

**SR 270 Pullman to Idaho State Line  
(Patterson) Mitigation Site**

**USACE IP 200500225**

**Eastern Region**

**2015 MONITORING REPORT**

**Wetlands Program**

*Issued March 2016*



**Washington State  
Department of Transportation**

Environmental Services Office

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# SR 270 Pullman to Idaho State Line (Patterson) Mitigation Site

## USACE IP 200500225



General Site Information		
<b>USACE IP Number</b>	200500225	
<b>Mitigation Location</b>	South of SR 270 between mileposts 7.7 and 8.3, Whitman County	
<b>LLID Number</b>	1170761467346	
<b>Construction Date</b>	2007–2009	
<b>Monitoring Period</b>	2009–2018	
<b>Year of Monitoring</b>	7 of 10	
<b>Area of Project Impact<sup>1</sup></b>	5.18 acres (USACE) 5.91 acres (Ecology)	
<b>Type of Mitigation</b>	Wetland Establishment	Wetland Enhancement
<b>Area of Mitigation (Patterson Site Only)<sup>2</sup></b>	3.48 acres	0.12 acre

<sup>1</sup> The impact acreages were referenced from the USACE permit 200500225 (USACE 2006) and the Water Quality Certification Order #2847 (Ecology 2005)

<sup>2</sup> The mitigation acreages were referenced from the *Final Mitigation Report for Pullman to Idaho State Line* (WSDOT 2005). Additional mitigation for this project is provided by the SR 270 Jorstad and SR 270 Sunshine Road Mitigation Sites which are reported on separately. See Appendix 3 for a summary of the mitigation areas on all three of the sites associated with this project.

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## Summary of Monitoring Results and Management Activities (2015)

Performance Standards	2015 Results <sup>3</sup>	Management Activities
Presence of wetland hydrology	Present in 2014 Hydrology monitoring discontinued after 2014	
No more than 30% cover of reed canarygrass, blackberries, and Scotch broom	35% cover (CI <sub>80%</sub> = 26-44%)	Occasional mowing, brush cutting and spraying of reed canarygrass and other noxious weeds
Native woody species will achieve 50% coverage in scrub-shrub (PSS) and forested (PFO) creation areas.	64% cover (CI <sub>80%</sub> = 54-73%)	Spring 2015 plantings: 250 coyote willow, 250 Drummond's willow, 250 Mackenzie willow, 250 red-osier dogwood
Two native woody plant species will achieve 5% or greater aerial cover in the forested and scrub-shrub creation areas.	5 species with at least 5% cover	
Native woody species will achieve 40% coverage in the buffer areas.	76% cover (CI <sub>80%</sub> = 70-83%)	Fall 2014 plantings: 50 golden currant, 25 black hawthorn, 25 quaking aspen
Two native woody species will achieve 5% or greater relative cover in buffer areas.	4 species with at least 5% cover	

