41. Mitigation Monitoring Report Cover Sheet steal

1: Bobcat Marsh Wetland Mitigation Bank **Identifiers:**

DSL Permit #: RF-43502 Corps Permit #: NWP-2008-658 Permittee: Port of Portland
County: Washington Report Date: 12/2014 Monitoring Year: 3
Date Removal-Fill Activity Completed: Mitigation bank – multiple R/F actions
Date mitigation was completed: Grading: 2008, 2010, 2011 Planting: May 2011, February 2012, April 2013 and December 2013
Date(s) of data collection: 7/25/2014
Report prepared by: Laura Trunk, Watershed Restoration Coordinator, City of Hillsboro

2: Monitoring Report Purpose:

This monitoring report is for a project that includes: (check all that apply):

- ☐ Compensatory **freshwater, non-tidal** wetland mitigation for permanent wetland impacts.
- ☐ Compensatory **estuarine** wetland mitigation for permanent wetland impacts.
- ☐ **Only non-wetland** compensatory mitigation.
- ☐ **Only** mitigation for **temporary** impacts that had a monitoring requirement.
- ☐ **Voluntary** wetland enhancement, creation or restoration (General authorization or individual permit) not funded with money from DSL's wetland mitigation fund.
- ☐ Voluntary wetland enhancement, creation or restoration (General authorization or individual permit) funded with money from DSL's **wetland mitigation fund**.
- ☒ **Mitigation Bank** Report
- ☐ Other _____

3: Results: *(add more rows if needed)*

	Performance standards	**Fully Met? Y/N**	**Comments/Reason for shortfall**
1.	Entire Site: During years of normal precipitation, no permanent standing water will be found on-site.	Y	All the ponds and creek channel dry completely in 2014.
2.	EM-The relative percent native cover for Year 1 must be 40%, Year 2 must by 50%, and Year 3 and thereafter must be 60%.	Y	The site had 106% native herbaceous cover within the emergent marsh units which exceeds the 60% cover required for Year 3 and thereafter.
3.	EM-The relative herbaceous invasive plant cover (including reed canary grass) is no more than 30% in Years 1 through 3, and no more than 20% in years 4 and 5. Invasive plants other than reed canary grass (RCG) cannot exceed 10%.	Y	The site had 2% invasive cover including RCG which was within the 30% cover limit for Year 3. The invasive plant cover without reed canary grass was 0%, which is within the limit of 10% invasive cover without RCG.
4.	EM – Bare substrate must represent no more than 20% cover by the 3rd year after planting.	Y	The site had 2% cover of bare substrate within the emergent marsh units which is within the 20% cover limit for Year 3.

5.	EM – 6 native species at Year 1 with a total cover of at least 10%.	N/A	This standard was met in Year 1.
6.	EM – 6 native species at Year 5 with a total cover of at least 30%. To quality, a species must have at least 5% cover in the habitat class and occurs in at least 10% of the plots sampled.	N/A	This standard does not apply until year five.
7.	SSF – The cover of woody invasive species is no more than 10% throughout the monitoring period.	Y	The site has 0% woody invasive species present on the site.
8.	SSF – The relative herbaceous invasive plant cover is no more than 30% in Years 1 through 3, and no more than 20% in Years 4 and 5.	Y	The site had 2% invasive herbaceous cover within the shrub-shrub/forested units which is within the 30% cover limit for Year 3.
9.	SSF – 6 native species (woody and herbaceous) at Year 5 with a total cover of at least 30%.	N/A	This standard does not apply until year five.
10.	SSF – Native woody stem density is at least 1,600 stems (trees) or plants (shrubs)/acre at Year 5. Native volunteers are counted, not dead plant or stems.	Y	The site has an average of 2,729 woody stems per acre exceeding Year 5 requirements in Year 3.
11.	SSF – Native woody canopy cover is 10% by Year 1, 30% by Year 2, 50% by Year 5.	Y	The woody canopy cover for the site was 55% exceeding the Year 5 requirement of 50% cover in Year 3.
12.	Shall meet 1987 Corps of Engineers Delineation Manual Wetland Hydrology Criteria.	Y	In 2014, the site met USACE wetland hydrology criteria.

4: Further Actions:

Remedial work recommended	Yes ☐	No ☒
Deed Restriction or other protection instrument attached	Yes ☐	No ☒
Final Monitoring Report?	Yes ☐	No ☒
Requesting release or partial release of financial security?	Yes ☒	No ☐

2. Bobcat Marsh Mitigation Bank Plan Purpose and Overview

A. Location.

The mitigation site is located at:

- Address: 2600 SW Hillsboro Highway, Hillsboro, OR 97123
- Latitude and Longitude: 45° 30’ 11” N 122° 59’17” W
- Township/Range: T 1S R2W Section 7 WM
- Tax lots: 200, 300 (Tax ID No. 1S207, 200 and 200)

The Bobcat Marsh Wetland Mitigation Bank site is located within the boundary of the 635-acre Jackson Bottom Wetland Preserve. The main public access to the preserve is one mile south of the Hillsboro city center on OR 219. The Bobcat Marsh Mitigation Bank is accessed by a gravel road between the Clean Water Services headquarters building on the north and the Jackson Bottom Wetland Preserve Education Center on the south. Portions of the mitigation bank are both north and south of the main gravel access road. Access to the mitigation bank area for the public is by foot only via the gravel road unless special permission from JBWP has been given.

The Bobcat Marsh Wetland Mitigation Bank boundary includes an area constructed in 2008 that is wetland mitigation associated with two ODOT projects. The ODOT project names and associated permit numbers for these two projects are shown in Table 1. This portion of the mitigation bank is shown in Figures B and C (Appendix A).

Table1: ODOT Permits

ODOT Project	ACOE Permit	DSL Permit
KN 11943 OR 219 @ Unger Rd.	N/A	34788-GA
KN 12861 OR 219 @ Burkhalter/Simpson Rds.	NWP 2005-00793	RF-35732

The monitoring of the wetland mitigation bank meets the regulatory mandate for monitoring for the permits listed above with the knowledge and approval of the permitting agencies.

B. Mitigation Goals and Objectives.

This mitigation project is a two user wetland mitigation bank that was developed by the Port of Portland (Port) and the Oregon Department of Transportation (ODOT) in partnership with the City of Hillsboro (land owner). The project is intended to replace the functions and values of wetlands lost at the Port's Hillsboro Airport, and for various ODOT projects in Tualatin River watershed.

The goal of the mitigation project was to restore 4.52 acres of wetlands and enhance 11.14 acres of wetlands in the Jackson Bottoms Wetland Preserve to result in 8.23 credits of wetland mitigation. The project area was planted with native trees, shrubs and herbs with the objective of creating forest and scrub shrub wetlands with smaller pockets of emergent wetland. The wetland types that are expected to become established include slope-outflow wetlands under the HGM classification and Palustrine Forested (PFO), Palustrine Scrub-Shrub (PSS), and Palustrine Emergent (PEM) seasonally flooded wetlands under the Cowardin classification system. Table 2 describes the wetland types that are expected to become established within the wetland mitigation bank.

The mitigation project area is approximately 18-acres in size (including wetlands, upland buffers, and an access road). The project area contained several large mounds consisting of material that was excavated in the early 1980's to create nearby ponds. The material was placed on agricultural fields that were drained in the 1920's by a drainage ditch, the Jackson Slough. Removal of these mounds and filling a portion of Jackson Slough was identified as a key project in the 2006 JBWP concept plan to improve habitat in the preserve and was the concept that directed the Bobcat Marsh Mitigation Plan.

Table 2: Types of Mitigation and Impacts

Impact Site*				Mitigation Site					
Wetland ID	HGM	Cowardin	Acres lost	Mitigation Method	Acres	HGM	Cowardin	Mitigation Ratio	Credits Pending **
NA	NA	NA							
NA				Enhance	11.14	Slope-outflow	PSS/PEM PFO/PSS PSS	3:1	3.71
NA	NA	NA		Create	- 0 -				- 0 -
NA	NA	NA		Restore	4.52	Slope-Outflow	PSS/PEM PFO/PSS PSS	1:1	4.52
Total					15.66				8.23

** Impact types and amounts are not applicable since this is a mitigation bank, not for a specific project.*
*** Until the post-project delineation has been completed, this column will be 'pending'.*

C. Maintenance and Management Actions.
In the past year, the following activities were conducted: *describe the season, extent, quantity, and type of treatments.*

In 2014, the restoration activity that occurred at Bobcat Marsh was planting 5,000 containerized plants around the site in October. Because the Mitigation Bank is meeting the stems per acre standard (2,729 stems per acre, performance standard 10) and the canopy cover standard (55% canopy cover, performance standard 11), no additional woody planting will be needed on the site. The site is also meeting its native herbaceous cover in both the emergent marsh and forested habitats. The native herbaceous cover within the emergent marsh is 106% and 83% in the forested habitat. No additional seeding will be needed on site. During the year the site received regular spot sprays throughout the growing season to control non-native/invasive species that germinated in the mitigation site. The dominant invasive species that came up in Bobcat Marsh were *Phalaris arundinacea* (reed canary grass), *Lotus corniculatus* (bird's-foot trefoil) and *Anthemis cotula* (Stinking chamomile). Below is a list of the species planted on site in 2014.

