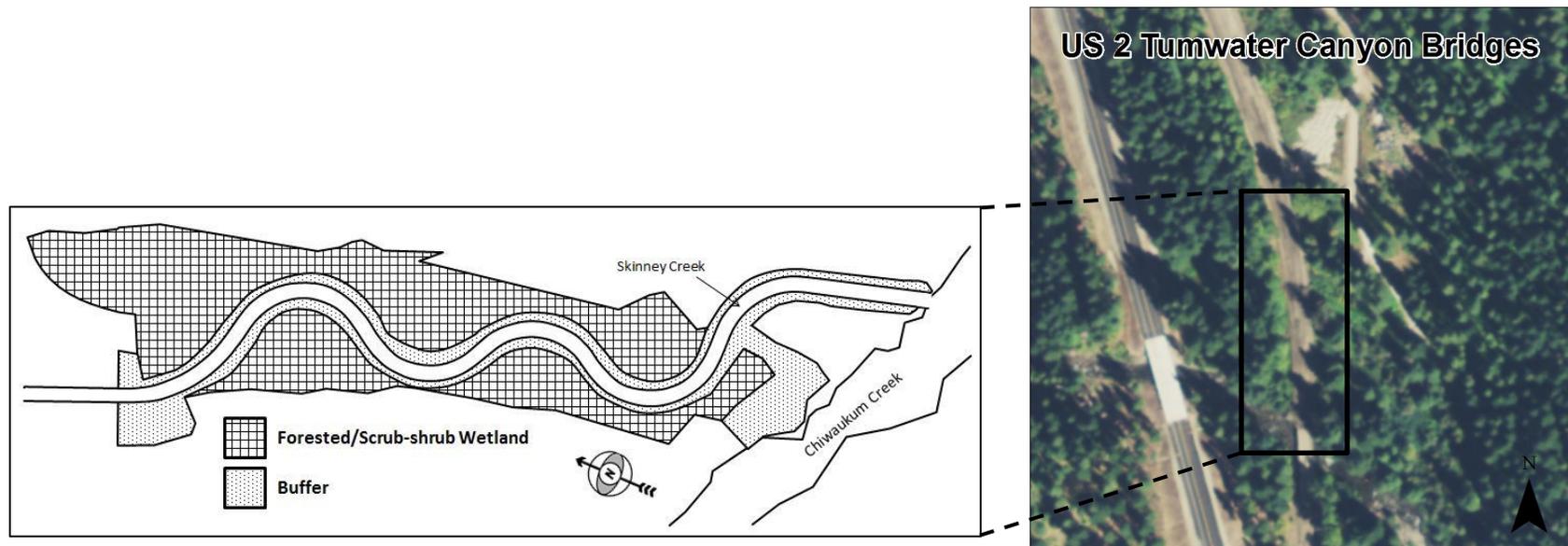


Figure 1 Site Sketch

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. It 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?

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 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 (*Phalaris arundinacea*), thistles (*Cirsium arvense*, *C. vulgare*, *Carduus acanthoides*, *C. nutans*, and *Onopordum acanthium*), common reed (*Phragmites australis*), 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 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).

The table below documents the sampling methodology utilized for the remaining performance standards (PS). For additional details on the methods see the [WSDOT Wetland Mitigation Site Monitoring Methods Paper](#) (WSDOT 2008).

