

SR 500/ I-205 Interchange Improvements (Burnt Bridge East) Mitigation Site

USACE NWS 2007-806-SOD

Southwest Region

2010 MONITORING REPORT

Wetland Assessment and Monitoring Program

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USACE NWS 2007-806-SOD



General Site Information	
USACE NWS Number	2007-806-SOD
Mitigation Location	Junction of I-205 southbound off-ramp and SR-500 westbound
LLID Number	1225678456548
Construction Date	2008-2009
Monitoring Period	2010-2019
Year of Monitoring	1 of 10
Area of Project Impact	0.022acre
Type of Mitigation	Wetland/Riparian Enhancement
Area of Mitigation	0.25 acre

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Summary of Monitoring Results and Management Activities (2010)

Performance Standards	2010 Results	Management Activities
90% minimum survival of woody plantings	93% survival	Targeted replanting during the 2011 dormant planting season.
Invasive noxious weeds will not exceed 15%	Qualitatively estimated at 3%	Weed control will occur throughout 2011.
Reed Canarygrass will be managed at a threshold 10% below baseline conditions	Standard achieved	
Japanese Knotweed shall not be present in any amount within the mitigation site	Not observed	

Report Introduction

This report summarizes first-year (Year-1) monitoring activities at the State Route (SR) 500/ I-205 Interchange Improvement Mitigation Site (Burnt Bridge East). 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. Vegetation monitoring occurred on the 25th of August, 2010.

What is the SR 500 Burnt Bridge East Mitigation Site?

This 0.25-acre mitigation site (Figure 1) is a wetland/riparian enhancement on the Kevanna Reach section of Burnt Bridge Creek at the junction of SR-500 eastbound off-ramp and I-205 northbound. This site was created to compensate for the loss of 0.022 acre of wetlands due to road improvements at the SR 500/ I-205 interchange. The wetland/riparian enhancement is designed to provide mitigation for lost wetland functions including wildlife habitat, biological support, improved floodplain function, and nutrient and sediment removal.