Woody Plant Species	Quantity
Fraxinus latifolia	500
Populus balsalmifera	500
Salix lasiandra	500
Rosa pisocarpa	1,000
Salix sitchensis	500
Spiraea douglasii	2,000

The restoration and maintenance activities that were performed on the Bobcat Marsh site in 2014 are shown in Table 3.

Table 3: 2014 Vegetation Planting and Management Activities

Date:	Actions Performed:

May 22 2014	Spot sprayed for invasive/non-native species.
July 17 2014	Spot sprayed for invasive/non-native species.
September 11 2014	Spot sprayed for invasive/non-native species.
September 30 2014	Entire site was mowed to allow for inter-planting and reduce rodent girdling.
October 4 2014	Installed 5,000 containerized trees/shrubs throughout higher portions of site. Plants were installed with volunteers and contractors.

D. Monitoring Methods

Vegetation and hydrology monitoring followed the routine methods specified in the DSL Removal-Fill Guidelines with the following exceptions:

Vegetation sample plots were randomly selected using GIS that divided the plots proportionately between habitat types (emergent and shrub-scrub/forested areas). To assess the vegetative cover and stem density in the mitigation site, 29 random points were generated and positioned onsite using GPS and marked with a t-post. To assess stem density, 29 circular plots (the centers of the circular plots are the randomly selected points), 12 square meters in size, were monitored. To assess the vegetative cover in the mitigation site, 24 meter-squared plots within the emergent marsh units and 34 meter-squared plots within the forested units were monitored. Two vegetative cover plots were placed within the larger circular plots. The herbaceous plots aligned with the center of the circular plots on opposite corners. Species composition, coverage and the number of stems was recorded for each plot.

E. Monitoring Data Locations.

This is a third year monitoring report. The plot locations did not change from the previous year monitoring report. See Figure D in Appendix A for the locations of the plots and the photo points.

F. Hydrology Methods and Context.

Hydrology monitoring was conducted in May 2014 to determine if the site meets USACE wetland hydrology criteria. Hydrology monitoring followed the methods outlined in the regional supplement to the Corps of Engineers wetland delineation manual: western mountains, valleys, and coast region. The 29 points that were used for the vegetation monitoring were also used for the hydrology sample plots. At each point inundation or soil saturation to the surface was visually observed and measured. If no standing surface water was present, a 16 inch soil pit was dug and within each pit the level of soil saturation or water table depth was measured. During sampling on May 19, 2014, 29 of 29 test pits (100%) revealed saturated soils at 11.5 inches or less, meeting hydrology criteria for a wetland site. See table 4 for hydrology monitoring data and appendix A for hydrology monitoring photos.

Table 4: Hydrology Monitoring Data

- Hydrology monitoring conducted on 19 May 2014 at Bobcat Marsh, JBWP.

Plot Number	GPS Location	Hydrology	Meets Wetland Hydrology	Notes

			Criteria	
Plot #1	N 45.50496 W 122.98973	Inundated @ +16"	Yes	*Photo Taken*
Plot #2	N 45.50492 W 122.98962	Inundated @ +2"	Yes	*Photo Taken*
Plot #3	N 45.50467 W 122.98900	Inundated @ +7.5"	Yes	*Photo Taken*
Plot #4	N 45.50456 W 122.98848	Inundated @ +2"	Yes	*Photo Taken*
Plot #5	N 45.50495 W 122.98885	SS @ -11"	Yes	C4, B2, B3, B7
Plot #6	N 45.50469 W 122.98840	SS @ -7", GW @ -11"	Yes	C4, B2, B3, B7
Plot #7	N 45.50406 W 122.98801	SS @ -11"	Yes	C4, B2, B3, B7
Plot #8	N 45.50407 W 122.98879	STS, GW @ -1"	Yes	
Plot #9	N 45.50418 W 122.98903	Inundated @ +2.5"	Yes	*Photo Taken*
Plot #10	N 45.50373 W 122.98863	SS @ -2", GW @ -5"	Yes	
Plot #11	N 45.50341 W 122.98892	STS, GW @ -1"	Yes	*Photo Taken*
Plot #12	N 45.50296 W 122.98850	SS @ -6", GW @ -8"	Yes	C4, B2, B3, B7
Plot #13	N 45.50251 W 122.98797	Inundated @ +6.5"	Yes	*Photo Taken*
Plot #14	N 45.50219 W 122.98862	STS, GW @ -5"	Yes	C4, B2, B3, B7
Plot #15	N 45.50223 W 122.98777	Inundated @ +18"	Yes	
Plot #16	N 45.50251 W 122.98722	Inundated @ +11"	Yes	*Photo Taken*
Plot #17	N 45.50281 W 122.98763	Inundated @ +3"	Yes	*Photo Taken*
Plot #18	N 45.50296 W 122.98734	SS @ -8", GW @ -11.5"	Yes	C4, B2, B3, B7
Plot #19	N 45.50324 W 122.98759	SS @ -6", GW @ -9"	Yes	*Photo Taken*
Plot #20	N 45.50367 W 122.98763	SS @ -5", GW @ -10"	Yes	
Plot #21	N 45.50240 W 122.98669	SS @ -12"	Yes	C4, B2, B3, B7
Plot #22	N 45.50208 W 122.98660	SS @ -11.5"	Yes	C4, B2, B3, B7
Plot #23	N 45.50192 W 122.98663	SS @ -7", GW @ -11"	Yes	C4, B2, B3, B7
Plot #24	N 45.50176 W 122.98686	SS @ -10.5"	Yes	C4, B2, B3, B7
Plot #25	N 45.50176 W 122.98743	Inundated @ +0.5"	Yes	*Photo Taken*
Plot #26	N 45.50132 W 122.98804	SS @ -7.5"	Yes	C4, B2, B3, B7
Plot #27	N 45.50149 W 122.98717	SS @ -8"	Yes	C4, B2, B3, B7
Plot #28	N 45.50326 W 122.98821	SS @ -7", GW @ -11"	Yes	C4, B2, B3, B7
Plot #29	N 45.50337 W 122.98794	SS @ -8", GW @ -14"	Yes	C4, B2, B3, B7, B13

**Photos of the hydrology monitoring are located in the appendices*.

Table 5: Precipitation Data

Field Dates	Observed Rainfall on Field Dates (in.)	Observed Rainfall Two Weeks Prior to Field Dates (in.)	Percent of Normal Rainfall for the Water Year to Date	Percent of Normal Precipitation for Three Months Prior to the Field Date
5/19/2014	0.1”	1.16”	63%	February - 115% March - 163% April - 92%

3. Results

A. Vegetation Standards.

Vegetation monitoring data is included in Appendix B. The following lists the performance standards (numbered as listed in the mitigation plan) and a description of whether or not they are being met.

2) **EM-The relative percent native cover for Year 1 must be 40%, Year 2 must be 50%, and Year 3 and thereafter must be 60%.**

In July, there was 106% native cover[1] within the emergent marsh areas. Native cover during monitoring events met the performance standard of 60% native cover for Year 3. The dominant native plant species that were found within the emergent plots were:

- *Alisma plantago aquatica*
- *Eleocharis ovata*
- *Eleocharis palustris*
- *Sagittaria latifolia*
- *Alopecurus aequalis*
- *Sparganium emersum*

All of these herbaceous species were ones that were seeded into the site.

Table 6: Native Vegetation Cover in Emergent Marsh

July, 2014	
% native cover, emergent marsh	**106%**

Sample mean = 106% native herbaceous cover, confidence interval 101-111% at an 80% confidence level.