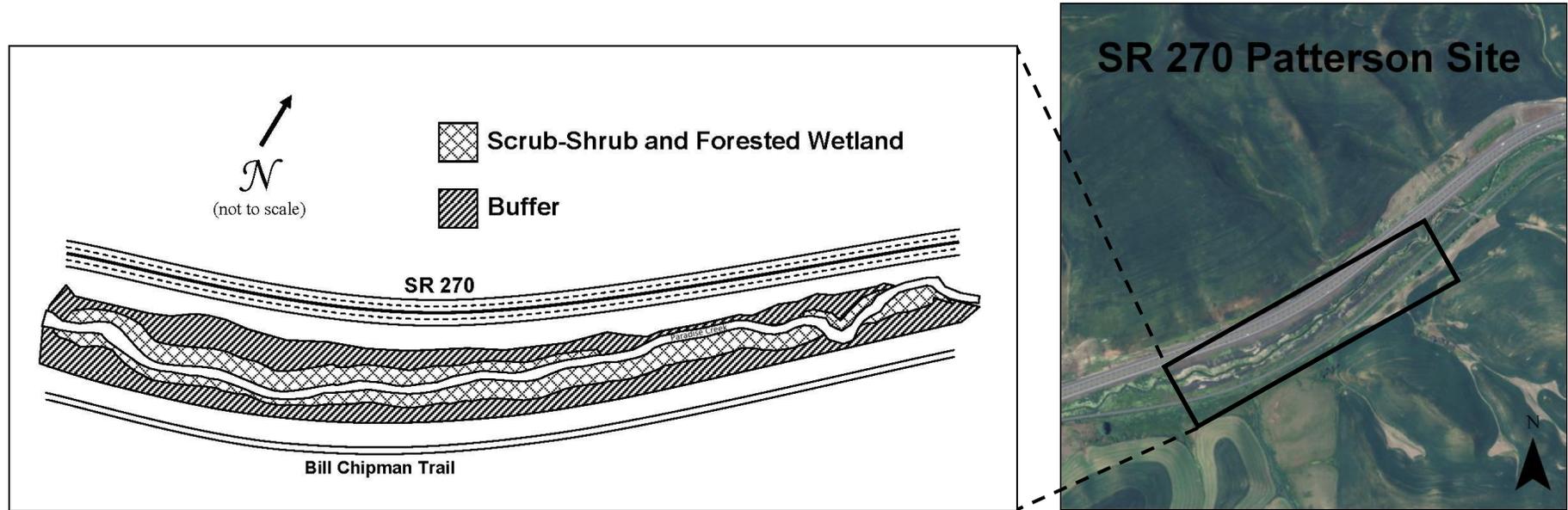
## Report Introduction

This report summarizes seventh-year (Year-7) monitoring activities at the State Route (SR) 270 Patterson 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 and photo-documentation and occurred on July 13 to 15.

<sup>3</sup> Estimated values are presented with their corresponding statistical confidence interval. For example, 35% cover (CI<sub>80%</sub> = 26-44%) means we are 80% confident that the true cover value is between 26% and 44%.

## What is the SR 270 Patterson Mitigation Site?

This 8.33-acre mitigation site (Figure 1) was created as partial compensation for the loss of 5.91 acres of wetlands due the widening of SR 270 from the City of Pullman to the Idaho state line. This project was designed to improve capacity and safety through the widening of the highway from a two-lane roadway to a four-lane facility with a 14-foot wide median left turn lane configuration. Additional improvements included the installation of rumble strips, guardrail, signing, and electrical signals. The Patterson Mitigation Site was designed to improve wetland and riparian functions such as flood flow alteration, sediment and nutrient/toxicant removal, erosion control, habitat suitability, plant richness, stream shading, and production of woody debris. This mitigation site is one of three mitigation sites created as compensation for this project. The other two are the Jorstad and Sunshine Road Mitigation Sites. See Appendix 3 for a summary of the mitigation acreages on all three sites.



**Figure 1 Site Sketch**

The SR 270 Patterson Mitigation Site consists of 3.48 acres of newly established scrub-shrub/forested wetland, as well as 0.12 acre of enhanced wetland and 4.73 acres of enhanced buffer. The site sketch has been altered to reflect how the site is developing rather than what was intended. The intended emergent zone has not developed on this site. Appendix 2 contains site directions.

## **What are the performance standards for this site?**

### Performance Standard 1

The soils will be saturated to the surface, or ponded water will be present for at least 3 consecutive weeks (10 percent) of the growing season in years when rainfall meets or exceeds the 30-year average.

### Performance Standard 2

No more than 30% coverage by the following non-native invasive species on the entire site: reed canarygrass (*Phalaris arundinacea*), non-native blackberries (*Rubus* sp.), and Scotch broom (*Cytisus scoparius*). Other invasive, non-native species will also be controlled if a problem becomes apparent on the mitigation sites.

### Performance Standard 3

Native woody species will achieve 50% coverage in scrub-shrub (PSS) and forested (PFO) creation areas.

### Performance Standard 4

Two native woody plant species will achieve 5% or greater aerial cover in the forested and scrub-shrub creation areas.

### Performance Standard 5

Native woody species will achieve 40% coverage in the buffer areas.

### Performance Standard 6

Two native woody plant species will achieve 5% or greater relative cover in buffer areas.

Appendix 1 shows the as-built planting plans (WSDOT 2008).

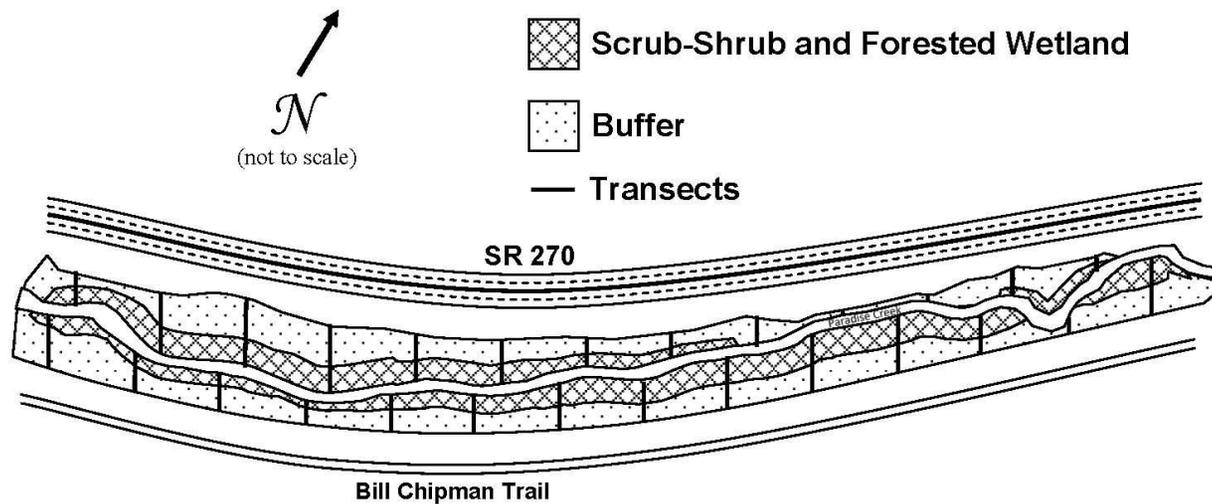
## How were the performance standards evaluated?

