I-5 Blakeslee to Grand Mound (TDA 11) Mitigation Site

USACE IP NWS-2008-744-SOD

Southwest Region

2015 MONITORING REPORT

Wetlands Program

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USACE IP NWS-2008-744-SOD

General Site Information	
USACE IP Number	NWS-2008-744-SOD
Ecology WQC#	6701
Mitigation Location	Located just north of the Thurston Co/Lewis Co. line on the west side of Interstate 5
Construction Date	2011-2012
Monitoring Period	2013 to 2022
Year of Monitoring	3 of 10
Area of Project Wetland Impact[1]	5.61
Type of Mitigation	Wetland Enhancement
Area of Mitigation[2]	12 acres

[1] The 5.61 acres of direct wetland impact is sourced from USACE 2009. This impact is mitigated for at the North Fork Newaukum Mitigation Bank with the debit of 6.79 credits.

[2] The wetland enhancement/restoration occurs at three total discharge areas (TDA 11, 12, 13) with a combined acreage of approximately 12 acres (WSDOT 2009).

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Summary of Monitoring Results and Management Activities (2015)

Performance Standards	2015 Results[1]	Management Activities
Density of 400 trees/acre and 4000 shrubs/acre in the forested areas. 2 tree species, 4 shrub species. No specie with more than 60% cover	**Riparian and Oak Forested Upland**: 1227 tress/acre ($CI_{80\%}$ = 905-1548) 5032 plants/acre ($CI_{80\%}$ = 4683-5380) 8 tree species and 14 shrub species Snowberry at 60% cover	
Density of shrubs in the scrub shrub areas. 4 shrub species. No species with more than 60% cover.	2108 plants/acre ($CI_{80\%}$ = 1905-2312) 8 species present, none with over 60% cover	
Cover of FAC or wetter species in the emergent zone on TDA 11, 13.	95% cover	
Density of 250 living Oregon white oak (*Quercus garryana*) trees per acre	500 plants/acre ($CI_{80\%}$ = 387-612)	
Blackberries and Class A noxious weeds will not exceed 15% in the scrub-shrub and forest planting areas	<1% cover of blackberries; no Class A weeds	Weed control: 4 times in 2014 and 2 times in 2015
Reed Canarygrass will be managed at a threshold 10% below the existing baseline conditions	No baseline survey conducted; 1% cover of reed canarygrass	
Japanese knotweed shall not be present	None present	
Exhibit floodplain functions by demonstrating seasonal inundation at various stages/depths with a hydrograph	Hydrograph not available, will provide in 2017	

Report Introduction

This report summarizes third-year monitoring activities at the Interstate (I) 5 TDA 11 Mitigation Site. Included are a site description, the performance standards, an explanation of monitoring methods, and an evaluation of site development. Monitoring occurred on July 6-7, 2015 and included vegetation surveys and photo-documentation.

[1] Estimated values are presented with their corresponding statistical confidence interval. For example, 1227 tress/acre ($CI_{80\%}$ = 905-1548) means we are 80% confident that the true density value is between 905 and 1548 trees per acre.

What is the I-5 TDA 11 Mitigation Site?

This mitigation site (Figure 1) is one of three enhanced floodplain wetlands called Total Discharge Areas (TDA). This site was enhanced to offset increased flow volumes from Phase 1 of the four mile Interstate 5 widening project by improving and restoring floodplain function. Nearby drain tiles were removed, drainage ditches were filled and the site was graded down approximately two to three feet, providing enhanced water quality and floodplain storage functions. The floodplain area was designed with undulating topography to create a more diverse set of hydrologic regimes ranging from saturated to seasonally inundated. The site also provides diverse vegetation communities, strata, and habitat types, enhancing wildlife habitat.

