

**SR 305 Vicinity Poulsbo South City Limits to Bond Road
(SR 305 Poulsbo and Wall 10) Mitigation Site**

USACE NWP 200500967

Olympic Region

2014 MONITORING REPORT

Wetlands Program

Issued March 2015



**Washington State
Department of Transportation**

Environmental Services Office

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SR 305 Vicinity Poulsbo South City Limits to Bond Road (SR 305 Poulsbo and Wall 10) Mitigation Site

USACE NWP 200500967



General Site Information			
USACE NWP Number	200500967		
Mitigation Location	Southwest of SR 305, near South Fork Dogfish Creek in Poulsbo, Kitsap County		
LLID Number	1226398477475		
Construction Date	2008		
Monitoring Period	2010-2020		
Year of Monitoring	5 of 10		
Area of Project Impact¹	2.05 acres		
Type of Mitigation	Wetland Establishment	Wetland Enhancement	Temporary Impact Re-vegetation
Area of Mitigation	2.33acres	2.20 acres	0.47 acre

¹Impacts and mitigation acreage sourced from Addendum to SR 305 Vicinity Poulsbo South City limits to Bond Road Final Wetland Mitigation Plan. (WSDOT 2007).

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Summary of Monitoring Results and Management Activities (2014)

Performance Standards	2014 Results ²	Management Activities
Wetland Hydrology	Present	
Forested and scrub-shrub communities present with five large woody debris piles and two perch poles	Present	
Native woody cover in the forested and scrub shrub wetland will achieve 40% cover	71% cover (CI _{80%} = 58-84%)	
The underplanted western red cedar (<i>Thuja plicata</i>) in the forested wetland areas will achieve 90% survival.	92% survival	120 Western red cedars planted on 12/24/13
Native woody cover in the buffer will achieve 30% cover	96% cover (CI _{80%} = 94-98%)	
The under planted western hemlock (<i>Tsuga heterophylla</i>) in the buffer areas will achieve 90% survival.	27% survival	45 Hemlocks planted 12/16/14
Noxious weeds will not exceed 20% aerial cover over the entire mitigation site and the stream realignment areas.	Less than 5%	Weed control occurred on 2/12/14, 3/12/14, 5/12/14, 6/25/14, & 10/14/14
Non-native knotweed species shall not be present over the entire mitigation site and the stream realignment areas	Not present	
(Wall 10) Native woody vegetation will achieve a minimum of 45% aerial cover in the riparian and the temporarily impacted retaining wall areas.	92% cover (CI _{80%} = 87-97%)	

Report Introduction

This report summarizes Year-5 monitoring activities at the State Route (SR) 305 Poulsbo Wetland Mitigation Site and Wall 10 re-vegetation area. Included are a site description, the performance standards, an explanation of monitoring methods, and an evaluation of site development. Monitoring activities included vegetation surveys, photo-documentation, and assessments of wetland hydrology. Vegetation surveys and photo documentation occurred July 7-9, 2014, hydrology assessments occurred March 13 and 26, 2014 and April 17, 2014, and re-planting of conifers occurred on December 16, 2014.

² Estimated values are presented with their corresponding statistical confidence interval. For example, 71% (CI_{80%} = 58-84% cover) means we are 80% confident that the true cover value is between 58% and 84%.

What is the SR 305 Poulsbo Mitigation Site?

This 13.6-acre mitigation site (Figure 1) located west of SR 305 focuses on establishing a scrub-shrub and forested wetland and enhancing the existing wetland with woody vegetation to provide structural diversity. This site was created to compensate for the loss of 2.05 acres of wetlands due to road improvements along SR 305. The large seasonally ponded depression and surrounding scrub-shrub and forested areas are designed to provide mitigation for lost wetland functions including flood flow alteration, sediment removal, nutrient and toxicant removal, erosion control and shoreline stabilization, production of organic matter and its export, general habitat suitability, habitat for wetland-associated birds, and general fish habitat.

