

**SR 502 NE 15th Ave to NE 102nd Ave
(Mill Creek Complex South) Mitigation Site**

USACE NWS 2009-1093

Southwest Region

2014 MONITORING REPORT

Wetlands Program

Issued March 2015



**Washington State
Department of Transportation**

Environmental Services Office

Author:

Doug Littauer

Editor:

Tony Bush

For additional information about this report or the WSDOT Wetlands Program, please contact:

Tony Bush, Wetlands Program
WSDOT, Environmental Services Office
P. O. Box 47332, Olympia, WA 98504
Phone: 360-570-6640 E-mail: busht@wsdot.wa.gov

Monitoring reports are published on the web at: <http://www.wsdot.wa.gov/Environment/Wetlands/Monitoring/reports.htm>

SR 502 NE 15th Ave to NE 102nd Ave (Mill Creek Complex South) Mitigation Site

USACE NWS 2009-1093



General Site Information		
USACE NWS Number	2009-2018	
Mitigation Location	500 feet north of NE 199 th St. between NE 58 th and NE 72 nd Ave, Clark County	
LLID Number	1226076457678	
Construction Date	2012-2013	
Monitoring Period	2014-2023	
Year of Monitoring	1 of 10	
Area of Project Impact	11.12 acres	
Type of Mitigation	Wetland Establishment	Wetland Enhancement
Planned Area of Mitigation¹	1.63 acres	0.11 acre

¹Additional mitigation provided for the SR 502 Corridor Widening project at SR 502 Mill Creek North, Sunset Oaks and I-5 Cedars Creek mitigation sites. See Appendix 3, Table 1 for a breakdown of mitigation sites and mitigation acreage.

This Page Intentionally Left Blank

Summary of Monitoring Results and Management Activities (2014)

Performance Standards	2014 Results ²	Management Activities
Wetland hydrology	Present	
90% woody survival across the site	94% survival (CI _{80%} = 93-96%)	
Blackberry species and Class B Noxious Weeds will not exceed 15%	No Class B species were observed. The cover of non-native blackberries was estimated at 2 percent.	5 separate weed control visits in 2014
If detected all Class A Noxious Weeds, Japanese Knotweed and Purple Loosestrife shall be eradicated	None observed	
Reed canarygrass will not exceed 25% cover	3 percent	

Report Introduction

This report summarizes Year-1 monitoring activities at the State Route (SR) 502 Mill Creek Complex South 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 visits occurred on March 6, 19, and April 10, 2014. Vegetation surveys occurred on August 18-20, 2014.

² Estimated values are presented with their corresponding statistical confidence interval. For example, 94% survival (CI_{80%} = 93-96%) means we are 80% confident that the true survival value is between 93% and 96%.

What is the SR 502 Mill Creek North Mitigation Site?

This 5-acre mitigation site (Figure 1) is a combination of wetland establishment and wetland enhancement. This site was created to partially compensate for the loss of 11.12 acre of wetlands due to road improvements along SR 502. The newly established ponded depression, and surrounding scrub-shrub and forested areas are designed to provide mitigation for lost wetland functions including wildlife habitat, nutrient and sediment removal, and floodflow attenuation.