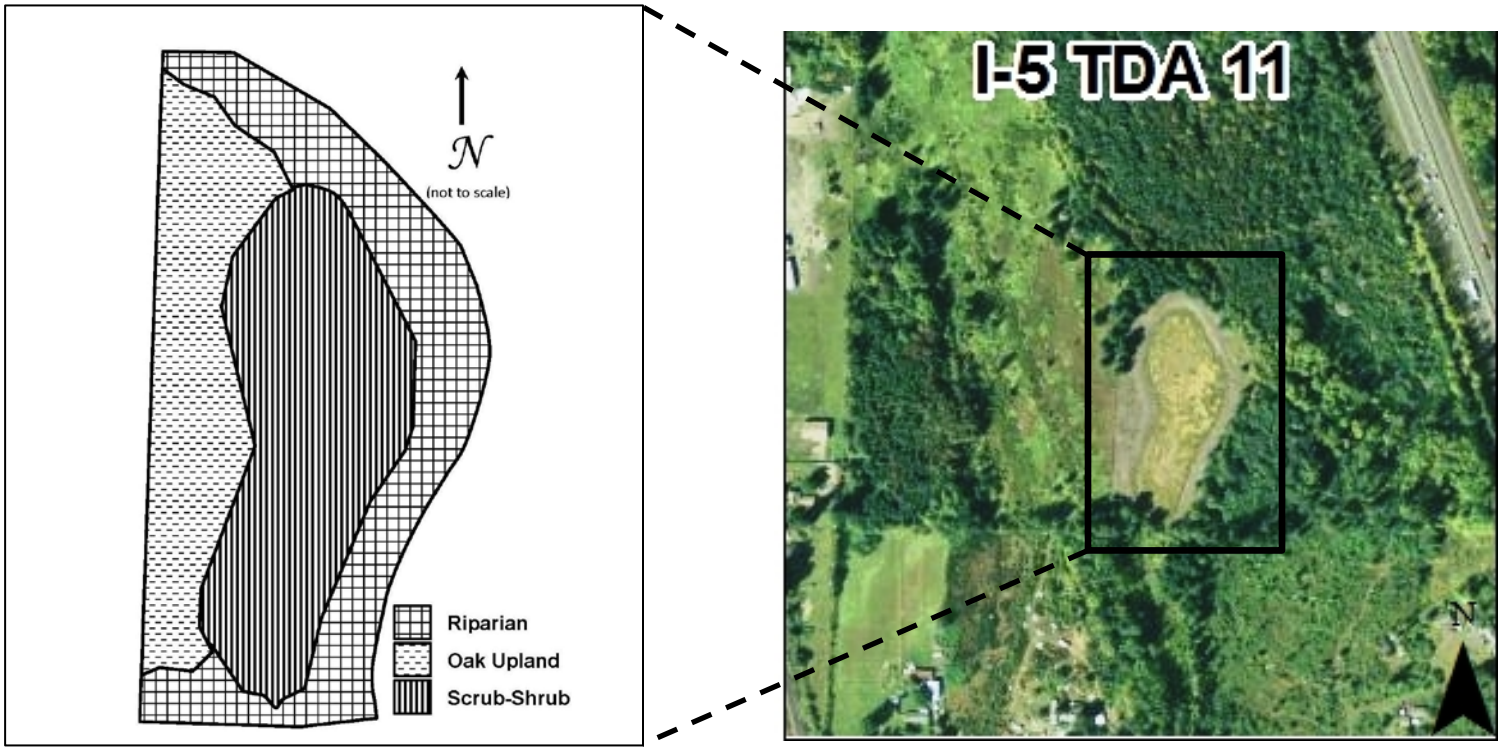

Figure 1 Site Sketch

TDA 11 consists of an emergent and scrub-shrub wetland bordered by oak woodland to the west, and riparian buffer on the other sides. Appendix 2 includes site directions.

What are the performance standards for this site?

Year 3

Performance Standard 1
Forested Areas (wetland, wetland buffer, riparian) will have a minimum density of 400 living native trees per acre, a minimum density of 4,000 living native shrubs per acre and at least 2 species of native trees and 4 species of native shrubs will be present in the forested areas. No single species will provide more than 60% total aerial cover.

Performance Standard 2
Scrub Shrub Areas (wetland, wetland buffer, riparian) will have a minimum density of 4,000 living native shrubs per acre and at least 4 species of native shrubs will be present in the Scrub Shrub areas. No single species will provide more than 60% total aerial cover.

Performance Standard 3
A minimum of 50% aerial cover of native facultative wet and wetter species within the emergent zone.

Performance Standard 4
There will be a minimum density of 250 living *Quercus garryana* trees per acre throughout the planted sections of the TDA-11 wetland restoration/enhancement area.