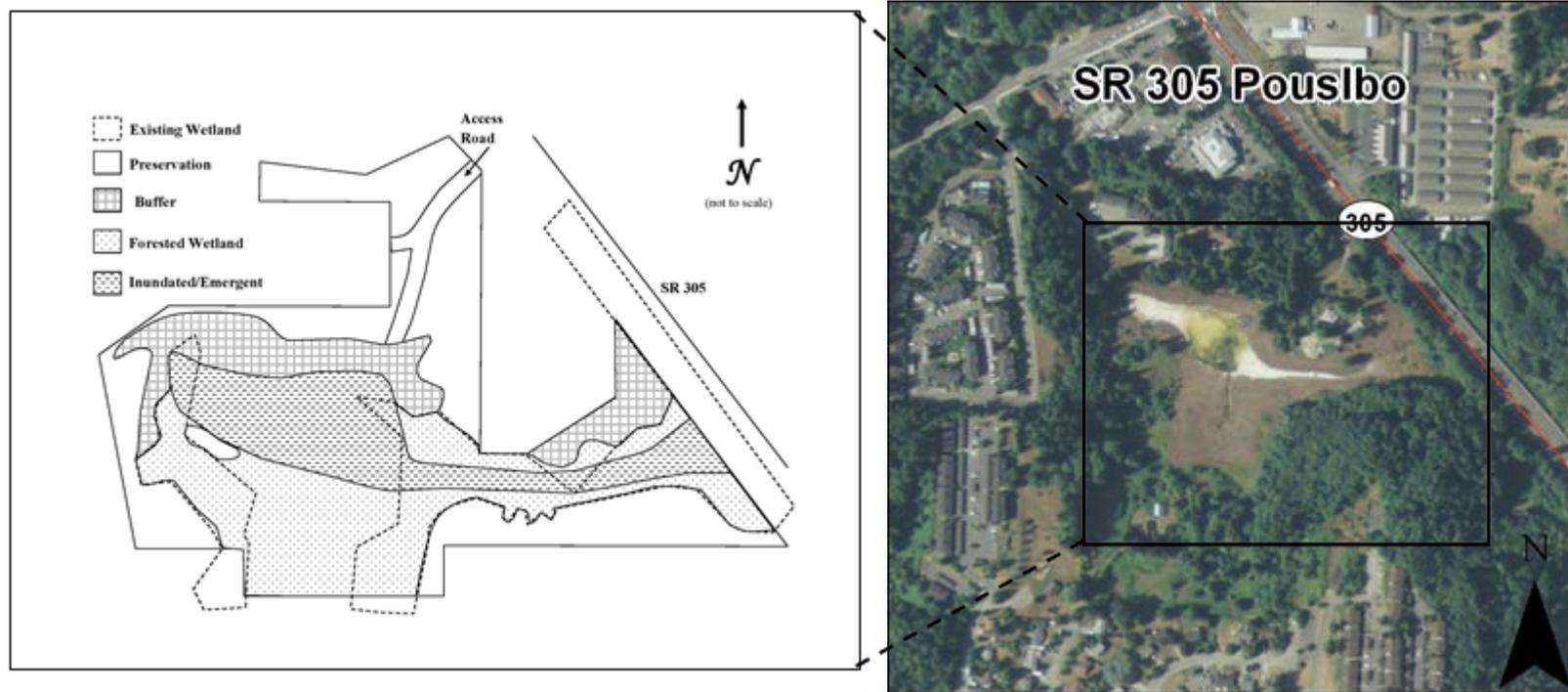


Figure 1 Site Sketch

The SR 305 Poulsbo Mitigation Site includes wetland establishment, wetland enhancement, buffer enhancement, and riparian enhancement adjacent to South Fork Dogfish Creek. Wall 10 is a replanted retaining wall located off site. Appendix 2 includes site directions.

What are the performance standards for this site?

