

**SR 410 214th Ave E to 234th Ave E Widening
(Fennel Creek 2) Mitigation Site**

USACE NWP (14) NWS-2009-280

Olympic Region

2015 MONITORING REPORT

Wetlands Program

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Environmental Services Office

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General Site Information		
USACE NWP 14 #	NWS-2009-280	
HPA Permit #	116556-1	
Mitigation Location	North of the intersection of Old Buckley Highway and Angeline Rd E near Bonney Lake, Pierce Co.	
LLID Number	1221749471762	
Construction Date	2010-2012	
Monitoring Period	2013-2022	
Year of Monitoring	3 of 10	
Type of Project Impact	Wetland	Buffer
Area of Project Impact¹	0.16 acre	3.05 acres
Type of Mitigation	Flood Storage Creation	Riparian Enhancement
Planned Area of Project Mitigation²	0.23 acre	1.16 acres

¹ Area of project impact numbers from USACE 2009.

² Area of mitigation type numbers from WSDOT 2009

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Summary of Monitoring Results and Management Activities (2015)

Performance Standards	2015 Results ³	Management Activities
A three strand wire fence and sensitive area signs will be present along the outer buffer limits/mitigation site boundary.	Present	
At least 0.23 acres (10,095 ft ²) of the flood storage creation area at the Fennel Creek 2 mitigation site will be inundated during rain events or 100 year flood events for Fennel Creek or the Lower Puyallup River.	0.52 acre inundated on 11/19/2015	
Achieve a density of 6 native woody plants, including native natural recruitment, per 100 ft ² in the tree and shrub planting areas.	9.9 plants/100ft ² (CI _{80%} = 9.0-10.9)	Planting occurred on 2/23, 2/24, and 5/12 in 2015.
Native vegetation in the emergent planting areas will achieve a minimum of 10% aerial cover.	79% cover (CI _{80%} = 76-82%)	
Noxious weeds will not exceed 20% aerial cover over the entire mitigation site.	<5% cover	Weed control activity occurred on 4/20/2015.
Bohemian knotweed (<i>Reynoutria bohemica</i>), Japanese knotweed (<i>Reynoutria japonica</i>), Himalayan knotweed (<i>Reynoutria polystachyum</i>), and giant knotweed (<i>Reynoutria sachalinensis</i>) shall not be present at the mitigation site.	None observed	

Report Introduction

This report summarizes third-year (Year-3) monitoring activities at the State Route (SR) 410 Fennel Creek 2 Mitigation Site. Included are a site description, the performance standards, an explanation of monitoring methods, and an evaluation of site development. Monitoring activities included vegetation surveys and photo-documentation on August 24 and 25, 2015, and assessments of wetland hydrology on November 19, 2015.

³Estimated values are presented with their corresponding confidence interval. For example, 9.9 plants/100ft² (CI_{80%} = 9.0-10.9) means we are 80% confident that the true density value is between 9.0 and 10.9 plants/100ft².

What is the SR 410 Fennel Creek 2 Mitigation Site?

This 21.3-acre mitigation site (Figure 1) is a linear riparian area adjacent to Fennel Creek, just upstream of the old WSDOT Fennel Creek Mitigation Site. This site was created to compensate for the loss of 0.16 acre of wetlands and 3.05 acres of buffer due to improvements to SR 410 from mileposts 15.61 to 17.10. The flood storage creation areas, enhanced riparian and upland areas, and enhanced stream features are designed to provide mitigation for lost hydrologic, water quality, and wildlife habitat functions.



Figure 1 Site Sketch

The SR 410 Fennel Creek 2 Mitigation Site contains woody and herbaceous vegetation on either side of Fennel Creek. Appendix 2 includes site directions.

What are the performance standards for this site?

Year 3

Performance Standard 1

A three strand wire fence and sensitive area signs will be present along the outer buffer limits/mitigation site boundary.

Performance Standard 2

At least 0.23 acre (10,095 square feet) of the flood storage creation area at the Fennel Creek 2 mitigation site will be inundated during rain events or 100 year flood events for Fennel Creek or the Lower Puyallup River.

