

**Mitigation Monitoring Report Cover Sheet**  
**Oregon Department of State Lands**

**Block 1: Report Information**

DSL Permit Number: 36703 COE Permit Number: *Nationwide Permit 27 -#200500701*  
 Permittee: *Gilmour*  
 County: *Benton* Report Date: November 15, 2010 Monitoring Year 4  
 Date Removal-Fill Activity Completed:  
 Date mitigation was completed Grading: *10/06* Planting: *5/07, 10/07*  
 Report submitted by: Oregon Wetlands LLC

**Block 2: Monitoring Report Purpose**

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

X Compensatory **freshwater** wetland mitigation for permanent wetland impacts.

NA Compensatory **estuarine** wetland mitigation for permanent wetland impacts.

**Only non-wetland** compensatory mitigation.

**Only mitigation for temporary** impacts that has a monitoring requirement.

Voluntary wetland enhancement, creation or restoration (General authorization or individual permit) not funded with money from our wetland mitigation revolving fund.

Voluntary wetland enhancement, creation or restoration (General authorization or individual permit) funded with money from **our wetland mitigation revolving fund**.

X **Mitigation Bank** Report

Other: \_\_\_\_\_

**Block 3: Results**

	Success Criteria	Met? (Y/N)	Comments/Reasons for Failure*
1.	Emergent Herbaceous	3 of 3 requirements	
2.	Wetgrass Prairie	5 of 6 requirements	Weighted Moisture index is 1.96, slightly wetter than the 2-3 goal.
3.	Shrub and Forest Restoration	6 of 6 requirements	
4.	Forest - Enhanced	2 of 2 On-track	Year 5 performance standard
5.	Hydrology - Delineation	1 of 1 requirements	

Remedial work recommended Yes      No X

Deed Restriction or other protection instrument attached

(noted: if a filed deed restriction was a required as a permit condition, please attach a copy): Yes      No  
*previously submitted*

Final Monitoring Report? Yes      No X

Requesting release or partial release of bond/credits Yes      No X

## TABLE OF CONTENTS

<b>1.0</b>	<b>REGULATORY BACKGROUND.....</b>	<b>3</b>
<b>2.0</b>	<b>WORK SUMMARY .....</b>	<b>3</b>
<b>3.0</b>	<b>AS-BUILT PLANS.....</b>	<b>4</b>
<b>4.0</b>	<b>HYDROLOGY PERFORMANCE STANDARDS, METHODOLOGY, AND RESULTS ...</b>	<b>4</b>
<b>4.1</b>	<b>PERFORMANCE STANDARDS.....</b>	<b>4</b>
<b>4.2</b>	<b>METHODOLOGY .....</b>	<b>4</b>
<b>4.3</b>	<b>RESULTS .....</b>	<b>4</b>
<b>5.0</b>	<b>VEGETATION PERFORMANCE STANDARDS AND METHODOLOGY .....</b>	<b>5</b>
<b>5.1.</b>	<b>Performance Standards.....</b>	<b>5</b>
<b>5.2</b>	<b>Methodology .....</b>	<b>5</b>
<b>5.3</b>	<b>VEGETATION MONITORING RESULTS.....</b>	<b>6</b>
<b>5.3.1</b>	<b>Emergent Vegetation .....</b>	<b>6</b>
<b>5.3.2</b>	<b>Wetland Prairie.....</b>	<b>6</b>
<b>5.3.3</b>	<b>Forest Enhanced.....</b>	<b>8</b>
<b>5.3.4</b>	<b>Shrub and Forest Restoration .....</b>	<b>8</b>
<b>6.0</b>	<b>SPECIES AREA CURVE .....</b>	<b>9</b>
<b>7.0</b>	<b>PHOTO POINT MONITORING.....</b>	<b>10</b>
<b>8.0</b>	<b>CREDIT SALES SUMMARY .....</b>	<b>11</b>

## LIST OF ATTACHMENTS

Attachment	1	Vegetation and Photo Monitoring Point Location Map
Attachment	2	Sample Plot Monitoring Data
Attachment	3	Monitoring Photos

## 1.0 REGULATORY BACKGROUND

The purpose of this report is to summarize the progress of the Evergreen Creek Wetland Mitigation Bank (Bank). The Bank is located on the west side of Bellfountain Road, at the intersection of Bellfountain and 53<sup>rd</sup> Street in T12S, R5W, Sec. 19, Tax Lot 700. The letter of approval for the Bank was signed on February 27, 2007 and is permitted as ACOE permit #200500701.

