

SR 167 Stage 3 Wetland Mitigation Site
C 7080

USACE 200401241

Northwest Region

2010 MONITORING REPORT

Wetland Assessment and Monitoring Program

Issued March 2011



Washington State
Department of Transportation

Environmental Services Office

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SR 167 Stage 3 Wetland Mitigation Site

USACE 200401241

	General Site Information			
	USACE Permit Number	200401241		
	Mitigation Location	West side of SR 167 just south of 15 th Street NW		
	LLID	1222496473189		
	Construction Date	2007		
	Monitoring Period	2008-2017		
	Year of Monitoring	3 of 10		
	Area of Project Impact	2.55 acres		
	Type of Mitigation	Wetland Restoration	Wetland Enhancement	Buffer Enhancement
	Area of Mitigation	2.58 acres	2.17 acres	0.74 acre

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Summary of Monitoring Results and Management Activities (2010)

Performance Standards	2010 Results	Management Activities
Wetland hydrology present	Not present in all intended areas.	
Four plants per 100 square feet in the scrub-shrub and forested wetland	Visually estimated at 5 plants/100ft ²	Supplemental Planting on 12/1 of Sitka spruce, Western red cedar and Oregon ash, 25 of each..
King County listed Class A weeds and reed canarygrass (<i>Phalaris arundinacea</i>), non-native blackberries (<i>Rubus</i> spp.), Scot's broom (<i>Cytisus scoparius</i>), Japanese knotweed (<i>Polygonum</i> spp.), and purple loosestrife (<i>Lythrum salicaria</i>) will not exceed 20 percent coverage in each forested and scrub-shrub wetland	Visually estimated at < 1%	Weed Control occurred in August and Sept. of 2010.
Four plants per 100 square feet in the buffer	Visually estimated at 7 plants/100ft ²	
King County listed Class A weeds and reed canarygrass (<i>Phyalaris arundinacea</i>), non-native blackberries (<i>Rubus</i> spp.), Scot's broom (<i>Cytisus scoparius</i>), Japanese knotweed (<i>Polygonum</i> spp.), and purple loosestrife (<i>Lythrum salicaria</i>) will not exceed 10 percent coverage in the buffer	Visually estimated at 2%	Manual and herbicide weed control occurred in August and Sept. of 2010.
Habitat structures are shown on the plans are in place	Present	

Report Introduction

This report summarizes third-year (Year-3) monitoring activities at the State Route (SR) 167 Stage 3 Mitigation Site. Included are a site description, the performance standards, an explanation of monitoring methods, and an evaluation of site performance. Monitoring activities included vegetation surveys, photo-documentation, and assessments of wetland hydrology. Vegetation surveys occurred on August 16th –18th and the 24th, 2010. Hydrology visits occurred on February 22nd and March 10th and 22nd, 2010.

What is the SR 167 Stage 3 Mitigation Site?

This 5.49-acre mitigation site (Figure 1) is a portion of an existing wetland located east of SR 167 and just to the south of 15th St. NW. This site was established to compensate for the loss of 2.55 acres of wetlands due to road improvements along SR 167 between 15th Avenue SW and 15th Avenue NW. Mitigation efforts on this site included removing structures and fill, grading, removing invasive vegetation, and planting native vegetation. The restored and enhanced wetlands are intended to provide flood storage capabilities, wildlife habitat, water quality functions, and organic matter production.