3) **EM - The relative herbaceous invasive plant cover (including reed canary grass) is no more than 30% in Years 1 through 3, and no more than 20% in years 4 and 5. Invasive plants other than reed canary grass cannot exceed 10%.**

In July, there was a 2% total invasive cover including reed canary grass within the emergent areas. The invasive plant cover without reed canary grass was 0%, which is within the limits of 10%. The percent herbaceous invasive coverage was met for both standards. The invasive coverage within the emergent marsh was very low because of the dense native herbaceous cover that was present.

Table 7: Invasive Species Cover

July, 2014	
% invasive cover, emergent marsh (including reed canary grass)	**2%**
% invasive cover, emergent marsh (excluding reed canary grass)	**0%**

Mean cover of herbaceous invasive species, INCLUDING canary grass (July 2014) = 2%; confidence interval 1-3% at an 80% confidence level.
Mean cover of herbaceous invasive species, EXCLUDING canary grass (July 2014) = 0%; confidence interval 0-0% at an 80% confidence level.

4) **EM – Bare substrate must represent no more than 20% cover by the 3rd year after planting.**

In July, there was 2% bare ground within the emergent areas.

[1] This value is the result of measuring absolute cover, and the presence of multiple strata (layers) of vegetation within the sample plot. See DSL vegetation monitoring guidelines (RMG's) for an explanation.

Table 8: Bare Substrate

July, 2014	
% bare substrate, emergent marsh	**2%**

Mean bare soil, emergent marsh habitats = 2% (July 2014); confidence interval 1-3% at an 80% confidence level.

5) **EM – Six native species at Year 1 with a total cover of at least 10%.**

This performance standard was met in Year 1.

6) **EM – Six native species at Year 5 with a total cover of at least 30%. To quantify, a species must have at least 5% cover in the habitat class and occurs in at least 10% of the plots sampled.**

This is the third year of monitoring, so this performance standard is not applicable at this time.

7) **SSF – The cover of woody invasive species is no more than 10% throughout the monitoring period.**

There are no woody invasive species present on the site; therefore this performance standard is met.

8) **SSF – The relative herbaceous invasive plant cover is no more than 30% in Years 1 through 3, and no more than 20% in Years 4 and 5.**

In July, there was 2% herbaceous invasive plant cover within the scrub shrub/forested areas. The dominant non-native/invasive species within the scrub shrub/forested areas were *Lotus corniculatus* (bird's-foot trefoil), *Anthemis cotula* (Stinking chamomile) and *Phalaris arundinacea* (reed canary grass).

Table 9: Percent Invasive Herbaceous Cover in Scrub-Shrub Wetlands

July, 2014	
% invasive herbaceous cover, shrub plantings	**2%**

Mean cover of herbaceous invasive species, SSF habitat = 2%; confidence interval 1-3% at an 80% confidence level.

9) **SSF – Six native species (woody and herbaceous) at Year 5 with a total cover of at least 30%.**

This is the third year of monitoring, so this performance standard is not applicable at this time.

10) **SSF – Native woody stem density is at least 1,600 stems (trees) or plants (shrubs)/acre at Year 5. Native volunteers are counted, not dead plant or stems.**

In July, 2014 there was 2,729 stems per acre. This is meeting the year 5 standard of 1,600 stems per acre in Year 3.

Table 10: Native Woody Stems per acre

July, 2014	
Native woody stems per acre	**2,729**

11) SSF – Native woody canopy cover is 10% by Year 1, 30% by Year 2, 50% by Year 5.

The average percent cover of native woody vegetation in July, 2014 was 55%; this is meeting the Year 5 performance standard of 50% in Year 3.

Table 11: Mean Percent Cover of Native Tree and Shrub Species

Species		**Indicator status***	**Mean % Cover**
Trees			
Fraxinus latifolia	Oregon Ash	2	
Populus balsalmifera	Black Cottonwood	3	
Crataegus douglasii	Black Hawthorn	3	
Percent Cover Trees[1]			**7.2%**
Shrubs			
Cornus alba	Red-osier Dogwood	2	
Lonicera involucrata	Black twinberry	3	
Physocarpus capitatus	Pacific Ninebark	2	
Rosa pisocarpa	Cluster/ Swamp Rose	3	
Salix lasiandra	Pacific Willow	2	
Salix hookeriana	Piper Willow	2	
Salix scouleriana	Scouler Willow	3	
Salix sitchensis	Sitka Willow	2	
Spiraea douglasii	Douglas Spirea	2	
Percent Cover Shrubs[2]			**47.8%**
Total cover, native woody vegetation[3]			**55.0%**

*1 = obligate, 2 = FACW, 3 = FAC, 4 = FACU, and 5 = UPL
[1]average of all plots with tree cover
[2]average of all plots with shrub cover
[3]average percent cover of all woody vegetation in sample plots (note that 55% total cover is not an additive statistic, but the true mean of woody vegetation cover across all sample plots; see sample data.)
Mean % cover = 55%, confidence interval 47-63% at an 80% confidence level.

B. Hydrology Standards Result:

1) Entire Site: During years of normal precipitation, no permanent standing water will be found on-site.

After multiple flood events from the Tualatin River in February and April, 2014, water levels in Bobcat Marsh gradually declined until the site went completely dry. The site was regularly monitored throughout the year to measure water levels in the ponds and creek channel to ensure the site dried completely (see Table 13 for monitoring data). On August 18, 2014 there was no permanent standing water found anywhere on the site. The water gauge data (Figure 1) shows the months when the site was flooded (5+ feet) and then the gradual drying for the site through the summer until it is completely dry. There are eight water gauges located throughout the site (in the each one of the backwater ponds and in multiple locations along the creek channel). See Figure E (Appendix A) for water gauge locations.

Figure 1: Water Gauge Data

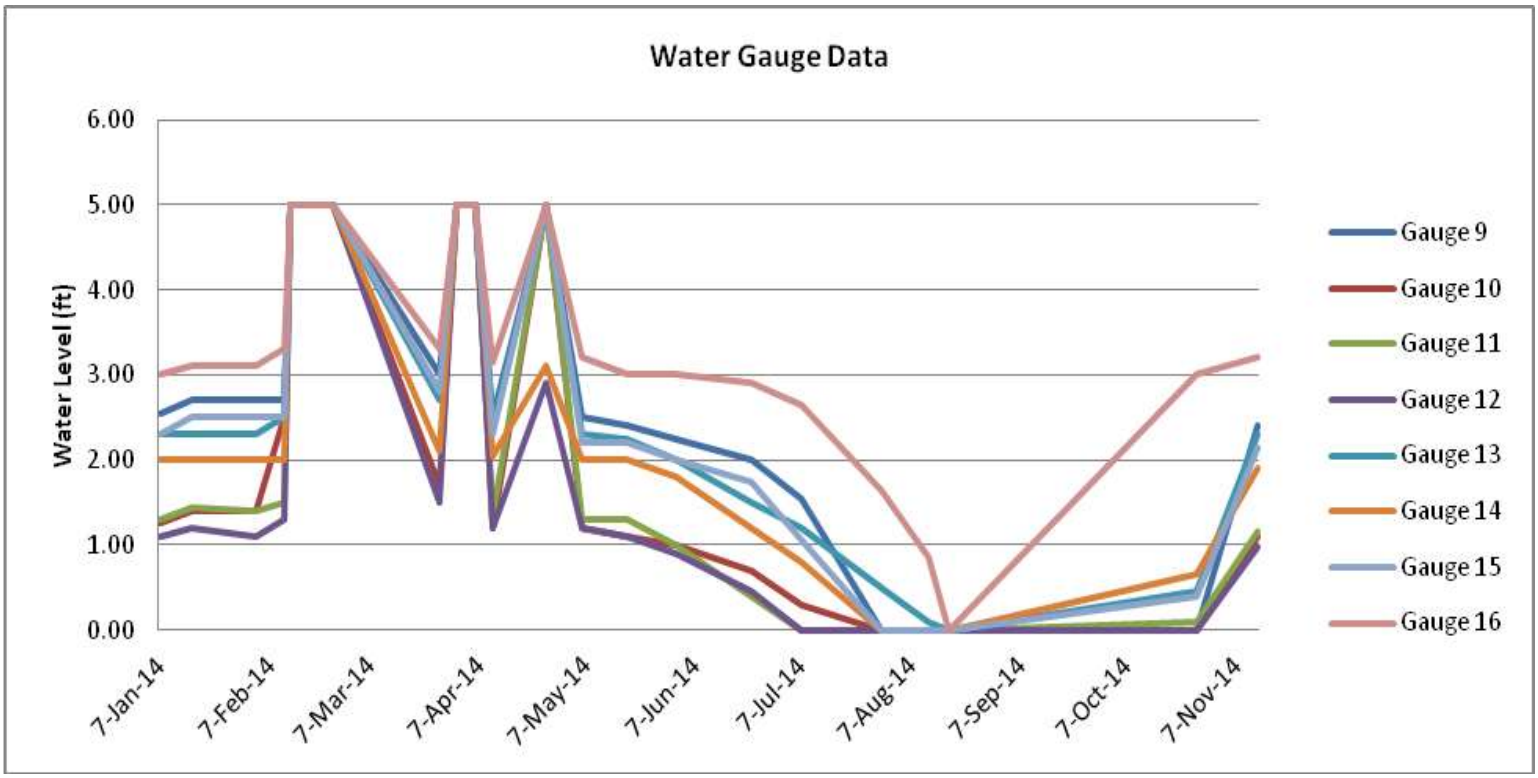

Table12: Water gauge data for Bobcat Marsh.