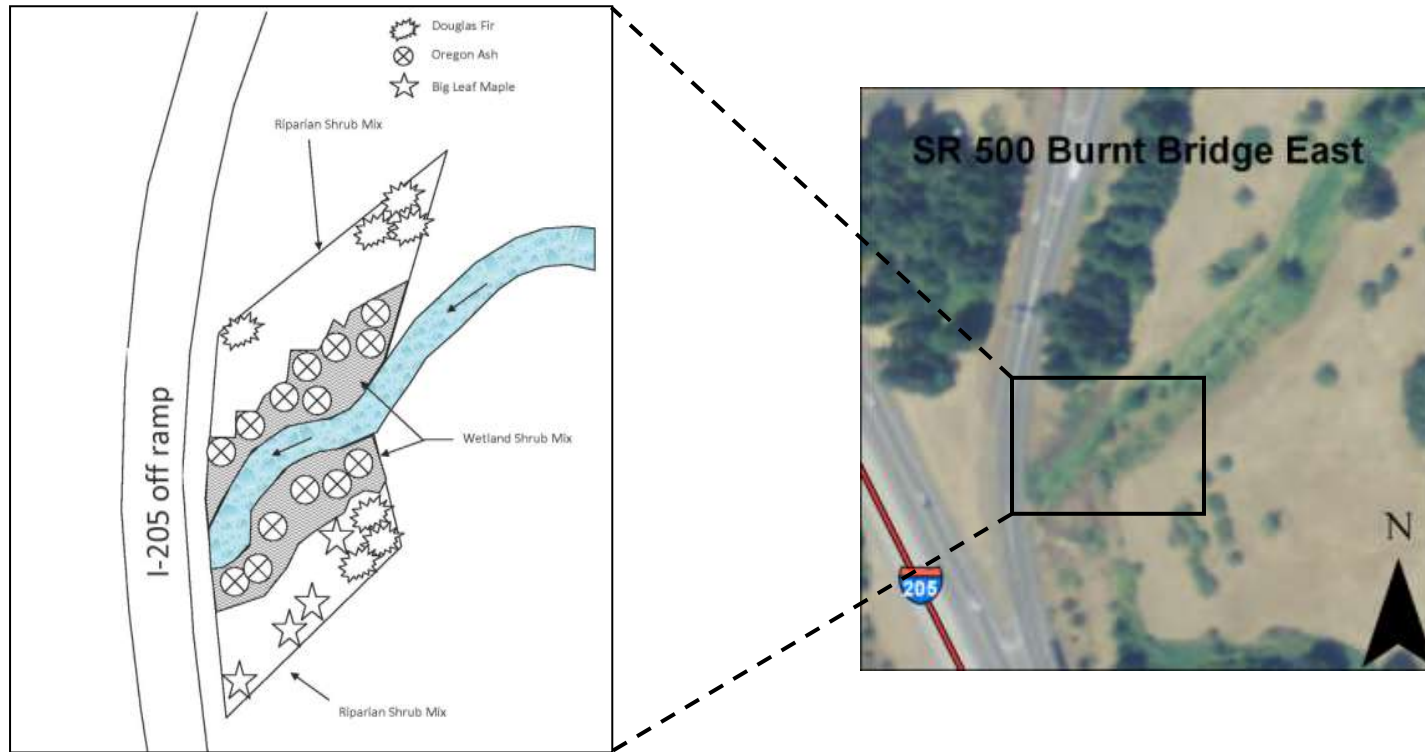


Figure 1 Site Sketch

The SR 500 Burnt Bridge East Mitigation Site contains two enhanced wetland benches and two riparian enhancement areas. Emergent and scrub-shrub areas flank the channel of Burnt Bridge Creek.

What are the performance standards for this site?

Performance Standard 1

At monitoring year 1, there will be a minimum survival rate of 90% in area identified on the Planting Plan.

Performance Standard 2

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

Performance Standard 3

The aerial extent of Reed Canarygrass in the mitigation site will be managed at a threshold 10% below the existing baseline conditions established in Performance Standard 6A.

Performance Standard 4

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

Appendix 1 provides the complete text of the performance standards for this project, and Appendix 2 shows the planting plan (Corlett and Kohl 2007).

How were the performance standards evaluated?

To evaluate standards for vegetative cover, a baseline was established parallel to the northern border of the site (Figure 2). Twenty one-meter sampling transects were randomly placed perpendicular to the baseline. The unequal-area belt transect method was used to determine survival (Performance Standard 1). Invasive cover was qualitatively assessed (Performance Standards 2, 3, and 4). Photographs were taken to evaluate tree and shrub growth in the scrub-shrub wetland.

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

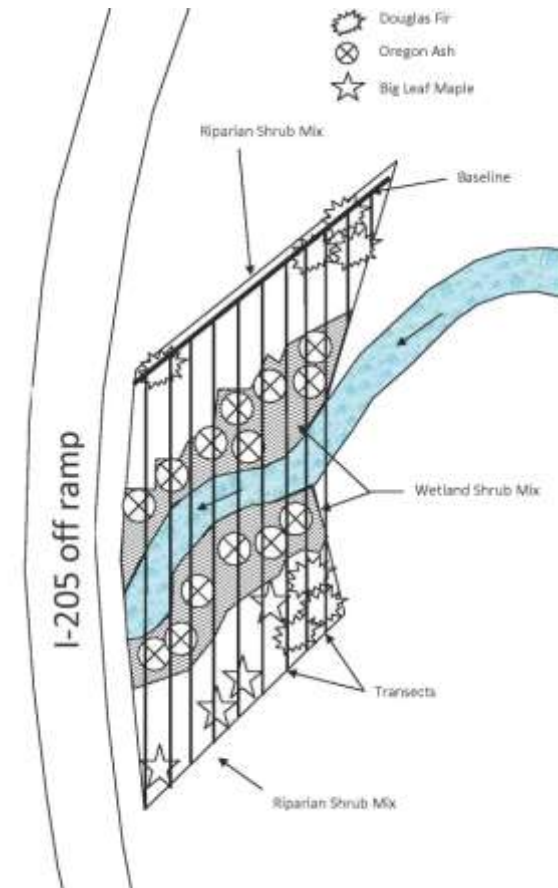


Figure 2 Site Sampling Design (2010)

How is the site developing?

The site is developing as planned. The survival rate of planted woody species in the wetland is very high. Weed control efforts have largely kept the invasive species population from inhibiting plant establishment throughout the site.