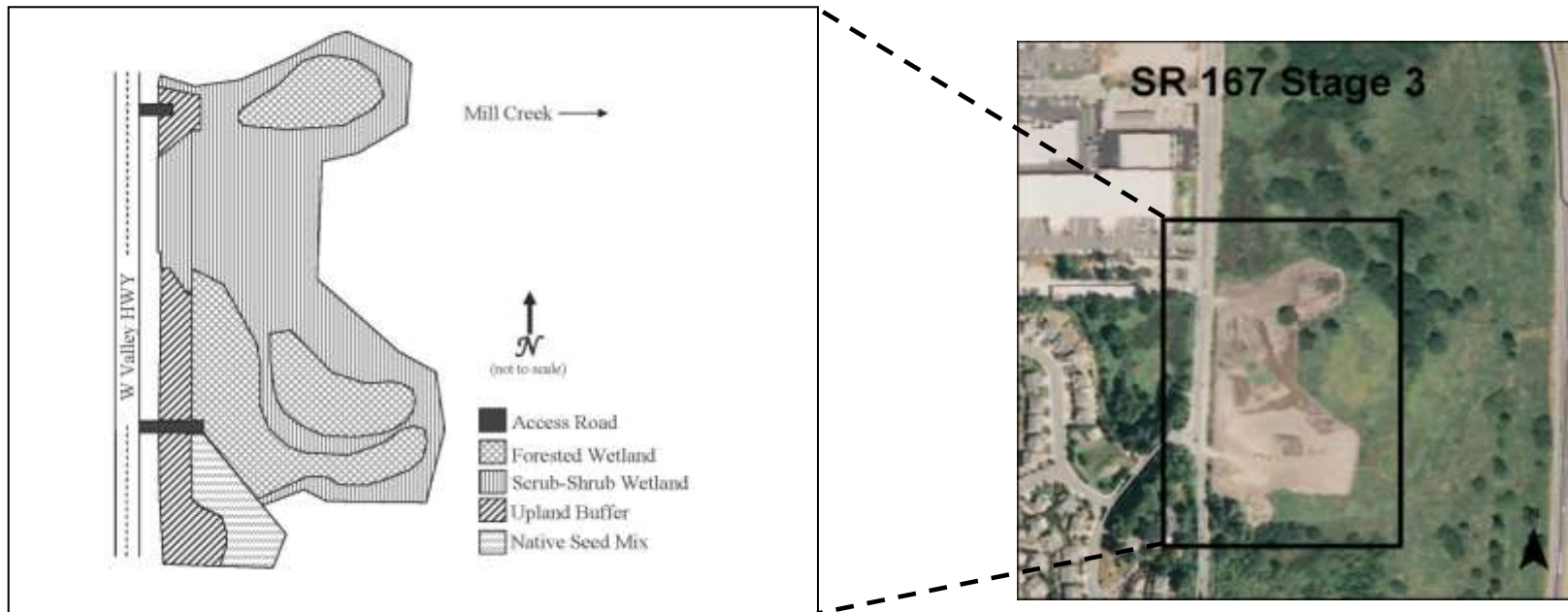


Figure 1 Site Sketch

The SR 167 Stage 3 Mitigation Site contains forested and scrub-shrub vegetation communities adjacent to existing wetlands in the Mill Creek floodplain.

What are the performance standards for this site?

Performance Standard 1

The soils will be saturated to the surface, or standing water will be present in a monitoring well at 12 inches below the surface or less, for a consecutive number of days greater than or equal to 12.5% of the growing season.

Performance Standard 2

The native woody species will maintain a minimum density of four plants per 100 square feet in scrub-shrub and forested wetland communities.

Performance Standard 3

King County listed Class A weeds and reed canarygrass (*Phalaris arundinacea*), non-native blackberries (*Rubus* spp.), Scot's broom (*Cytisus scoparius*), Japanese knotweed (*Polygonum* spp.), and purple loosestrife (*Lythrum salicaria*) will not exceed 20 percent coverage in each forested and scrub-shrub wetland community.

Performance Standard 4

The native woody species will maintain a minimum density of four plants per 100 square feet in buffer communities.

Performance Standard 5

King County listed Class A weeds and reed canarygrass (*Phyalaris arundinacea*), non-native blackberries (*Rubus* spp.), Scot's broom (*Cytisus scoparius*), Japanese knotweed (*Polygonum* spp.), and purple loosestrife (*Lythrum salicaria*) will not exceed 10 percent coverage in the upland buffer community.

Performance Standard 6

Habitat structures are shown on the plans are in place.

Appendix 1 provides the complete text of the performance measures for this project, and Appendix 5 shows the planting plan (WSDOT 2006).

How were the performance standards evaluated?

To evaluate vegetative standards, visual estimates of density were conducted for the buffer and the forested and scrub/shrub communities (Performance Standards 2 and 4). Invasive cover was visually estimated for the buffer and the forested and scrub/shrub communities (Performance Standards 3 and 5).

WSDOT staff collected hydrology data using methods described in the *Washington State Wetlands Identification and Delineation Manual* (Ecology 1997) (Performance Standard 1). To determine extent of inundation and surface saturation visual observations were made. In areas where surface saturation or inundation was not apparent, two temporary pits were necessary during each of three visits. Water depth was also measured by six piezometers. Depth of standing water was recorded. Locations of saturation, inundation, and pits were recorded on a map (Appendix 3).

Habitat structures were counted to ensure all logs and root wads were present according to plan (Performance Standard 6).

For additional details on the methods, see Appendix 2 of this report or view the [WSDOT Wetland Mitigation Site Monitoring Methods Paper](#) (WSDOT 2008).

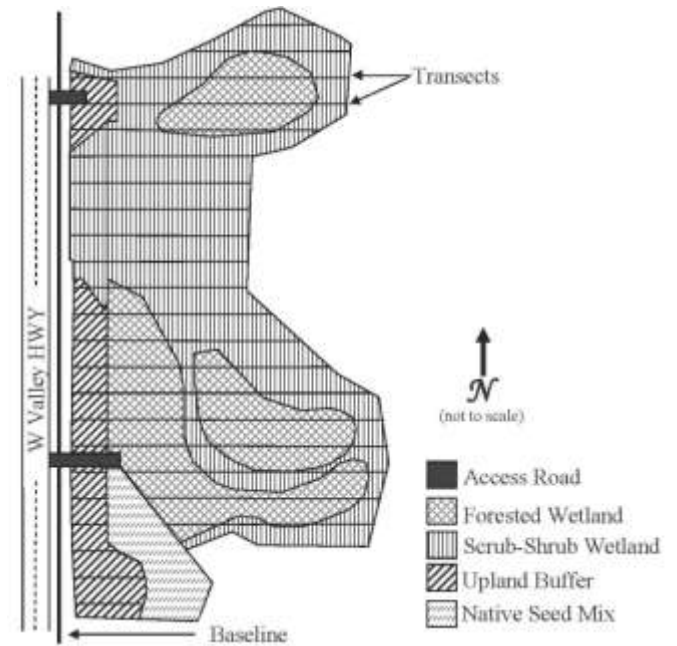


Figure 2 Site Sampling Design for Final Year Standards 2014 (2010)

How is the site developing?

This site is developing quite well and is currently achieving all Year-3 vegetative standards and final year vegetative performance standards (Year-10) (See Appendix 4). This site has high cover of woody species and few invasive species in both the wetland and upland areas. Due to the rapid development of vegetation, sampling for woody cover was conducted to address final-year (2017) performance standards and assess the potential for early closeout.

