

SR 6 South Fork Chehalis River Bridge Replacement Project Mitigation Site

USACE (23) NWS-2007-1966

Southwest Region

2014 MONITORING REPORT

Wetlands Program

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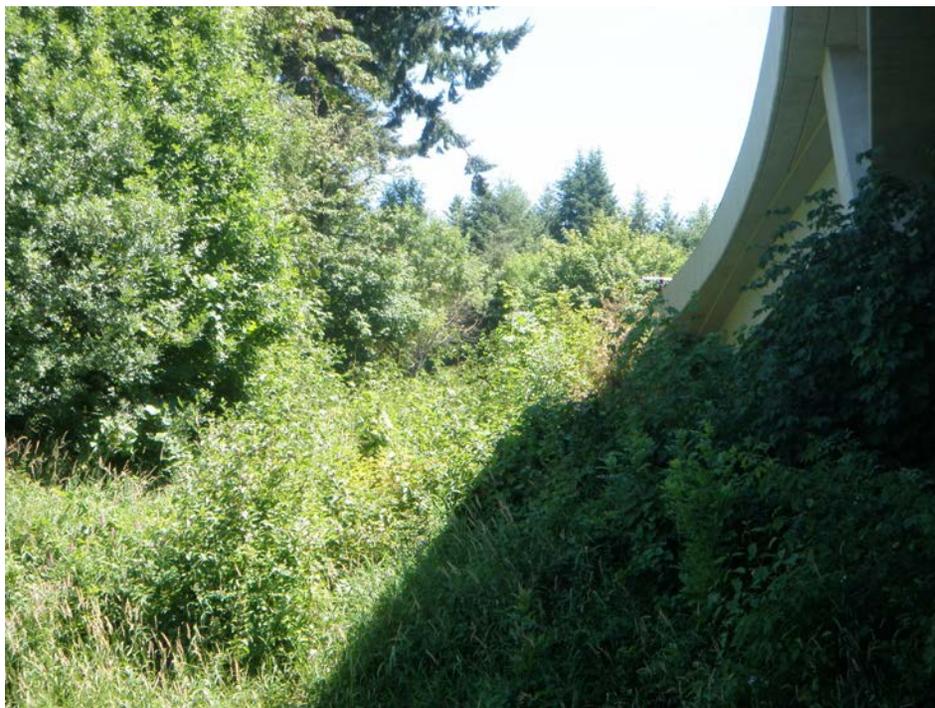
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USACE (23) NWS-2007-1966



General Site Information		
USACE NWP 23 Number	NWS-2007-1966	
Mitigation Location	Bridge across the South Fork of the Chehalis River on SR 6 in Lewis Co.	
LLID Number	1231265466018	
Construction Date	2008-2009	
Monitoring Period	2010-2014	
Year of Monitoring	5 of 5	
Type of Impact¹	Wetland Buffer	Stream Buffer
Area of Project Impact	0.85 acre	0.31 acre
Type of Mitigation	Wetland Buffer Enhancement	Stream Buffer Enhancement
Area of Mitigation	0.5 acre	0.7 acre

¹ Wetland impact for this project is 0.26 acre (USACE 2007). WSDOT shall debit a total of 0.26 wetland mitigation credits from the North Fork Newaukum Bank credit ledger to compensate for this impact. The areas of buffer impacts, and areas of mitigation provided are taken from WSDOT 2007.

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Summary of Monitoring Results and Management Activities (2014)