On February 26, 2015, a request to discontinue hydrology monitoring (Performance Standard 1) was sent to the USACE and the Department of Ecology. This request was accepted on April 2, 2015.

The table to the right 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).

	PS 2	PS 3, 4	PS 5, 6
<b>Attribute</b>	Cover	Cover	Cover
<b>Target pop.</b>	Invasive species	Native Woody	Native Woody
<b>Zone</b>	Entire site	PSS/PFO	Buffer
<b>Sample method</b>	Point Line	Line Intercept	Line Intercept
<b>SU length</b>	5 m	4 m	4 m
<b>Points per SU</b>	25		
<b>Total # of SU</b>	24	20	23

**Placement of Baseline:** The baseline was established in two segments (one on each side of and roughly parallel to Paradise Creek) using a GPS unit.



**Figure 2 Site Sampling Design (2015)**

## How is the site developing?

This mitigation site is developing mostly as planned, with the obvious exception of the failure of the intended emergent area, which was never able to get established due to the unstable banks and flashy hydrology of Paradise Creek through the site. Beaver dams in the downstream half of the site have helped to slow the creek and the resulting erosion in these areas, but erosion continues to be a problem, particularly in the upstream portion.

The forested/scrub-shrub wetland and buffer areas have developed diverse and vigorous native plant communities. The woody cover in these areas is somewhat patchy but overall cover is high and all of the current performance standards for native woody cover and diversity in these zones (Performance Standards 3–6) are being met.

For the most part, the invasive species have been kept in check and have not significantly hindered the development of the plantings. The exception to this is reed canarygrass, which dominates the banks of the creek channel (originally the intended emergent area) and some adjacent portions of the forested and scrub-shrub wetland. The cover of reed canarygrass (Performance Standard 2) is the only performance standard not currently being met on this site. Controlling reed canarygrass on this site is problematic, however, since killing it along the immediate creek banks will likely only worsen erosion problems at this point in time, and leaving it provides a robust ongoing source of seeds and rhizomes to colonize other parts of the site. The woody plantings should eventually start to partially shade out the reed canarygrass, and help stabilize the creek banks with their own roots, but this will take many more years to have a significant effect.

### Results for Performance Standard 1

(Presence of wetland hydrology):

On February 26, 2015, a request to discontinue hydrology monitoring was sent to USACE and the Department of Ecology. This request was accepted on April 2, 2015.

Two hydrology monitoring visits were conducted in 2014 on April 16 and May 8, during which it was determined that hydrology was present throughout the intended wetland areas. Saturation to the soil surface or a water table within the upper 12 inches of the soil was observed at each of 10 hydrology monitoring locations during each visit.

### Results for Performance Standard 2

(No more than 30% cover of reed canarygrass, blackberries, and Scotch broom):

The cover of reed canarygrass (*Phalaris arundinacea*) across the entire mitigation site is estimated at 35% (CI<sub>80%</sub> = 26-44%). Because some areas of the site have steep, unstable creek banks, sampling transects were terminated just prior to the unsafe banks. These unstable bank areas (which were dominated by reed canarygrass) were not, consequently, included in the sampled area or the resulting cover estimate. Blackberries (*Rubus spp.*) and Scotch broom (*Cytisus scoparius*) are not present in the mitigation area. Several other invasive species (not covered by the performance standard) were present on-site in relatively small amounts. Their inclusion in the invasive species cover estimate only increases the total a couple of percentage points to 37% (CI<sub>80%</sub> = 29-45%). These species included poison hemlock (*Conium maculatum*), scentless false mayweed (*Tripleurospermum inodorum*), bull thistle (*Cirsium vulgare*), prickly lettuce (*Lactuca serriola*), common tansy (*Tanacetum vulgare*), common St. Johnswort (*Hypericum perforatum*), Fuller's teasel (*Dipsacus fullonum*), kochia (*Bassia scoparia*), Canada thistle (*Cirsium arvense*), yellow sweetclover (*Melilotus officinalis*), and climbing nightshade (*Solanum dulcamara*).

### Results for Performance Standard 3

(Native woody species will achieve 50% coverage in scrub-shrub [PSS] and forested [PFO] creation areas):

The native woody cover in the scrub-shrub and forested wetland areas (Photo 1) is estimated at 64% (CI<sub>80%</sub> = 54-73%).

Results for Performance Standard 4

(Two native woody plant species will achieve 5% or greater aerial cover in the forested and scrub-shrub creation areas):

Within our sample, five native woody species achieved 5% or greater cover in the forested and scrub-shrub wetland. Those species are sandbar willow (*Salix exigua*), Drummond's willow (*Salix drummondiana*), black cottonwood (*Populus balsamifera*), Nootka rose (*Rosa nutkana*), and redosier dogwood (*Cornus alba*).