The site was intended to provide wildlife habitat, and it appears that this function is being supported. Seventeen species of birds, five which are wetland dependent and three of which are wetland associated, have been observed during the 3-year monitoring period. A pair of Red-tailed Hawks (*Buteo jamaicensis*) has been observed utilizing the raptor perch on site and a predated American Robin (*Turdus migratorius*) nest with deceased young was found on the ground. Coyote scat and mole hills have also been found on site. Black cottonwood (*Populus balsamifera*), willows (*Salix* sp), red alder (*Alnus rubra*), and redosier dogwood (*Cornus sericea*) are dominant species in the wetland, providing cover and foraging opportunities for wildlife.

Ground water discharge, flood attenuation, sediment and toxicant retention, and nutrient removal and transformation were other functions intended for this site. Variations in topography due to grading as well as plant establishment activities have likely enhanced the performance of these functions.

Results for Performance Standard 1
(Wetland hydrology present):

Wetland hydrology was not present in all the intended areas (Appendix 3) (Photo 1). A wetland delineation is planned for spring 2011 to determine if adequate hydrology exists on site.

Results for Performance Standard 2
(Native woody density in scrub/shrub and forested wetland will have a minimum density of four plants per 100 square feet):

Density of native woody species was visually estimated at five plants per 100 square feet in the scrub-shrub and forested wetland communities. Dominant species include Sitka willow (*Salix sitchensis*), redosier dogwood (*Cornus sericea*), and Pacific willow (*Salix lucida* ssp. *Lasiandra*).



Photo 1
Wetland hydrology (March 2010)

Results for Performance Standard 3

(King County listed Class A weeds will not exceed 20 percent coverage in each forested and scrub-shrub wetland community):

Cover of the applicable invasive species was visually estimated to be less than one percent in the forested and scrub-shrub wetland communities. The invasive species observed on site (any wetland zone and including class B and C weeds not listed in the standard) were reed canarygrass (*Phalaris arundinacea*), purple loosestrife (*Lythrum salicaria*), Himalayan blackberry (*Rubus armeniacus*), cutleaf blackberry (*Rubus laciniatus*), Scotch broom (*Cytisus scoparius*), poison hemlock (*Conium maculatum*), bull thistle (*Cirsium vulgare*), Canada thistle (*Cirsium arvense*), and spotted knapweed (*Centaurea stoebe*).

Results for Performance Standard 4

(Native woody density in the buffer will have a minimum density of four plants per 100 square feet):

Density of native woody species was visually estimated at seven plants per 100 square feet in the buffer. Dominate species include thimbleberry (*Rubus parviflorus*), red elderberry (*Sambucus racemosa*), and Douglas-fir (*Pseudotsuga menziesii*) (Photo 2).

What is planned for this site?

Ongoing weed control is planned through the 2011 growing season.

Results for Performance Standard 5

(King County listed Class A weeds will not exceed 20 percent coverage in each forested and scrub-shrub wetland community):

Cover of the applicable invasive species was visually estimated to be two percent in the buffer.

Results for Performance Standard 6

(Habitat structures are shown on the plans are in place):

All habitat structures were observed in place as shown on the plans.



**Photo 2
Woody cover in the buffer (August 2010)**

Appendix 1 – Goals and Performance Standards

The following excerpt is from the *SR 167 15th St. SW to S 180th St. Stage 3 Final Wetland Mitigation Report* (WSDOT 2005). The performance criteria addressed this year are identified in **bold** font.

Objective – Hydrology

The mitigation site will possess ground and/or surface water inundation or saturation sufficient to support the wetland sites.

Interim Performance Measure

Years 1-10

- **The soils will be saturated to the surface, or standing water will be present in a monitoring well at 12 inches below the surface or less, for a consecutive number of days greater than or equal to 12.5% of the growing season. Wetland hydrology will be determined using indicators of wetland hydrology, as listed in the *Washington State Wetlands Identification and Delineation Manual* (Ecology publication #96-94).**

Year 5

- The wetland areas will be delineated using current methodology to assure that the mitigation site contain 2.58 acres of restored wetland in total.

Success Standards

Year 10

- The wetland areas will be delineated using current methodology to assure that the mitigation site contain 2.58 acres of restored wetland in total.

Objective 2 – Wetland Mitigation

The mitigation sites will include a total of approximately 0.74 acre of scrub-shrub and 1.84 acres of forested restored wetland vegetation, and 2.17 acres of enhanced wetland vegetation.

Interim Performance Measure

Year 1

- The vegetation will achieve 100 percent survival of planted woody species at the end of the first year plant establishment period. If all dead woody species plantings are replaced, the performance measure will be met.
- King County listed Class A weeds and reed canarygrass (*Phalaris arundinacea*), non-native blackberries (*Rubus* spp.), Scot's broom (*Cytisus scoparius*), Japanese knotweed (*Polygonum spp.*), and purple loosestrife (*Lythrum salicaria*) will not exceed 20 percent coverage in each forested and scrub-shrub wetland community. If coverage by native plant species falls below 80 percent of the success standard, then contingency actions shall be implemented and the invasive species list shall be evaluated to determine if additional invasive species should be controlled.