Performance Standards ²	2014 Results ³	Management Activities
There will be a minimum density of 300 living native trees per acre and there will be a density of 3,000 living native shrubs per acre.	Trees: 1,444 plants/acre (CI _{80%} = 954-1,934) Shrubs: 3,741 plants/acre (CI _{80%} = 3,301-4,182)	
At least 2 species of native trees and 4 species of native shrubs will be present. No single species will provide more than 60% total aerial cover.	6 species of trees present 11 species of shrubs present	
The aerial extent of blackberry (<i>Rubus</i> species) and Class A noxious weeds will not exceed 15% in the combined, scrub shrub and forest, planting areas of the mitigation site.	3 percent cover of blackberries, no Class A noxious weeds present	
Japanese knotweed (<i>Reynoutria japonica</i>) shall not be present in any amount within the mitigation site.	None observed	
<p>The aerial extent of reed canarygrass (<i>Phalaris arundinacea</i>) in the mitigation site will be managed at a threshold 10% below the existing baseline conditions established in Performance Standard 6A.</p> <p>Reed Canarygrass will exist as an understory component that does not out compete the dominant native tree and shrub species or exceed existing baseline conditions.</p>	See results section	
The on-site mitigation areas will be surveyed to demonstrate that the mitigation area contains 0.5 acres of total wetland buffer and 0.7 acres of combined riparian area in compliance with the estimated acreages of Table 2. Visual acreage estimates of the various Cowardin vegetation classes will be conducted to document the development of plant communities on the site.	Approximately 1.20 acres of planted areas on site. PSS and PEM communities present.	

²Estimated values are presented with their corresponding statistical confidence interval. For example, 1,444 plants/acre (CI_{80%} = 954-1,934) means we are 80% confident that the true density value is between 954-1,934 plants/acre.

³ The forested and scrub-shrub areas were not discernible in the field and were sampled together. The performance standards for these two zones have been combined into standards that apply to the two intended woody zones as one. This applies to performance standards 1 and 2.

Report Introduction

This report summarizes fifth-year (Year-5) monitoring activities at the State Route (SR) 6 Chehalis River Bridge Mitigation Site. Included are a site description, the performance standards, an explanation of monitoring methods, and an evaluation of site success. Monitoring activities included vegetation surveys and photo-documentation, which took place on July 9, 2014.

What is the SR 6 Chehalis River Bridge Mitigation Site?

This 1.2-acre wetland buffer and stream buffer mitigation site (Figure 1) is made up of approximately 0.5 acre of established wetland buffer and 0.7 acre of enhanced stream buffer to compensate for the loss of functions due to the construction of a new bridge across the south fork of the Chehalis River. These buffer areas are designed to provide mitigation for lost buffer functions including slope stabilization, water quality, shade, wildlife habitat, and visual/glare screening.