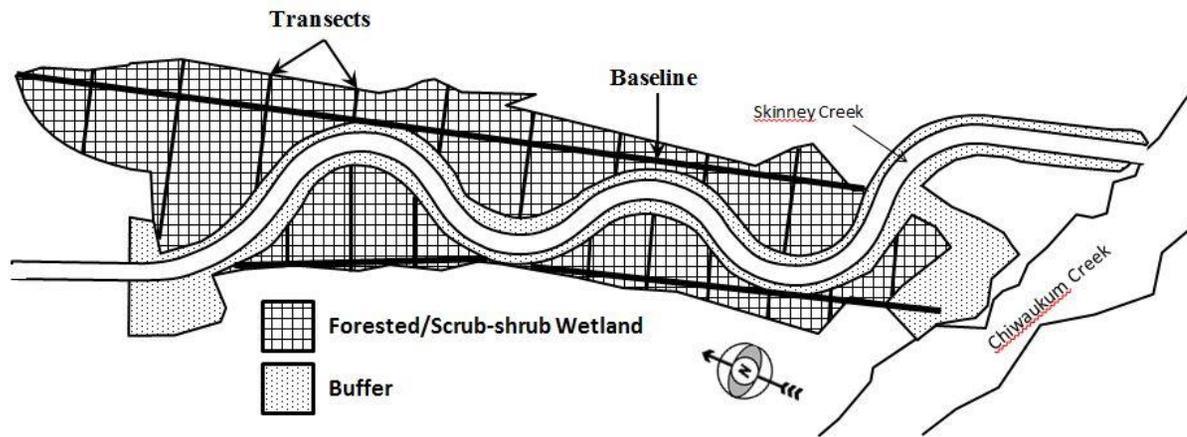


Figure 2 Site Sampling Design (2015)

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.

	PS 2	PS 3
Attribute	Density	Cover
Target pop.	Native woody	Invasive species
Zone	PSS/PFO	Entire site
Sample method	UBT	Visual estimates
SU width	2 m	
Total # of SU	16	

How is the site developing?

This mitigation site is doing very well in its first year of monitoring. Woody plantings have a high survival rate and are becoming well established. Most of the site was sheet mulched, contributing to the low cover of invasive species on site and helped establishment of woody plantings. The realignment of Skinney Creek, which now meanders through the mitigation site, shows no signs of bank erosion and both planted and native volunteer vegetation is becoming well established on the banks. This is also the area of the site that has the highest cover of invasive species (primarily reed canarygrass), but even here the invasive species cover is relatively low and does not seem to be significantly interfering with the establishment of the woody plantings and volunteer native species.

Results for Performance Standard 1
(Presence of wetland hydrology):

Two hydrology monitoring visits were conducted in 2015 by WSDOT region staff on April 22 and May 7. Three hydrology monitoring pit locations were established during the first visit and checked at each visit. During both visits in 2015, inundation, saturation to the soil surface, or a water table within the upper 12 inches of the soil, was observed at each of the hydrology pit locations (Photo 1).

Results for Performance Standard 2
(Minimum density of 4 plants/100 ft² in the scrub-shrub and forested wetland):

The density of native woody species in the forested and scrub-shrub wetland areas of the site (Photo 2) is estimated at 9.6 plants/100ft² (CI_{80%} = 7.7-11.5). The most abundant species are Sitka alder (*Alnus viridis*), thimbleberry (*Rubus parviflorus*), Nootka rose (*Rosa nutkana*), and hardhack (*Spiraea douglasii*).



Photo 1
Water in hydrology monitoring pit (May 2015)



Photo 2
Woody density in the PFO/PSS (July 2015)

Results for Performance Standard 2

(Invasive plant species will be controlled across the mitigation site until Year 10 performance standards have been achieved):