Results for Performance Standard 5

(Native woody species will achieve 40% coverage in the buffer areas):

The native woody cover in the buffer (Photo 2) is estimated at 76% ( $CI_{80\%} = 70-83\%$ ).

Results for Performance Standard 6

(Two native woody plant species will achieve 5% or greater relative cover in buffer areas):

Within our sample, four native woody species achieved 5% or greater cover in the buffer. Those species are Wood's rose (*Rosa woodsii*), snowberry (*Symphoricarpos albus*), golden currant (*Ribes aureum*), and western serviceberry (*Amelanchier alnifolia*).



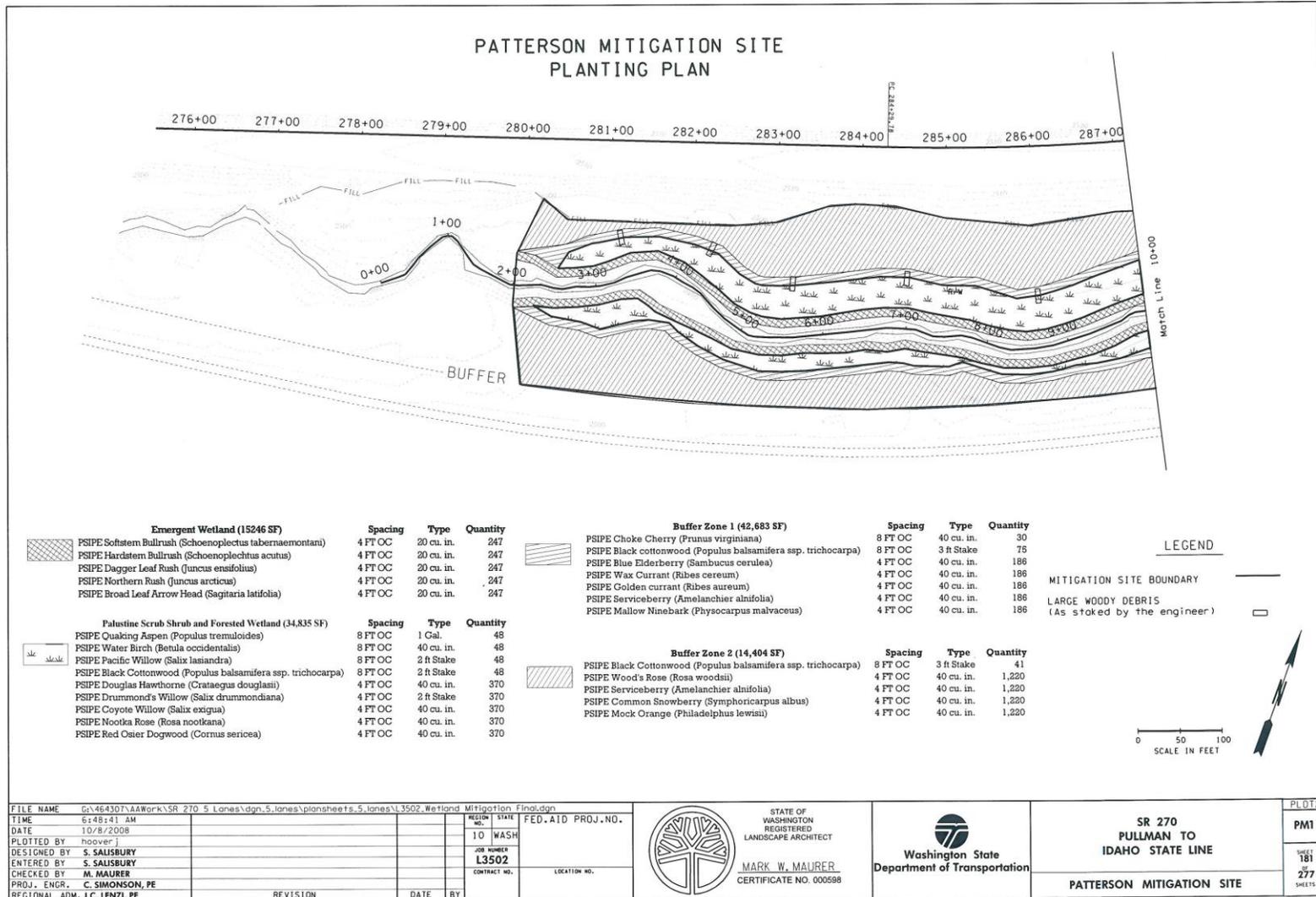
**Photo 1**  
**Woody cover in the PSS/PFO (July 2015)**