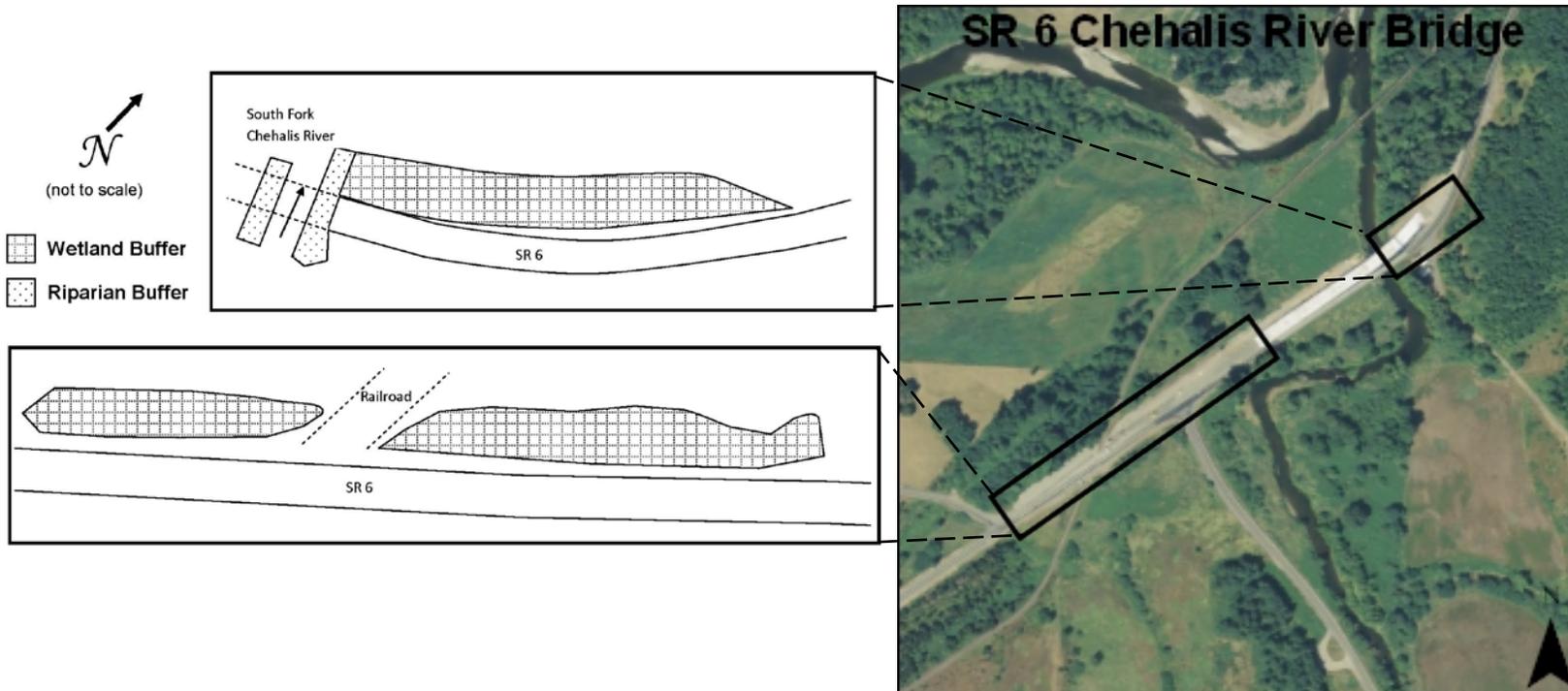


Figure 1 Site Sketch

The SR 6 Chehalis River Bridge Mitigation Site contains a riparian buffer directly adjacent to the east and west river banks and a wetland buffer on the north side of SR 6. Plantings include shrubs in the riparian zone and the wetland buffer area that is bisected by the railroad. The wetland buffer located in the northern most section of the site is a forested community that includes conifers. Appendix 2 includes site directions.

What are the performance standards for this site?

Year 5

Performance Standard 1

There will be a minimum density of 300 living native trees per acre and there will be a density of 3,000 living native shrubs per acre.

Performance Standard 2

At least two species of native trees and four species of native shrubs will be present. No single species will provide more than 60 percent total aerial cover.

Performance Standard 3

The aerial extent of Blackberry Species and Class A noxious weeds will not exceed 15 percent in the combined, scrub shrub and forest, planting areas of the mitigation site.

Performance Standard 4

Japanese Knotweed shall not be present in any amount within the mitigation site.

Performance Standard 5

The aerial extent of Reed Canarygrass in the mitigation site will be managed at a threshold 10 percent below the existing baseline conditions. Reed Canarygrass will exist as an understory component that does not out compete the dominant native tree and shrub species or exceed existing baseline conditions.

Performance Standard 6

The on-site mitigation areas will be surveyed to demonstrate that the mitigation area contains 0.5 acres of total wetland buffer and 0.7 acres of combined riparian area in compliance with the estimated acreages of Table 2. Visual acreage estimates of the various Cowardin vegetation classes will be conducted to document the development of plant communities on the site.

Appendix 1 shows the as built (WSDOT 2010).

How were the performance standards evaluated?

To evaluate standards for vegetative density, a 341 meter segmented baseline was established east to west parallel to SR 6 (Figure 2). Twenty-eight transects were placed perpendicular to the baseline using the systematic random method. The unequal area belt transect method was used to determine woody density in the wetland buffer (Performance Standard 1). Due to safety concerns the riparian buffer was not included in this sample. There were 28 one-meter sample units placed along the sampling transects.

The cover of woody species was visually assessed in the wetland buffer (Performance Standard 2). The cover and presence of invasive species on the site was also assessed with visual estimates (Performance Standards 3, 4, and 5).

To assess the amount of planted areas as well as Cowardin classes present, planting areas were digitized in GIS. Field notes and photos were consulted to determine the Cowardin class of the various planted areas.