Performance Standard 5
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 on-site mitigation areas, TDA 11, TDA 12, and TDA 13 restoration/enhancement areas.

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

Performance Standard 7
Japanese knotweed shall not be present in any amount within the mitigation sites.

Performance Standard 8
The sites will exhibit floodplain functions including seasonal inundation at various stages/depths compared to baseline conditions. Provide hydrologic data in the form of a hydrograph in monitoring years 3, 5, and 7.

Appendix 1 shows the site schematic (WSDOT 2011).

How were the performance standards evaluated?

The tables below document the sampling methodology utilized for all of the performance standards (PS) as required by the mitigation plan or permits. For additional details on the methods see the [WSDOT Wetland Mitigation Site Monitoring Methods Paper](#) (WSDOT 2008).

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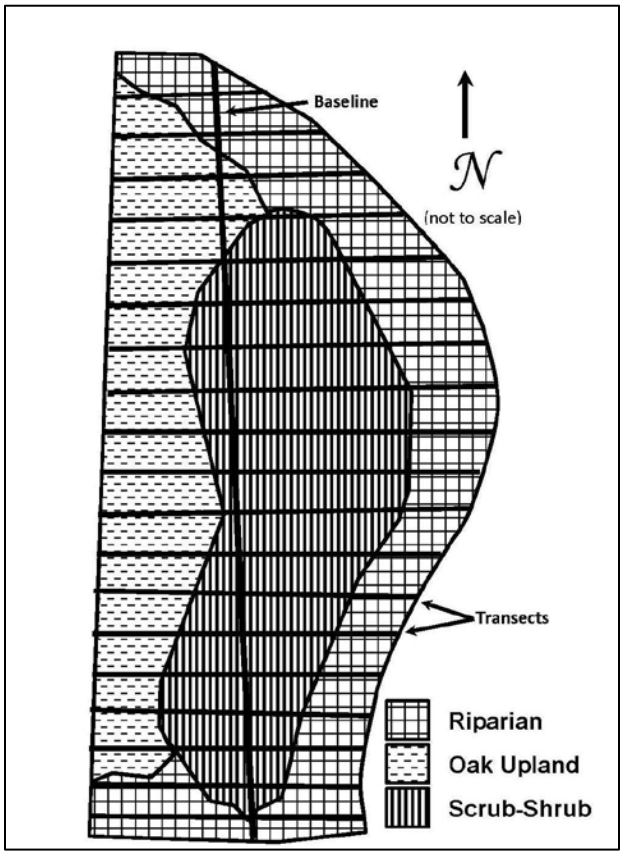


Figure 2 Site Sampling Design (2015)

Placement of Baseline: From the center of the gate roughly through the center of the site South to North.
Single Baseline: Length 197m Transects 1-19

	PS 1 & 2	PS 3	PS 4	PS 5,6, &7
Attribute	Density	Cover	Density	Presence/Absence & Cover
Target pop.	Native Woody	Herbaceous	Native Woody	Noxious Weeds/ Invasive sp.
Zone	Riparian / Oak Upland and Scrub/shrub	Emergent	Oak Upland	Entire site
Sample method	UBT	Qualitative	UBT	Qualitative
SU length	Variable	N/A	Variable	N/A
SU width	1m	N/A	1m	N/A
Points per SU	N/A	N/A	N/A	N/A
Total # of SU	37/ 18 (SS)	N/A	17	N/A
Other				

How is the site developing?

In general this site is developing well, however there are discrepancies with the planting plans and the performance standards for the scrub/shrub and emergent zones that may make it difficult for the site to meet the final year performance standards. There are performance standards for an emergent zone that aren't on the as-built planting plans and were not created. The original restoration concept maps from WSDOT (2008) show an intended emergent zone but the as-built planting plans from WSDOT (2011) show this area as being entirely planted as scrub/shrub. Currently, the area planted as scrub/shrub (Appendix 1), is not meeting the native woody performance standard and is a mosaic of emergent species with scattered native woody species. If this area is re-planted to meet future native woody density performance standards, eventually the emergent component of the site will decline. If the native woody species are not re-planted then the area will not meet the density standard in the future, leaving more of an emergent component.