Water Gauge Data											
	7-Jan-14	16-Jan-14	3-Feb-14	11-Feb-14	13-Feb-14	25-Feb-14	27-Mar-14	1-Apr-14	6-Apr-14	11-Apr-14	26-Apr-14
Gauge 9	2.55	2.70	2.70	2.70	5.00	5.00	3.00	5.00	5.00	2.50	5.00
Gauge 10	1.25	1.40	1.40	2.50	5.00	5.00	1.70	5.00	5.00	1.20	5.00
Gauge 11	1.30	1.45	1.40	1.50	5.00	5.00	2.80	5.00	5.00	1.35	5.00
Gauge 12	1.10	1.20	1.10	1.30	5.00	5.00	1.50	5.00	5.00	1.20	2.90
Gauge 13	2.30	2.30	2.30	2.50	5.00	5.00	2.70	5.00	5.00	2.40	5.00
Gauge 14	2.00	2.00	2.00	2.00	5.00	5.00	2.10	5.00	5.00	2.05	3.10
Gauge 15	2.30	2.50	2.50	2.50	5.00	5.00	2.80	5.00	5.00	2.30	5.00
Gauge 16	3.00	3.10	3.10	3.30	5.00	5.00	3.30	5.00	5.00	3.15	5.00

Water Gauge Data Continued										
	6-May-14	19-May-14	2-Jun-14	23-Jun-14	7-Jul-14	30-Jul-14	12-Aug-14	18-Aug-14	27-Oct-14	13-Nov-14
Gauge 9	2.50	2.40	2.25	2.00	1.55	0.00	0.00	0.00	0.00	2.40
Gauge 10	1.20	1.10	1.00	0.70	0.30	0.00	0.00	0.00	0.00	1.10
Gauge 11	1.30	1.30	1.00	0.40	0.00	0.00	0.00	0.00	0.10	1.15
Gauge 12	1.20	1.10	0.90	0.45	0.00	0.00	0.00	0.00	0.00	0.98
Gauge 13	2.30	2.25	2.00	1.50	1.20	0.50	0.10	0.00	0.45	2.30
Gauge 14	2.00	2.00	1.80	1.20	0.80	0.00	0.00	0.00	0.65	1.90
Gauge 15	2.20	2.20	2.00	1.75	1.05	0.00	0.00	0.00	0.40	2.15
Gauge 16	3.20	3.00	3.00	2.90	2.65	1.65	0.85	0.00	3.00	3.20

*5 feet on the graph indicates where the site was flooded from the Tualatin River and the water gauges were completely submerged in water.

12) Shall meet 1987 Corps of Engineers Delineation Manual Wetland Hydrology Criteria.

This is the third annual monitoring report. A formal delineation will be conducted at the end of the five year monitoring period to determine if the site meets the 1987 USACE Manual wetland criteria.

C. Delineation of wetland acreage achieved.

This is a third annual monitoring report. A formal delineation will not be conducted until the end of the five-year monitoring period or when it appears all the proposed success standards are being met, if that occurs before the end of the fifth year.

D. Other performance standard result:

There are no other performance standards for this site.

Function Assessment.

This is a third annual monitoring report, so a functional assessment has not yet been conducted. At the end of the fifth year of monitoring a functional assessment will be completed for the site. Since the site is a wetland mitigation bank, the functions will not be compared to impact site functions except as credits are withdrawn, but will be compared with the proposed functions that were projected as part of the wetland mitigation banking documents. The weighted functional assessment calculation spreadsheet that was submitted as part of the banking documents is attached in Appendix C.

4. Conclusions and Recommendations

1. Project status.

The mitigation project is in compliance with all the performance standards. No additional restoration activities (e.g., planting woody vegetation or seeding) are needed for Bobcat Marsh. The future management of the site will focus on ensuring the establishment of the woody vegetation and controlling invasive species. But if the woody vegetation on the site is reduced by herbivorous animals (i.e., beaver or nutria) or drought, the site will be replanted until it reaches performance standards. We will continue to use adaptive management to make the project successful.

B. Recommendations.

To facilitate woody plant growth and establishment, the majority of the maintenance activities will focus on eliminating invasive species, reducing rodent girdling and reducing competition from herbaceous plants. The following activities will occur on the site in 2015.

Table 13: Vegetation Management Activities

Date:	Maintenance Actions:
May, 2015	• Ring spray around woody plants to reduce rodent girdling and plant competition. • Spot spray entire site for invasive species.

July, 2015	• Ring spray around woody plants to reduce rodent girdling and plant competition. • Spot spray entire site for invasive species.
September, 2015	Spot spray entire site for invasive species.
October, 2015	Mow the entire site to reduce rodent girdling.

Spot spraying will occur throughout the year as needed to target invasive/non-native species. This will greatly reduce the percent cover of invasive species in the emergent marsh and scrub-shrub areas and increase the cover of native wetlands species. If large areas are sprayed to control non-native species, the resulting bare areas will be seeded with natives to prevent re-infestation of non-natives.

C. Financial Security Status.

A performance bond or other type of financial security was not required to be posted for this wetland mitigation bank since the bank sponsors are public agencies.

5. Maps and Figures

The following maps and graphics are included in Appendix A

A: As-built survey
The as-built report, maps and plans were submitted to the agencies in October 2011. Figure A includes the as-built survey from this submittal.

B: Habitat units
The project was constructed as planned. The plans for the plantings, which show the types of habitat units planned for this site, are shown in Figure B.

C: Mitigation plan.
The enhancement and restoration areas are show in Figure C.

D: Monitoring plan
The monitoring plan, including the photo point locations and the vegetation monitoring plot locations, are shown in Figure D.

E: Water Gauge Locations
The water gauge location map shows the locations of the water gauges.

6. Appendices

Appendix A – Plans, Maps, and Ground-levels of Photos of Site

- Figure A: As-built survey
- Figure B: Habitat units
- Figure C: Mitigation Plan
- Figure D: Monitoring plan
- Figure E: Water Gauge locations
- Bobcat Marsh Credit Ledger