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

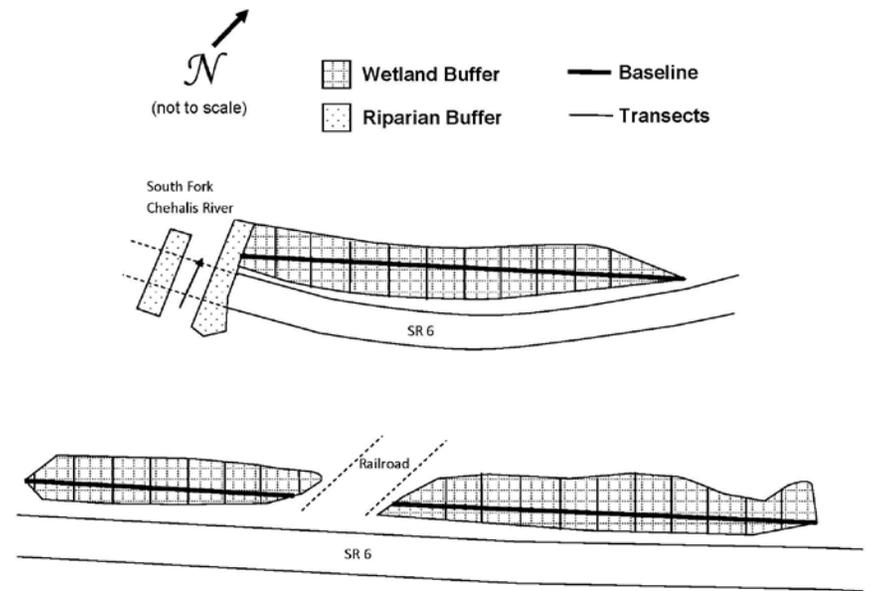


Figure 2 Site Sampling Design (2014)

Is this site a success?

This site has generally developing as planned. The planted species in the wetland buffer are fairly dense and have met the final year performance standards. The functions associated with wetland buffers; primarily sediment and nutrient removal, general habitat suitability and screening from the road are being supported with the successful achievement of the performance standards.

The planted areas impacted by mowing in 2012 have been restored (Appendix 2 Photo points 2 and 4). The debris is no longer present and these areas are now vegetated with native woody species.

Although there are several established shrubs present, the riparian buffer remains dominated by reed canarygrass. High flows and repeated deposition of woody debris have not facilitated the establishment of native shrubs. While some willows (*Salix* species) and dogwoods (*Cornus* species) are present, the steepness of the banks prevents both quantitative monitoring as well as maintenance activities due to safety issues (Photo 2).

Several species of birds and signs of wildlife were observed during the monitoring visit. Coyote scat, herbivory, raccoon tracks, and many garter snakes are some of the observations made.

Results for Performance Standard 1

(There will be a minimum density of 300 living native trees per acre and there will be a density of 3,000 living native shrubs per acre):

The density of trees in the wetland buffer areas is 1,444 plants/acre ($CI_{80\%} = 954-1,934$) (Photo 1). This exceeds the performance standard target. The most abundant tree species are bigleaf maple (*Acer macrophyllum*), red alder (*Alnus rubra*), and western red cedar (*Thuja plicata*). The density of shrubs in the wetland buffer is 3,741 plants/acre ($CI_{80\%} = 3,301-4,182$) (Photo 2). The most abundant shrub species include snowberry (*Symphoricarpos albus*), salmonberry (*Rubus spectabilis*), and redosier dogwood (*Cornus alba*).

Results for Performance Standard 2

(At least 2 species of native trees and 4 species of native shrubs will be present. No single species will provide more than 60% total aerial cover):

Six species of trees and 11 species of shrubs are present on the mitigation site. See Appendix 3 Table 1 for a complete list of species present. No one species provides more than 60 percent cover.



