Fidalgo Bay Mitigation Site

SR 20: Quiet Cove to SR 20 Spur Safety Improvements (MP 44.65 to MP 47.87) WIN # A02027C USACE NWP (23) 200601135

SR 11 Chuckanut Park and Ride MP 0.0 WIN # A01100G USACE NWP (12, 18) NWS-2008-460

SR 9 Martin Road to Thunder Creek WIN # A00942A WADOE AO # 6581

Northwest Region

2014 MONITORING REPORT

Wetlands Program

Issued March 2015

Washington State Department of Transportation

Environmental Services Office

Author:
Tom Mohagen

Editor:
Tony Bush

For additional information about this report or the WSDOT Wetlands Program, please contact:

Tony Bush, Wetlands Program
WSDOT, Environmental Services Office
P. O. Box 47332, Olympia, WA 98504
Phone: 360-570-6640 E-mail: busht@wsdot.wa.gov

Monitoring reports are published on the web at: http://www.wsdot.wa.gov/Environment/Wetlands/Monitoring/reports.htm

Fidalgo Bay: SR 20: Quiet Cove to SR 20 Spur Safety Improvements Mitigation Site
USACE NWP (23) 200601135

SR 11 Chuckanut Park and Ride MP 0.0 USACE NWP (12, 18) NWS-2008-460

SR 9 Martin Road to Thunder Creek WADOE AO # 6581

General Site Information				
USACE NWP #	(23) 200601135**,** (12, 18) NWS-2008-460-SOD			
WADOE AO	6581			
Mitigation Location	Within the city limits of Anacortes adjacent to Fidalgo Bay			
LLID #	1225719484631			
Construction	2009			
Monitoring Period	2010-2019			
Year of Monitoring	5 of 10			
Area of Project Impact	Wetland		Buffer	Stream Buffer[1]
	0.70 acre		0.53 acre	0.28 acre
Type of Mitigation	Wetland Establishment	Wetland Enhancement	Buffer Enhancement	Stream Enhancement
Area of Mitigation[2]	1.39 acres	0.45 acre	1.46 acres	1.18 acres

[1]WSDOT enhanced 0.99 (0.28 of which is restoration) acre of riparian buffer at Meadow Creek and 0.19 acre of riparian buffer at unnamed creek to mitigate for stream buffer impacts.

[2] For a breakdown of the permanent wetland impacts and wetland mitigation acreage for each project, see Appendix 3, Table 1. Impacts acreage source USACE (2006), USACE (2008), and Ecology (2009). Mitigation acreage source WSDOT (2007).

This Page Intentionally Left Blank

Summary of Monitoring Results and Management Activities (2014)

Performance Standards (Year-10, 2019)	2014 Results	Management Activities
1.39 acres of re-established wetland	Present	
60% cover of native woody vegetation in the scrub/shrub wetland community	80% native cover	
80% cover of native herbaceous cover in the emergent wetland	90% native cover	
50% cover of native woody vegetation in the upland buffer community	70% native cover	
No more than 30% cover by non-native invasive species across the entire mitigation site.	<5% invasive cover	8 separate visits for weed control throughout 2014

Report Introduction

This report summarizes Year-5 monitoring activities at the State Route (SR) 20 Fidalgo Bay Mitigation Site. Included are a site description, the performance standards, an explanation of monitoring methods, and an evaluation of site success. Monitoring activities included vegetation surveys and photo-documentation. Vegetation monitoring occurred on August 13, 2014.

What is the SR 20 Fidalgo Bay (Quiet Cove) Mitigation Site?

This 5.95-acre mitigation site (Figure 1) is a combination of wetland enhancement, establishment, and existing wetland located southeast of Fidalgo Bay at the corner of SR 20 and March Point Road in the city of Anacortes. This site was created to compensate for the loss of 0.70 acre of wetlands due to road improvements along State Routes 9, 11, and 20. The seasonally ponded depressions and surrounding scrub-shrub areas are designed to provide mitigation for lost wetland functions including wildlife habitat, biological support, and storm water control.

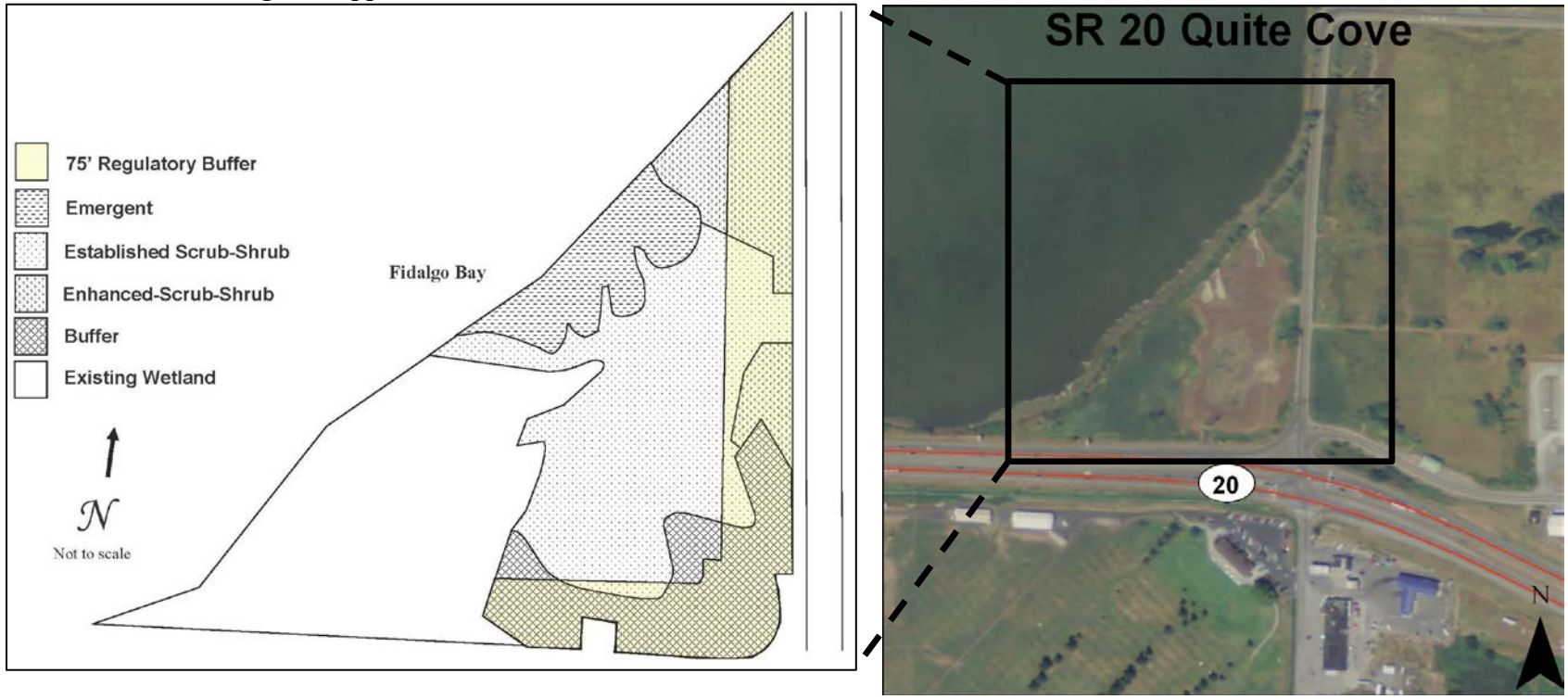


Figure 1 Site Sketch

The SR 20 Fidalgo Bay (Quiet Cove) Mitigation Site contains three established emergent finger-like depressions that are tidally influenced from Fidalgo Bay. Scrub-shrub areas flank the finger-like depressions and buffer enhancement borders the site to the east and south. Appendix 2 includes site directions.