The riparian and oak upland planting zones are developing on a positive trajectory. Both tree and shrub densities greatly exceed the performance standard. Snowberry (*Symphoricarpos albus*) is on the verge of exceeding the 60 percent cover threshold. The shrub layer is diverse but all other seven species present provide lower cover. Approximately 15 percent of the conifers appeared stressed, particularly western red cedar (*Thuja plicata*), most likely a result of the dry summer. Large numbers of Oregon ash (*Fraxinus latifolia*) are volunteering along the eastern edge of the riparian planting zone and constitute 10 percent of the stems counted across both forested zones.

The site was intended to provide general wildlife habitat and it appears that this function is being supported. Sixteen species of birds have been observed during the 3-year monitoring period. Deer and coyote scat have been observed on site, as well as deer herbivory. Chorus frogs have also been observed during monitoring visits.

Flood flow attenuation, sediment and nutrient removal are other functions intended for this site. Grading and plant establishment activities have likely enhanced the performance of these functions, as evidenced by the thick algal mats present within the scrub/shrub wetland.

Results for Performance Standard 1
(Density of 400 living native trees per acre, a minimum density of 4,000 living native shrubs per acre and at least 2 species of native trees and 4 species of native shrubs No single species will provide more than 60% total aerial cover.):

Density of tree species in the forested zones is estimated to be 1,227 plants/acre ($CI_{80\%}$ = 905-1,548) (Photo 1). Density of shrub species in the forested zones is estimated to be 5,032 plants/acre ($CI_{80\%}$ = 4,683-5,380). A total of eight tree species and 15 species of shrubs are present within the forested planting areas. Snowberry is estimated to provide 60% of the total cover across both forested zones.

Results for Performance Standard 2
(A minimum density of 4,000 living native shrubs per acre and at least 4 species of native shrubs will be present in the Scrub Shrub areas. No single species will provide more than 60% total aerial cover.):

The density of shrubs in the scrub/shrub zone is estimated at 2,108 plants/acre ($CI_{80\%}$ = 1,905-2,312). There are eight species of native shrubs within the scrub/shrub planting zone. No single species provides more than 60% total aerial cover, however hardhack (*Spiraea douglasii*) is fast approaching this threshold (Photo 2).

Photo 1
Woody density in the oak and riparian forested upland (July 2015)

Results for Performance Standard 3
(A minimum of 50% aerial cover of native facultative wet and wetter species within the emergent zone.):

The cover of native facultative or wetter species within the emergent zone is estimated at 95%. This consists of an approximately two meter of band of tufted hairgrass (*Deschampsia caespitosa*) and slough sedge (*Carex obnupta*) around the outside edge and predominantly common spikerush (*Eleocharis palustris*) within the center of the zone. This area is planted with scattered native woody species as well.

Results for Performance Standard 4
(Density of 250 living Oregon white oak (*Quercus garryana*) trees per acre):

The density of living Oregon white oak (*Quercus garryana*) in the oak upland zone is estimated at 500 plants/acre ($CI_{80\%}$ = 387-612). This greatly exceeds the performance standard for year three.

Results for Performance Standard 5
(The aerial extent of blackberry species and Class A noxious weeds will not exceed 15%):

No Class A weeds were observed on-site during vegetation monitoring. The cover of non-native blackberry species is visually estimated to be less than one percent.

Photo 2
Shrub density in scrub/shrub wetland (July 2015)

Photo 3
Emergent cover in scrub/shrub wetland (July 2015)

Results for Performance Standard 6
(The aerial extent of Reed Canarygrass at the mitigation sites will be managed at a threshold 10% below the existing baseline conditions):

No pre-construction survey of reed canarygrass (*Phalaris arundinacea*) was conducted. However, cover of reed canarygrass remains low across the site. Overall cover is visually estimated at three percent and is concentrated in the northeast corner of the riparian buffer.

Results for Performance Standard 7
(Japanese knotweed shall not be present in any amount within the mitigation sites.