Photo 1
Woody cover in the wetland buffer (July 2014)



Photo 2
Native shrubs and Reed Canarygrass in the Riparian buffer (July 2014)

Results for Performance Standard 3

(The aerial extent of Blackberry Species and Class A noxious weeds will not exceed 15% in the combined, scrub shrub and forest, planting areas of the mitigation site.):

No Class A noxious weeds were observed in or near the mitigation site in 2014. The cover of non-native blackberries is qualitatively estimated at three percent.

Results for Performance Standard 4

(Japanese Knotweed shall not be present in any amount within the mitigation site):

Japanese knotweed was not observed in or near the mitigation site in 2014.

Results for Performance Standard 5

(The aerial extent of Reed Canarygrass in the mitigation site will be managed at a threshold 10 percent below the existing baseline conditions. Reed Canarygrass will exist as an understory component that does not out compete the dominant native tree and shrub species or exceed existing baseline conditions.

The cover of reed canarygrass observed onsite is visually estimated to be less than two percent in the wetland buffer planting areas. Baseline conditions were not quantitatively documented, however the floodplain area was a monoculture of reed canarygrass prior to construction, with the monoculture also dominating adjacent properties and the South Fork Chehalis Floodplain. Despite the presence of reed canarygrass, several willows are established in the riparian area (Appendix 2 Photo Points 1b and 6b. Reed canarygrass cover in the floodplain planting areas is slightly lower than the baseline conditions that were present before the area was planted.

Results for Performance Standard 6

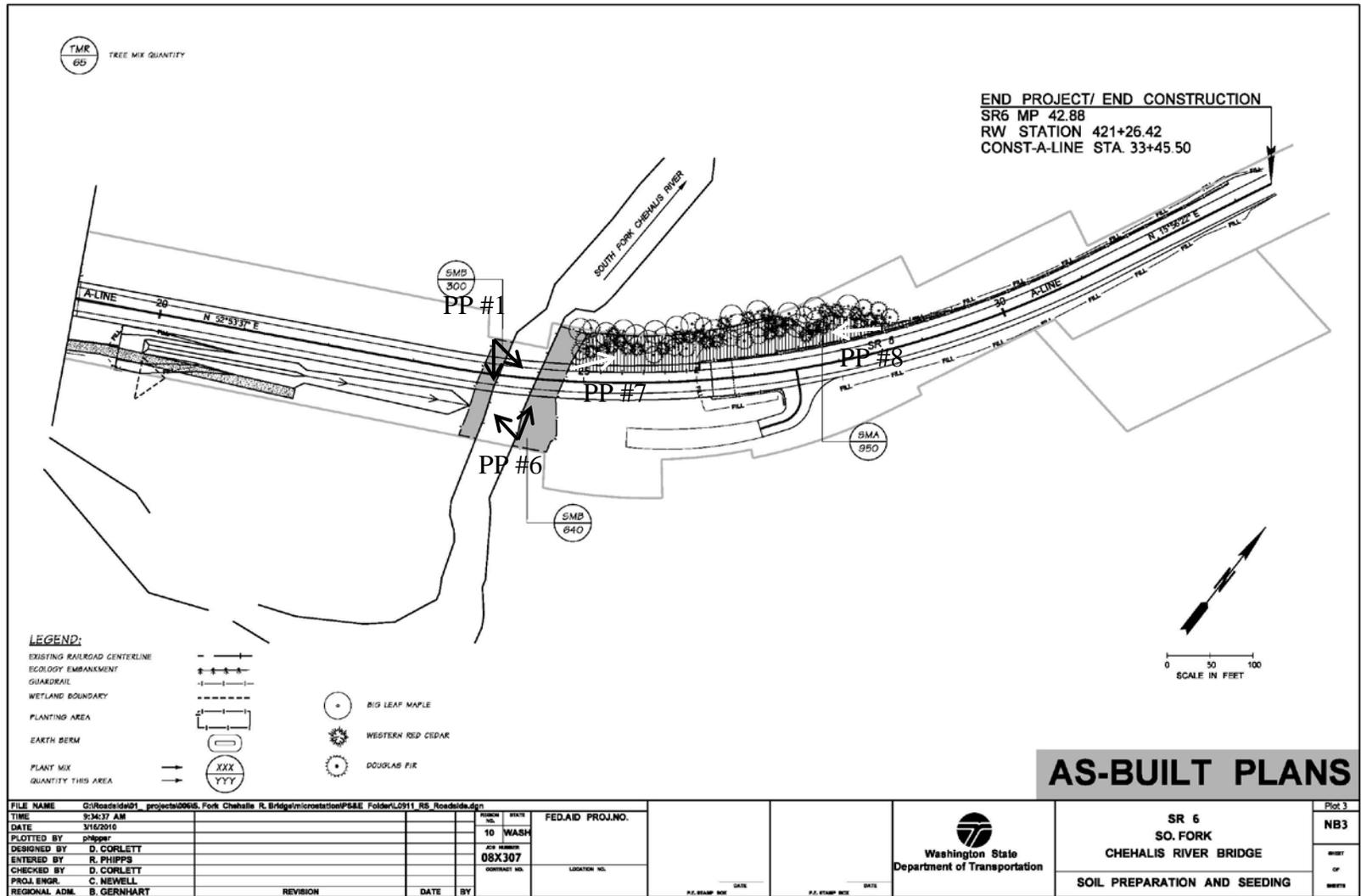
(The on-site mitigation areas will be surveyed to demonstrate that the mitigation area contains 0.5 acres of total wetland buffer and 0.7 acres of combined riparian area. Visual acreage estimates of the various Cowardin vegetation classes will be conducted to document the development of plant communities on the site)