What are the performance standards for this site

Year-10 (2019)

Performance Standard 1
The wetland areas will be delineated using current methods. The mitigation site will contain 1.39 acres of re-established wetland.

Performance Standard 2
Native facultative or wetter woody species will achieve a minimum of 60 percent coverage in the scrub-shrub wetland communities. Native colonizing vegetation will be included in these coverage calculations.

Performance Standard 3
Native facultative or wetter herbaceous vegetation will achieve a minimum of 80 percent coverage in the emergent wetland communities. Native colonizing vegetation will be included in this coverage calculation.

Performance Standard 4
Native woody species will achieve a minimum of 50 percent coverage in the upland buffer community. Native colonizing vegetation will be included in this coverage calculation.

Performance Standard 5
No more than thirty percent cover by non-native invasive species as listed in Table 10 (Appendix 3, Table 2) across the entire mitigation site. Japanese knotweed and purple loosestrife shall not be present on the mitigation site. The presence of these two species will initiate the invasive species contingency measures.

Appendix 1 shows the as built (WSDOT 2007).

How were the performance standards evaluated?

The site has developed more rapidly than anticipated and has been meeting the year-10 final year standards for the buffer, emergent cover, and wetland woody cover, for two years. On April 23, 2014 a request to discontinue quantitative sampling for all vegetative performance standards was sent to USACE the Department of Ecology, this request was accepted on April 28, 2014 by the Department of Ecology and May 22, 2014 by USACE. All vegetative performance standards were assessed qualitatively.

WSDOT staff performed a wetland delineation 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 Standards 1). The site was delineated on May 6, 2013 and has met the final-year year ten wetland acreage requirements. On February 20, 2014 a request to discontinue hydrology monitoring was sent to USACE and the Department of Ecology, this request was accepted on February 20, 2014 by USACE and on February 24, 2014 by the Department of Ecology.

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

How is the site developing?

This mitigation site is developing as planned and in the fifth year of monitoring the site is already a success meeting all final-year performance standards for the third year in a row.

The emergent zone has a diverse mix of salt tolerant and fresh water herbaceous species. Species observed in this area include silverweed cinquefoil (*Argentina anserina*), seacoast bulrush (*Schoenoplectus maritimus*), Lyngbye's sedge (*Carex lyngbyei*), and seaside arrow-grass (*Triglochin maritima*). These are all salt tolerant species (Hutchinson, 1988) indicating that the area is influenced by salt water seeping through at the base of the dike. The areas surrounding the depressions are slightly higher in elevation and are dominated by slough sedge (*Carex obnupta*), soft rush (*Juncus effusus*), and soft-stem bulrush (*Schoenoplectus tabernaemontani*).

Both the wetland and buffer communities are thriving with a diverse mixture of species, a number of fruit bearing species providing food for wildlife. Canopy structural diversity is beginning to occur providing different niches for a variety of bird species.

Ground water discharge, flood attenuation, sediment and toxicant retention, and nutrient removal and transformation are some of the functions intended for this site. Grading and plant establishment have likely enhanced the performance of these functions.

The site is intended to provide wildlife habitat and food chain support, and it appears that both functions are supported. Sixteen species of birds, pacific chorus frogs, rabbits, coyote sign and garter snakes were observed on site during monitoring. There were signs of predation observed on site as well.

Results for Performance Standard 1
(1.39 acres of wetland will be re-established):

A delineation conducted in May 2013 indicated a total of 4.80 acres of wetland was documented on site. The total area of intended wetland on site is 4.49 acres. See Appendix 4 for the full delineation report.

Results for Performance Standard 2
(60 percent native woody coverage in the scrub-shrub wetland communities):

Wetland woody cover is qualitatively estimated at 80 percent (Photo 1). The scrub/shrub is dominated by willows (*Salix spp.*) with an understory of twinberry honeysuckle (*Lonicera involucrata*) and redosier dogwood (*Cornus alba*). The percent cover continues to slowly increase over time.

Results for Performance Standard 3
(80% native herbaceous cover in the emergent wetland community):

Herbaceous cover is qualitatively estimated at 90 percent (Photo 2). There is a diverse community of both salt water tolerant and freshwater species differentiated in area by slight changes in elevation.

Photo 1
Woody cover in the scrub-shrub wetland (August 2014)

Photo 2
Emergent cover in Wetland 1 (August 2014)

Results for Performance Standard 4
(50% native woody cover in the buffer community):

Native woody cover in the buffer is qualitatively estimated at70 percent. This greatly exceeds the final year performance standard. The dominant species include a red alder (*Alnus rubra*) over story and a snowberry (*Symphoricarpos albus*) understory (Photo 3).

Results for Performance Standard 5
(Less than thirty percent cover by listed non-native invasive species across the entire site):

Cover of non-native invasive species across the site is qualitatively estimated at one percent cover. This consist of isolated individuals of thistles (*Cirsium* spp.), Himalayan blackberry (*Rubus armeniacus*), and reed canarygrass (*Phalaris arundinacea*). Listed species are included in Appendix 3, Table 2.

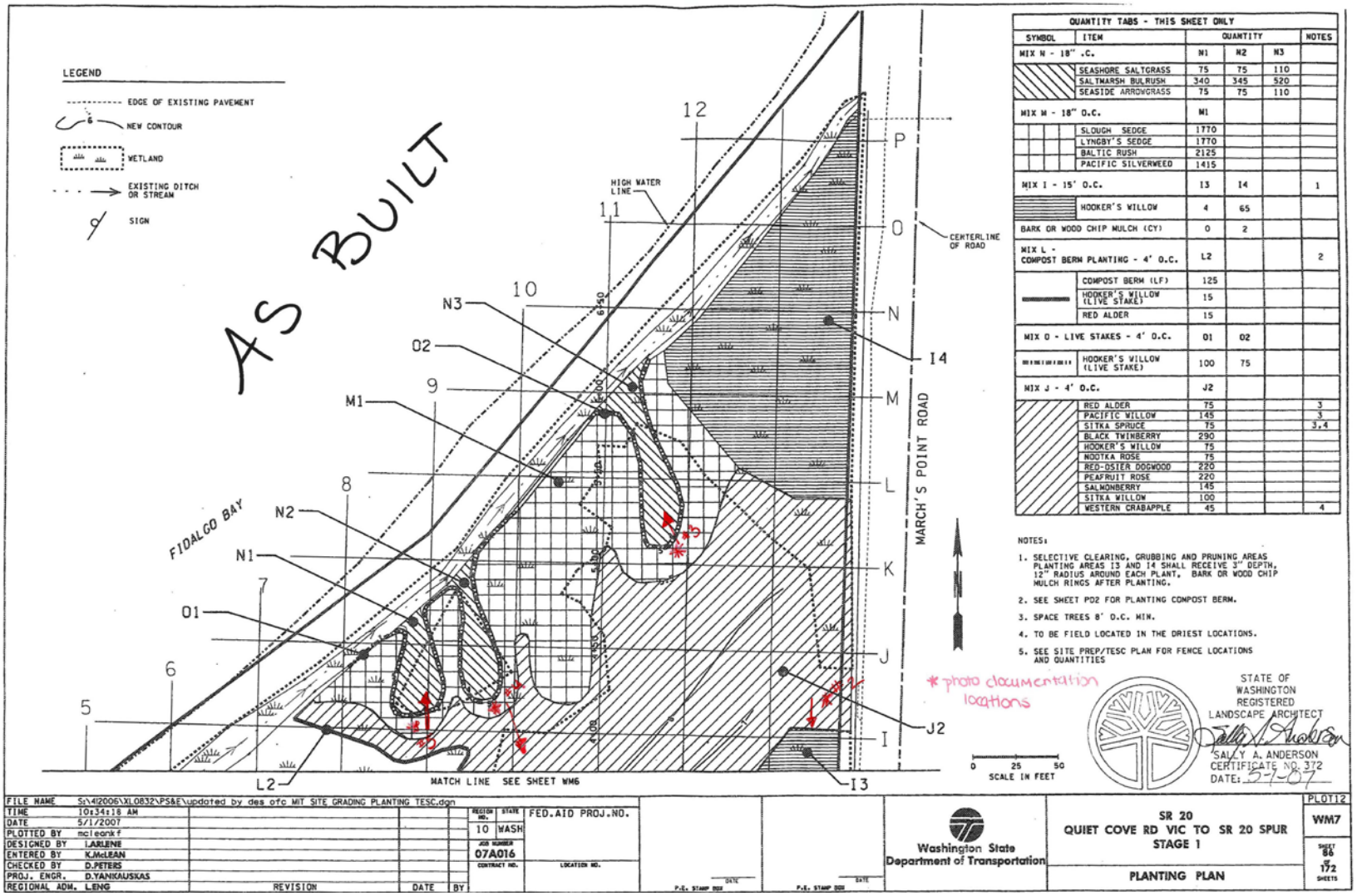
Photo 3
Woody cover in the buffer (August 2014)