- Photos Point Photos
- Hydrology Monitoring Photos

Appendix B - Vegetation Data and Data Plot Locations

- Vegetation Data
- Data Plot Locations

APPENDIX A

Plans, Maps, and Ground-level Photos of Site

Figure A: As-Built Survey

Figure B:
Habitat Units for the
Bobcat Marsh Mitigation Bank

Bank Boundary
2008 ODOT Mitigation Site

2011 Aerial Photo Shown

N

0 Feet 300

Habitat Type

PFO/PSS
PSS
PEM/PSS

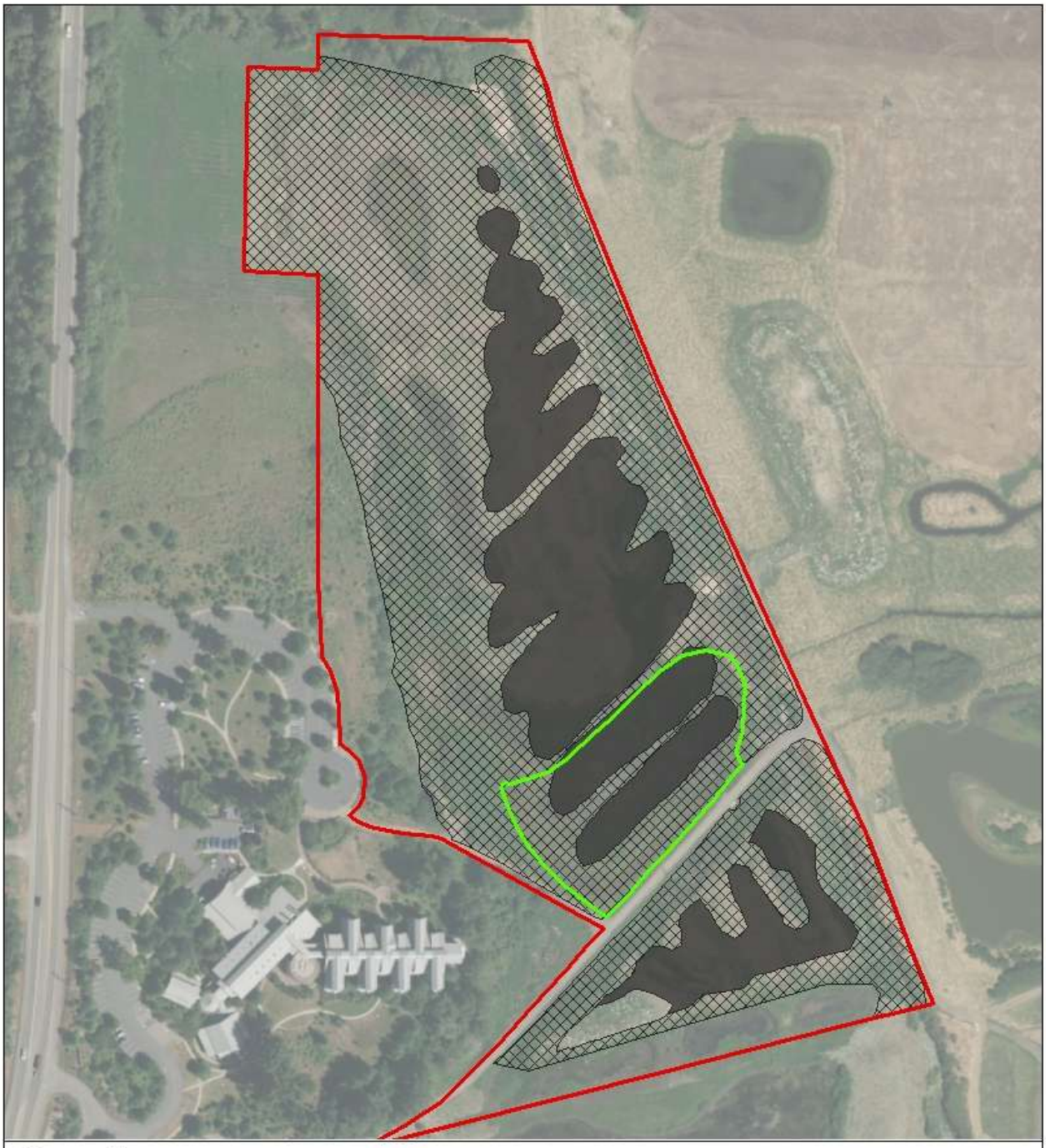

Figure C:
Mitigation Plan for the
Bobcat Marsh Mitigation Bank

Bank Boundary
2008 ODOT Mitigation Site

2011 Aerial Photo Shown

N

0 Feet 300

Mitigation Type

Restoration
Enhancement

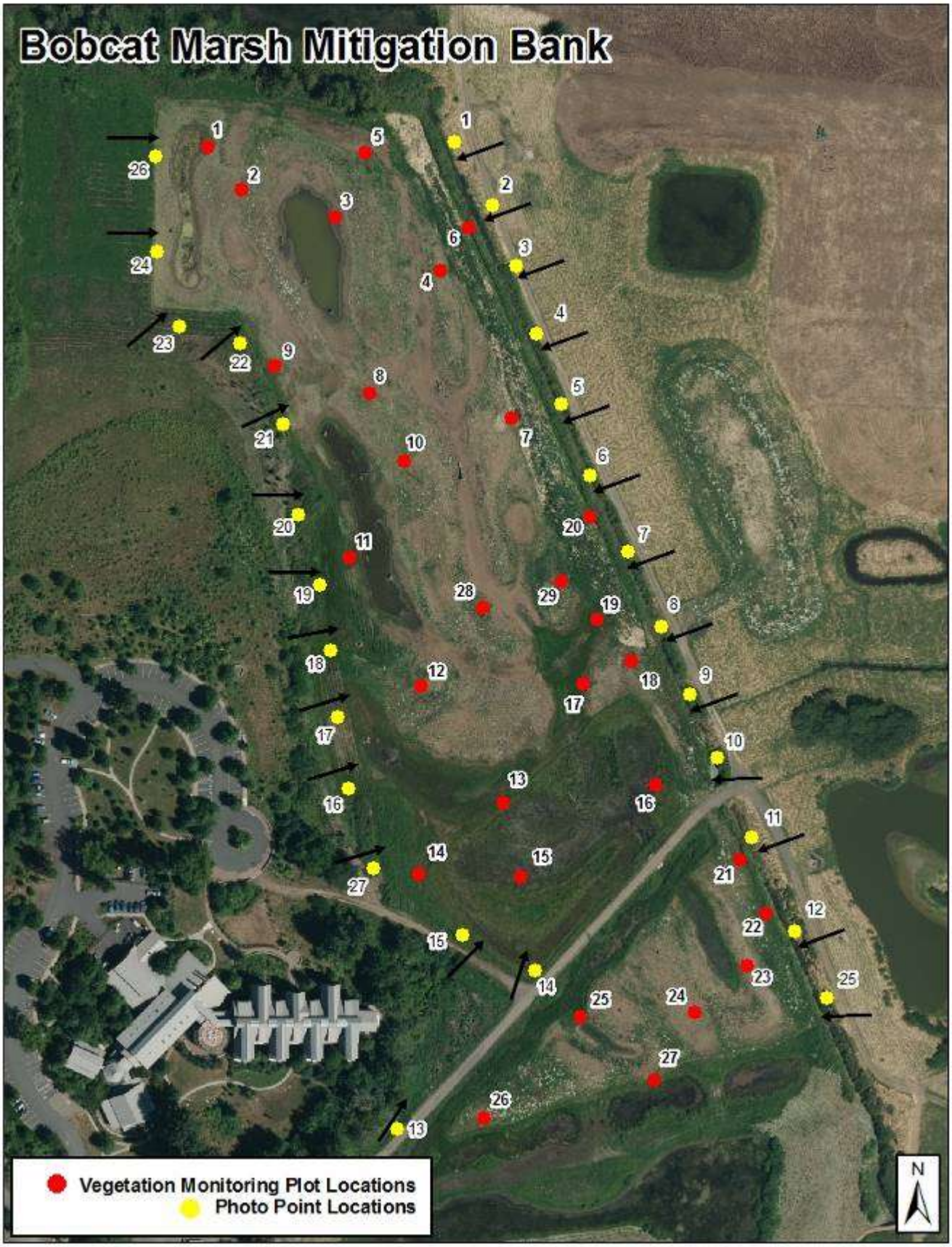

Figure D: Monitoring Points

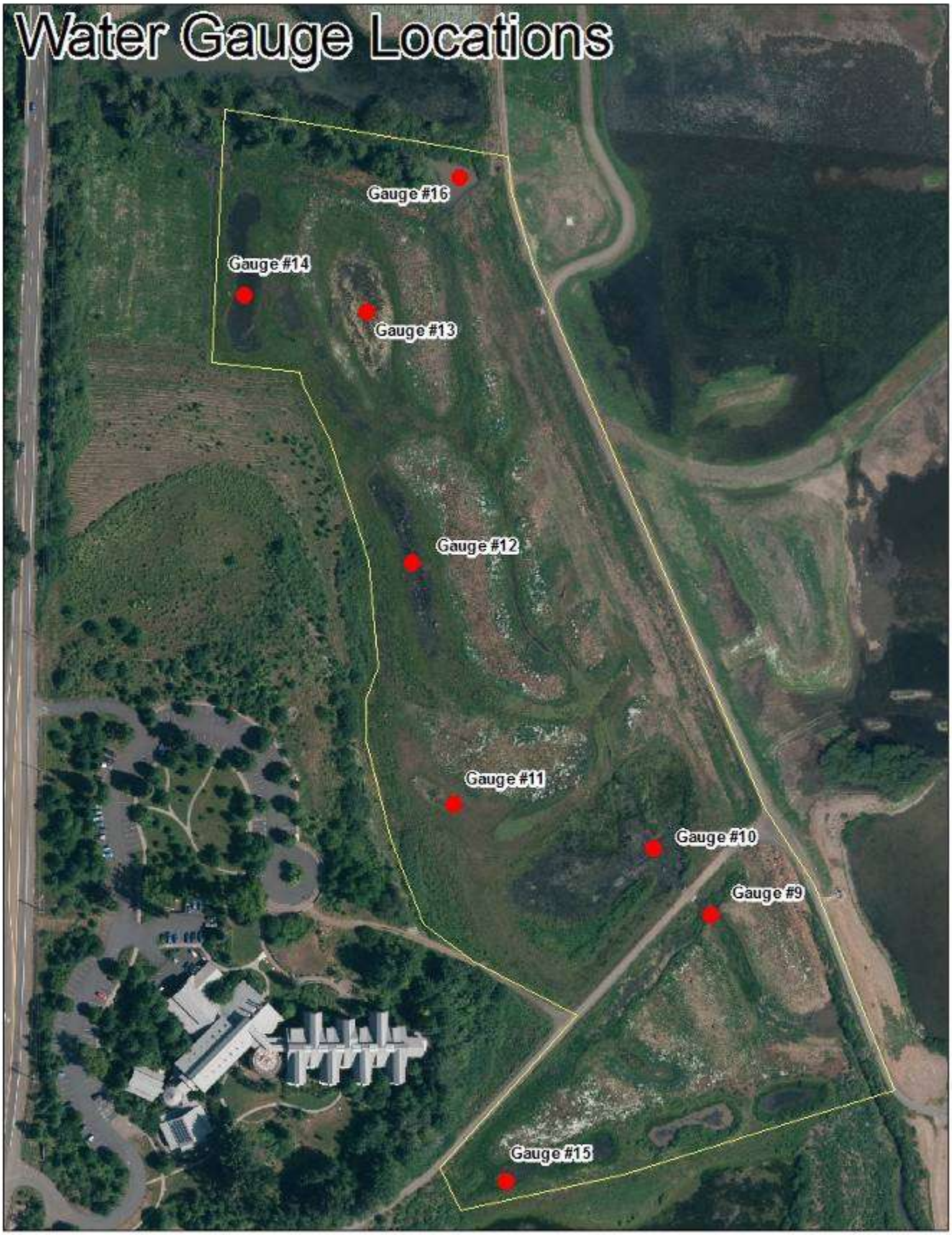

Figure E: Water Gauge Locations

Bobcat Marsh Credit Ledger

Transaction Date	Transaction Type (Credit release or withdrawal)	Jurisdiction (Federal, State or both)	Number of Credits	Credit Unit (acre)	State Permit Number	Federal Permit Number	Credit Type (HGM, Cowardin, other)	Balance of released credits
12/29/11 (official letter 1/11/12)	10% certification release (MBI signed)		+0.526					0.526
	10% certification release (initial planting)		+0.526					1.052
	10% certification release (as-built grading approval)		+0.526					1.578
1/4/12	US 26/ Glencoe Interchange KN12885	Both	-1.15	1.15	RF 48453	NWP-2011-147	Riverine flow-through/Slope, PEM	0.428
1/11/12	US 26: W. Fork Dairy Creek Bridge KN14838	Both	-0.021	0.021	GP 48453	NWP-2011-509	Depressional Outflow, PEM/PSS/PFO	0.407
8/12	OR 217 ATM	Both	-0.05	0.05	51205	2012-282	RFT/PEM	0.357
12/12	US26: Cornell-185	Both	-0.12	0.12	DSL43826-GA	NWP2009-4912	Depressional outflow and Slope Headwaters/PEM	0.237
3/13	US 26 @ Shute Rd. (Brookwood)	Both	-0.12	0.12	52921	NWP2103-63	Depressional-outflow, PEM	0.117
4/2013	OR99-I5 ramps	Both	-0.03	0.03	52674	NWP2013-37	RFT/Depressional-outflow/PEM	0.087
12-13	20%LTMP		+1.052					1.139

SITE PHOTOS

Bobcat Marsh Mitigation Bank - Photo Point

Photo-point 1: North end of mitigation site, looking west.

Photo-point 2: Looking west into mitigation site.

Photo-point 3: Looking west into mitigation site.

Photo-point 4: Looking west into mitigation site.

Photo-point 5: Looking west into mitigation site.

Photo-point 6: Looking west into mitigation site.

Photo-point 7: Looking west into mitigation site.

Photo-point 8: Looking west into mitigation site.

Photo-point 9: Looking west into mitigation site.