A total of approximately 1.20 acres of mitigation area were planted with native woody vegetation. All three wetland/stream buffer planting areas have developed into scrub-shrub communities, however since they are primarily upland areas they are not technically any Cowardin community since Cowardin is used to describe wetland vegetation communities. The riparian buffer communities along

the banks of the Chehalis River have not established woody vegetation due to frequent high water levels and remain dominated by herbaceous vegetation. See map in Appendix 4.

What is planned for this site?

Routine weed control will continue in 2015.



Appendix 2 – Photo Points

The photographs below were taken from permanent photo-points on July 9, 2014 and document current site development.



Photo Point 1a



Photo Point 1b



Photo Point 2a



Photo Point 2b



Photo Point 2c



Photo Point 3



Photo Point 4



Photo Point 5



Photo Point 6a



Photo Point 6b



Photo Point 7



Photo Point 8

Driving Directions:

From I-5 take Exit 77 for SR 6 West toward Raymond/Pe Ell. Approximately 8.5 miles west of Interstate 5, a bridge spans the South Fork of the Chehalis River. On the west side of the bridge and north side of the road is a pull out to park in. The site is located on the north side of the road on both sides of the river

Appendix 3 – Data Tables

Table 1 Trees and Shrubs Present

Tress Present	Shrubs Present
bigleaf maple (<i>Acer macrophyllum</i>)	Nootka rose (<i>Rosa nutkana</i>)
red alder (<i>Alnus rubra</i>)	snowberry (<i>Symphoricarpos albus</i>)
Oregon ash (<i>Fraxinus latifolia</i>)	oceanspray (<i>Holodiscus discolor</i>)
western red cedar (<i>Thuja plicata</i>)	salmonberry (<i>Rubus spectabilis</i>)
black cottonwood (<i>Populus balsamifera</i>)	tall oregonrape (<i>Mahonia aquifolium</i>)
Douglas-fir (<i>Pseudotsuga menziesii</i>)	cluster rose (<i>Rosa pisocarpa</i>)
	redosier dogwood (<i>Cornus alba</i>)
	twinberry honeysuckle (<i>Lonicera involucrata</i>)
	Pacific willow (<i>Salix lasiandra</i>)
	Indian plum (<i>Oemleria cerasiformis</i>)
	vine maple (<i>Acer circinatum</i>)

Appendix 4 – Map of Planting Areas and Cowardin Classes



Literature Cited

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6. [WSDOT] Washington State Department of Transportation. 2010. SR 6 South Fork Chehalis River Bridge Replacement Project Mitigation Site As-built Planting Plan.