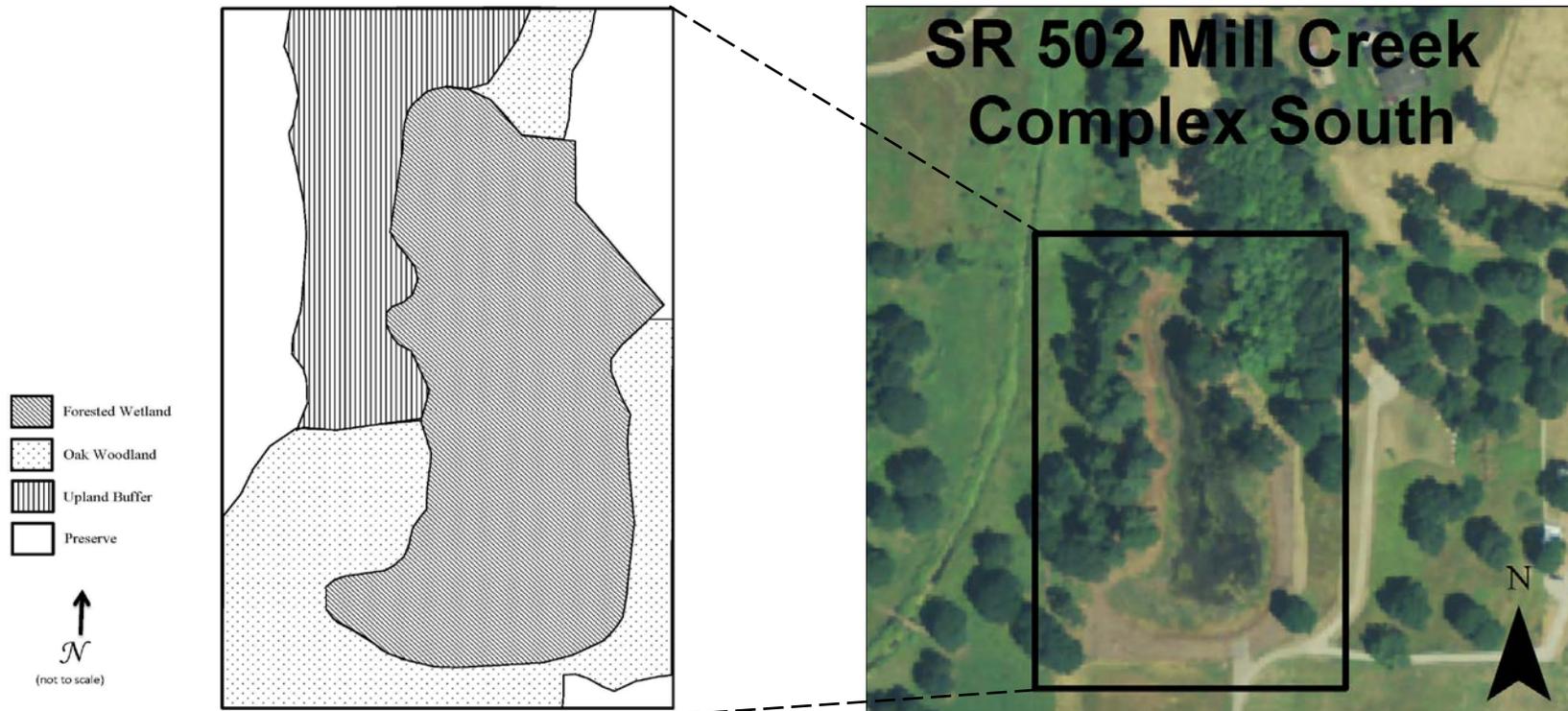


Figure 1 Site Sketch

The SR 502 Mill Creek Complex South Mitigation Site contains existing stands of Oregon White Oak with an enhanced understory of upland and wetland trees and shrubs. Appendix 2 includes site directions.

What are the performance standards for this site?

Year 1

Performance Standard 1

The soils will be saturated to the surface, or standing water will be present 12 inches or less below the surface for at least 10% of the growing season (growing season as defined in the Soil Survey of Clark County, WA., USDA, 1972) in years when rainfall meets or exceeds the 30-year precipitation average.

Performance Standard 2

At monitoring year 1, there will be a minimum survival rate of 90% in all areas identified on the Revegetation Concept as Wetland Creation, Wetland Enhancement, Wetland Buffer, and Oak Woodland Preservation/Enhancement Areas.

Performance Standard 3

The aerial extent of Blackberry Species and Class B (WA Dept of Agriculture and Clark County Weed Board) noxious weeds will not exceed 15% in the combined wetland and buffer areas.