Year 5

Performance Standard 1

The soils in the wetland creation and enhancement areas will be saturated to the surface, or standing water will be present at 12 inches below the surface or less, on consecutive days amounting to at least 12.5 percent of the growing season. Depending on site microclimate, this should be at least 30 consecutive days during the period between March 1 and October 31.

Performance Standard 2

Forested and scrub-shrub vegetation communities should be present within the wetland along with at least five large woody debris piles and two perch poles.

Performance Standard 3

Native woody vegetation in the forested and scrub-shrub wetland areas will achieve a minimum of 40 percent aerial cover.

Performance Standard 4

The underplanted *Thuja plicata* (western red cedar) in the forested wetland areas will achieve 90 percent survival. If all dead *T. plicata* plantings are replaced, the performance standard will be met.

Performance Standard 5

Native woody vegetation in the buffer will achieve a minimum of 30 percent aerial cover.

Performance Standard 6

The underplanted *Tsuga heterophylla* (western hemlock) in the buffer areas will achieve 90 percent survival. If all dead, *T. heterophylla* plantings are replaced, the performance measure will be met.

Performance Standard 7

Noxious weeds will not exceed 20 percent aerial cover over the entire mitigation site and the stream realignment areas.

Performance Standard 8

Polygonum bohemicum (Bohemian knotweed), *Polygonum cuspidatum* (Japanese knotweed), *Polygonum polystachyum* (Himalayan knotweed), and *Polygonum sachalinense* (giant knotweed) shall not be present at the mitigation site or stream realignment areas.

Performance Standard 9

Native woody vegetation will achieve a minimum of 45 percent aerial cover in the riparian and the temporarily impacted retaining wall areas.

Year 10

Performance Standard 1

Native woody vegetation in the buffer will achieve a minimum of 75 percent aerial cover.

Appendix 1 shows the as-built (WSDOT 2009).

How were the performance standards evaluated?

WSDOT staff made observations of wetland hydrology indicators as described in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and *the Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (Version 2.0) (USACE 2010) (Performance Standard 1).

A total count of large woody debris piles and perch poles was completed to determine the presence of habitat structures according to plan (Performance Standard 2).

To evaluate standards for vegetative cover in the wetland, a baseline was established east to west through the middle of the site (Figure 2). Ten sampling transects were randomly placed perpendicular to the baseline using the systematic random method. Fourteen fifteen-meter long sample units were placed randomly along these transects. The line intercept method was used to determine woody cover (Performance Standard 3).

To evaluate standards for vegetative cover in the upland buffer, a segmented baseline was established east to west through the two buffer sections on the north side of the site (Figure 2). Ten sampling transects were randomly placed perpendicular to the baseline using the systematic random method. Ten five-meter long sample units were placed randomly along these transects. The line intercept method was used to determine woody cover (Performance Standard 5).

A total count of all western hemlock (*Tsuga heterophylla*) in the buffer and a total count of all western red cedar (*Thuja plicata*) in the forested wetland were conducted (Performance Standards 4 and 6).

The cover of noxious weeds on site was estimated qualitatively (Performance Standard 7, 8).

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

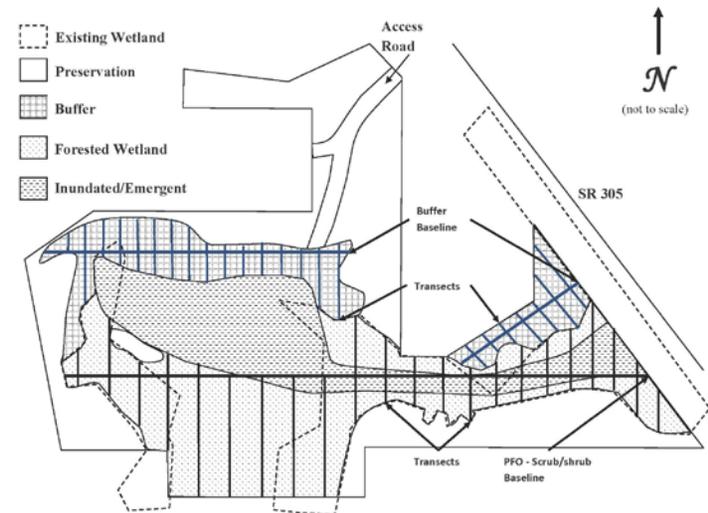


Figure 2 Site Sampling Design (2014)

How is the site developing?