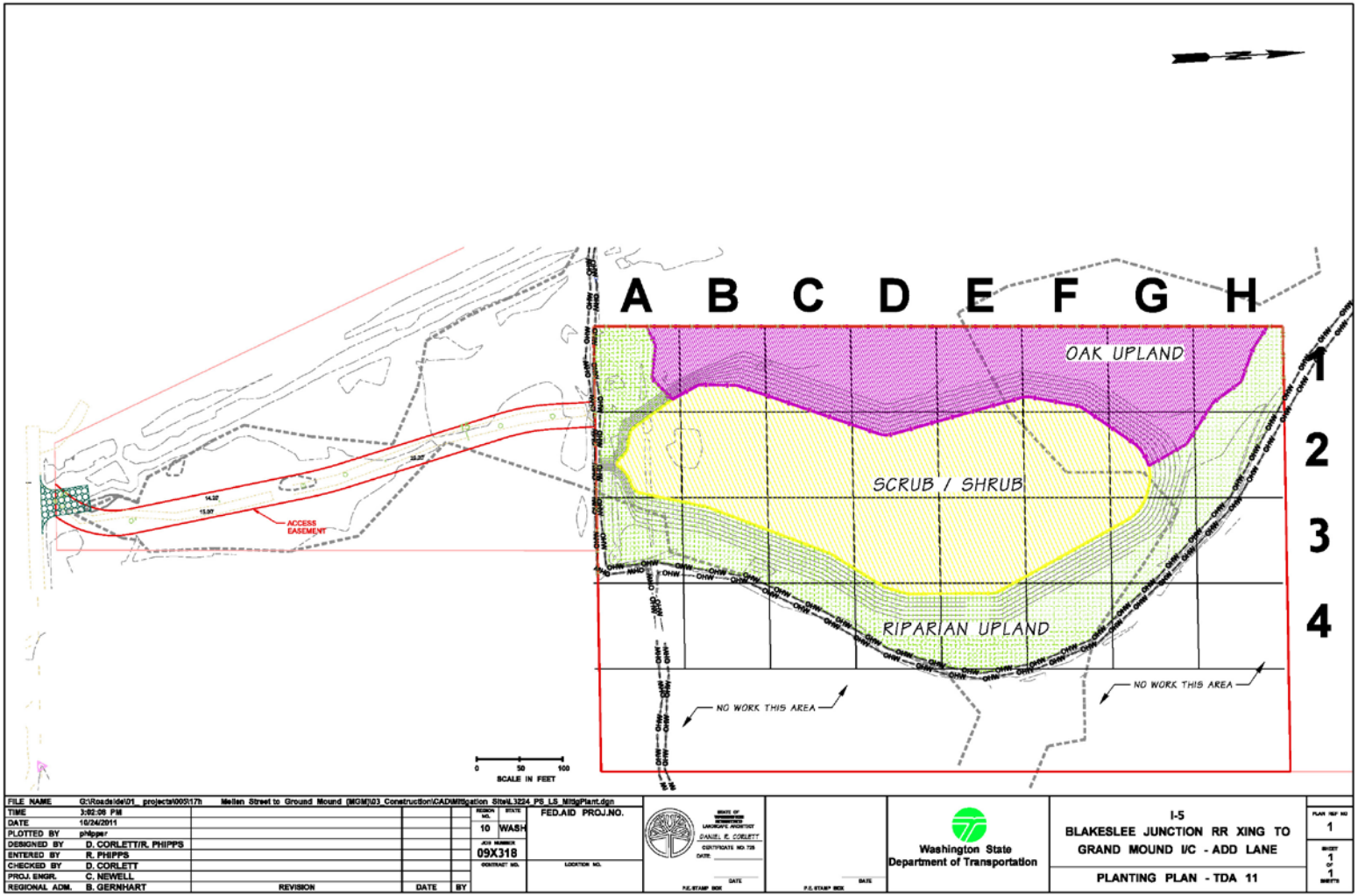
Japanese knotweed was not observed during monitoring activities

What is planned for this site?

The region has plans to continue weed control as necessary.