Performance Standard 4

If/when detected, Class A Noxious Weeds (WA Dept. of Agriculture and Clark County), Japanese Knotweed, and Purple Loosetrife shall be treated so that the species do not exist on the site. These species shall not be included in the 15% cover allowed for invasive species.

Performance Standard 5

At monitoring years 1, 3, 5, and 7, the aerial extent of Reed Canarygrass shall not exceed 25% total cover in the wetland creation, wetland enhancement, or buffer enhancement areas.

Appendix 1 shows the planting plan (WSDOT 2012).

How were the performance standards evaluated?

To evaluate standards for vegetative cover, a segmented baseline was established through the center of the site. Twenty-five sampling transects were randomly placed perpendicular to the baseline. The unequal belt transect method was used to estimate woody survival (Performance Standard 2). The presence or absence of Class A Noxious Weeds, the cover of blackberries and Class B Noxious Weeds, and the cover of reed canarygrass was evaluated qualitatively (Performance Standards 3, 4, and 5).

WSDOT staff collected hydrology 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).

For additional details on the methods, see the [WSDOT Wetland Mitigation Site Monitoring Methods Paper](#) (WSDOT 2008).

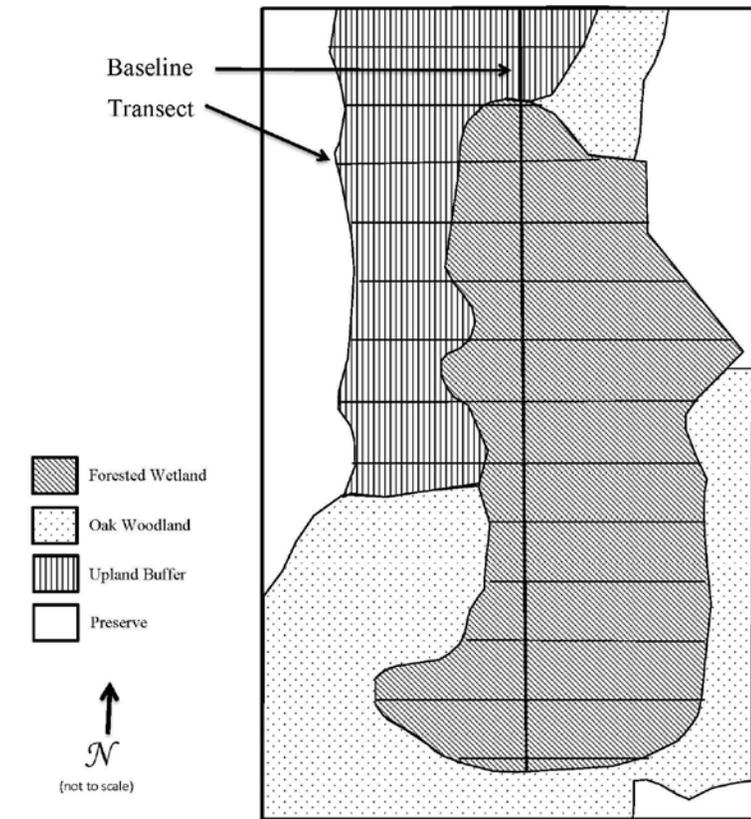


Figure 2 Site Sampling Design (2014)

How is the site developing?

In general the site is developing as intended. The survival of native woody plantings slightly exceeds the performance standard target. A diverse native emergent understory has developed rapidly in the forested wetland with a mosaic of herbaceous species. The cover of all invasive species is minimal across the site.

The site was intended to provide wildlife habitat, flood flow alteration, and nutrient/sediment removal. It appears that all three functions are provided by the mitigation site. Eight avian species were observed during vegetation monitoring. Both passerines and raptors were observed, primarily in the mature forested ash and oak communities present on the site. The dense emergent vegetation that is partially submerged in the spring (Photo 1) should provide amphibian breeding habitat, and the connection to Mill Creek provides an outlet for the export of organic material to the downstream aquatic environment.