What is planned for this site?

Routine weed control will continue in 2015.

Appendix 1 – Planting Plan (As built) With Photopoint Locations

(from WSDOT 2007)



QUANTITY TABS - THIS SHEET ONLY					
SYMBOL	ITEM	QUANTITY			NOTES
MIX N - 18" .C.		N1	N2	N3	
	SEASHORE SALTGRASS	75	75	110	
	SALTMARSH BULRUSH	340	345	520	
	SEASIDE ARROWGRASS	75	75	110	
MIX M - 18" O.C.		M1			
	SLOUGH SEDGE	1770			
	LYNGBY'S SEDGE	1770			
	BALTIC RUSH	2125			
	PACIFIC SILVERWEED	1415			
MIX I - 15' O.C.		I3	I4		1
	HOOKER'S WILLOW	4	65		
BARK OR WOOD CHIP MULCH (CY)		0	2		
MIX L - COMPOST BERM PLANTING - 4' O.C.		L2			2
	COMPOST BERM (LF)	125			
	HOOKER'S WILLOW (LIVE STAKE)	15			
	RED ALDER	15			
MIX O - LIVE STAKES - 4' O.C.		O1	O2		
	HOOKER'S WILLOW (LIVE STAKE)	100	75		
MIX J - 4' O.C.		J2			
	RED ALDER	75			3
	PACIFIC WILLOW	145			3
	SITKA SPRUCE	75			3,4
	BLACK TWINBERRY	290			
	HOOKER'S WILLOW	75			
	NOOTKA ROSE	75			
	RED-OSIER DOGWOOD	220			
	PEAFRUIT ROSE	220			
	SALMONBERRY	145			
	SITKA WILLOW	100			
	WESTERN CRABAPPLE	45			4

NOTES:

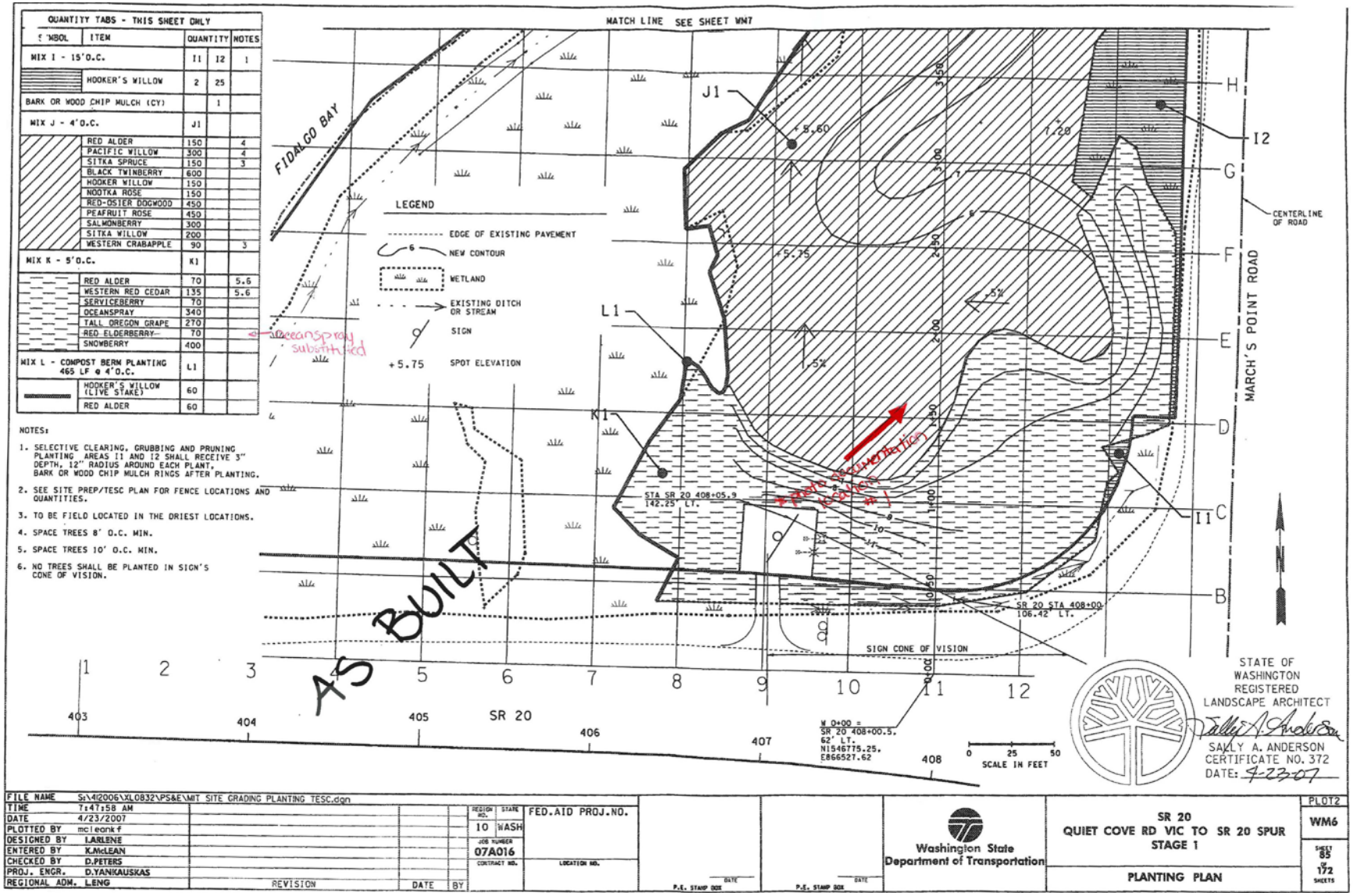
1. SELECTIVE CLEARING, GRUBBING AND PRUNING AREAS PLANTING AREAS I3 AND I4 SHALL RECEIVE 3" DEPTH, 12" RADIUS AROUND EACH PLANT. BARK OR WOOD CHIP MULCH RINGS AFTER PLANTING.
2. SEE SHEET PO2 FOR PLANTING COMPOST BERM.
3. SPACE TREES 8' O.C. MIN.
4. TO BE FIELD LOCATED IN THE DRIEST LOCATIONS.
5. SEE SITE PREP/TESC PLAN FOR FENCE LOCATIONS AND QUANTITIES