The site continues to develop in a positive trajectory. The forested wetland has been meeting the year 7 performance standard for three straight years and is on course to meet the final year 10 success standards by the next reporting year. The buffer is currently exceeding the final year success standard and has developed into dense and diverse community. Non-native invasive species observed on the mitigation site have been consistently minimal and WSDOT continues to manage for these species

The site is intended to provide wildlife habitat. The interspersed vegetation communities, shallow inundation, and the presence of habitat structures and perch poles supports the achievement of this function.

Twenty-three species of birds have been observed throughout the monitoring visits. Deer, rodents and birds have been observed using the habitat structures. Birds' nests, garter snakes, rabbits, and raccoon tracks have also been observed during monitoring visits. Pacific chorus and red-legged frogs have been observed as well egg masses and tadpoles providing evidence of on-site breeding.

Western red cedar (*Thuja plicata*) and western hemlock (*Tsuga heterophylla*) have been planted underneath the developing deciduous canopy. Deciduous canopies provide a partially shaded canopy under which coniferous trees (e.g., Western red cedar, Western hemlock) can become established. Cedar and hemlock are considered climax species in Western Washington forested wetlands, and as such, mature, coniferous swamps are considered to be high quality wetland systems.

Results for Performance Standard 1
(Wetland Hydrology):

Based on three hydrology visits in the months of March and April 2014, the hydrology standard was not fully achieved. Water was not observed in the top twelve inches of the soil surface on the third visit in well number two. Well number two is located within the narrow constriction between the western and eastern portion of the site at the upper edge of the transition between wetland and buffer (See Appendix 1 for a map of well locations and Appendix 3 for results).

Water was observed in various depths across the site (Photo 1) during each of the three visits, with the PEM being inundated throughout spring into the summer monitoring visit in July.

Results for Performance Standard 2
(Forested and scrub-shrub communities present with five large woody debris piles and two perch poles):

As documented in past reports the site has developed emergent and forested communities. Six habitat structures and two perch poles were observed on site.

Results for Performance Standard 3
(Native woody cover in the forested and scrub-shrub wetland will achieve 40% cover):

Woody cover in the forested wetland is 71 percent cover ($CI_{80\%} = 58-84\%$) (Photo 2). This exceeds year-7 standards for the third year in a row and is just shy of the year 10 success standard. The dominant species include twinberry honeysuckle (*Lonicera involucrata*), Nootka rose (*Rosa nutkana*), redosier dogwood (*Cornus alba*), Sitka willow (*Salix sitchensis*), and red alder (*Alnus rubra*).



Photo 1
Inundation in the wetland (April 2014)

Results for Performance Standard 4

(The underplanted western red cedar in the forested wetland areas will achieve 90% survival.):

A total of 110 western red cedar (*Thuja plicata*) was documented within the forested wetland, a survival of 92 percent. This meets the year-5 performance standard.

Results for Performance Standard 5 and 1(Year-10)

(Native woody cover in the buffer will achieve 20% cover):

Native woody cover in the buffer is 96 percent cover ($CI_{80\%} = 94-98\%$) (Photo 3). This exceeds the year 10 success standard of 75 percent cover. The dominant species in this zone include thimbleberry (*Rubus parviflorus*), red alder (*Alnus rubra*), snowberry (*Symphoricarpos albus*), and oceanspray (*Holodiscus discolor*).