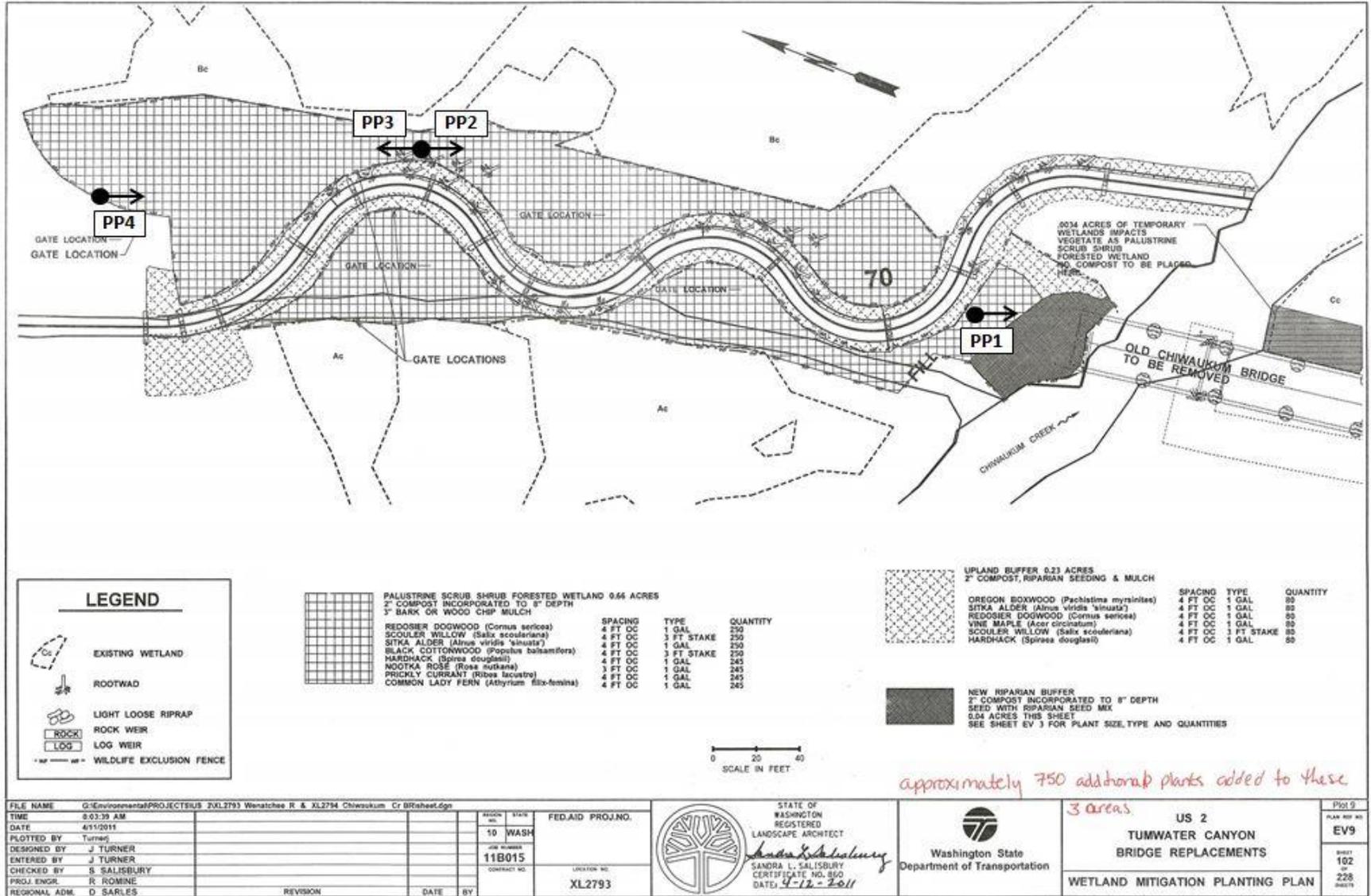
The entire forested and scrub-shrub wetland area of the site was sheet mulched during construction, and weeds are not a concern at this point. Overall cover of invasive plant species across the mitigation site was visually estimated at less than five percent. The cover of invasive species was estimated at about one percent in the forested and scrub-shrub wetland areas and about 10 percent in the upland buffer areas (primarily reed canarygrass along the creek banks). Invasive species observed onsite include reed canarygrass (*Phalaris arundinacea*), scentless false mayweed (*Tripleurospermum inodorum*), prickly lettuce (*Lactuca serriola*), bull thistle (*Cirsium vulgare*), common St. Johnswort (*Hypericum perforatum*), common tansy (*Tanacetum vulgare*), oxeye daisy (*Leucanthemum vulgare*), Queen Anne's lace (*Daucus carota*), yellow sweetclover (*Melilotus officinalis*), lambsquarter (*Chenopodium album*), Scotch broom (*Cytisus scoparius*) and knapweed (*Centaurea sp.*).

What is planned for this site?

Weed control will be conducted as needed and the temporary fencing around the planting areas will be removed.

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 July 21, 2015 and document current site development.



Photo Point 1



Photo Point 2



Photo Point 3



Photo Point 4

Driving Directions:

Contact WSDOT South 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

1. [USACE] US Army Corps of Engineers. 2011. Department of the Army Nationwide Permit 23 Number NWS-2010-1255.
2. [USACE] US Army Corps of Engineers. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0), Wakeley JS, Lichvar RW, Noble CV, editors. Vicksburg (MS): US Army Engineer Research and Development Center. ERDC/EL TR-10-3. Available at: http://www.usace.army.mil/Portals/2/docs/civilworks/regulatory/reg_supp/west_mt_finalsupp.pdf
3. [WSDOT] Washington State Department of Transportation. 2011. Tumwater Canyon Bridge Replacements Project. Wenatchee (WA): Washington State Department of Transportation, North Central Region.
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