Photo-point 10: Looking west into mitigation site.

Photo-point 11: Looking west into mitigation site.

Photo-point 12: Looking west into mitigation site.

Photo-point 13: Looking northeast into mitigation site.

Photo-point 14: Looking Northeast into mitigation site.

Photo-point 15: Looking North into mitigation site.

Photo-point 16: Looking East into mitigation site.

Photo-point 17: Looking East into mitigation site.

Photo-point 18: Looking East into mitigation site.

Photo-point 19: Looking East into mitigation site.

Photo-point 20: Looking East into mitigation site.

Photo-point 21: Looking East into mitigation site.

Photo-point 22: Looking northeast into mitigation site.

Photo-point 23: Looking northeast into mitigation site.

Photo-point 24: Looking east into mitigation site.

Photo-point 25: Looking west into mitigation site.

Photo-point 26: Looking east into mitigation site.

Photo-point 27: Looking east into mitigation site.

Hydrology Monitoring Photos – May 19, 2014

Hydrology Reference Photo Plot #1

*Inundated @ +16”

Hydrology Reference Photo Plot #2

* Inundated @ +2”

Hydrology Reference Photo Plot #3

* Inundated @ +7.5”

Hydrology Reference Photo Plot #4

***** Inundated @ +2”

Hydrology Reference Photo Plot #9

***** Inundated @ +2.5”

Hydrology Reference Photo #11

* Saturated to Surface, Ground Water @ -1”

Hydrology Reference Photo #13

***** Inundated @ +6.5”

Hydrology Reference Photo #16

***** Inundated @ +11”

Hydrology Reference Photo #17

***** Inundated @ +3”

Hydrology Reference Photo #19

* Saturated to Surface, Ground Water @ -9”

APPENDIX B

Vegetation Data and Data Plot Locations

Data Plot Locations

Plots are marked in the field with a t-post painted pink and GPS coordinates collected using a GPS receiver with an accuracy of 3 meters.

Plot Number	*Longitude*	*Latitude*
1	-122.98973	45.50496
2	-122.98962	45.50492
3	-122.98900	45.50467
4	-122.98848	45.50456
5	-122.98882	45.50497
6	-122.98840	45.50469
7	-122.98801	45.50406
8	-122.98879	45.50407
9	-122.98903	45.50418
10	-122.98864	45.50370
11	-122.98892	45.50341
12	-122.98852	45.50293
13	-122.98797	45.50251
14	-122.98862	45.50219
15	-122.98777	45.50223
16	-122.98722	45.50251
17	-122.98763	45.50281
18	-122.98734	45.50296
19	-122.98759	45.50324
20	-122.98763	45.50367
21	-122.98669	45.50240
22	-122.98657	45.50211
23	-122.98663	45.50192
24	-122.98686	45.50176
25	-122.98743	45.50176
26	-122.98801	45.50130
27	-122.98715	45.50146
28	-122.98821	45.50326
29	-122.98794	45.50337