FILE NAME	S:\412006\XL0832\PS&E\updated by des ofc MIT SITE GRADING PLANTING TESC.dgn
TIME	10:34:18 AM
DATE	5/1/2007
PLOTTED BY	mcleankf
DESIGNED BY	L.ARLENE
ENTERED BY	K.McLEAN
CHECKED BY	D.PETERS
PROJ. ENGR.	D.YANKAUSKAS
REGIONAL ADM.	L.ENG

REVISION | DATE | BY

REGION NO. 10 | STATE WASH | FED.AID PROJ.NO.
JOB NUMBER 07A016
CONTRACT NO. | LOCATION NO.
P.E. STAMP BOX DATE | P.E. STAMP BOX DATE

PLOT12 | SHEET 86 | 172 SHEETS


QUANTITY TABS - THIS SHEET ONLY
SYMBOL | ITEM | QUANTITY | NOTES
MIX I - 15' O.C. | I1 | I2 | 1
HOOKER'S WILLOW | 2 | 25
BARK OR WOOD CHIP MULCH (CY) | 1
MIX J - 4' O.C. | J1
RED ALDER | 150 | 4
PACIFIC WILLOW | 300 | 4
SITKA SPRUCE | 150 | 3
BLACK TWINBERRY | 600
HOOKER WILLOW | 150
NOOTKA ROSE | 150
RED-OSIER DOGWOOD | 450
PEAFRUIT ROSE | 450
SALMONBERRY | 300
SITKA WILLOW | 200
WESTERN CRABAPPLE | 90 | 3
MIX K - 5' O.C. | K1
RED ALDER | 70 | 5.6
WESTERN RED CEDAR | 135 | 5.6
SERVICEBERRY | 70
OCEANSPRAY | 340
TALL OREGON GRAPE | 270
RED ELDERBERRY | 70
SNOWBERRY | 400
MIX L - COMPOST BERM PLANTING 465 LF @ 4' O.C. | L1
HOOKER'S WILLOW (LIVE STAKE) | 60
RED ALDER | 60
NOTES:
1. SELECTIVE CLEARING, GRUBBING AND PRUNING PLANTING AREAS I1 AND I2 SHALL RECEIVE 3" DEPTH, 12" RADIUS AROUND EACH PLANT, BARK OR WOOD CHIP MULCH RINGS AFTER PLANTING.
2. SEE SITE PREP/TESC PLAN FOR FENCE LOCATIONS AND QUANTITIES.
3. TO BE FIELD LOCATED IN THE DRIEST LOCATIONS.
4. SPACE TREES 8' O.C. MIN.
5. SPACE TREES 10' O.C. MIN.
6. NO TREES SHALL BE PLANTED IN SIGN'S CONE OF VISION.
MATCH LINE SEE SHEET WM7
FIDALGO BAY
LEGEND
EDGE OF EXISTING PAVEMENT
NEW CONTOUR
WETLAND
EXISTING DITCH OR STREAM
SIGN
+5.75 SPOT ELEVATION
oceanspray substituted
J1
L1
K1
+5.60
+5.75
5%
1.5%
1.20
STA SR 20 408+05.9 142.25' LT.
+ photo documentation location #1
AS BUILT
SIGN CONE OF VISION
SR 20 STA 408+00 106.42' LT.
W 0+00 = SR 20 408+00.5, 62' LT. N1546775.25, E866527.62
SR 20
MARCH'S POINT ROAD
CENTERLINE OF ROAD
H
I2
G
F
E
D
I1
C
B
1 2 3 4 5 6 7 8 9 10 11 12
403 404 405 406 407 408
SCALE IN FEET 0 25 50
STATE OF WASHINGTON REGISTERED LANDSCAPE ARCHITECT
SALLY A. ANDERSON
CERTIFICATE NO. 372
DATE: 4-23-07
FILE NAME S:\4I2006\XL0832\PS&E\MIT SITE GRADING PLANTING TESC.dgn
TIME 7:47:58 AM
DATE 4/23/2007
PLOTTED BY mcleonkf
DESIGNED BY I.ARLENE
ENTERED BY K.McLEAN
CHECKED BY D.PETERS
PROJ. ENGR. D.YANKAUSKAS
REGIONAL ADM. L.ENG
REVISION DATE BY
REGION NO. 10 STATE WASH
JOB NUMBER 07A016
CONTRACT NO.
FED.AID PROJ.NO.
LOCATION NO.
P.E. STAMP BOX DATE
P.E. STAMP BOX DATE
Washington State Department of Transportation
SR 20
QUIET COVE RD VIC TO SR 20 SPUR
STAGE 1
PLANTING PLAN
PLOT2 WM6
SHEET 85 OF 172 SHEETS

Appendix 2 – Photo Points

The photographs below were taken from permanent photo-points on August 13, 2014 and document current site development.

