I-5 Blakeslee to Grand Mound (TDA 12) 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
LLID Number	1230017467746
Construction Date	2011-2012
Monitoring Period	2013 to 2022
Year of Monitoring	3 of 10
Area of Project Wetland Impact[1]	5.61 acres
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 species with more than 60% cover	Tree Density: 328 plants/acre ($CI_{80\%}$ = 264-391) Shrub Density: 3983 plants/acre ($CI_{80\%}$ = 3642-4323) There are more than 2 tree species and 4 shrub species present. No species appears to be more than 60% cover.	Installed plants throughout the site December 14-17, 2015
Density of 4000 shrubs/acre in the scrub-shrub areas. 4 shrub species. No species with more than 60% cover.		
50% cover of FAC or wetter species in the emergent zone	89% cover ($CI_{90\%}$ = 85-94%)	
Blackberries and Class A noxious weeds will not exceed 15% in the scrub-shrub and forest planting areas	No Class A weeds observed. Non-native blackberry cover is less than 5%	Weed control occurred March 18, 2015 and July 1, 2015
Reed Canarygrass will be managed at a threshold 10% below the existing baseline conditions	Reed canarygrass cover is 2%	
Japanese knotweed shall not be present	Japanese knotweed was not observed on site	
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 Year-3 monitoring activities at the Interstate (I) 5 TDA 12 Mitigation Site. Included are a site description, the performance standards, and an explanation of monitoring methods. Monitoring activities included vegetation surveys and photo-documentation on July 6 to 8, 2015.

[3] Estimated values are presented with their corresponding statistical confidence interval. For example, 328 plants/acre ($CI_{80\%}$ = 264-391) means we are 80% confident that the true density value is between 264 and 391 plants/acre.

What is the I-5 TDA 12 Mitigation Site?

This mitigation site (Figure 1) is one of three enhanced floodplain wetlands called Threshold 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 several feet, providing enhanced water quality and water quantity functions. The site also provides diverse vegetation communities and habitat types, enhancing wildlife habitat.