Year 3

- **The native woody species will maintain a minimum density of four plants per 100 square feet in scrub-shrub and forested wetland communities.**
- **King County listed Class A weeds and reed canarygrass (*Phalaris arundinacea*), non-native blackberries (*Rubus* spp.), Scot's broom (*Cytisus scoparius*), Japanese knotweed (*Polygonum spp.*), and purple loosestrife (*Lythrum salicaria*) will not exceed 20 percent coverage in each forested and scrub-shrub wetland community. If coverage by native plant species falls below 80 percent of the success standard, then contingency actions shall be implemented and the invasive species list shall be evaluated to determine if additional invasive species should be controlled.**

Year 5

- Native facultative or wetter woody species will achieve a minimum of 35 percent coverage in each PSS and PFO community. Native colonizing vegetation will be included in this coverage calculation.
- King County listed Class A weeds and reed canarygrass (*Phalaris arundinacea*), non-native blackberries (*Rubus* spp.), Scot's broom (*Cytisus scoparius*), Japanese knotweed (*Polygonum spp.*), and purple loosestrife (*Lythrum salicaria*) will not exceed 20 percent coverage in each forested and scrub-shrub wetland community. If coverage by native plant species falls below 80 percent of the success standard, then contingency actions shall be implemented and the invasive species list shall be evaluated to determine if additional invasive species should be controlled.
- Three native facultative or wetter vegetation species each will achieve at least five percent or greater relative cover in the PSS community.
- Three native facultative or wetter vegetation species each will achieve at least five percent or greater relative cover in the PFO community.

- Relative cover of red alder will be less than 30 percent in the wetland restoration and enhancement areas.

Year 7

- Native facultative or wetter woody species will achieve a minimum of 50 percent coverage in each PSS and PFO community. Native colonizing vegetation will be included in this coverage calculation.
- King County listed Class A weeds and reed canarygrass (*Phytolacca arundinacea*), non-native blackberries (*Rubus* spp.), Scot's broom (*Cytisus scoparius*), Japanese knotweed (*Polygonum spp.*), and purple loosestrife (*Lythrum salicaria*) will not exceed 20 percent coverage in each forested and scrub-shrub wetland community. If coverage by native plant species falls below 80 percent of the success standard, then contingency actions shall be implemented and the invasive species list shall be evaluated to determine if additional invasive species should be controlled.
- Three native facultative or wetter vegetation species each will achieve at least six percent or greater relative cover in the PSS community.
- Three native facultative or wetter vegetation species each will achieve at least six percent or greater relative cover in the PFO community.
- Relative cover of red alder will be less than 30 percent in the wetland restoration and enhancement areas.

Success Standards

Year 10

- Native facultative or wetter woody species will achieve a minimum of 75 percent coverage in each PSS and PFO community. Native colonizing vegetation will be included in this coverage calculation.
- King County listed Class A weeds and reed canarygrass (*Phytolacca arundinacea*), non-native blackberries (*Rubus* spp.), Scot's broom (*Cytisus scoparius*), Japanese knotweed (*Polygonum spp.*), and purple loosestrife (*Lythrum salicaria*) will not exceed 20 percent coverage in each forested and scrub-shrub wetland community. If coverage by native plant species falls below 80 percent of the success standard, then contingency actions shall be implemented and the invasive species list shall be evaluated to determine if additional invasive species should be controlled.
- Three native facultative or wetter vegetation species each will achieve at least eight percent or greater relative cover in the PSS community.
- Three native facultative or wetter vegetation species each will achieve at least eight percent or greater relative cover in the PFO community.

- Relative cover of red alder will be less than 30 percent in the wetland restoration and enhancement areas.

Objective 3 – Buffer Vegetation

The mitigation sites will include a total of approximately 0.74 acre of upland buffer vegetation.

Interim Performance Measure

Year 1

- The vegetation will achieve 100 percent survival of planted woody species at the end of the first year plant establishment period. If all dead woody species plantings are replaced, the performance measure will be met.
- King County listed Class A weeds and reed canarygrass (*Phalaris arundinacea*), non-native blackberries (*Rubus* spp.), Scot's broom (*Cytisus scoparius*), Japanese knotweed (*Polygonum spp.*), and purple loosestrife (*Lythrum salicaria*) will not exceed 20 percent coverage in each upland buffer community. If coverage by native plant species falls below 80 percent of the success standard, then contingency actions shall be implemented and the invasive species list shall be evaluated to determine if additional invasive species should be controlled.

Year 3

- **The native woody species will maintain a minimum density of four plant per 100 square feet in buffer communities.**
- **King County listed Class A weeds and reed canarygrass (*Phalaris arundinacea*), non-native blackberries (*Rubus* spp.), Scot's broom (*Cytisus scoparius*), Japanese knotweed (*Polygonum spp.*), and purple loosestrife (*Lythrum salicaria*) will not exceed 10 percent coverage in the upland buffer community.**

Year 5

- Native upland buffer woody species will achieve a minimum of 30 percent coverage in each upland buffer community. Native colonizing vegetation will be included in this coverage calculation.
- King County listed Class A weeds and reed canarygrass (*Phalaris arundinacea*), non-native blackberries (*Rubus* spp.), Scot's broom (*Cytisus scoparius*), Japanese knotweed (*Polygonum spp.*), and purple loosestrife (*Lythrum salicaria*) will not exceed 20 percent coverage in each upland buffer community. If coverage by native plant species falls below 80 percent of the success standard, then contingency actions shall be implemented and the invasive species list shall be evaluated to determine if additional invasive species should be controlled.
- Relative cover of red alder will be less than 30 percent in the upland buffer community.
- Three native upland vegetation species each will achieve at least 5 percent relative cover in the buffer community.