Emergent Marsh Herbacous Plot Numbers

Scientific Name	Common Name	Native (N), Non-native (NN) or Invasive (I)	Indicator status	Row Average emergent marsh	1a	1b	2a	2b	3a	3b	4a	4b	9a	9b	11a	11b	13a	13b	15a	15b	16a	16b	17a	17b	23a	23b	25a	25b
Native Herbaceous Species																												
Alisma plantago aquatica	Broadleaf water-plaintain	N	1	29%	40%	20%	40%	10%	25%	5%	65%	80%	2%			15%	10%	10%		20%	20%	10%	100%	30%	80%	2%	10%	5%
Alopecurus aequalis	Short-awn foxtail	N	1	47%				90%						4%														
Beckmannia syzigachne	American sloughgrass	N	1	10%																					0.1			
Bidens frondosa	Nodding beggartick	N	2	5%									0.1%		10%													
Carex unilateralis	One-sided sedge	N	2	1%							1.0%																	
Deschampsia cespitosa	Tufted hairgrass	N	2	2%										2%														
Carex utriculata	Southern beaked sedge	N	NL	10%				10%																				
Carex stipata	Sawbeak sedge	N	1	2%							2.0%																	
Eleocharis ovata	Oviod spikerush	N	1	50%									90%	60%	30%	50%								20%				
Eleocharis palustris	Creeping spikerush	N	1	39%	60%	20%	15%		80%	95%	80%	60%	5%				80%	80%	5%	10%	5%	1%		45%	3%	15%		
Epilobium watsonii	Watson willowherb	N	2	3%												3%												
Epilobium densiflorum	Spiked primrose	N	2	1%										1%														
Juncus effusus	Soft rush	N	2	3%							4%			2%														
Leersia oryzoides	Ricecut grass	N	1	3%																					3%			
Lotus purshianus	Spanish clover	N	NL	10%										10%														
Ludwigia palustris	Marsh seedbox	N	1	26%		50%	60%		20%	2%	10%	40%	3%						2%	5%	45%	5%		5%	12%	15%	64%	85%
Lycopus americanus	American bugleweed	N	1	1%							1%																	
Madia glomerata	Clustered tarweed	N	4	20%										20%														
Polygonum hydropiperoides	Waterpepper	N	2	8%													10%	5%										
Sagittaria latifolia	Wapato	N	1	24%											50%	5%			80%	30%	10%				2%	5%	25%	10%
Sparganium emersum	Narrowleaf burreed	N	1	40%															3%	15%	20%	90%				70%		
Typha latifolia	Common cattail	N	1	10%											10%	10%												
Non-Native Herbaceous Species																												
Mentha pulegium	Pennyroyal	NN	1	0%								0.1%																
Phalaris arundinacea	Reed canarygrass	I	2	9%			5%								15%	20%		0.1%							0.1		1%	
Bare Substrate																												
Bare Soil				11%		10%												5%	10%	20%								
Total Cover			109%		100%	90%	120%	110%	125%	102%	163%	180%	100%	99%	115%	103%	100%	95%	90%	80%	100%	106%	100%	100%	120%	107%	100%	100%
% bare substrate			2%		0%	10%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	10%	20%	0%	0%	0%	0%	0%	0%	0%	0%
% native cover, emergent marsh			106%		100%	90%	115%	110%	125%	102%	163%	180%	100%	99%	100%	83%	100%	95%	90%	80%	100%	106%	100%	100%	110%	107%	99%	100%
% invasive cover (including RCG), emergent marsh			2%		0%	0%	5%	0%	0%	0%	0%	0%	0%	0%	15%	20%	0%	0%	0%	0%	0%	0%	0%	0%	10%	0%	1%	0%
% invasive cover (excluding RCG), emergent marsh			0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Prevalence Index	sample mean	standard deviation	square root of (# sample units)	standard error	standard error (t-factor for 80% CI)	mean+standard error	mean-standard error
% cover native species, emergent marsh	106%	23%	5.38516481	4%	5%	111%	101%
% cover invasive species, emergent marsh (including RCG)	2%	5%	5.38516481	1%	1%	3%	1%
% cover invasive species, emergent marsh (excluding RCG)	0%	0%	5.38516481	0%	0%	0%	0%
% cover bare soil, emergent marsh	2%	4%	5.38516481	1%	1%	3%	1%

Scrub-Shub/Forested Wetland Herbacous Plot Numbers

Scientific Name	mon N	Native (N), Non-native (NN) or Invasive (I)	Indicator status	Row Average upland habitat	5a	5b	6a	6b	7a	7b	8a	8b	10a	10b	12a	12b	14a	14b	18a	18b	19a	19b	20a	20b	21a	21b	22a	22b	24a	24b	26a	26b	27a	27b	28a	28b	29a	29b
Native Herbaceous Species																																						
Alisma plantago aquatica	Broadl	N	1	4%							4%																											
Alopecurus aequalis	Short-a	N	1	4%							2%	5%																										
Beckmannia syzigachne	Ameri	N	1	1%							1%	1.0%																										
Bidens frondosa	Noddi	N	2	2%			0.1%	1%									3%	2%																				
Carex unilateralis	One-si	N	2	3%				1%			5%	2%																										
Carex obnupta	Slough	N		2%										2%																								
Deschampsia cespitosa	Tufted	N		1%																										1%								
Eleocharis ovata	Oviod	N	1	50%							20%	80%																										
Hordeum Brachyantherum	Meado	N	2	12%							1%	2%		3%					3%	0.1%									80%	15%					2%		1%	
Lythrum hyssopifolia	Hyssop loosestrife			0%			0.1%																															
Madia glomerata	Cluster	N	4	76%	100%	100%	85%	90%	95%	95%	20%	10%	100%	95%	100%	95%	2%	10%	96%	100%	100%	100%	85%	95%	100%	60%	95%	100%	10%	20%	100%	98%	80%	85%	60%	20%	99%	100%
Rumex salicifolium	Willov	N	2	2%		2%										3%				1%																		
Non-Native Herbaceous Species																																						
Anthemis cotula	Stinkin	I	4	2%	0.1%	0.1%			0.1%							1%																	5%	5%	1%			
Lactuca serriola	Prickly	NN	4	2%																						2%												
Lotus corniculatus	Birdsfo	I	3	2%						1%						1%			1%				1%		0.1%				5%	5%					1%	0.1%		
Mentha pulegium	Pennyr	NN	1	1%							1%																											
Phalaris arundinacea	Reed c	I	2	3%							10%			0.1%			5%	3%									5%		5%	0.1%		2%		0.1%				
Bare Substrate																																						
Bare Soil				33%			10%	8%	5%	4%							90%	85%					14%	5%		38%				59%			15%	10%	36%	80%		
Total % Cover			85%		100%	102%	85%	92%	95%	96%	64%	100%	100%	100%	100%	100%	10%	15%	100%	101%	100%	100%	86%	95%	100%	62%	100%	100%	100%	41%	100%	100%	85%	90%	64%	20%	100%	100%
% Bare Ground			14%		0%	0%	10%	8%	5%	4%	0%	0%	0%	0%	0%	0%	90%	85%	0%	0%	0%	0%	14%	5%	0%	38%	0%	0%	0%	59%	0%	0%	15%	10%	36%	80%	0%	0%
% of vegetative cover in native species			83%		100%	102%	85%	92%	95%	95%	53%	100%	100%	100%	100%	98%	5%	12%	99%	101%	100%	100%	85%	95%	100%	60%	95%	100%	90%	36%	100%	98%	80%	85%	62%	20%	100%	100%
% of vegetative cover in Introduced species (including RCG)			2%		0%	0%	0%	0%	0%	1%	11%	0%	0%	0%	0%	2%	5%	3%	1%	0%	0%	0%	1%	0%	0%	2%	5%	0%	10%	5%	0%	2%	5%	5%	2%	0%	0%	0%
% of vegetative cover in Introduced species (excluding RCG)			1%		0%	0%	0%	0%	0%	1%	1%	0%	0%	0%	0%	2%	0%	0%	1%	0%	0%	0%	1%	0%	0%	2%	0%	0%	5%	5%	0%	0%	5%	5%	2%	0%	0%	0%

Prevalence Index	sample mean	standard deviation	square root of (# sample units)	standard error	standard error (t-factor for 80% CI)	mean+standard error	mean-standard error
% native cover, shrub	83%	27%	5.385165	5%	7%	90%	76%
% invasive cover, shrub	2%	3%	5.385165	1%	1%	3%	1%
% cover bare soil, shrub	14%	26%	5.385165	5%	6%	20%	8%