Wildlife habitat, biological support, improved floodplain function, and nutrient and sediment removal are functions intended for this site. Plant establishment activities have likely enhanced the performance of these functions.

Results for Performance Standard 1
(90% survival of planted woody species):

Survival across the site is 93 percent. This meets the performance standard for Year-1. The plantings in the portion of the site north of Burnt Bridge Creek appear to be faring better than those in the south. The majority of the mortality occurred within the riparian plantings in the southern half of the site. The plantings in this area appear stressed (Photo 1).

Results for Performance Standard 2
(Blackberry Species and Class A noxious weeds will not exceed 15%):

The aerial extent of blackberry species and Class A noxious weeds is qualitatively estimated at three percent. This is comprised solely of Himalayan blackberry (*Rubus armeniacus*). Bull thistle (*Cirsium vulgare*) is also present on site; however it was not included in the cover estimate.

Results for Performance Standard 3
(Reed Canarygrass will be managed at a threshold 10% below baseline conditions):

Baseline condition measurements were estimated at nearly 100 percent coverage. The current aerial cover is qualitatively estimated at 12 percent. This meets the performance standard. The cover is concentrated along Burnt Bridge Creek. Management of reedcanary grass is evident on site (Photo 2).



Photo 1
Woody cover in the riparian planting area (August 2010)



Photo 2
Reed canarygrass control (August 2010)

Results for Performance Standard 4

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

Japanese knotweed (*Polygonum cuspidatum*) was not observed on site.

What is planned for this site?

Weed control will continue throughout 2011 and focused on Reed Canarygrass and Blackberry species. A pre-emergent application is planned early in the 2011 growing season to reduce spring and summer annual weed growth.

Targeted replanting will occur during the 2011 dormant planting season as needed.

Appendix 1 – Goals and Performance Standards

The following excerpt is from the *SR SR-500/I-205 Interchange Improvements Project Wetland Mitigation Plan* (Corlett and Kohl 2007). The performance criteria addressed this year are identified in **bold** font.

GOALS AND OBJECTIVES

Goals

The goal of the proposed compensatory mitigation is to replace and enhance wetland functions which will be lost due to wetland impacts associated with the proposed project, as well as target wetland and watershed functions identified as limiting factors in the Burnt Bridge Creek watershed. The enhanced wetland/riparian areas are anticipated to provide the following functions:

- Provide opportunities for nutrient and sediment removal
- Provide general forested wetland/riparian habitat
- Provide improved floodplain function

Functions and Values

The following is an itemized list of functions and values that will likely be provided by the proposed mitigation site:

Nutrient and Sediment Removal

Upstream urbanization throughout the watershed will likely increase nutrient and sediment loads in the creek. The existing floodplain benches on the site provide the ability to slow floodwaters and naturally trap suspended sediments from seasonal high flows passing through the site.

Wildlife Habitat/ Riparian Function

Dense plantings within the mitigation site will increase overall habitat for numerous upland and wetland wildlife species and will provide improved corridor continuity within a larger riparian network. The interspersions of wetland and upland habitats and improved stream-floodplain connectivity will create areas for nesting and foraging, cover, movement, food chain support, and connectivity to the larger Burnt Bridge Creek watershed. The site will also provide increased floodplain roughness, large woody debris, and stream shading opportunities,

Conceptual Objectives, Performance Measures, and Success Standards

The following list of objectives describes the proposed mitigation at the Burnt Bridge Creek (Kevanna Reach) Mitigation Site:

1. Enhance 0.25 acres of wetland/riparian habitat of various Cowardin vegetation classes within the mitigation site.
2. Enhance wetland/riparian function by creating/rehabilitating a mosaic of emergent, scrub shrub, and forested wetland and riparian habitats suitable for floodplain areas by promoting the development of dense native plant communities.
3. Promote the development of native wetland and upland plant communities by limiting the growth and spread of noxious and nuisance vegetation, including Reed Canarygrass.

The performance standards below provide the benchmarks for measuring the successful ecological development of the wetland mitigation site. Monitoring of mitigation success standards begins immediately following initial planting with the collection of baseline data and initial (year 1) survival standards.

Objective 1: Enhance 0.25 acres of wetland/riparian habitat of various Cowardin vegetation classes within the mitigation site.