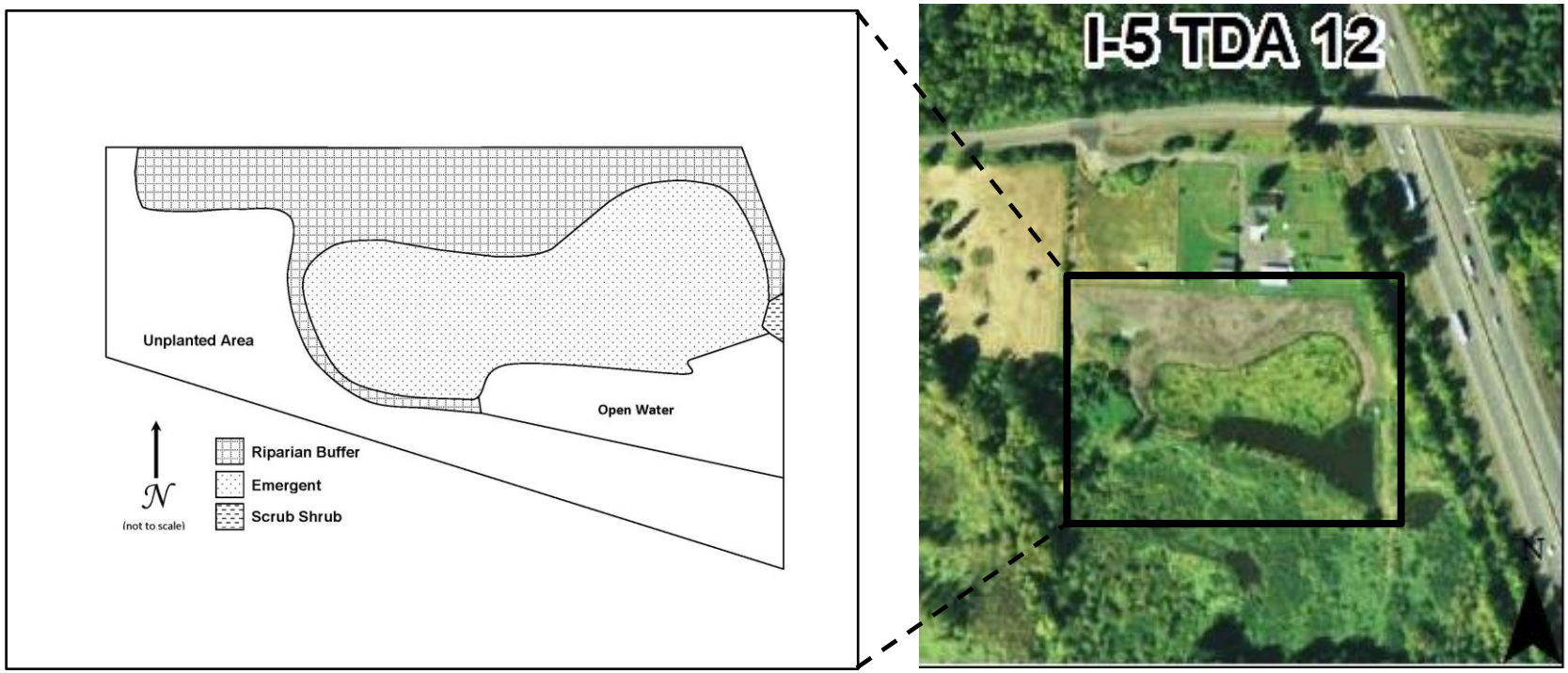


Figure 1 Site Sketch

TDA 12 consists of a riparian upland that slopes down to a large emergent area with high cover of thin stemmed herbaceous vegetation. The southern border of the parcel is adjacent to a stream and existing wetlands, providing hydrologic and wildlife connectivity.

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
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 5
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 6
Japanese knotweed shall not be present in any amount within the mitigation sites.

Performance Standard 7
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 As Built planting plan (WSDOT 20011).

How were the performance standards evaluated?

The table below documents the sampling methodology used for all of the performance standards (PS) required by the mitigation plan or permits. For additional details on the methods see the WSDOT Wetland Mitigation Site Monitoring Methods Paper (WSDOT 2008).

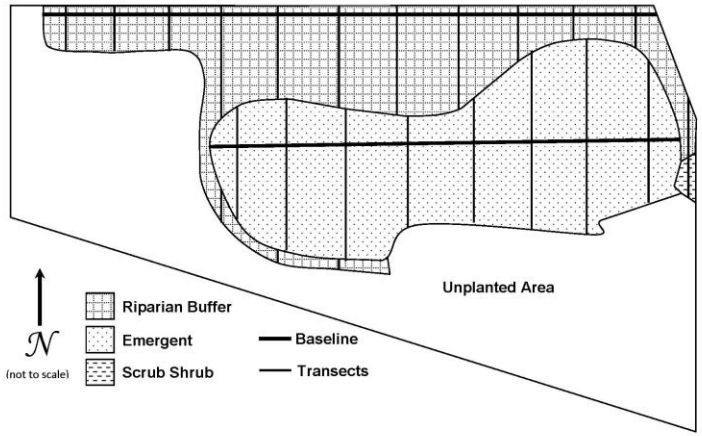


Figure 2 Site Sampling Design (2015)

Placement of Buffer Baseline: The 170 meter long riparian buffer baseline was placed along the fence line on the north side of the site.

Placement of Emergent Baseline: The 132 meter long emergent baseline was placed through the middle of the emergent zone, east to west.

	PS 1&2	PS 3	PS 4,5,6
Attribute	Density	Cover	Cover
Target pop.	Native Woody	Herbaceous	Noxious Weeds/ Invasive sp.
Zone	Buffer	Emergent	SS/PFO
Sample method	UBT	Point Line	Qualitative
SU length	N/A	20	N/A
SU width	1 meter	N/A	N/A
Points per SU	N/A	20	N/A
Total # of SU	19	20	N/A

How is the site developing?