Photo Point 1

Photo Point 2

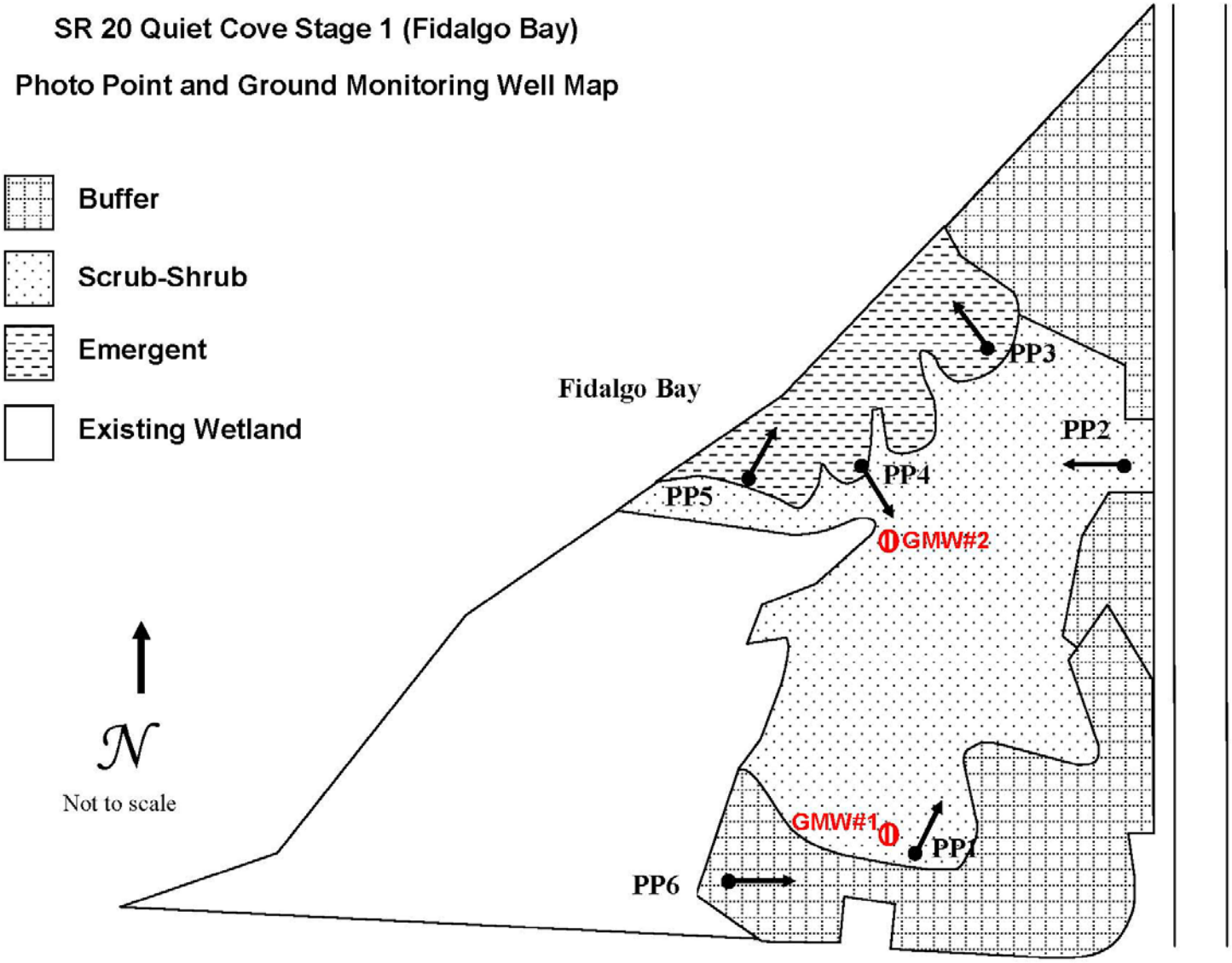
Photo Point 3

Photo Point 4

The photographs below were taken from permanent photo-points on August 13, 2014 and document current site development.

Photo Point 5

Photo Point 6


SR 20 Quiet Cove Stage 1 (Fidalgo Bay)
Photo Point and Ground Monitoring Well Map
Buffer
Scrub-Shrub
Emergent
Existing Wetland
Fidalgo Bay
PP3
PP2
PP4
PP5
GMW#2
GMW#1
PP1
PP6
N
Not to scale

Driving Directions:
Take I-5 north. Take exit 230 (WA SR 20) toward Burlington/Anacortes. Turn left onto SR 20 West. Drive approximately 11 miles to the intersection of Marchs Point Road and SR 20. The site is on the north side of the road before you get to where the SR 20 and SR 20 spur split. There is a golf course on the south side of the road.

Appendix 3 – Data Tables

Table 1 Breakdown of the permanent wetland impacts and wetland mitigation acreage by project[3]

Project	Permit	Permanent Wetland Impacts	Wetland Mitigation
SR 20 Quiet Cove Stage 1	USACE # 200601135	0.66 acre	1.14 acres
SR 11 Chuckanut Park and Ride	USACE # NWS 2008-46-SOD	0.009 acre	0.01 acre
SR 9 Martin Road to Thunder Creek	Ecology Administrative Order # 6581	0.02 acre	0.02 acre
	Total:	0.689 acre	1.17 acres

Table 2. Mitigation Plan Table 10 Non-native invasive species
(from SR 20: Quiet Cove to SR 20 Spur Safety Improvements Final Wetland Mitigation Report, 2007)

Scientific Name	Common Name
Buddleia alternifolia	fountain butterfly bush
Cytisus scoparius	Scot's broom
Geranium robertianum	herb Robert
Hedera helix	English ivy
Ilex aquifolium	English holly
Iris pseudoacorus	yellow flag iris
Lythrum salicaria	purple loosestrife
Phalaris arundinacea	reed canarygrass
Polygonum cuspidatum (and related species and hybrids)	Japanese knotweed
Prunus laurocerasus	English laurel
Rubus laciniatus	evergreen blackberry
Rubus armeniacus (discolor)	Himalaya or Armenian blackberry

[3] Wetland impacts and acreages sourced from (USACE 2006), (USACE 2008), and (Ecology 2009).

Appendix 3 – Delineation Report

WETLAND DELINEATION REPORT

SR 20 Fidalgo Bay Mitigation Site

SR 20: Quiet Cove to SR 20 Spur Safety Improvements
(MP 44.65 to MP 47.87)
USACE (NPW 23) 200601135

SR 11 Chuckanut Park and Ride MP 0.0
USACE (NPW 12, 18) NWS-2008-460-SOD

SR 9 Martin Road to Thunder Creek Widening and Re-alignment
(MP 62.71 to MP 63.40)
Ecology Water Quality Certification Order 6581

Skagit County, Washington

Prepared by:
Tatiana Dreisbach
WSDOT Environmental Services Office
Olympia, Washington

February 24, 2014

Washington State
Department of Transportation

Introduction

This report was prepared by the Washington State Department of Transportation (WSDOT) to describe the wetland boundary delineation for the SR 20 Fidalgo Bay mitigation site. Field work was conducted by WSDOT wetland biologists Tatiana Dreisbach and Tom Mohagen, on May 6, 2013. The delineation identifies 4.80 acres of wetland within the mitigation site boundaries.

General Information for the SR 20 Fidalgo Bay mitigation site			
Location:	S5, T34N, R2E. Skagit County. (Vicinity map, Figure 1)		
		**USACE NWP 23 Number**	200601135
		USACE NWP 12, 18 Number	NWS-2008-460-SOD
		Ecology WQC	6581
		Long./Lat. ID Number	1225719484631
		Land Resource Region (LRR)	A
		Major Land Resource Area (MLRA)	2
		Construction Date	2009
		Monitoring Period	2010-2019
		Year of Monitoring	4 of 10 (in 2013)
Area of Project Impact (acres)[1]			
USACE (NWP 23) 200601135	0.66		
USACE (NWP 12, 18) NWS-2008-460-SOD	0.009		
Ecology WQC 6581	0.02		
Total:	**0.689**		
Mitigation			
Type of Mitigation	Intended Area (acres)		
Establishment	1.39		
Enhancement	0.45		
Preservation	2.65		
Total Intended Wetland Mitigation Area[2]	**4.49**		
2013 Delineation Results (acres)			
Total Delineated Wetland Area	**4.80**		

[1] Project impact numbers from USACE Nationwide Permit 200601135 (USACE 2008a), USACE Nationwide Permit NWS-2008-460-SOD (USACE 2008b), and Ecology WQC 6581 (Ecology 2009).

[2] Area of mitigation from the *Final Wetland Mitigation Report SR 20: Quiet Cove to SR 20 Spur Safety Improvements (MP 44.65 to MP 47.87* (WSDOT 2007). Establishment (1.39 acres), enhancement (0.45 acre), and buffer (1.46 acres) provided in Mitigation Report. Preservation area (2.65 acres) inferred from plan by subtracting buffer, establishment, and enhancement from the total site area (5.95 acres).