Year 7

- Native upland buffer woody species will achieve a minimum of 40 percent coverage in each upland buffer community. Native colonizing vegetation will be included in this coverage calculation.
- King County listed Class A weeds and reed canarygrass (*Phalaris arundinacea*), non-native blackberries (*Rubus* spp.), Scot's broom (*Cytisus scoparius*), Japanese knotweed (*Polygonum spp.*), and purple loosestrife (*Lythrum salicaria*) will not exceed 20 percent coverage in each upland buffer community. If coverage by native plant species falls below 80 percent of the success standard, then contingency actions shall be implemented and the invasive species list shall be evaluated to determine if additional invasive species should be controlled.
- Relative cover of red alder will be less than 30 percent in the upland buffer community.
- Three native upland vegetation species each will achieve at least 6 percent relative cover in the buffer community.

Success Standards

Year 10

- Native upland buffer woody species will achieve a minimum of 50 percent coverage in each upland buffer community. Native colonizing vegetation will be included in this coverage calculation.
- King County listed Class A weeds and reed canarygrass (*Phalaris arundinacea*), non-native blackberries (*Rubus* spp.), Scot's broom (*Cytisus scoparius*), Japanese knotweed (*Polygonum spp.*), and purple loosestrife (*Lythrum salicaria*) will not exceed 20 percent coverage in each upland buffer community. If coverage by native plant species falls below 80 percent of the success standard, then contingency actions shall be implemented and the invasive species list shall be evaluated to determine if additional invasive species should be controlled.
- Relative cover of red alder will be less than 30 percent in the upland buffer community.
- Three native upland vegetation species each will achieve at least 8 percent relative cover in the buffer community.

Objective 4 – Wildlife

Wildlife cover and forage availability for birds and mammals should be provided. The addition of fruit and nut bearing shrubs, twelve brush piles, two perch posts with one bat box on each post, two rock piles with habitat log, and eight logs with branches will increase habitat diversity and structural complexity in newly vegetated areas. Overall, restoring and enhancing scrub-shrub and forested wetland communities and enhancing upland buffer areas should provide feeding, breeding, and nesting habitat for passerines, raptors, small and large mammals, and snakes.

Interim Performance Measure

Year 1

- Habitat structures as shown on the plan have been installed.

Year 3

- **Habitat structures are shown on the plans are in place.**
- **Vegetation standards in Objective apply.**

Year 5

- Vegetation standards in Objective apply.

Year 7

- Vegetation standards in Objective apply.

Success Standards

Year 10

- Vegetation standards in Objective apply.

MONITORING PLAN

All wetland creation areas will be monitored for a minimum of ten years. Formal monitoring procedures be performed in years one, three, five, seven, and ten after Initial Acceptance of the mitigation construction. The site should be evaluated informally the summer following plant installation to evaluate survival rates and to document the presence of any non-native invasive species. A monitoring report will be submitted to the Corps of Engineers, Washington State Department of Ecology, King County and other resource agencies for review and comment for monitoring years one, three, five, seven, and ten. The results of the year two informal monitoring will also be submitted to the Corps of Engineers for review and comment. Successful mitigation will be measured by attainment of the performance standards described in this mitigation plan document.

CONTINGENCY PLAN

WSDOT anticipates the mitigation goals will be achieved with the construction and installation of the mitigation design as shown on the grading and planting plans and detail sheets. However, contingency actions may be needed to correct unforeseen problems.

Hydrology

Failure to meet the proposed hydrology standard of success may result in some or all of the following contingency actions:

- Consult wetland experts and permitting agencies to determine an appropriate course of action.

- Grading revision – Site elevations may need to be adjusted in order to achieve specified water depths across the site.

Vegetation

Failure to meet the proposed vegetation standard of success will result in some or all of the following contingency actions.

- Plant additional vegetation – Additional vegetation planting may be required to meet cover or plant survival standards. Plant species will be evaluated in relation to site conditions to determine if plant substitutions will be required.
- Weed control – Control of competitive weed species may be required if plant survival or cover standards are not met. Methods of weed control could include hand or mechanical weeding, mulching, or herbicide application.

Herbivore control – If vegetation cover or survival standards are not met because of animal browse, the wildlife responsible will be identified and appropriate damage control methods employed. Possible control methods include fencing, use of repellents, and temporary barriers.

Appendix 2 – Methods

To evaluate vegetative Year-3 standards, visual estimates of density were conducted for the buffer and the forested and scrub/shrub communities (Performance Standards 2 and 4). Invasive cover was visually estimated for the buffer and the forested and scrub/shrub communities (Performance Standards 3 and 5). Habitat structures were counted (Performance Standard 6).

To assess vegetation Year-10 standards, a 264-meter baseline was established parallel to the fence along the western border of the site. Twenty-six temporary sampling transects were placed perpendicular to the baseline using a systematic random sampling method (Figure 2). Aerial cover of woody species in the scrub-shrub, forested, and buffer zone (Performance Standard 2, 4, 5,6,7,9, and 10) was assessed using the line intercept method. Thirty 10-meter line-segment sample units were randomly positioned along the sampling transects in the forested zone. Forty-seven 10-meter line-segment sample units were randomly positioned along the sampling transects in the scrub/shrub zone. Fourteen 10-meter line-segment sample units were randomly positioned along the sampling transects in the buffer zone. Invasive cover was visually estimated for the buffer and the forested and scrub/shrub communities (Performance Standards 3 and 8).