This site is fairly successful despite not meeting the density performance standards for year three. The vegetation communities planned for the site have become established and appear to be thriving.

Some of the functions intended for this site include water quality improvement and flood flow attenuation. The emergent zone has high vegetative cover and supports a diverse herbaceous plant community. This vegetation likely slows water velocity, helps sediment to settle out of the water and can also take up and process the toxicants and nutrients present from stormwater runoff. The grading of the emergent zone has created the opportunity to provide increased water storage capacity in the event of a flood.

The riparian buffer area is dominated by snowberry (*Symphoricarpos albus*) but there are several other shrub and tree species that make up the community in this zone. This zone buffers the emergent wetland and open water areas, decreasing the amount of toxicants and nutrients that reach the water.

The site was intended to provide wildlife habitat and it appears that this function is supported. Several species of birds were observed during our site visit. Small mammal sign, most likely muskrat, was observed in the emergent area. The signs observed include tracks, dens in the slope near the edge of the wetland, and trails from the dens to the water. Native amphibians and deer sign were also observed.

Results for Performance Standards 1 and 2
(Density of 400 trees/acre in the forested areas and 4000 shrubs/acre in the forested and scrub-shrub areas. Two tree species, four shrub species. No species with more than 60% cover):

The density of trees in the scrub-shrub area and the riparian buffer combined is 328 plants/acre ($CI_{80\%}$ = 264-391). Tree species present include bigleaf maple (*Acer macrophyllum*), western red cedar (*Thuja plicata*), Douglas-fir (*Pseudotsuga menziesii*), and Oregon ash (*Fraxinus latifolia*). The red cedar appeared to be suffering some mortality but the Douglas fir plantings were thriving in the sun (Photo 1)

The density of shrubs in the scrub-shrub area and riparian buffer is 3983 plants/acre ($CI_{80\%}$ = 3642-4323). Shrub species present include snowberry (*Symphoricarpos albus*), beaked hazelnut (*Corylus cornuta*), vine maple (*Acer circinatum*), and western serviceberry (*Amelanchier alnifolia*) (Photo 2).

While no one species makes up more than 60 percent cover across the site, snowberry is definitely a dominant species. The scrub-shrub community on this site is so small and so similar in composition to the riparian buffer; it was included in the riparian buffer sample.

Photo 1
Trees in the Riparian Buffer (July 2015)

Photo 2
Woody cover in the Riparian Buffer (July 2015)

Results for Performance Standard 3
(50% cover of FAC or wetter species in the emergent zone):

The emergent zone has 89% cover ($CI_{90\%}$ = 85-94%) and is made up of a diverse community of herbaceous species. Common spikerush (*Eleocharis palustris*) provides a large amount of cover in this zone but is interspersed with simplestem bur-reed (*Sparganium emersum*), slough sedge (*Carex obnupta*), marsh seedbox (*Ludwigia palustris*), and broadleaf cattail (*Typha latifolia*) (Photos 3 and 4).

Results for Performance Standard 4
(Blackberries and Class A noxious weeds will not exceed 15% in the scrub-shrub and forest planting areas):

No Class A weeds were observed on site at the time of monitoring. There were occasional patches of non-native blackberry species interspersed with the woody plantings in the riparian buffer. Cover is qualitatively estimated at less than five percent.

Results for Performance Standards 5 and 6
(Reed Canarygrass will be managed at a threshold 10% below the existing baseline conditions and Japanese knotweed shall not be present):

The reed canarygrass on site is minimal, approximately two percent. It was concentrated along the edge of the wetland as it transitioned into the upland with a couple of small patches in the interior of the emergent zone.