Results for Performance Standard 6

(The under planted western hemlock in the buffer areas will achieve 90% survival.):

A total count of 14 western hemlocks was documented within the upland buffer, a survival of 26 percent. An additional 56 Douglas-fir (*Pseudotsuga menziesii*) were counted in the buffer, constituting a conifer component in the buffer. All the dead plantings were replaced meeting the performance standard.



Photo 2
Woody cover in the Wetland (July 2014)



Photo 3
Woody cover in the buffer (July 2014)

Results for Performance Standard 7 and 8

(Noxious weeds will not exceed 20% cover and Non-native knotweed species shall not be present over the entire mitigation site and the stream realignment areas):

Cover of noxious weeds across the mitigation site is qualitatively estimated to be less than five percent. Species observed include Himalayan blackberry (*Rubus armeniacus*), cutleaf blackberry (*Rubus laciniatus*), bull thistle (*Cirsium vulgare*), and Scotch broom (*Cytisus scoparius*). These species were observed scattered sporadically throughout the wetland area. The Wall 10 area has approximately five percent cover of non-native species. No non-native knotweed species were observed on the site or at the Wall 10 area.

Results for Performance Standard 9

(Native woody vegetation will achieve a minimum of 15% aerial cover in the riparian and the temporarily impacted retaining wall areas

Cover of woody species in the Wall 10 retaining wall area is 92 percent (CI_{80%} = 87-97%) (Photo 4). Red alder (*Alnus rubra*) is dominant in this area with redosier dogwood (*Cornus alba*), and Pacific willow (*Salix lasiandra*) as sub-dominants.



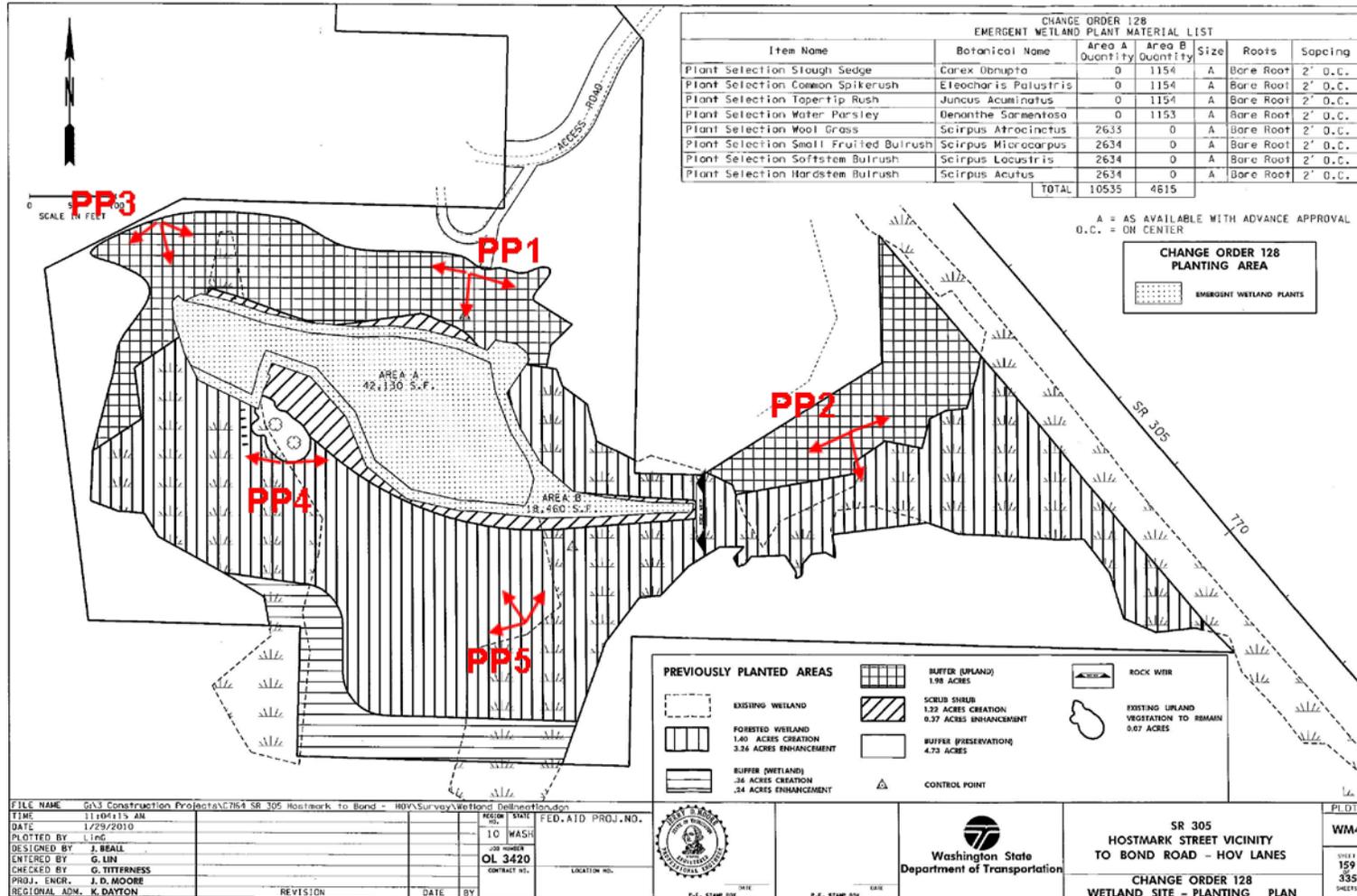
Photo 4
Woody cover in the Wall 10 re-vegetation area (July 2014)