Performance Standard 3

Achieve a density of six native woody plants, including native natural recruitment, per 100 square feet in the tree and shrub mix planting areas (Riparian Mix A and Riparian Mix B planting areas).

Performance Standard 4

Native vegetation in the emergent planting areas will achieve a minimum of 10 percent aerial cover.

Performance Standard 5

Noxious weeds will not exceed 20 percent over the entire mitigation site.

Performance Standard 6

Bohemian knotweed, Japanese knotweed, Himalayan knotweed, and giant knotweed shall not be present at the mitigation site.

Appendix 1 shows the planting plan (As Built) (WSDOT 2009).

How were the performance standards evaluated?

WSDOT staff collected hydrology data using methods described in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987), *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (Version 2.0) (USACE 2010) and a Global Positioning System (Trimble Mapping Grade) (Performance Standard 2).

The tables below document the sampling methodology utilized for all other 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).

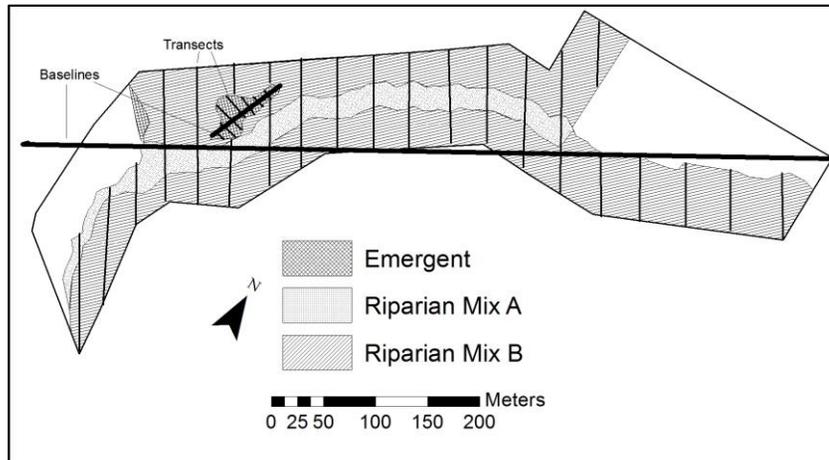


Figure 2 Site Sampling Design (2015)

Placement of Baseline: The baseline for the riparian planting areas was set-up along the eastern edge of the site along the fence line (667 meters, 23 transects). A separate baseline was used for the emergent area and was placed through the center of this zone (77 meters, 15 transects).

	PS 1	PS 3	PS 4	PS 5&6
Attribute	Fence	Density	Cover	Cover
Target pop.	NA	Native Woody	Native Herbaceous	Noxious Weeds
Zone	Entire Site	Riparian	Emergent	Entire Site
Sample method	Qualitative	UBT	Point intercept	Qualitative
SU length	NA	NA	5m	NA
SU width	NA	1m	NA	NA
Points per SU	NA	NA	20	NA
Total # of SU	NA	23	23	NA

How is the site developing?

This site is developing as intended. Planted woody species are established across the riparian area, filling in the areas between the existing mature vegetation. A diverse community of planted as well as existing emergent vegetation is also present across much of the site. Invasive species were observed, but in limited quantities. No Class A noxious species are currently present. Shallowly inundated areas observed on November 19, 2015 indicate that the flood storage functions are being provided. Hummingbirds, deer, frogs, a red-tailed hawk, swallows, and a garter snake were observed.

Results for Performance Standard 1

(A three strand wire fence and sensitive area signs present):

The fence and signs are present and intact (Photo 1).

Results for Performance Standard 2

(0.23 acres inundated in the flood storage creation area):

An area of 0.53 acre of inundation was observed in the flood storage creation area at the time of monitoring (November 19, 2015) (Appendix 3) (Photo 2).