Photo 3
Overview of Emergent cover in Wetland (July 2015)

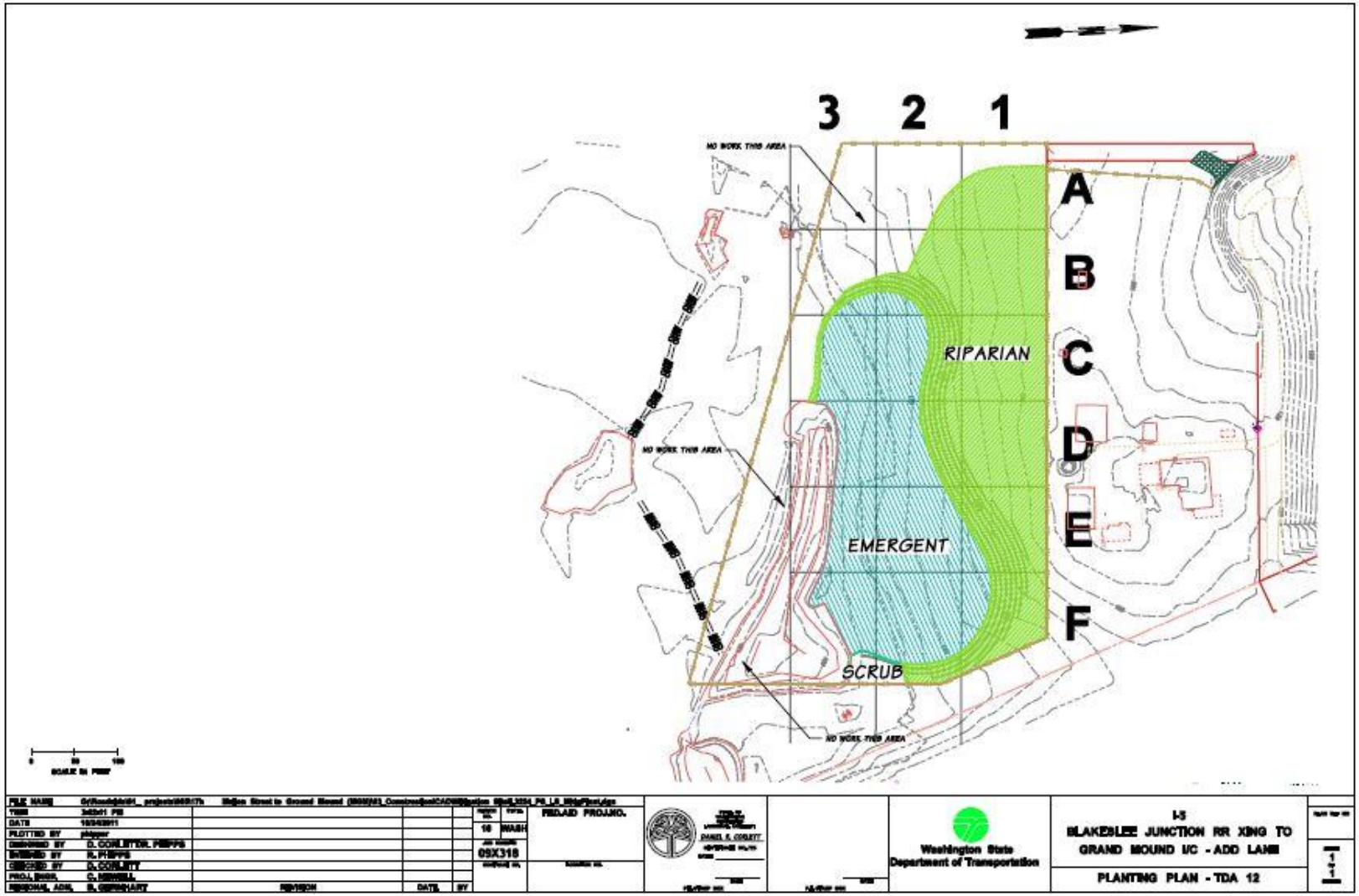
Photo 4
Emergent cover in Wetland (July 2015)

What is planned for this site?