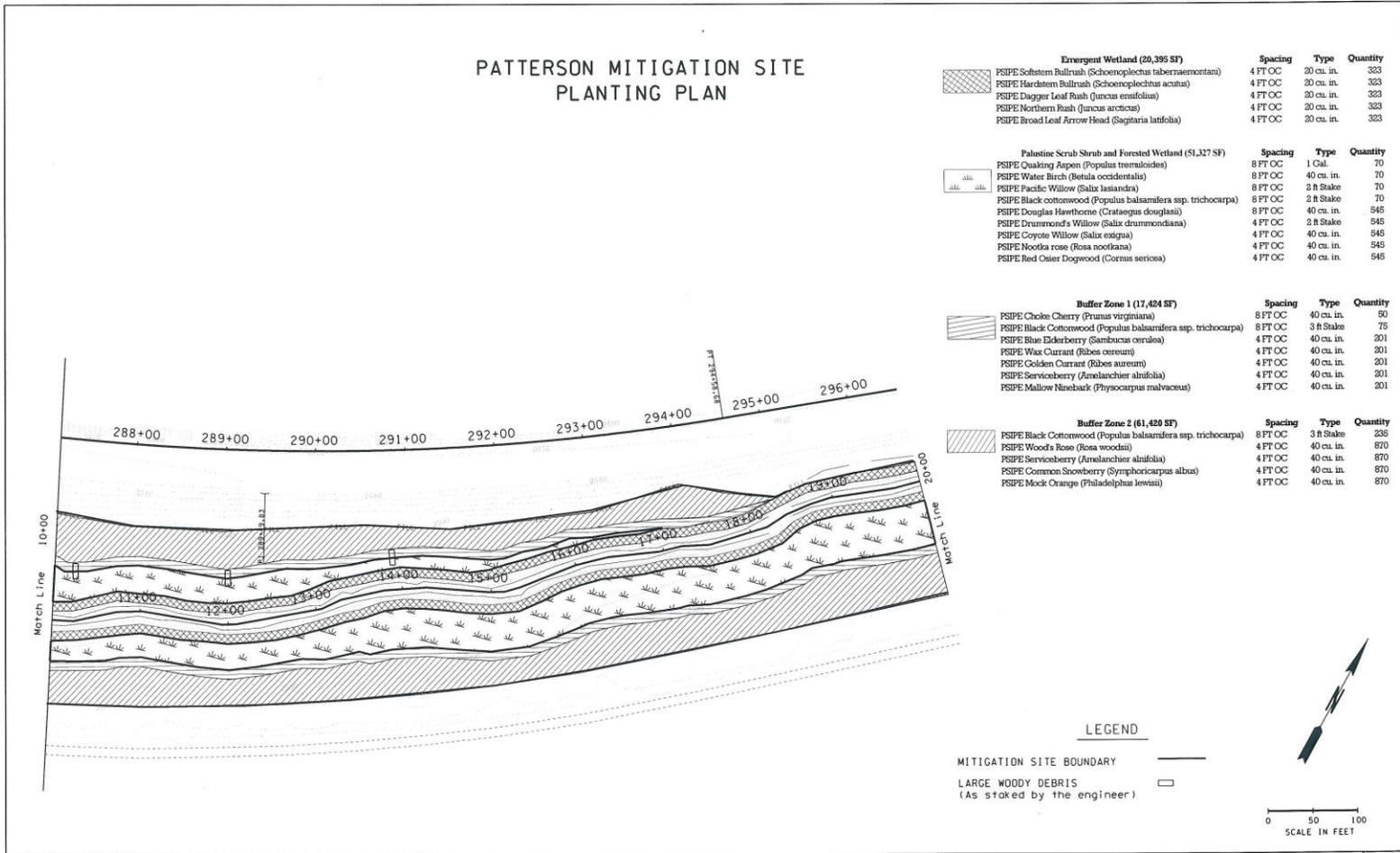
**Photo 2**  
**Woody cover in the buffer (July 2015)**

# Appendix 1 – As-built Planting Plans

(from WSDOT 2008)



# PATTERSON MITIGATION SITE PLANTING PLAN



Emergent Wetland (20,395 SF)			
	Spacing	Type	Quantity
PSIFE Softstem Bullrush ( <i>Schoenoplectus tabernaemontani</i> )	4 FT OC	20 cu. in.	333
PSIFE Hardstem Bullrush ( <i>Schoenoplectus acutus</i> )	4 FT OC	20 cu. in.	333
PSIFE Dagger Leaf Rush ( <i>Juncus eriofolius</i> )	4 FT OC	20 cu. in.	333
PSIFE Northern Rush ( <i>Juncus arcticus</i> )	4 FT OC	20 cu. in.	333
PSIFE Broad Leaf Arrow Head ( <i>Sagittaria latifolia</i> )	4 FT OC	20 cu. in.	333