**Photo 1
Fence with sensitive area signs (August 2015)**



**Photo 2
Inundated flood storage creation area
(November 2015)**

Results for Performance Standard 3

(Density of 6 native woody plants/100ft² in the tree and shrub mix planting areas):

Density of native woody plants in the riparian planting areas is estimated at 9.9 plants/100ft² (CI_{80%}= 9.0-10.9) (Photo 3). This value exceeds the performance standard target. Plantings near the creek (Riparian mix A) are not as dense as the rest of the site (Riparian mix B). Dominant species include black cottonwood (*Populus balsamifera*), willows (*Salix* species), and roses (*Rosa* species).

Results for Performance Standard 4

(10% cover native vegetation in the emergent planting areas):

Cover of native vegetation in the emergent planting area is estimated at 79 percent (CI_{80%}= 76-82%) (Photo 4). This value exceeds the performance standard target. Dominant species include slough sedge (*Carex obnupta*) and blunt spikerush (*Eleocharis obtusa*).

Results for Performance Standard 5

(No more than 20% cover noxious weeds across the entire site):

Cover of noxious weeds across the entire site is qualitatively estimated at less than five percent. Reed canarygrass (*Phalaris arundinacea*) is concentrated along the creek banks. Bull thistle (*Cirsium vulgare*) and Canada thistle (*Cirsium arvense*) are scattered throughout the site individually and in small clusters. A few Himalayan blackberry (*Rubus armeniacus*), cutleaf blackberry (*Rubus laciniatus*), paleyellow iris (*Iris pseudacorus*), Scotch broom (*Cytisus scoparius*), and climbing nightshade (*Solanum dulcamara*) individuals were also observed.



Photo 3
Density in the Riparian Area (August 2015)



Photo 4
Cover in the Emergent Planting Area (August 2015)

Results for Performance Standard 6

(Bohemian knotweed, Japanese knotweed, Himalayan knotweed, and giant knotweed shall not be present):

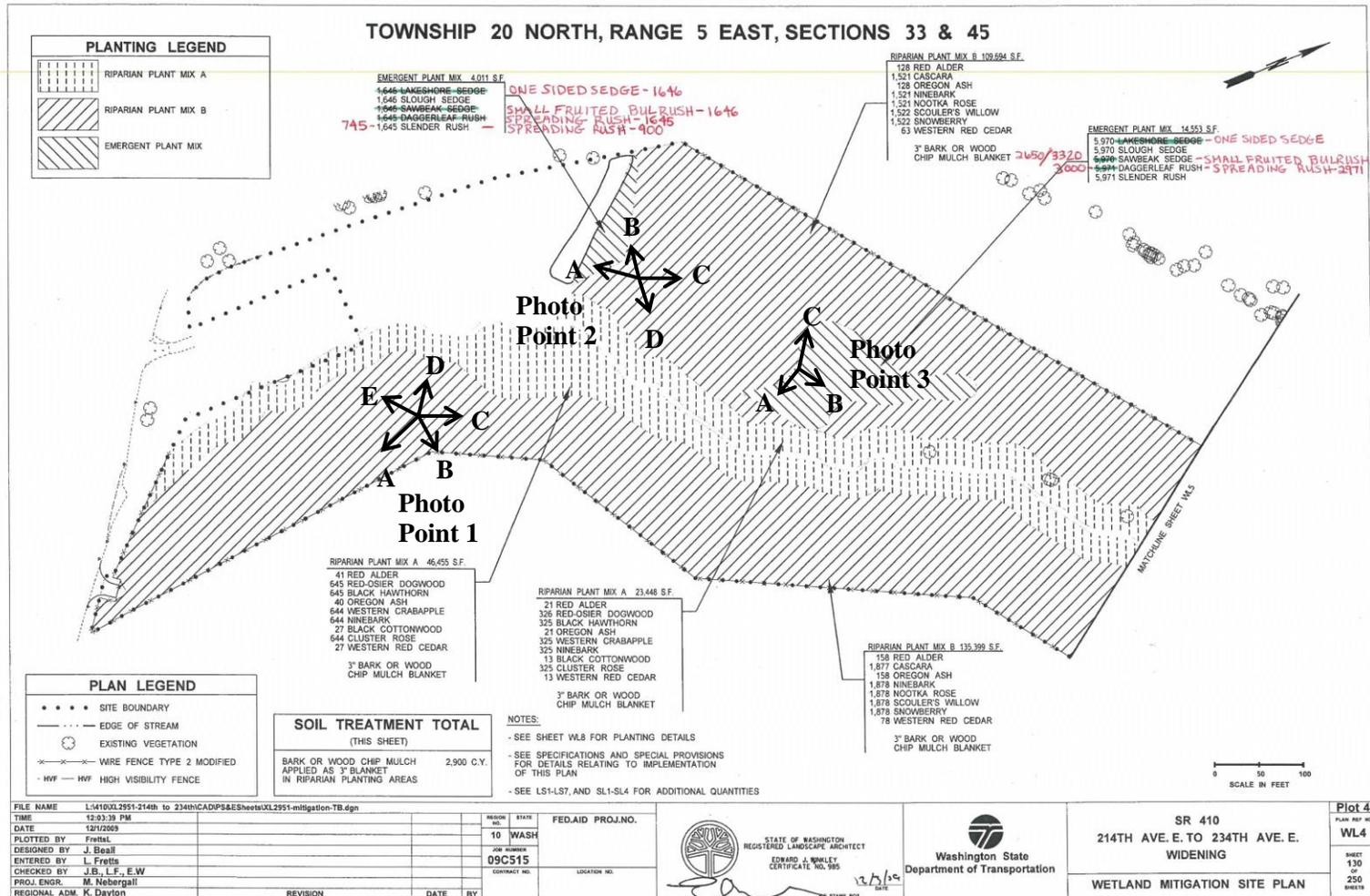
No knotweed was observed on the entire mitigation site.