The creation of the topographic depression already provides storage for floodwater that would otherwise discharge to Mill Creek and potentially contribute to further erosion. The dense emergent vegetation has the potential to trap sediment before it enters Mill Creek.

Results for Performance Standard 1
(Wetland hydrology present):

The majority of the site was either inundated or saturated to the surface on each of the three hydrology visits (Photo 1). Shallow wells were installed on the second hydrology visit. One of those wells did have adequate time to equilibrate, so a reading was not obtained. The remaining wells all met hydrology criteria on the other visit. See Appendix 3 Table 2 for complete results.

Results for Performance Standard 2
(90% survival of planted woody species):

Survival of planted woody species across the site is estimated at 94% (CI_{80%} = 93-96%) (Photos 2 and 3). This survival estimate exceeds the performance standard target. Survival appears to be higher in the upland planting area than the wetland planting areas, and a significant number of redosier dogwood (*Cornus alba*), and willows (*Salix spp.*) appeared stressed.



Photo 1
Inundation within the wetland establishment (March 2014)

Results for Performance Standard 3

(15% cover of Class B Noxious weeds and Blackberry species):

Cover of invasive species across the site is estimated at two percent. This consists exclusively of Himalayan blackberry (*Rubus armeniacus*) which was primarily located in the upland area in the western portion of the site. No Class B Noxious species were observed.

Results for Performance Standard 4

(Presence/absence of Class A noxious weeds, Purple loosestrife, and Japanese knotweed):

No Class A noxious weeds or Japanese knotweed were observed on site.

Results for Performance Standard 5

(25% cover of reed canarygrass):

Reed canarygrass cover is estimated at three percent. The majority of the reed canarygrass is located in the northeast portion of the site in both the established wetland and the forested preserve area. Three weed control visits occurred at this site in 2014 between April and October. Weed control will continue in 2015.



Photo 2
Woody vegetation in the established wetland (August 2014)