Palestine Scrub Shrub and Forested Wetland (51,327 SF)			
	Spacing	Type	Quantity
PSIFE Quaking Aspen ( <i>Populus tremuloides</i> )	8 FT OC	1 Cal.	70
PSIFE Water Birch ( <i>Betula occidentalis</i> )	8 FT OC	40 cu. in.	70
PSIFE Pacific Willow ( <i>Salix lasiandra</i> )	8 FT OC	2 ft Stake	70
PSIFE Black cottonwood ( <i>Populus balsamifera</i> ssp. <i>trichocarpa</i> )	8 FT OC	2 ft Stake	70
PSIFE Douglas Hawthorne ( <i>Crataegus douglasii</i> )	8 FT OC	40 cu. in.	545
PSIFE Drummond's Willow ( <i>Salix drummondiana</i> )	4 FT OC	2 ft Stake	545
PSIFE Coyote Willow ( <i>Salix esauya</i> )	4 FT OC	40 cu. in.	545
PSIFE Nootka rose ( <i>Rosa nootkana</i> )	4 FT OC	40 cu. in.	545
PSIFE Red Osier Dogwood ( <i>Cornus sericea</i> )	4 FT OC	40 cu. in.	545

Buffer Zone 1 (17,424 SF)			
	Spacing	Type	Quantity
PSIFE Choke Cherry ( <i>Prunus virginiana</i> )	8 FT OC	40 cu. in.	50
PSIFE Black Cottonwood ( <i>Populus balsamifera</i> ssp. <i>trichocarpa</i> )	8 FT OC	3 ft Stake	75
PSIFE Blue Elderberry ( <i>Sambucus cernua</i> )	4 FT OC	40 cu. in.	201
PSIFE Wax Currant ( <i>Ribes cereum</i> )	4 FT OC	40 cu. in.	201
PSIFE Golden Currant ( <i>Ribes aureum</i> )	4 FT OC	40 cu. in.	201
PSIFE Serviceberry ( <i>Amelanchier alnifolia</i> )	4 FT OC	40 cu. in.	201
PSIFE Mallow Ninebark ( <i>Physocarpus malvaceus</i> )	4 FT OC	40 cu. in.	201

Buffer Zone 2 (61,450 SF)			
	Spacing	Type	Quantity
PSIFE Black Cottonwood ( <i>Populus balsamifera</i> ssp. <i>trichocarpa</i> )	8 FT OC	3 ft Stake	235
PSIFE Wood's Rose ( <i>Rosa woodsii</i> )	4 FT OC	40 cu. in.	870
PSIFE Serviceberry ( <i>Amelanchier alnifolia</i> )	4 FT OC	40 cu. in.	870
PSIFE Common Snowberry ( <i>Symphoricarpos albus</i> )	4 FT OC	40 cu. in.	870
PSIFE Mock Orange ( <i>Philadelphus lewisii</i> )	4 FT OC	40 cu. in.	870

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**MARK W. MAURER**  
CERTIFICATE NO. 000598

Washington State  
Department of Transportation

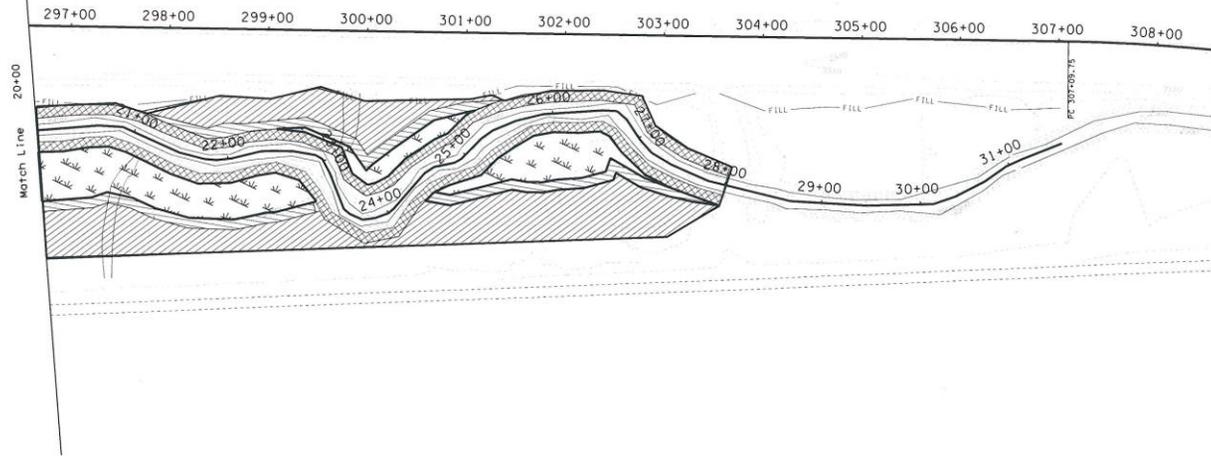
SR 270  
PULLMAN TO  
IDAHO STATE LINE  
**PATTERSON MITIGATION SITE**

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277 SHEETS

## PATTERSON MITIGATION SITE PLANTING PLAN

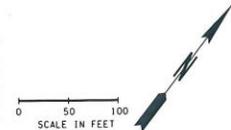
### LEGEND

MITIGATION SITE BOUNDARY   
 LARGE WOODY DEBRIS   
 (As staked by the engineer)