What is planned for this site?

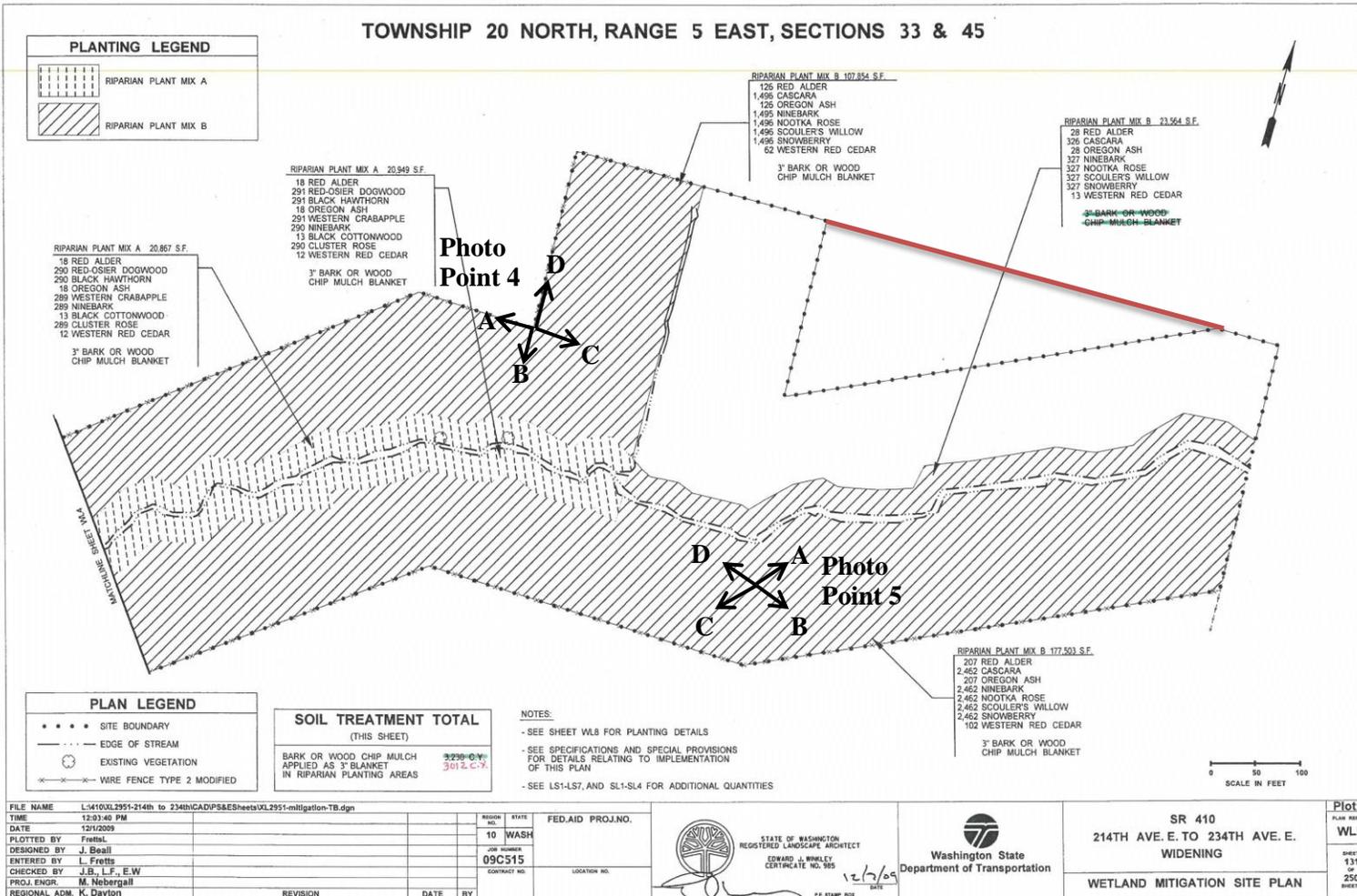
Routine weed control will continue on this site.