			Plot Numbers - Stems per Acre																												
Species		**Native (N) or Introduced (I)**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**
Trees																															
Crataegus douglasii	Black Hawthorn	N			10	1	7		5	1		2				4		2		10	2	8	11	12		5				7	
Fraxinus latifolia	Oregon Ash	N	9	7	25	5	19	2	8	14	14	16		25	25			2		26	8	8	13	9		17	12	6		20	5
Populus trichocarpa	Black Cottonwood	N	4	1	17	1					23	5		5	2									6		10	7	7	1	10	10
	Total Live Trees		**13**	**8**	**52**	**7**	**26**	**2**	**13**	**15**	**37**	**23**	**0**	**30**	**27**	**4**	**0**	**4**	**0**	**36**	**10**	**16**	**24**	**27**	**0**	**32**	**19**	**13**	**1**	**37**	**15**
Shrubs																															
Cornus stolonifera	Red-osier Dogwood	N	2	1				1		1	5	5		1	4	2	2					2	6	2			5	11	1	1	8
Lonicera involucrata	Black twinberry	N			22							3														15	5	1		9	
Physocarpus capitatus	Pacific Ninebark	N			1										1											1	4	5		1	
Rosa pisocarpa	Cluster/ Swamp Rose	N	1	5	2	23	3	7	5	4	9	20	6	14	19	19	5	1		9	10	13	15	32		19	15	12	5	35	8
Salix geyeriana	Geyer willow	N							1												1						2	1			
Salix lasiandra	Pacific Willow	N	9	11	1	11		16	7	14	24	6	7	4	1	18	22	9	34	1	6	1		1	4		1	3	5	1	15
Salix piperi	Piper Willow	N	19	14	9	4		10	4	9	16	10	6	2	3	4	25	3	6	1	2				5		31	12	21	5	9
Salix scouleriana	Scouler Willow	N	29	17	7	9	4	5	9	16	31	10	3	5		6				5	7	4	4	1		6	5	9		7	8
Salix sitchensis	Sitka Willow	N	10	10	8	9	3	4	9	17	11	16		3	1	2		2		1		3	3	1		4	3	8		11	4
Spiraea douglasii	Douglas Spirea	N	8	17	5	26	7	40	29	14	22	16	40	22	15	4	10	28	7	10	17	10	20	16	7	4	7	18	7	6	14
		Total Live Shrubs	**78**	**75**	**55**	**82**	**17**	**83**	**64**	**75**	**118**	**86**	**62**	**51**	**44**	**55**	**64**	**43**	**47**	**27**	**43**	**33**	**48**	**53**	**16**	**49**	**78**	**80**	**39**	**76**	**66**
		Total Number of Stems:	**91**	**83**	**107**	**89**	**43**	**85**	**77**	**90**	**155**	**109**	**62**	**81**	**71**	**59**	**64**	**47**	**47**	**63**	**53**	**49**	**72**	**80**	**16**	**81**	**97**	**93**	**40**	**113**	**81**
		Stems per Acre:	**3276**	**2988**	**3852**	**3204**	**1548**	**3060**	**2772**	**3240**	**5580**	**3924**	**2232**	**2916**	**2556**	**2124**	**2304**	**1692**	**1692**	**2268**	**1908**	**1764**	**2592**	**2880**	**576**	**2916**	**3492**	**3348**	**1440**	**4068**	**2916**
		Average Stems per Acre:	**2729**																												

			Plot Numbers - Percent Cover																												
Species		**Native (N) or Introduced (I)**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**
Trees																															
Crataegus douglasii	Black Hawthorn	N			2.0%	1.0%	1.0%		1.0%	1.0%		1.0%				2.0%		1.0%		3.0%	1.0%	2.0%	3.0%	10.0%		1.0%				2.0%	
Fraxinus latifolia	Oregon Ash	N	3.0%	2.0%	15.0%	1.0%	5.0%	1.0%	3.0%	2.0%	5.0%	5.0%		10.0%	10.0%			1.0%		5.0%	2.0%	3.0%	2.0%	3.0%		5.0%	7.0%	5.0%		10.0%	5.0%
Populus trichocarpa	Black Cottonwood	N	2.0%	1.0%	10.0%	1.0%					4.0%	7.0%		3.0%	1.0%									4.0%		12.0%	2.0%	5.0%	5.0%	5.0%	5.0%
	% Cover Trees		**5.0%**	**3.0%**	**27.0%**	**3.0%**	**6.0%**	**1.0%**	**4.0%**	**3.0%**	**9.0%**	**13.0%**	**0.0%**	**13.0%**	**11.0%**	**2.0%**	**0.0%**	**2.0%**	**0.0%**	**8.0%**	**3.0%**	**5.0%**	**5.0%**	**17.0%**	**0.0%**	**18.0%**	**9.0%**	**10.0%**	**5.0%**	**17.0%**	**10.0%**
Shrubs																															
Cornus stolonifera	Red-osier Dogwood	N	1.0%	1.0%				1.0%		1.0%	1.0%	2.0%		1.0%	1.0%	1.0%	1.0%					1.0%	1.0%	1.0%			2.0%	3.0%	1.0%	1.0%	4.0%
Lonicera involucrata	Black twinberry	N			5.0%							1.0%														6.0%	1.0%	1.0%		2.0%	
Physocarpus capitatus	Pacific Ninebark	N			1.0%										1.0%											1.0%	1.0%	2.0%		1.0%	
Rosa pisocarpa	Cluster/ Swamp Rose	N	1.0%	1.0%	1.0%	5.0%	2.0%	4.0%	2.0%	2.0%	10.0%	10.0%	5.0%	5.0%	5.0%	20.0%	1.0%	1.0%		4.0%	3.0%	5.0%	5.0%	30.0%		15.0%	20.0%	10.0%	5.0%	15.0%	10.0%
Salix geyeriana	Geyer willow	N							1.0%												1.0%						1.0%	1.0%			
Salix lasiandra	Pacific Willow	N	15.0%	10.0%	1.0%	6.0%		7.0%	2.0%	10.0%	20.0%	10.0%	5.0%	2.0%	1.0%	75.0%	50.0%	5.0%	10.0%	1.0%	4.0%	1.0%		1.0%	3.0%		1.0%	2.0%	6.0%	1.0%	10.0%
Salix piperi	Piper Willow	N	25.0%	8.0%	5.0%	3.0%		5.0%	3.0%	10.0%	10.0%	12.0%	10.0%	1.0%	1.0%	1.0%	50.0%	1.0%	5.0%	1.0%	2.0%				4.0%		60.0%	20.0%	60.0%	3.0%	15.0%
Salix scouleriana	Scouler Willow	N	25.0%	20.0%	10.0%	10.0%	3.0%	2.0%	5.0%	20.0%	15.0%	20.0%	2.0%	4.0%		2.0%				2.0%	2.0%	2.0%	2.0%	1.0%		5.0%	5.0%	15.0%		5.0%	25.0%
Salix sitchensis	Sitka Willow	N	5.0%	5.0%	8.0%	7.0%	2.0%	2.0%	5.0%	15.0%	10.0%	25.0%		2.0%	1.0%	1.0%		1.0%		1.0%		2.0%	2.0%	1.0%		2.0%	1.0%	5.0%		20.0%	5.0%
Spiraea douglasii	Douglas Spirea	N	2.0%	5.0%	3.0%	10.0%	1.0%	20.0%	6.0%	4.0%	5.0%	10.0%	65.0%	10.0%	5.0%	2.0%	5.0%	15.0%	3.0%	3.0%	5.0%	2.0%	4.0%	10.0%	2.0%	1.0%	5.0%	15.0%	3.0%	2.0%	10.0%
		% Cover Shrubs	**74.0%**	**50.0%**	**34.0%**	**41.0%**	**8.0%**	**41.0%**	**24.0%**	**62.0%**	**71.0%**	**90.0%**	**87.0%**	**25.0%**	**15.0%**	**102.0%**	**107.0%**	**23.0%**	**18.0%**	**12.0%**	**17.0%**	**13.0%**	**14.0%**	**44.0%**	**9.0%**	**30.0%**	**97.0%**	**74.0%**	**75.0%**	**50.0%**	**79.0%**
		Total % Cover	**79.0%**	**53.0%**	**61.0%**	**44.0%**	**14.0%**	**42.0%**	**28.0%**	**65.0%**	**80.0%**	**103.0%**	**87.0%**	**38.0%**	**26.0%**	**104.0%**	**107.0%**	**25.0%**	**18.0%**	**20.0%**	**20.0%**	**18.0%**	**19.0%**	**61.0%**	**9.0%**	**48.0%**	**106.0%**	**84.0%**	**80.0%**	**67.0%**	**89.0%**

Total Average % Cover of Woody Vegetation:	55.0%
Total Average % Cover of Trees:	7.2%
Total Average % Cover of Shrubs:	47.8%

Prevalence Index	**sample mean**	**standard deviation**	**square root of (# sample units)**	**standard error**	**standard error(t-factor for 80% CI)**	**mean+standard error**	**mean-standard error**
% cover woody vegetation	**55%**	**32%**	**5.38516**	6%	8%	63%	47%
# live stems	**76**	**27**	**5.38516**	5	7	82	69