Performance Standards	Monitoring Methods
1A. Interim Performance Measure Wetlands and riparian areas will be delineated at monitoring year 5 to assess the development of estimated conditions noted in Table 2.	Conduct wetland delineation using current USACE methodology, the Washington State Wetland Delineation Manual (WDOE, 1997), and applicable supplements at year 5.
1B. Success Standard (final year of monitoring) At monitoring year 10, the mitigation area will be delineated to demonstrate that the mitigation site contains 0.25 acres of total wetland/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.	Conduct wetland delineation using current methods at year 10 to provide documentation of wetland acreage and make visual observations of Cowardin vegetation classes.

Contingency: If surveyed wetland acreages or visual estimates of Cowardin vegetation classes fall significantly short of the estimated acreages of Table 2 at year 10, WSDOT will consult the various resource agencies for the development of appropriate adaptive management or remedial procedures.

Objective 2: Enhance wetland/riparian function by creating/rehabilitating a mosaic of emergent, scrub shrub, and forested wetland and riparian habitats suitable for floodplain areas by promoting the development of dense native plant communities.

Performance Standards	Monitoring Methods
<p>2A Success Standard The mitigation site will be planted in accordance with the final wetland planting plan,</p>	As-built plans documenting that the mitigation site has been planted according to the planting plan will be submitted within year 1.
<p>2B Success Standard At monitoring year 1, there will be a minimum survival rate of 90% in area identified on the Planting Plan.</p>	Conduct major plant assessment of contract-installed vegetation (plant counts based on as-built plans).
<p>2C Success Standard At monitoring year 3, 5, and 7, there will be a minimum density of native trees and/or shrubs in Forested, Scrub Shrub, and Buffer areas as follows: <u>Forested Areas:</u></p> <ul style="list-style-type: none"> • minimum density of 400 living native trees per acre • minimum density of 4,000 living native shrubs per acre • at least 2 species of native trees and 4 species of native shrubs will be present in the forested area. No single species will provide more 60% total aerial cover. <p><u>Scrub Shrub Areas:</u></p> <ul style="list-style-type: none"> • minimum density of 4,000 living native shrubs per acre • at least 4 species of native shrubs will be present in the Scrub Shrub area. No single species will provide more 60% total aerial cover. 	Use current monitoring protocols (see Monitoring Plan) to determine density (number of living trees per acre) and species diversity in scrub shrub, forested, and buffer areas.
<p>2D. Success Standard At monitoring year 3, 5, and 7, there will be a minimum percent cover of native emergent vegetation in emergent areas as follows:</p> <ul style="list-style-type: none"> • Year 3 - minimum of 50% aerial cover of native facultative wet and wetter species within the emergent zone. • Year 5 - minimum of 60% aerial cover of native facultative wet and wetter species within the emergent zone. • Year 7 - minimum of 65% aerial cover 	Use current monitoring protocols (see Monitoring Plan) to determine percent cover of native emergent vegetation in the emergent areas.

<p>of native facultative wet and wetter species within the emergent zone.</p> <ul style="list-style-type: none"> • At least 5 species of native herbaceous facultative wet and wetter species will be present in the emergent area. No single species will provide more 70% total aerial cover. 	
<p>2E. Success Standard (<i>final year monitoring</i>)</p> <p>At monitoring year 10, there will be a minimum density of native trees and/or shrubs in Forested, Scrub Shrub, and Buffer areas as follows:</p> <p><u>Forested Areas:</u></p> <ul style="list-style-type: none"> • minimum density of 300 living native trees per acre • minimum density of 3,000 living native shrubs per acre • At least 2 species of native trees and 4 species of native shrubs will be present in the forested area. No single species will provide more 60% total aerial cover. <p><u>Scrub Shrub Areas:</u></p> <ul style="list-style-type: none"> • minimum density of 3,000 living native shrubs per acre • At least 4 species of native shrubs will be present in the Scrub Shrub area. No single species will provide more 60% total aerial cover. 	<p>Use current monitoring protocols (see Monitoring Plan) to determine density (number of living trees per acre) and species diversity in scrub shrub, forested, and buffer areas.</p>
<p>2F. Success Standard</p> <p>At monitoring year 10, there will be a minimum percent cover of native emergent vegetation in emergent areas as follows:</p> <ul style="list-style-type: none"> • minimum of 75% aerial cover of native facultative wet and wetter species within the emergent zone. • At least 5 species of native herbaceous facultative wet and wetter species will be present in the emergent area. No single species will provide more 70% total aerial cover. 	<p>Use current monitoring protocols (see Monitoring Plan) to determine percent cover of native emergent vegetation in the emergent areas.</p>

Contingency: If the monitoring reports indicate insufficient establishment and/or plant survival, those areas not meeting current-year standard(s) will be replanted to bring them in compliance with the failing current-year standard(s).