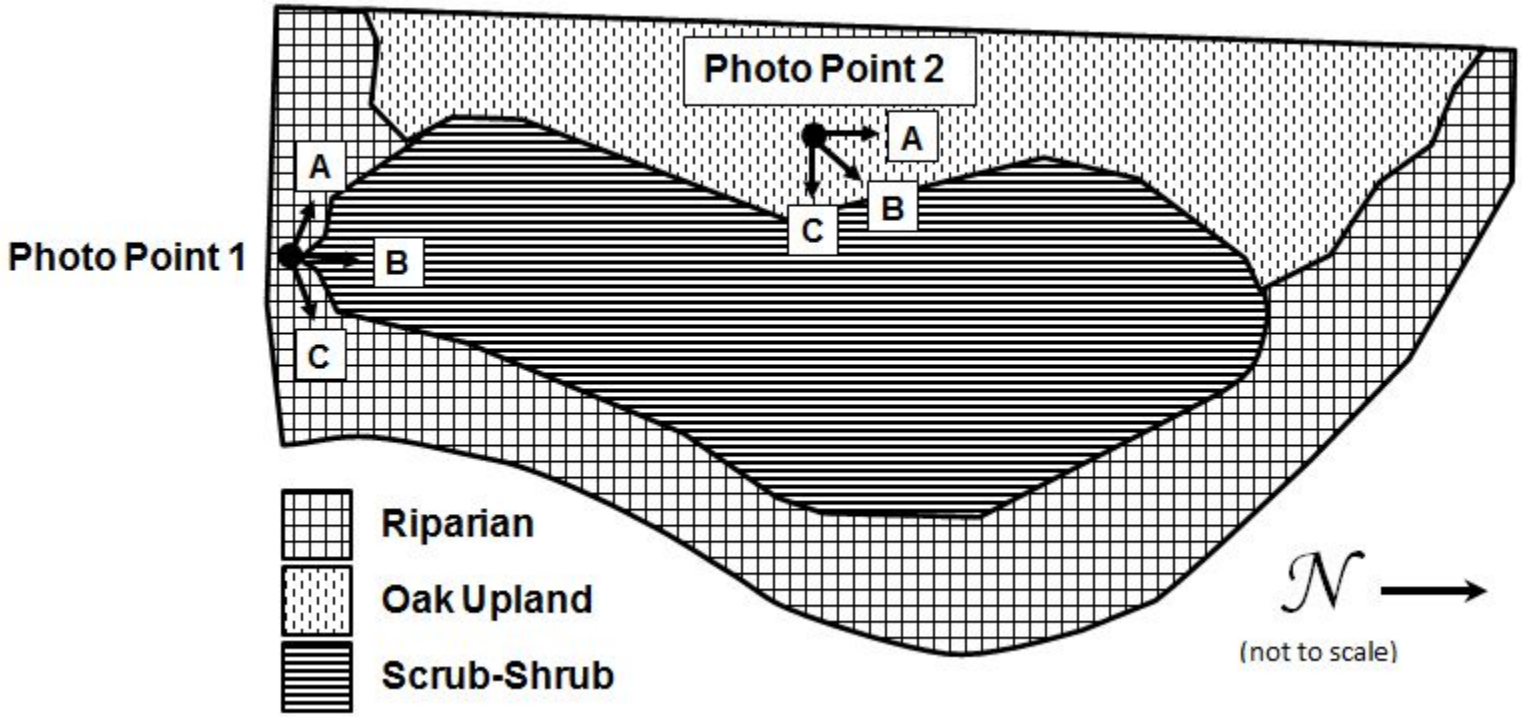
Appendix 1 – As-Built Planting Plan

(from WSDOT 2011)



Appendix 2 – Photo Points

The photographs below were taken from permanent photo-points on July 7, 2015 and document current site development.



The photographs below were taken from permanent photo-points on July 7, 2015 and document current site development.

Photo Point 1a

Photo Point 1b

Photo Point 1c

Photo Point 2a

Photo Point 2b

Photo Point 2c

Driving Directions:
From I-5, take exit 88 for US 12. Go west on US 12 toward Tenino/Aberdeen and then take the first left onto Elderberry St SW/Old HWY 99 SW. In about 2.5 miles, take a left onto 222nd Ave SW. In about 0.3 miles there will be a driveway on the left. Park here and walk to the end of the driveway to access the site.

Literature Cited

1. [USACE] US Army Corps of Engineers. 2009. Department of the Army Individual Permit Number NWS-2008-744-SOD.

2. [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

3. [WSDOT] Washington State Department of Transportation. 2009. Amended April 2009. I-5 Mellen Street to Grand Mound Stage 1 Final Mitigation Plan. Vancouver (WA): Washington State Department of Transportation, Southwest Region.

4. [WSDOT] Washington State Department of Transportation. 2011. I-5 Blakeslee Junction RR Xing to Grand Mound IC - Add Lane TDA 11 As-built Planting Plan.