Sample size analysis confirmed sufficient sampling had been completed based on site sampling objectives and the desired level of statistical confidence. The sample size equation shown here (below) was used to perform the analysis on data collected (Performance Standard 2, 4, 5,6,7,9, and 10). In this equation, the precision level (*B*) equals half the maximum acceptable confidence interval width multiplied by the sample mean.

$$n = \frac{(z)^2 (s)^2}{(B)^2}$$

n = unadjusted sample size
z = standard normal deviate
s = sample standard deviation
B = precision level

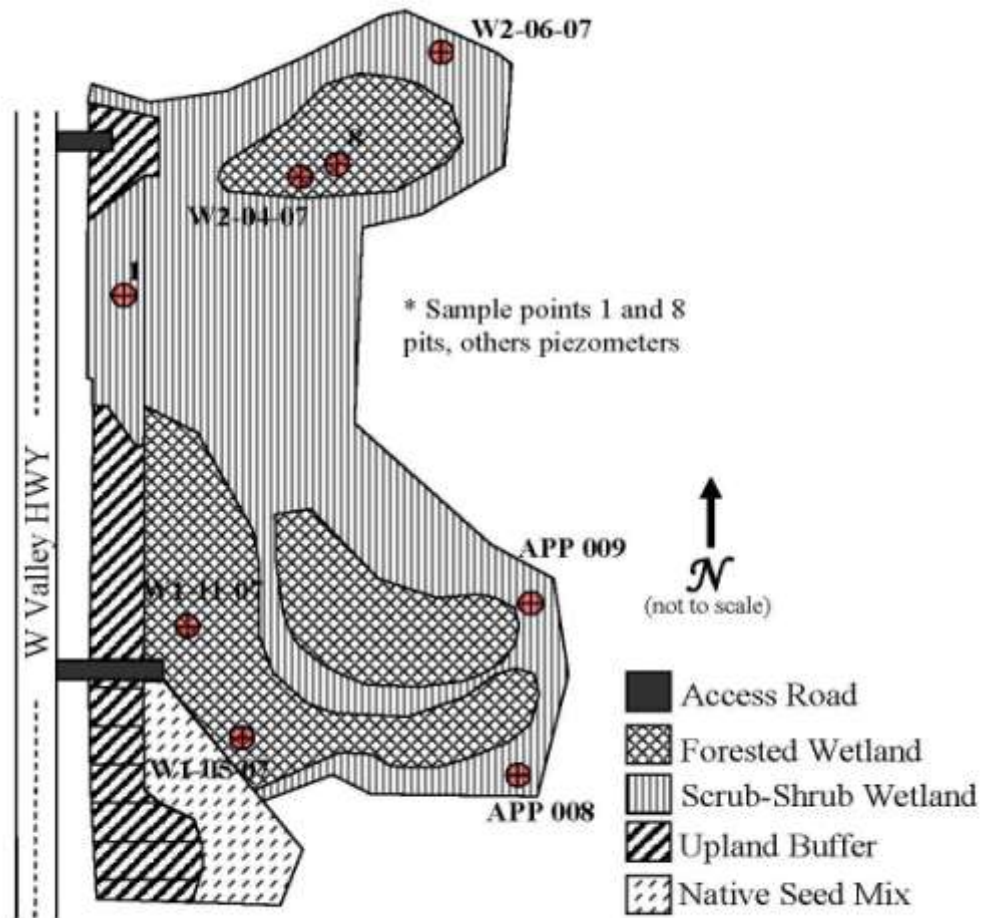
WSDOT staff collected hydrology data using methods described in the *Washington State Wetlands Identification and Delineation Manual* (Ecology 1997) (Performance Standard 1). To determine extent of inundation and surface saturation visual observations were made. In areas where surface saturation or inundation was not apparent, two temporary pits were necessary during each of three visits. Water depth was also measured by six piezometers. Depth of standing water was recorded. Locations of saturation, inundation, and pits were recorded on a map (Appendix 3).

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

Appendix 3 – Hydrology Data

Hydrology Monitoring			
Date	2/22/2010	3/10/2010	3/22/2010
Observer	SP/TM	KA, SP	TM, SP
Was wetland hydrology observed in intended areas	No	No	No
Surface observation	Small area of inundation within the forested wetland in the north end of the site. Saturated within the forested wetland and a small portion of scrub shrub in the south end of the site	Not very much surface water onsite. Scattered areas of saturation in low areas on the south end of the site and near the parking and gate on the north end of the site.	Very little surface hydrology on site. Two small areas saturated to the surface or shallowly inundated (see map).
Subsurface Observations			
Pit 1	standing water at 17", saturated to 13.5"	Standing water at 17" and saturation at 14"	No standing water or saturation after 33 minutes
Pit 2	standing water at 16"	Used info from Piezos W1-11-07 and W1-05-07	Not dug
Piezo APP009	11.5"	12.5"	12"
Piezo APP008	16"	17"	19"
Piezo W1-05-07	11.5"	12"	14"
Piezo W1-11-07	17.5"	17"	19"
Pit 8 & Piezo W2-4-07	Pit 8: standing water at 10', saturated to 9" Piezo: 16"	Pit 8: standing water at 12.5 and saturation at 8", Piezo: 16.5"	Pit 8: No standing water after 38 minutes, but saturation from 5"-8" (water very slowly dribbling into pit). Well: 17"
Pit 9 & Piezo W2-6-07	Pit 9: standing water at 16", saturated to 15.5" Piezo: 16.5"	Piezo at 16"	Well: 16"
water marks			
drift lines			
sediment deposits			
water-stained leaves		yes	