What is planned for this site?

The region will continue weed control on the site as needed.

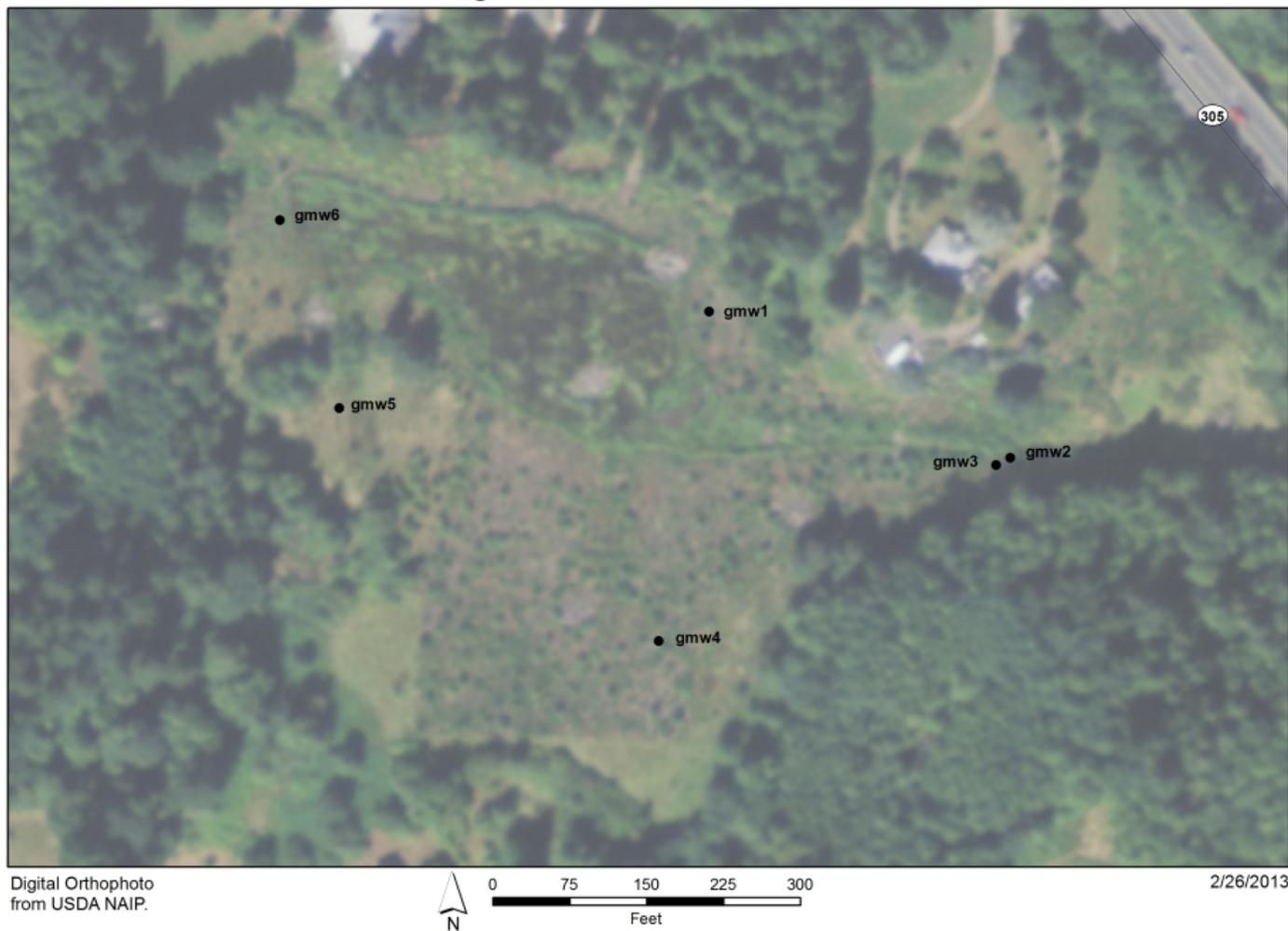
Appendix 1 – As-Built with Photo Point Locations Hydrology Pit or Well Locations