Location

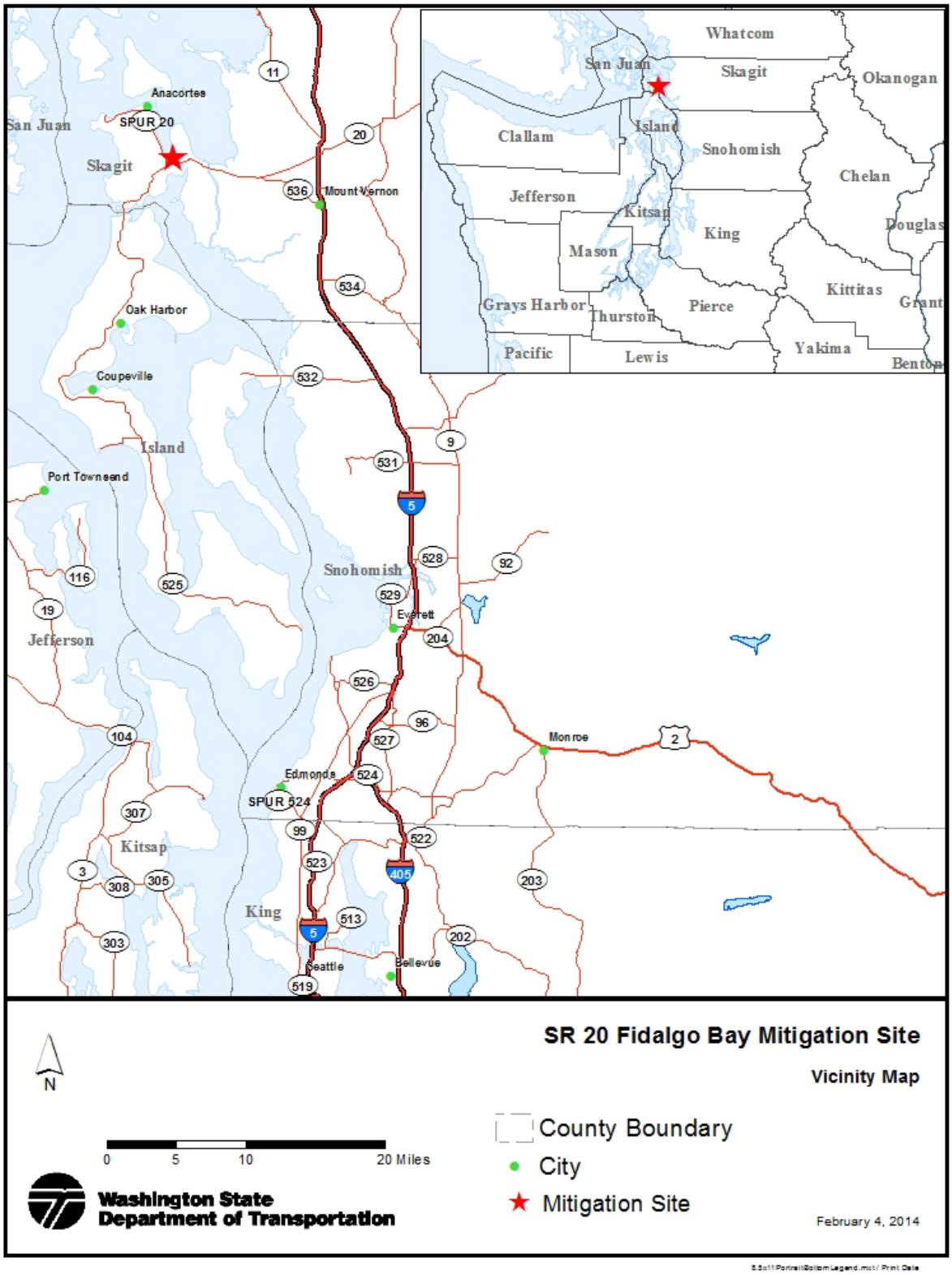


Figure 1. Vicinity Map

Methods

Wetland boundaries within the SR 20 Fidalgo Bay mitigation site were delineated using routine 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)

Wetland boundaries were delineated based on on-site observations of hydrology, soils, and plant communities, in conjunction with background information.

A Global Positioning System (GPS) Trimble GeoXT mapping grade unit was used to record the wetland boundaries and sampling point locations (Figure 2). Wetland boundary points were recorded at regular intervals and at any change in direction along the boundary.

Wetland Delineation and Study Area

Study Area

Wetlands described in this report were assessed only within the wetland mitigation site boundary (Figure 2). Wetland preservation areas and wetland areas that are considered regulatory buffers are present within the mitigation site boundary and are included in this delineation.

Wetlands

Delineation data were collected at four sampling points and recorded on wetland determination data forms (Appendix A). Paired wetland and upland sample points were used to define the wetland edge. Additional wetland sample points characterize various wetland vegetation communities. Data recorded on wetland determination data forms characterize typical wetland and upland conditions observed on site. Vegetation, soils, and hydrology were examined in many additional sampling locations to determine the wetland boundary. The delineation determined 4.80 acres of wetland were present within the SR 20 Fidalgo Bay mitigation site. The delineation acreage includes wetland preservation and wetland that is regulated as buffer.

Precipitation

The Regional Delineation Supplement Version 2.0 (USACE 2010) recommends using methods described in Chapter 19 in *Engineering Field Handbook* (NRCS 1997) to determine if precipitation occurring in the three full months prior to the site visit was normal, drier than normal, or wetter than normal. Actual rainfall is compared to the normal range of the 30-year average. When considering the three prior months as whole, normal precipitation conditions were present prior to field work. The first prior month was wetter than normal, the second prior month was normal, and the third prior month was drier than normal. (Appendix B-1).

Light precipitation was recorded in the ten days preceding field work (Appendix B-2).

Growing Season

The following evidence of the growing season was observed at the time of the delineation:

- new vegetative growth was present on herbaceous vegetation
- leaves on woody species were fully emerged.

Figure 2. Study area in blue, wetland boundary in red, and sampling point locations in black.

SR 20 Fidalgo Bay Mitigation Site – Wetland Delineation Summary			
Total Delineated Wetland Area		4.80 acres	
		**Wetland Determination Data Form(s)**	Appendix A; Sampling Point W1-SP1, W1-SP2, W1-SP3
		Upland Determination Data Form(s)	Appendix A; Sampling Point W1-SP4
		Delineator(s)	Tatiana Dreisbach, Tom Mohagen
		Delineation Date	May 6, 2013
Vegetation	Trees – saplings generally under 20 feet tall. Over time a forested Cowardin class is likely to establish. Shrubs – Hooker's willow (*Salix hookeriana*), Pacific willow (*Salix lasiandra*), red alder (*Alnus rubra*), snowberry (*Symphoricarpos albus*) Herbs – seacoast bulrush (*Schoenoplectus maritimus*), broadleaf cattail (*Typha latifolia*), fringed willowherb (*Epilobium ciliatum*)		
Soils	Soils examined to a depth of 22 inches exhibited hydric characteristics. Matrix colors of 10YR 2/1, 10YR 3/1, and 5Y 3/1 were observed. Redoximorphic concentrations and depletions were observed in some layers. Indicator Redox Dark Surface (F6) met.		
Hydrology	The mitigation site is just behind a dike, separating it from the tidelands in Fidalgo Bay. The elevation behind the dike, on the mitigation site, is lower than the tiedflats beyond the dike. Hydrology primarily driven by a high groundwater table associated with the adjacent tideflats and landscape position at or just below sea level. Areas of inundation were present in the wetland. Water in observation pits was at varying depths within the upper 12 inches of the soil surface.		
Rationale for Delineation	Positive indicators of all three wetland criteria are present. Placement of boundary determined by presence/absence of vegetation and hydrology indicators as well as topographic break. The wetland is generally bordered by fill slopes of road prisms to the east and south and a borrow ditch and dike to the west. The distinct topographic break created by these features correlated with presence/absence of wetland indicators, especially hydrology indicators. Hydric soils are present in some upland locations however, contemporary hydrology was not present in these areas.		

Limitations

This wetland delineation report documents the investigation, best professional judgment and conclusions of WSDOT based on the site conditions encountered at the time of this study. The wetland delineation was performed in compliance with accepted standards for professional wetland biologists and applicable federal, state, and local ordinances. It is correct and complete to the best of our knowledge. It should be considered a preliminary jurisdictional determination of wetlands and other waters until it has been reviewed and approved in writing by the appropriate jurisdictional authorities.