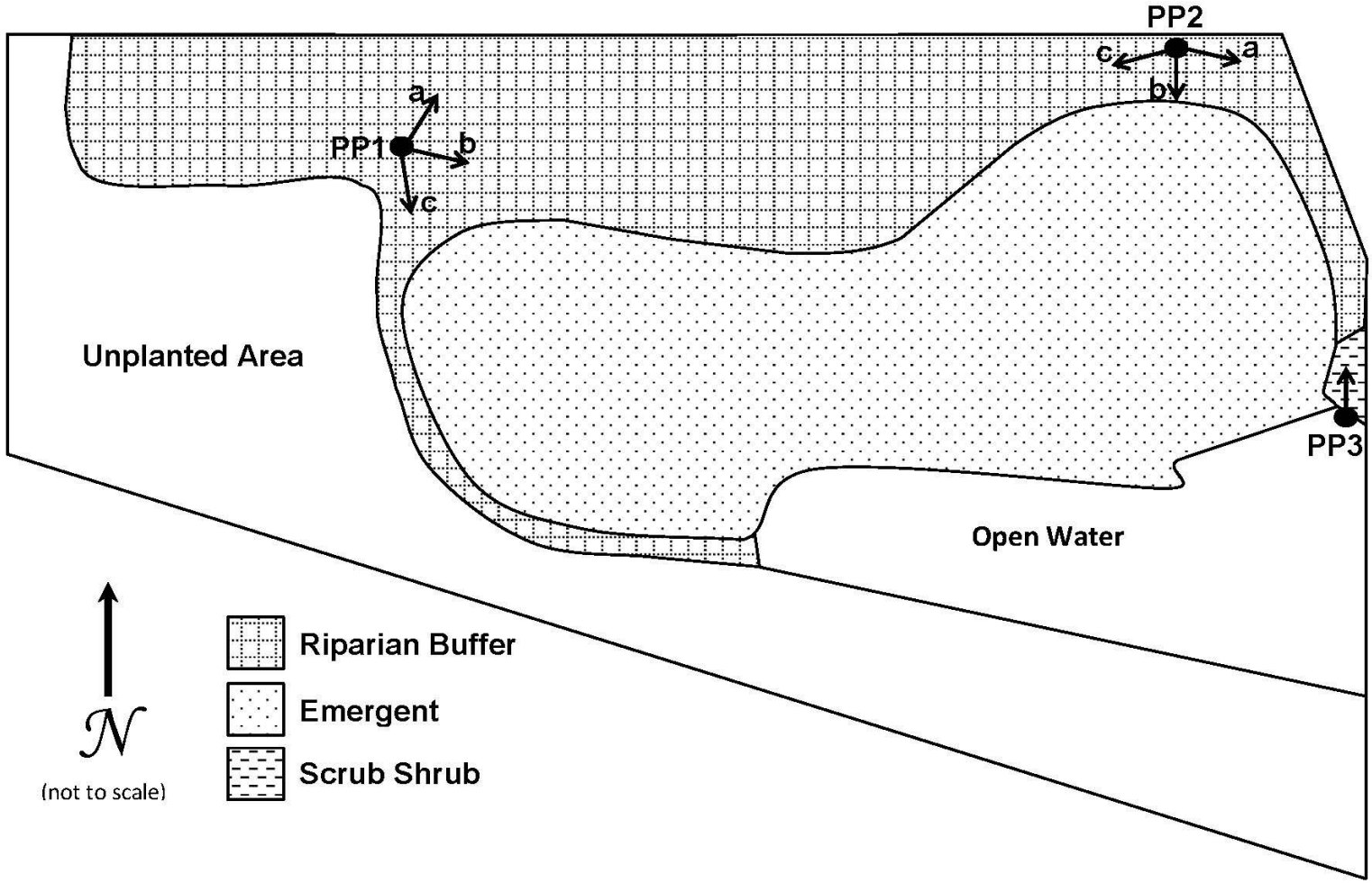
The region has plans to continue weed control and replant areas that experienced die off during the last year.

Appendix 1 – As-Built Planting Plan

(from WSDOT 20011)



Appendix 2 – Photo Points



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

Photo Point 3

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. 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.

3. [WSDOT] Washington State Department of Transportation. 2011. I-5 Blakeslee Junction RR xing to Grand Mound I/C – Add Lane (TDA 12) As-built Planting Plan.

4. [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