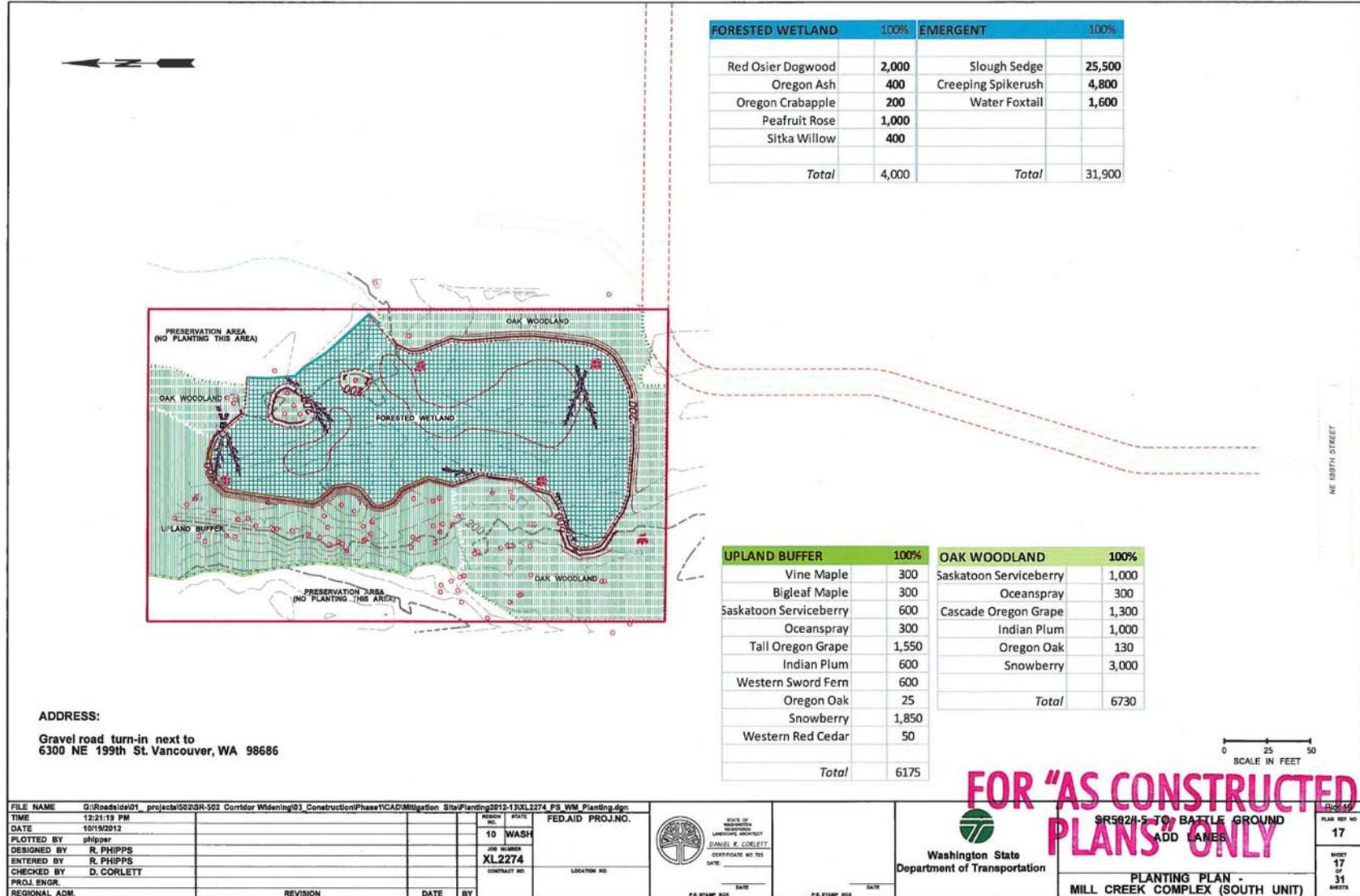
Photo 3
Woody vegetation in the upland buffer (August 2014)

What is planned for this site?

Weed control will continue in 2015.

Appendix 1 – As-Built Planting Plan

(WSDOT 2014)



Appendix 2 – Photo Points

The photographs below were taken from permanent photo-points on August 20, 2014 and document current site development.