Objective 3: Promote the development of native wetland/riparian and upland plant communities by limiting the growth and spread of noxious and nuisance vegetation, including Reed Canarygrass.

Performance Standards	Monitoring Methods
<p>6A. Performance Standard Conduct a pre-construction survey of the existing extent of invasive vegetation including Reed Canarygrass, Blackberry Species, and Japanese Knotweed, to establish a baseline for invasive species monitoring and management at years 1, 3, 5, 7, and 10.</p>	<p>Provide photographic and map (GPS or notations on plan sheets) documentation of existing stands of Reed Canarygrass, Blackberry species, and Japanese Knotweed.</p>
<p>6B. Performance Standard At monitoring years 1, 3, 5, 7, and 10, Invasive Species will be managed as follows:</p> <p>The aerial extent of Blackberry Species and Class A noxious weeds will not exceed 15% in the <u>combined</u> emergent, scrub shrub, forest, and buffer planting areas of the mitigation site.</p> <p>The aerial extent of Reed Canarygrass in the mitigation site will be managed at a threshold 10% below the existing baseline conditions established in Performance Standard 6A. In monitoring years 7 and 10 (final year of monitoring), 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> <p>Japanese Knotweed shall not be present in any amount within the mitigation site.</p>	<p>Observe and map (notations on plan sheets) locations of Reed Canarygrass, Blackberry Species, and Japanese Knotweed as part of annual vegetation surveys using current monitoring techniques. For larger stands, GPS measurements of stand perimeters will be provided to measure the extent of change over time. Observations will form the basis of on-going site management and integrated vegetation management activities.</p>

Contingency: Implement a long-term integrated vegetation management plan to maintain the aerial extent of invasive species at or below the established thresholds. Weed management activities may be conducted in all monitoring years.

Japanese Knotweed discovered during monitoring or routine site visits and maintenance, it shall be immediately removed and chemically treated for elimination.

Monitoring Plan

The monitoring objective for the mitigation areas is to achieve the prescribed standards unless WSDOT, in consultation with the regulatory agencies, establish replacement standards based on circumstances and conditions observed at the mitigation site.

A monitoring plan will be developed that addresses the success standards listed in this plan. The site will be monitored in years 1, 3, 5, 7, and 10 by the WSDOT Wetland Mitigation Monitoring Program to evaluate compliance with performance standards, formal monitoring. In formal monitoring years, years 1, 3, 5, 7, and 10, reports of the formal monitoring will be prepared and submitted both to the Corps of Engineers and Ecology. Additional monitoring will occur in intervening non-report years in order to inform and guide site development activities, informal monitoring. Successful mitigation will be measured by attainment of the performance standards described in the mitigation plan.

The Wetland Mitigation Monitoring Program uses objective-based monitoring to document the condition of WSDOT's wetland mitigation sites. Monitoring protocols are selected based on objectives specified in the mitigation plan, and evaluation of current site conditions. Quantitative data collection techniques presently in use are based on standard ecological and biostatistical methods described in Bonham (1989), Elzinga et al. (1998), Krebs (1999), Zar (1999), and other sources. The Wetland Program's current monitoring methods include the key concepts of objective-based monitoring, adaptive management, and statistical rigor. Quantitative monitoring methods employed involve sample size analyses and may include the point-line, point-frame, quadrat, and line-intercept methods as defined by the works cited above.