Hydrology Pit Map



Appendix 4 – Year-10 Performance Standards and Results

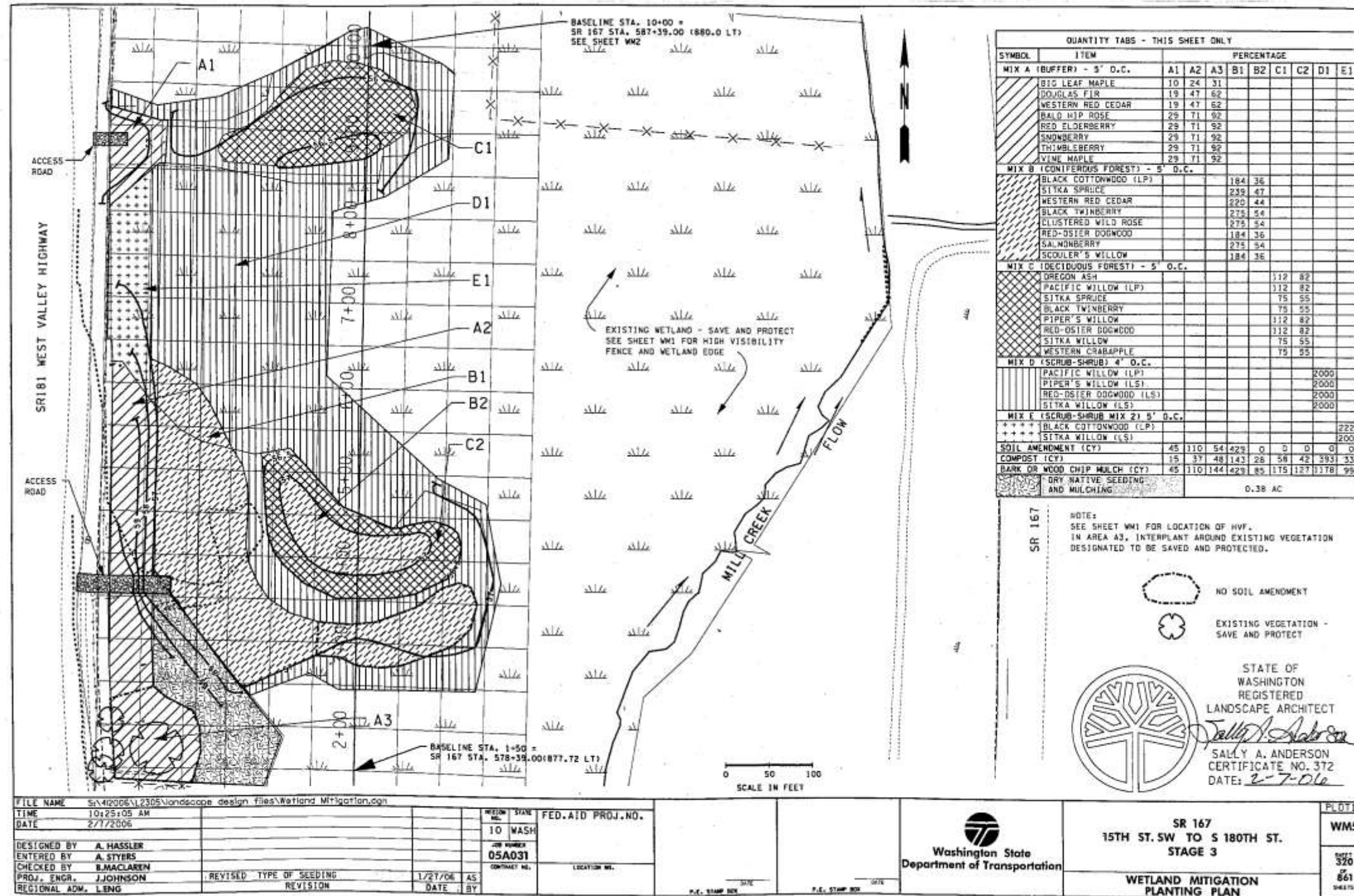
Final Year Year-10 Performance Standards and Results

Performance Standards ¹	2010 Results
Wetland hydrology present.	Not present in all intended areas.
Native facultative or wetter woody species will achieve a minimum of 75 percent coverage in each PSS and PFO community.	<ul style="list-style-type: none"> • Forest wetland 80% (CI_{80%} =73-87%) native cover • Scrub/shrub wetland 95% (CI_{90%} =91-98%) native cover
King County listed Class A weeds and reed canarygrass (<i>Phalaris arundinacea</i>), non-native blackberries (<i>Rubus</i> spp.), Scot’s broom (<i>Cytisus scoparius</i>), Japanese knotweed (<i>Polygonum</i> spp.), and purple loosestrife (<i>Lythrum salicaria</i>) will not exceed 20 percent coverage in each forested and scrub-shrub wetland	Visually estimated at < 1%
Three native facultative or wetter vegetation species each will achieve at least eight percent or greater relative cover in the PSS community.	5 native species with > 8% relative cover
Three native facultative or wetter vegetation species each will achieve at least eight percent or greater relative cover in the PFO community.	5 native species with > 8% relative cover
Relative cover of red alder will be less than 30 percent in the wetland restoration and enhancement areas.	<ul style="list-style-type: none"> • Forest wetland 15% (CI_{80%} =9-20%) alder relative cover • Scrub/shrub wetland 4% (CI_{80%} =2-6%) alder relative cover
Native upland buffer woody species will achieve a minimum of 50 percent coverage in each upland buffer community.	85% (CI _{80%} =72-98%) native cover
King County listed Class A weeds and reed canarygrass (<i>Phalaris arundinacea</i>), non-native blackberries (<i>Rubus</i> spp.), Scot’s broom (<i>Cytisus scoparius</i>), Japanese knotweed (<i>Polygonum</i> spp.), and purple loosestrife (<i>Lythrum salicaria</i>) will not exceed 10 percent coverage in the buffer.	Visually estimated at 2%
Relative cover of red alder will be less than 30 percent in the upland buffer community.	18% (CI _{80%} =8-28%) alder relative cover
Three native upland vegetation species each will achieve at least 8 percent relative cover in the buffer community.	5 native species with > 8% relative cover