Photo Point 1a



Photo Point 1b



Photo Point 1c



Photo Point 1d



Photo Point 1e



Photo Point 2a



Photo Point 2b



Photo Point 2c

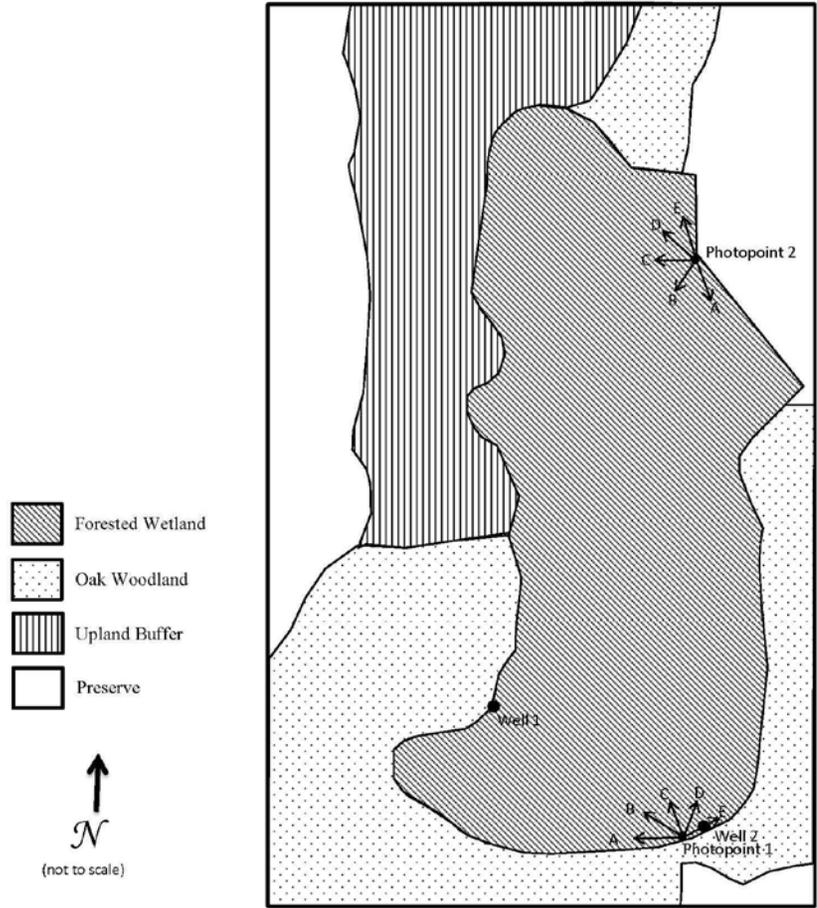


Photo Point 2d



Photo Point 2e

Photo Point and Groundwater Monitoring Well Map



Driving Directions: From I-5 South, take Exit 11 onto SR 502 towards Battle Ground. In 2.7 miles turn right onto NE 50th Ave. Turn left onto NE 199th St. In 0.6 miles turn left onto an unmarked gravel road and proceed 1000 feet to the site.

Appendix 3 – Data Tables

Table 1. Mitigation site acreage⁴

Mitigation Type	Cedars Creek Mitigation Site (ac)	Mill Creek North Mitigation Site (ac)	Sunset Oaks Mitigation Site (ac)	Mill Creek Complex South (ac) ³	East Fork Lewis Mitigation Bank (credits)	Totals (ac)
Wetland Establishment	0.33	3.88		1.63		5.84
Wetland Enhancement				0.11		0.11
Wetland Reestablishment		13.91	6.54		4.72	25.17
Wetland Preservation				0.5		0.5
Future Mitigation						
Establishment	4.37	0.68				5.05
Reestablishment		12.2	14.39			26.59

³ Acreage numbers for Mill Creek Complex South were taken from the Final Critical Areas Mitigation Plan (WSDOT 2012).

All other acreage numbers were taken from USACE Permit Number NWS-2009-1093

Table 2. Hydrology Observations.

Date	Surface Observations	Well ID #	Water Level (inches below soil surface unless otherwise noted)
March 6, 2014	Entire site is inundated.	1	Saturated to the soil surface
		2	Saturated to the soil surface
March 19, 2014	Site is inundated in all low areas.	1	Not enough time allowed after well installation for water level to equilibrate
		2	Saturated to the soil surface
April 10, 2014	All low areas inundated	1	9
		2	Saturated to the soil surface

⁴ Additional mitigation for the SR 502 Corridor Widening project will be added in 2015

Literature Cited

1. Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Vicksburg (MS): US Army Engineer Waterways Experiment Station. Technical Report Y-87-1. Available at: <http://el.ercd.usace.army.mil/elpubs/pdf/wlman87.pdf>
2. [USACE] US Army Corps of Engineers. 2012. Department of the Army Individual Permit Number 2009-1093.
3. [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
4. [WSDOT] Washington State Department of Transportation. 2012. SR 502 Corridor Widening. Vancouver (WA): Washington State Department of Transportation, Southwest Region.
5. [WSDOT] Washington State Department of Transportation. 2014. SR 502 Corridor Final As-Built Report. Vancouver (WA): Washington State Department of Transportation, Southwest Region.
6. [WSDOT] Washington State Department of Transportation. 2008. WSDOT Wetland Mitigation Site Monitoring Methods. <http://www.wsdot.wa.gov/NR/rdonlyres/C211AB59-D5A2-4AA2-8A76-3D9A77E01203/0/MethodsWhitePaper052004.pdf>