(from WSDOT 2009)



Ground Monitoring Well Locations

GPS Data - SR 305 Poulsbo Mitigation Site, 2/21/2013



Appendix 2 – Photo Points

The photographs below were taken from permanent photo-points on July 9, 2014 and document current site development.

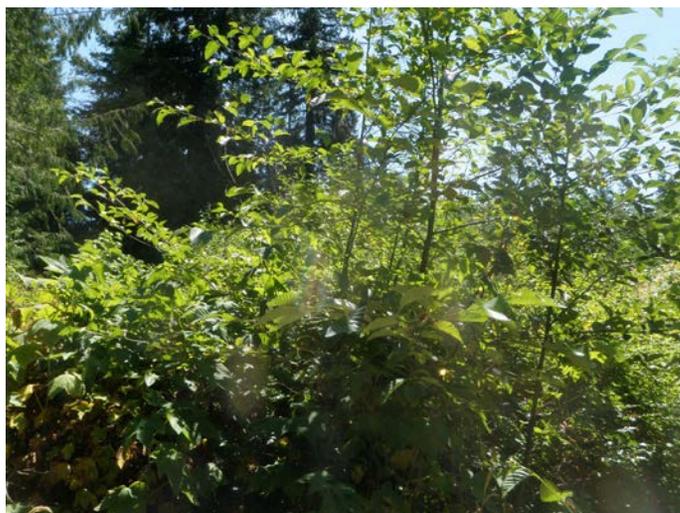


Photo Point 1a



Photo Point 1b



Photo Point 1c

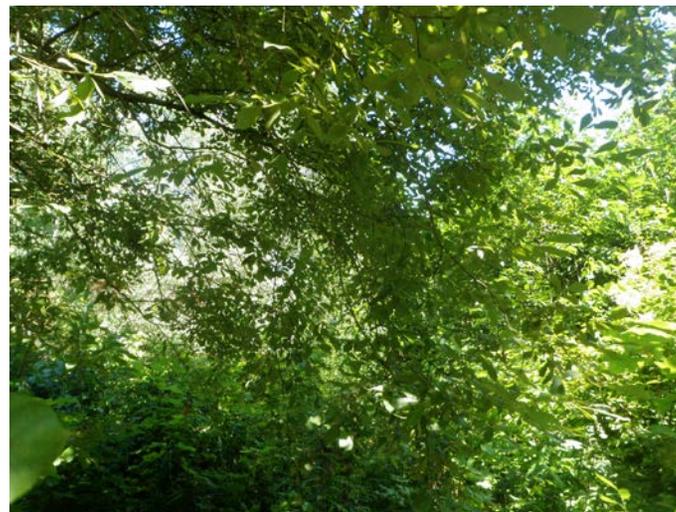


Photo Point 2a

The photographs below were taken from permanent photo-points on July 9, 2014 and document current site development.



Photo Point 2b



Photo Point 2c



Photo Point 3a



Photo Point 3b

The photographs below were taken from permanent photo-points on July 9, 2014 and document current site development.



Photo Point 3c



Photo Point 4a



Photo Point 4b



Photo Point 5a

The photographs below were taken from permanent photo-points on July 9, 2014 and document current site development.



Photo Point 5b



Photo Point 5c

Driving Directions:

Take highway 3 up to SR 305. Exit on the off ramp for SR 305 towards Poulsbo. At the end of the ramp, take a right onto SR 305. Continue through two lights on SR 305: Viking Way and SR 307/Bond Rd. After the Bond Rd/SR 307 light, there will be a mailbox and driveway on the right hand side of the road. The site is located up this first driveway before you reach the guardrail. Turn right on the driveway and park on the left hand side of the circular driveway at the end (so you don't block the neighbor).

Appendix 3 – Data Tables

Table 1 Hydrology Observations

Date	Surface Observations	Water Level (inches below soil surface unless otherwise noted)	
March 13, 2014	Inundation in the PEM and within the channel that flows east through the site. Water is also seeping through the soil on the slope along the southeastern border of the site.	Well 1	2.5"