Emergent Wetland (15,752 SF)			
	Spacing	Type	Quantity
	4 FT OC	20 cu. in.	250
PSIPE Softstem Bullrush ( <i>Schoenoplectus tabernaemontani</i> )	4 FT OC	20 cu. in.	250
PSIPE Hardstem Bullrush ( <i>Schoenoplectus acutus</i> )	4 FT OC	20 cu. in.	250
PSIPE Dagger Leaf Rush ( <i>Juncus ensifolius</i> )	4 FT OC	20 cu. in.	250
PSIPE Northern Rush ( <i>Juncus arcticus</i> )	4 FT OC	20 cu. in.	250
PSIPE Broad Leaf Arrow Head ( <i>Sagittaria latifolia</i> )	4 FT OC	20 cu. in.	250
Palustine Scrub Shrub and Forested Wetland (19,178 SF)			
	Spacing	Type	Quantity
	8 FT OC	1 Gal.	26
PSIPE Quaking Aspen ( <i>Populus tremuloides</i> )	8 FT OC	40 cu. in.	26
PSIPE Water Birch ( <i>Betula occidentalis</i> )	8 FT OC	2 ft Stake	26
PSIPE Pacific Willow ( <i>Salix lasiandra</i> )	8 FT OC	2 ft Stake	26
PSIPE Black Cottonwood ( <i>Populus balsamifera</i> ssp. <i>trichocarpa</i> )	4 FT OC	40 cu. in.	205
PSIPE Douglas Hawthorne ( <i>Crataegus douglasii</i> )	4 FT OC	2 ft Stake	205
PSIPE Drummond's Willow ( <i>Salix drummondiana</i> )	4 FT OC	40 cu. in.	205
PSIPE Coyote Willow ( <i>Salix exigua</i> )	4 FT OC	40 cu. in.	205
PSIPE Nootka Rose ( <i>Rosa nootkana</i> )	4 FT OC	40 cu. in.	205
PSIPE Red Osier Dogwood ( <i>Cornus sericea</i> )	4 FT OC	40 cu. in.	205

Buffer Zone 1 (8,978 SF)			
	Spacing	Type	Quantity
	8 FT OC	40 cu. in.	20
PSIPE Choke Cherry ( <i>Prunus virginiana</i> )	8 FT OC	3 ft Stake	30
PSIPE Black Cottonwood ( <i>Populus balsamifera</i> ssp. <i>trichocarpa</i> )	4 FT OC	40 cu. in.	146
PSIPE Blue Elderberry ( <i>Sambucus oerulea</i> )	4 FT OC	40 cu. in.	146
PSIPE Wax Currant ( <i>Ribes cereum</i> )	4 FT OC	40 cu. in.	146
PSIPE Golden Currant ( <i>Ribes aureum</i> )	4 FT OC	40 cu. in.	146
PSIPE Serviceberry ( <i>Amelanchier alnifolia</i> )	4 FT OC	40 cu. in.	146
PSIPE Mallow Ninebark ( <i>Physocarpus malvaceus</i> )	4 FT OC	40 cu. in.	146
Buffer Zone 2 (33,106 SF)			
	Spacing	Type	Quantity
	8 FT OC	3 ft Stake	124
PSIPE Black Cottonwood ( <i>Populus balsamifera</i> ssp. <i>trichocarpa</i> )	4 FT OC	40 cu. in.	525
PSIPE Wood's Rose ( <i>Rosa woodsii</i> )	4 FT OC	40 cu. in.	525
PSIPE Serviceberry ( <i>Amelanchier alnifolia</i> )	4 FT OC	40 cu. in.	525
PSIPE Common Snowberry ( <i>Symphoricarpos albus</i> )	4 FT OC	40 cu. in.	525
PSIPE Mock Orange ( <i>Philadelphus lewisii</i> )	4 FT OC	40 cu. in.	525