Appendix 1 – As-Built Planting Plan with Photo Point Locations

(from WSDOT 2012)



TOWNSHIP 20 NORTH, RANGE 5 EAST, SECTIONS 33 & 45



FILE NAME	L:\410\XL2951-214th to 234th\CAD\PS&ESheets\XL2951-mitigation-TB.dgn
TIME	12:03:40 PM
DATE	12/1/2009
PLOTTED BY	Fretts
DESIGNED BY	J. Beall
ENTERED BY	L. Fretts
CHECKED BY	J.B., L.F., E.W
PROJ. ENGR.	M. Hebergall
REGIONAL ADM.	K. Dayton
REVISION	DATE BY

REGION NO.	10
STATE	WASH
JOB NUMBER	09C515
CONTRACT NO.	
LOCATION NO.	

FED.AID PROJ.NO.	
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STATE OF WASHINGTON
REGISTERED LANDSCAPE ARCHITECT
EDWARD J. WINKLEY
CERTIFICATE NO. 985
12/7/09
P.E. STAMP BOX

Washington State
Department of Transportation

SR 410
214TH AVE. E. TO 234TH AVE. E.
WIDENING
WETLAND MITIGATION SITE PLAN

Plot 5
PLAN REF NO
WL5
SHEET
131
OF
250
SHEETS

Appendix 2 – Photo Points

The photographs below were taken from permanent photo-points on August 25, 2015 and document current site development.



Photo Point 1a



Photo Point 1b



Photo Point 1c



Photo Point 1d



Photo Point 1e



Photo Point 2a



Photo Point 2b



Photo Point 2c



Photo Point 2d



Photo Point 3a



Photo Point 3b



Photo Point 3c



Photo Point 4a



Photo Point 4b



Photo Point 4c



Photo Point 4d



Photo Point 5a



Photo Point 5b



Photo Point 5c



Photo Point 5d

Driving Directions:

From SR 410 in Bonney Lake, turn left onto 192nd Avenue East. Proceed about a half mile and the site will be just across the highway and to the left.

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. Available at: <http://el.ercd.usace.army.mil/elpubs/pdf/wlman87.pdf>
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5. [WSDOT] Washington State Department of Transportation. 2009. SR 410 214th Ave E to 234th Ave E Widening (Fennel Creek 2) Final Environmental Mitigation Plan. Olympia (WA): Washington State Department of Transportation, Olympic Region.
6. [WSDOT] Washington State Department of Transportation. 2012. SR 410 214th Ave E to 234th Ave E Widening (Fennel Creek 2) Mitigation Site As-built Planting Plan.
7. [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>