		Well 2	9"
		Well 3	1"
		Well 4	2.5"
		Well 5	3.5"
March 26, 2014	Inundation in the PEM.	Well 1	2"
		Well 2	11"
		Well 3	0.5"
		Well 4	1.5"
		Well 5	6.5"
April 1, 2014	Inundation in the PEM, algal mats and drainage patterns observed.	Well 1	4"
		Well 2	17"
		Well 3	6.5"
		Well 4	0"
		Well 5	12"

Literature Cited

1. Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Vicksburg (MS): US Army Engineer Waterways Experiment Station. Technical Report Y-87-1.
2. [USACE] US Army Corps of Engineers. 2006. Department of the Army Individual Permit Number 200500967.
3. [USACE] US Army Corps of Engineers. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0), Wakeley JS, Lichvar RW, Noble CV, editors. Vicksburg (MS): US Army Engineer Research and Development Center. ERDC/EL TR-10-3. Available at: http://www.usace.army.mil/Portals/2/docs/civilworks/regulatory/reg_supp/west_mt_finalsupp.pdf
4. [WSDOT] Washington State Department of Transportation. 2006. SR 305 Vicinity Poulsbo South City limits to Bond Road Final Wetland Mitigation Plan. Tumwater (WA): Washington State Department of Transportation, Olympic Region.
5. [WSDOT] Washington State Department of Transportation. 2007. Addendum to SR 305 Vicinity Poulsbo South City limits to Bond Road Final Wetland Mitigation Plan. Tumwater (WA): Washington State Department of Transportation, Olympic Region.
6. [WSDOT] Washington State Department of Transportation. 2009. SR 305 Vicinity Poulsbo South City Limits to Bond Road Mitigation Site As-built Planting Plan.
7. [WSDOT] Washington State Department of Transportation. 2010. SR 305 Vicinity Poulsbo South City Limits to Bond Road Mitigation Site Change Order 128 Wetland Planting Plan.
8. [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>