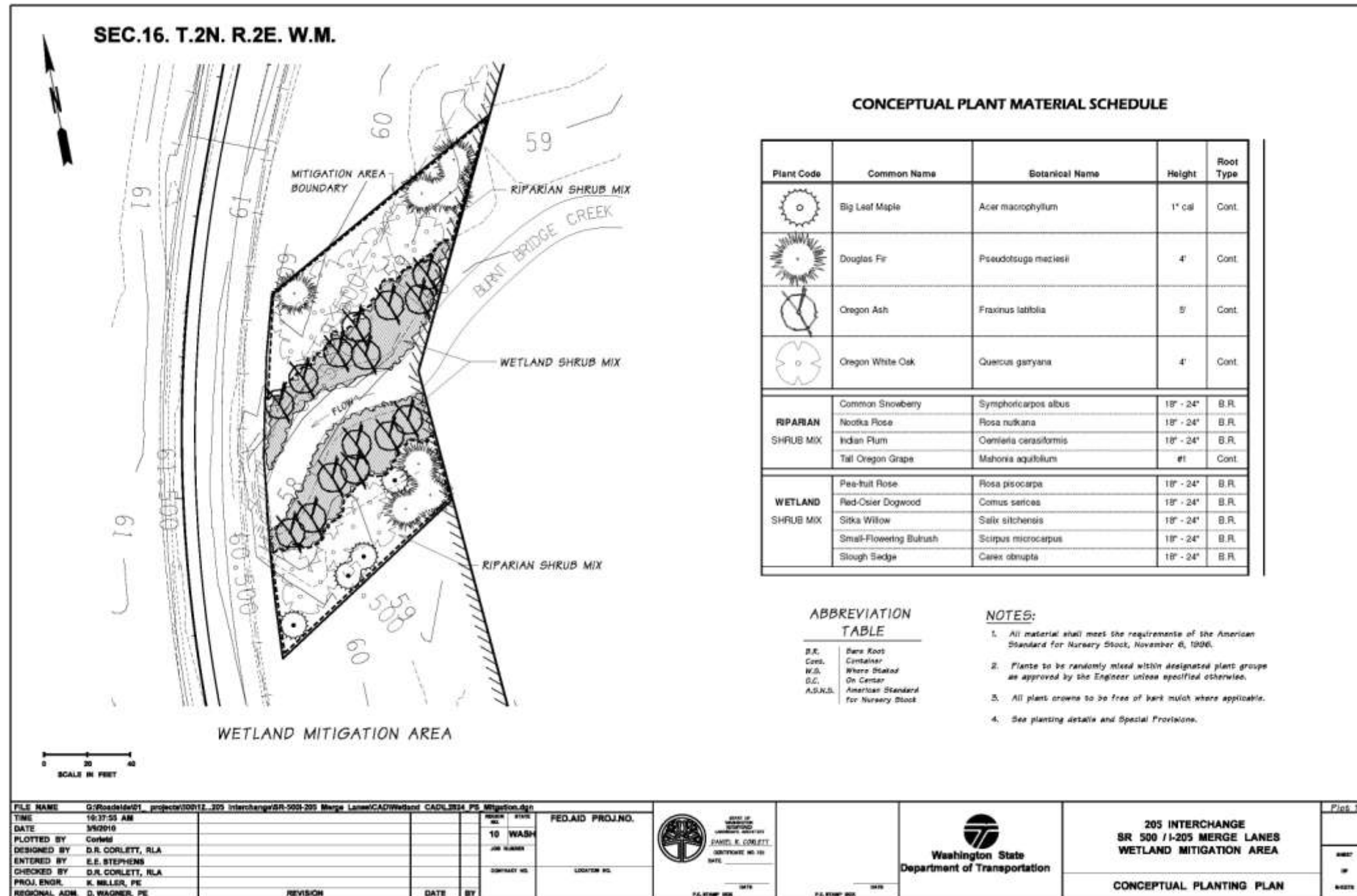
Formal and informal monitoring of the mitigation site will occur over the 10-year monitoring period. Table 4 lists the monitoring schedule for the mitigation site. Successful mitigation will be measured by attainment of the performance standards described in this mitigation plan document. Monitoring and establishment/contingency activities will cease as soon as all success standards have been attained.

Table 5. Monitoring Schedule.