References

1. [Ecology] Washington State Department of Ecology. 2009. Water Quality Certification Order Number 6581.
2. Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Vicksburg (MS): US Army Engineer Waterways Experiment Station. Technical Report Y-87-1. Available from: http://el.erdc.usace.army.mil/elpubs/pdf/wlman87.pdf
3. Lichvar RW, Kartesz JT. 2013. North American Digital Flora: National Wetland Plant List (US), version 3.1 [Internet]. Hanover (NH): US Army Corps of Engineers, Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory and Chapel Hill (NC): BONAP. [cited 2014 Feb 4]. Available from: http://wetland_plants.usace.army.mil
4. [NRCS] Natural Resource Conservation Service. 1997. Hydrology Tools for wetland determination. Chapter 19 in Engineering Field Handbook. Fort Worth (TX): US. Department of Agriculture, NRCS. http://www.wsdot.wa.gov/NR/rdonlyres/0685A8C8-0512-4568-BE7F-6FF6D75C15ED/0/WetDelinCh19.pdf
5. [NRCS] Natural Resources Conservation Service [Internet]. 2014. Field Office Technical Guide. US Department of Agriculture. Climate Data for Skagit County, Station Anacortes, Washington 94202. [cited 2014 Feb 4]. Available at: http://agacis.rcc-acis.org/53057/mtot
6. [NRCS] Natural Resource Conservation Service [Internet]. 2014. Web Soil Survey for Skagit County, Washington. US Department of Agriculture. [cited 2014 Feb 4]. Available at: http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx
7. [USACE] US Army Corps of Engineers. 2008a. Department of the Army Nationwide 23 Permit Number 200601135. Permit modification in 2008.
8. [USACE] US Army Corps of Engineers. 2008b. Department of the Army Nationwide 12 ad 18. Permit Number NWS-2008-460-SOD.
9. [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), ed. 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
10. [WSDOT] Washington State Department of Transportation. 2007. Final Wetland Mitigation Report SR 20: Quiet Cove to SR 20 Spur Safety Improvements (MP 44.65 to MP 47.85). Skagit County, WA: Washington State Department of Transportation, Northwest Region.
11. [WSDOT] Washington State Department of Transportation. 2014. Wetland Delineation and Assessment [Internet]. Olympia (WA): Environmental Services Office. [cited 2014 Feb 4]. Available at: http://www.wsdot.wa.gov/Environment/Wetlands/Delineation.htm

Appendix A —Wetland Determination Data Form

Wetland Delineation Data Forms for:

W1-SP1

W1-SP2

W1-SP3

W1-SP4

Wetland polygons, sampling point locations, and wetland names shown in Figure 2.

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

Project/Site: SR 20 Fidalgo Bay **City/County:** Anacortes/Skagit **Sampling Date:** 22-Apr-13

Applicant/Owner: wsdot **State:** wa **Sampling Point:** w1-sp1

Investigator(s): Tom Mohagen, Tatiana Dreisbach **Section, Township, Range:** S 5 T 34N R 2E

Landform (hillslope, terrace, etc.): historic tideflat, behind dike **Local relief (concave, convex, none):** concave **Slope:** 2.0 % / 1.1 °

Subregion (LRR): LRR A **Lat.:** 48.463 **Long.:** -122.574 **Datum:** NAD83HARN

Soil Map Unit Name: Hydraquents, tidal **NWI classification:** PEM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ◉ No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present? Yes ◉ No ○	
Wetland Hydrology Present? Yes ◉ No ○	

Remarks:

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 15 x 15 feet)			
1.		☐ 0.0%	
2.		☐ 0.0%	
3.		☐ 0.0%	
4.		☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 x 15 feet)			
1.		☐ 0.0%	
2.		☐ 0.0%	
3.		☐ 0.0%	
4.		☐ 0.0%	
5.		☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5 x 5 feet)			
1. Schoenoplectus maritimus	25	☑ 100.0%	OBL
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	25	= Total Cover	
Woody Vine Stratum (Plot size: 5 x 5 feet)			
1.		☐ 0.0%	
2.		☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	25	x 1 =	25
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	25 (A)		25 (B)

Prevalence Index = B/A = 1.000

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrologic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - Wetland Non-Vascular Plants** [1]
- ☐ **Problematic Hydrophytic Vegetation** [1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.**

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: w1-sp1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining. M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☑ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ◉ No ○

Remarks:

Soil pit not dug. Inundated to 6 inches. Soils meet the definition of a hydric soil due to prolonged periods of inundation, soil saturation, or a high water table during the growing season.

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (LRR A)
- ☐ Frost Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ◉	No ○	Depth (inches):	6
Water Table Present?	Yes ◉	No ○	Depth (inches):	0
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches):	0

Wetland Hydrology Present? Yes ◉ No ○

Describe Recorded Data (stream gauge, monitor well, aerial photos, previous inspections), if available:

Remarks:

Brackish water coming in at the toe of the dike.

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

Project/Site: SR 20 Fidalgo Bay **City/County:** Anacortes/Skagit **Sampling Date:** 22-Apr-13

Applicant/Owner: wsdot **State:** wa **Sampling Point:** w1-sp2

Investigator(s): Tom Mohagen, Tatiana Dreisbach **Section, Township, Range:** S 5 T 34N R 2E

Landform (hillslope, terrace, etc.): historic tideflat, behind dike **Local relief (concave, convex, none):** concave **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 48.463 **Long.:** -122.573 **Datum:** NAD83HARN

Soil Map Unit Name: Hydraquents, tidal **NWI classification:** PEM

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ◉ No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present? Yes ◉ No ○	
Wetland Hydrology Present? Yes ◉ No ○	

Remarks:
Data point in wetland preservation area dominated by broadleaf cattail (Typha latifolia).

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 15 x 15 feet)			
1.		☐ 0.0%	
2.		☐ 0.0%	
3.		☐ 0.0%	
4.		☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 x 15 feet)			
1.		☐ 0.0%	
2.		☐ 0.0%	
3.		☐ 0.0%	
4.		☐ 0.0%	
5.		☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5 x 5 feet)			
1. Typha latifolia	95	☑ 100.0%	OBL
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	95	= Total Cover	
Woody Vine Stratum (Plot size: 5 x 5 feet)			
1.		☐ 0.0%	
2.		☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	95	x 1 =	95
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	95 (A)		95 (B)

Prevalence Index = B/A = 1.000

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrologic Vegetation
- ☑ 2 - Dominance Test is > 50%
- ☑ 3 - Prevalence Index is ≤3.0 [1]
- ☐ 4 - Morphological Adaptations [1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ 5 - Wetland Non-Vascular Plants [1]
- ☐ Problematic Hydrophytic Vegetation [1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: w1-sp2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining. M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☑ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ◉ No ○

Remarks:

Soil pit not dug. Inundated to 1 inch. Soils meet the definition of a hydric soil due to prolonged periods of inundation, soil saturation, or a high water table during the growing season.

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (LRR A)
- ☐ Frost Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ◉	No ○	Depth (inches):	1
Water Table Present?	Yes ◉	No ○	Depth (inches):	0
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches):	0

Wetland Hydrology Present? Yes ◉ No ○

Describe Recorded Data (stream gauge, monitor well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

Project/Site: SR 20 Fidalgo Bay **City/County:** Anacortes/Skagit **Sampling Date:** 22-Apr-13

Applicant/Owner: wsdot **State:** wa **Sampling Point:** w1-sp3

Investigator(s): Tom Mohagen, Tatiana Dreisbach **Section, Township, Range:** S 5 T 34N R 2E

Landform (hillslope, terrace, etc.): historic tideflat, behind dike **Local relief (concave, convex, none):** concave **Slope:** 2.0 % / 1.1 °

Subregion (LRR): LRR A **Lat.:** 48.463 **Long.:** -122.572 **Datum:** NAD83HARN

Soil Map Unit Name: Hydraquents, tidal **NWI classification:** PSS

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ◉ No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Hydric Soil Present? Yes ◉ No ○	
Wetland Hydrology Present? Yes ◉ No ○	

Remarks:

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 15 x 15 feet)			
1.		☐ 0.0%	
2.		☐ 0.0%	
3.		☐ 0.0%	
4.		☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 x 15 feet)			
1. Salix hookeriana	30	☑ 40.0%	FACW
2. Salix lasiandra	30	☑ 40.0%	FACW
3. Alnus rubra	10	☐ 13.3%	FAC
4. Symphoricarpos albus	5	☐ 6.7%	FACU
5.	0	☐ 0.0%	
	75	= Total Cover	
Herb Stratum (Plot size: 5 x 5 feet)			
1. Epilobium ciliatum	20	☑ 74.1%	FACW
2. Conium maculatum	5	☐ 18.5%	FAC
3. Geranium molle	2	☐ 7.4%	UPL
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	27	= Total Cover	
Woody Vine Stratum (Plot size: 5 x 5 feet)			
1.		☐ 0.0%	
2.		☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 73

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	**x 1 =**	0
FACW species	80	**x 2 =**	160
FAC species	15	**x 3 =**	45
FACU species	5	**x 4 =**	20
UPL species	2	**x 5 =**	10
Column Totals:	102	**(A)**	235 **(B)**

Prevalence Index = B/A = 2.304

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrologic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - Wetland Non-Vascular Plants** [1]
- ☐ **Problematic Hydrophytic Vegetation** [1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.**

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: w1-sp3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR	2/1	100						Sandy Loam with grave	ammended compost layer braking down. Lots of OM
2-8	5Y	3/1	100						Sandy Loam	
8-22	10YR	3/2	70	7.5YR	3/4	15	C	PL/M	Silt Loam	concentration is distinct
+mottle				5Y	5/1	15	D	M		

[1]Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining. M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☑ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (LRR A)
- ☐ Frost Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ○	No ◉	Depth (inches):	
Water Table Present?	Yes ◉	No ○	Depth (inches):	15
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches):	5

Wetland Hydrology Present? Yes ◉ No ○

Describe Recorded Data (stream gauge, monitor well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

Project/Site: SR 20 Fidalgo Bay **City/County:** Anacortes/Skagit **Sampling Date:** 22-Apr-13

Applicant/Owner: wsdot **State:** wa **Sampling Point:** w1-sp4

Investigator(s): Tom Mohagen, Tatiana Dreisbach **Section, Township, Range:** S 5 T 34N R 2E

Landform (hillslope, terrace, etc.): slope on old access pad/road **Local relief (concave, convex, none):** concave **Slope:** 10.0 % / 5.7 °

Subregion (LRR): LRR A **Lat.:** 48.463 **Long.:** -122.572 **Datum:** NAD83HARN

Soil Map Unit Name: Hydraquents, tidal **NWI classification:** Upland

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ◉ No ○	**Is the Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present? Yes ◉ No ○	
Wetland Hydrology Present? Yes ○ No ◉	

Remarks:

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 15 x 15 feet)			
1.		☐ 0.0%	
2.		☐ 0.0%	
3.		☐ 0.0%	
4.		☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 x 15 feet)			
1. Alnus rubra	20	☑ 40.0%	FAC
2. Thuja plicata	20	☑ 40.0%	FAC
3. Symphoricarpos albus	5	☐ 10.0%	FACU
4. Mahonia aquifolium	5	☐ 10.0%	FACU
5.	0	☐ 0.0%	
	50	= Total Cover	
Herb Stratum (Plot size: 5 x 5 feet)			
1. Epilobium ciliatum	10	☑ 37.0%	FACW
2. Cardamine oligosperma	15	☑ 55.6%	FAC
3. Conium maculatum	2	☐ 7.4%	FAC
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	27	= Total Cover	
Woody Vine Stratum (Plot size: 5 x 5 feet)			
1.		☐ 0.0%	
2.		☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 73

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	10	x 2 =	20
FAC species	57	x 3 =	171
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	77	(A)	231 (B)

Prevalence Index = B/A = 3.000

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrologic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - Wetland Non-Vascular Plants** [1]
- ☐ **Problematic Hydrophytic Vegetation** [1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.**

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: w1-sp4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR	3/2	100						Sandy Loam	gravels and organics
3-16	10YR	4/1		2.5Y	5/1	10	D	M	Silt Loam	upland with hydric soils
+mottle				10YR	5/6	3	C	M		concentration is prominent

[1]Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining. M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☑ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ◉ No ○

Remarks:

Upland soils occurring within a historic estuary/tideflat. Hydric soils present, however hydrology indicators indicating presence of current or active hydrology are not present.

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (LRR A)
- ☐ Frost Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ○	No ◉	Depth (inches):
Water Table Present?	Yes ○	No ◉	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ○	No ◉	Depth (inches):

Wetland Hydrology Present? Yes ○ No ◉

Describe Recorded Data (stream gauge, monitor well, aerial photos, previous inspections), if available:

Remarks:

Appendix B — Precipitation Data

Appendix B-1. Comparison of Observed and Normal Precipitation (NRCS 1997)

Monthly precipitation data for Anacortes, Washington.

		Long-term rainfall records[a]							
	Month	3 yrs. in 10 less than	Average	3 yrs. in 10 more than	Rain fall[a]	Condition dry, wet, normal[b]	Condition Value	Month weight value	Product of previous two columns
1st prior month	Apr	1.49	1.86	2.12	3.56	W	3	3	9
2nd prior month	Mar	1.67	2.21	2.58	2.14	N	2	2	4
3rd prior month	Feb	1.75	2.49	2.95	1.58	D	1	1	1
								Sum	**14**

[a]NRCS 2014
[b]Conditions are considered normal if they fall within the low and high range around the average.

Note: If sum is
- 6 - 9 then prior period has been drier than normal
- 10 - 14 then period has been normal
- 15 - 18 then period has been wetter than normal

Condition value:
- Dry (D) =1
- Normal (N) =2
- Wet (W) =3

Conclusions: Normal precipitation conditions were present prior to the field visit.

Appendix B-2. Daily Precipitation 10 days preceding field work, Anacortes, Washington

Date (2013)	Daily Precipitation (inches)[a]
May 5	0.00
May 4	0.00
May 3	0.00
May 2	0.00
May 1	0.00
Apr 30	0.08
Apr 29	0.08
Apr 28	0.12
Apr 27	0.00
Apr 26	M

[a] NOAA 2014
"M"= missing data

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. [Ecology] Washington State Department of Ecology. 2009. Administrative Order #6581.
3. Hutchinson, Ian. 1988. Salinity Tolerance of Plants of Estuarine Wetlands and Associated Uplands. Washington State Shorelands and Coastal Zone Management Program: Wetlands Section.
4. [USACE] US Army Corps of Engineers. 2008. Department of the Army Permit Number 200601135.
5. [USACE] US Army Corps of Engineers. 2008. Department of the Army Permit Number NWS 2008-460.
6. [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
7. [WSDOT] Washington State Department of Transportation. 2007. SR 20: Quiet Cove to SR 20 Spur Safety Improvements Final Wetland Mitigation Report. Seattle (WA): Washington State Department of Transportation, Northwest Region.
8. [WSDOT] Washington State Department of Transportation. 2007. SR 9 Martin Road to Thunder Creek Widening and Re-alignment (MP62.71 to MP 63.40) Wetland Mitigation Memo. Seattle (WA): Washington State Department of Transportation, Northwest Region.
9. [WSDOT] Washington State Department of Transportation. 2008. Wetland Mitigation Report - SR 11 Chuckanut Park and Ride (MP 0.0). Seattle (WA): Washington State Department of Transportation, Northwest Region.
10. [WSDOT] Washington State Department of Transportation. 2007. SR 20 Quiet Cove Rd Vic to SR 20 Spur Stage 1 Mitigation Site As-built Planting Plan.

11. [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