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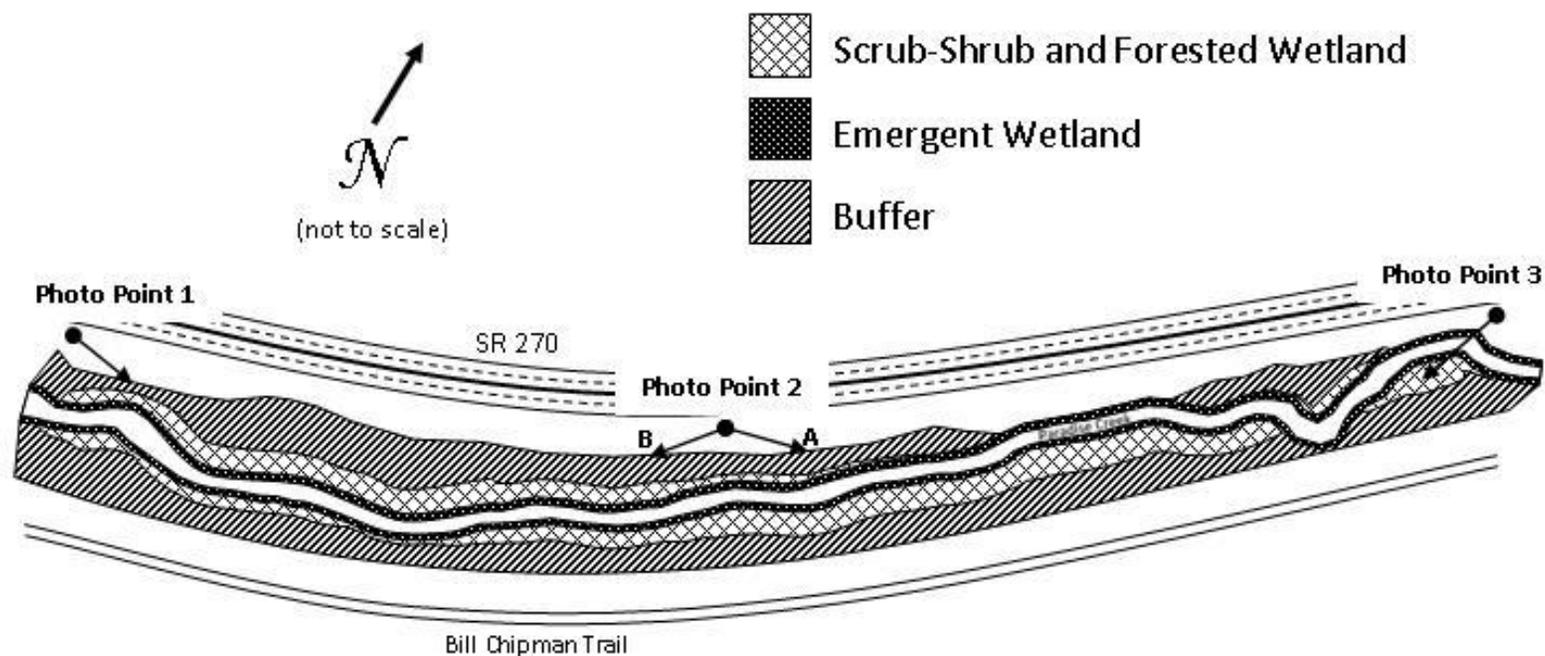
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CERTIFICATE NO. 000598

Washington State  
Department of Transportation

SR 270 PULLMAN TO IDAHO STATE LINE	PLOT11 PM3
PATTERSON MITIGATION SITE	SHEET 183 OF 277 SHEETS

## Appendix 2 – Photo Points

The photographs below were taken from permanent photo-points on July 16, 2015 and document current site development.



### Driving Directions:

Head east on SR 270 out of Pullman, WA. The site is located on the south side of SR 270 between Mileposts 7.7 and 8.3, between the highway and the Bill Chipman trail. To access the site, drive past it on SR 270 and turn into a car dealership just east of the site. A gravel road leads behind the dealership that gives you access to the trail. Enter the site from the trail.



**Photo Point 1**



**Photo Point 2a**



**Photo Point 2b**



**Photo Point 3**

# Appendix 3 – Project Impacts and Mitigation Summary

(from WSDOT 2005)

**Table 1 – Project Wetland Impacts**

Type of Wetland Impact	Area of Impact (acres)
Impacts to wetlands regulated by the U.S. Army Corps of Engineers	5.18
Impacts to isolated wetlands regulated only by the Washington State Department of Ecology	0.73
<b>Total Project Wetland Impacts</b>	<b>5.91</b>

**Table 2 – Project Mitigation by Site**

Mitigation Site	Wetland Establishment (acres)	Wetland Enhancement (acres)	Riparian Enhancement (acres)	Buffer Establishment (acres)
Jorstad	0.00	0.64	2.09	0.00
Patterson	3.48	0.12	0.00	4.73
Sunshine Road	2.90	0.00	0.00	1.12
<b>Project Mitigation Totals</b>	<b>6.38</b>	<b>0.76</b>	<b>2.09</b>	<b>5.85</b>

## Literature Cited

1. [Ecology] Washington State Department of Ecology. 2005. Water Quality Certification Order Number 2847.
2. [USACE] US Army Corps of Engineers. 2006. Department of the Army Individual Permit Number 200500225.
3. [WSDOT] Washington State Department of Transportation. 2005. Final Mitigation Report for Pullman to Idaho State Line. Spokane (WA): WSDOT Eastern Region.
4. [WSDOT] Washington State Department of Transportation. 2008. SR 270 Pullman to Idaho State Line Patterson Mitigation Site As-built Planting Plans.
5. [WSDOT] Washington State Department of Transportation. 2008. WSDOT Wetland Mitigation Site Monitoring Methods. <http://www.wsdot.wa.gov/NR/ronlyres/C211AB59-D5A2-4AA2-8A76-3D9A77E01203/0/MethodsWhitePaper052004.pdf>