<i>Monitoring Year</i>	<i>Type of Monitoring</i>	
	<i>Formal</i>	<i>Informal</i>
1	Yes	quarterly site visits
2	No	quarterly site visits
3	Yes	quarterly site visits
4	No	quarterly site visits
5	Yes	quarterly site visits
7	Yes	quarterly site visits
10	Yes	quarterly site visits

Appendix 2 – Planting Plan

(from Corlett and Kohl 2007)



Appendix 3 – Photo Points

The photographs below were taken from permanent photo-points on August 25th, 2010 and document current site development.



Photo Point 1



Photo Point 2



Photo Point 3

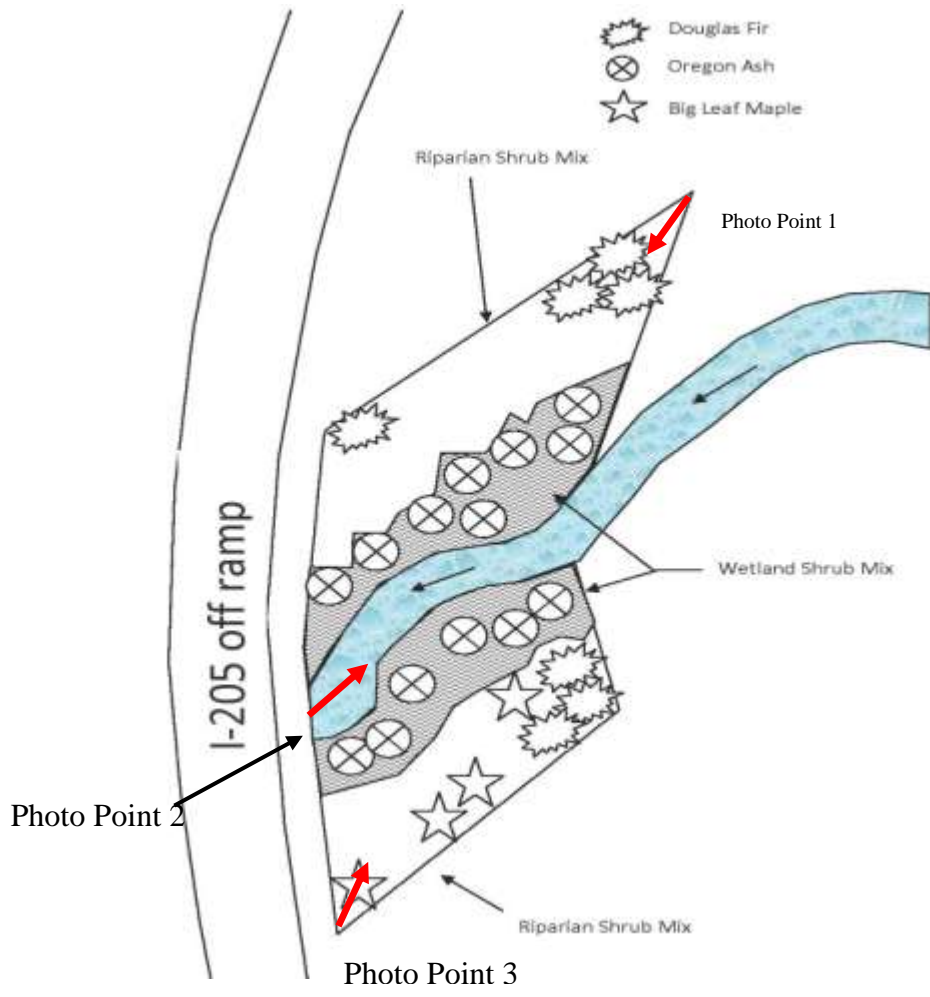


Photo Point Map

Literature Cited

1. Corlett, Dan and Tom Kohl. 2007. SR-500/I-205 Interchange Improvements Project Mitigation Plan.
2. Corlett, Dan. 2010. 205 Interchange SR 500/I205 Merge Lanes Wetland Mitigation Area. Conceptual Planting Plan.
3. United States Army Corps of Engineers. 2007. Department of the Army Permit Number NWS-2007-806-SOD.
4. Washington State Department of Transportation (WSDOT) WSDOT Wetland Mitigation Site Monitoring Methods (12 June 2008). <http://www.wsdot.wa.gov/NR/rdonlyres/C211AB59-D5A2-4AA2-8A76-3D9A77E01203/0/MethodsWhitePaper052004.pdf>