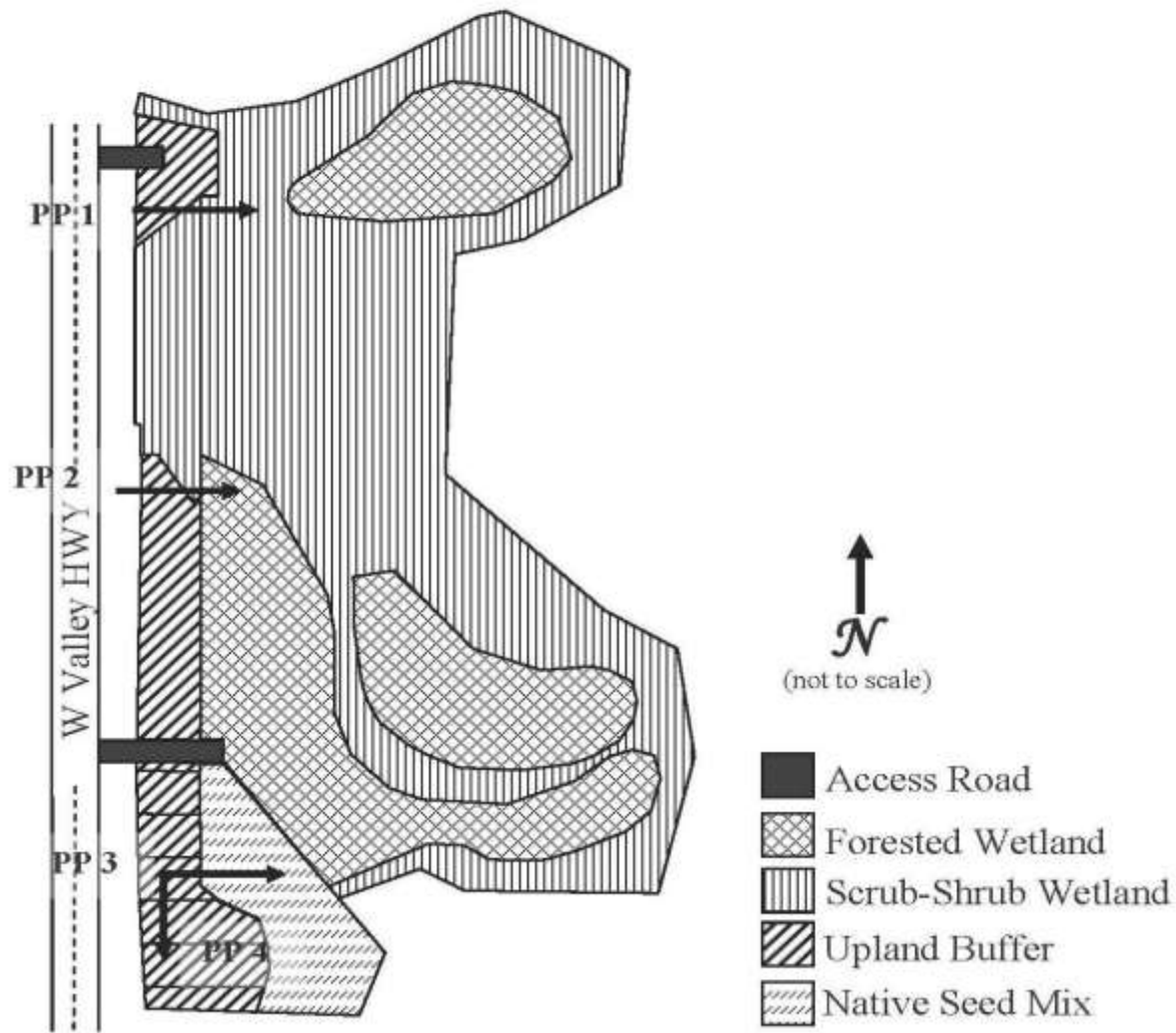
¹ These performance standards were evaluated using the methods described in Appendix 2

Appendix 5 – Planting Plan

(Hassler 2006)



Appendix 6 – Photo Point Map and Photo Points



The photographs below were taken from permanent photo-points on August 24th, 2010 and document current site development.



Photo Point 1



Photo Point 2



Photo Point 3



Photo Point 4

Literature Cited

1. Hassler, Andrea. SR 167 - 15th Street SW to 15th Street - Stage 3 Planting Plan. 2006. WSDOT Urban Corridors Office, Bellevue, WA.
2. United States Army Corps of Engineers. 1998. Department of the Army Permit Number 200401241.
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