The Bank is 174.52 acres, which includes a combination of enhancement of cropped wetland (161.5 acres), enhancement of remnant ash and shrub/scrub riparian area (13.4 acres). The total potential credits produced include:

<u>Type of Credit</u>	<u>Acres</u>	<u>Ratio</u>	<u>Credits</u>
Cropped Wetland Enhancement	161.12	2:1	80.31
Enhancement	13.4	3:1	<u>4.46</u>
Total	174.52 acres		84.77
Credits Used for Graveled Parking Area			<u>(0.25)</u>
Total Credits Produced			<b>84.52 credits</b>

## 2.0 WORK SUMMARY

Work in the summer (July) 2009 following monitoring began with mowing of all levees, prairie areas on the North side of site, and ~ 25 acres in SW prairie where forbs were planted the previous fall. In late August, all tree and shrub rows were mowed to aid in weed control efforts the following spring. In September, all borders and existing forested areas were spot herbicide treated for non-natives. A diverse mix of native forbs species were planted during February (2010) in ~15 acres of the prairie on the south side, just south of the planted PFO area. An additional ~5 acres was planted just off the south parking area.

Beginning in early March, efforts concentrated on covering all older prairie areas to spot treat unwanted species before native grasses got tall and inhibited detection. All prairie areas were walked at least two times targeting velvet grass, annual ryegrass, rough-stalk bluegrass, annual blue grass, and any other non-natives encountered. Prairie areas where forbs were planted were walked multiples times targeting Prickly lettuce, Thistle spp., and any other non-native species encountered. The existing forested area was periodically spot treated throughout the season, with St. John's wart and curly dock being the main targets. All tree and shrub plantings were walked every two weeks thru July to spot treat any invading species, Canadian thistles, prickly lettuce, and sow thistles were the primary targets.

As spring moved to summer focus shifted towards patrolling the emergent draw down zones for optimistic species such as spatula-leaf loosestrife and penny royal. A 60ft band along the South and West boundaries were broadleaf herbicide treated when conditions were favorable. All borders were spot treated for non-natives to prevent these species from entering the site.

Following the site visit in June, all levees, a 60ft buffer along borders, maintenance trails through prairies, and ~5 acres off the south parking area were mowed. In early fall several hundred Wapato bulbs were planted randomly throughout the emergent areas following excellent results from test plots the previous fall. In October an ~2 ac. test plot was planted in the South prairie to a variety of native forbs to test another method of incorporating forbs into grass dominated prairies.

**Table 1 - Summary of Restoration Activities at Evergreen Mitigation Bank from July 2009 through October 2010**

<b>Activity</b>	<b>Location</b>
Site Preparation	Ongoing on borders
Existing forested vegetation treatment	All non-native vegetation treated (on-going)
Prairie seeding	A diverse mix of forbs was planted in ~20 acres of prairie on the South side.
Spot weed control	100% of mitigation bank area (on going)
Broadleaf weed control	60ft band along south and west borders
Mowing 2009	All levees, 60ft band along borders, all north prairie areas, and~ 25 acres in SW prairie.
Mowing 2010	All levees, 60ft band along borders, and ~5 ac. off of south parking area.

### **3.0 AS-BUILT PLANS**

The as-built plans were submitted within 60 days of grading as specified in the final instrument.

### **4.0 HYDROLOGY PERFORMANCE STANDARDS, METHODOLOGY, AND RESULTS**

#### **4.1 PERFORMANCE STANDARDS**

Wetland hydrology sufficient to meet the criteria defined in the 1987 Corps of Engineers Wetland Delineation Manual (1987 Wetland Delineation Manual), will be present in at least three out of five years if the weather records are close to normal and no irrigation is supplied. Water depth and depth of saturation will be evaluated throughout the site using a combination of monitoring wells and a one time hydrology and vegetation delineation designed to meet the requirements of the 1987 Wetland Delineation Manual. The soil parameter is expected to be disturbed by the proposed grading, therefore lack of hydric soils indicators will not be interpreted as disqualifying a plot as wetland.

#### **4.2 METHODOLOGY:**

**Water Monitoring Tubes:** Ten (number of tubes will be driven by the site conditions, following bank grading) groundwater monitoring tubes will be constructed and monitored to show the duration of saturation. Tube monitoring data shall be collected three times between approximately March 1 and May 30 to demonstrate sufficient duration of wetness to meet the 1987 Wetland Delineation Manual. The monitoring report will also include precipitation date for the monitoring period from the nearest recording station. The locations of the monitoring tubes will be representative of the hydrological variation on site to prove duration of saturation needed to meet the 87 Manual criteria. These will be included on the as-built drawings.

**Delineation:** Paired plots concentrating along the wetland boundary, for any plots dominated by upland vegetation, and in any high areas will be utilized to indicate the exact location of the wetland boundary. The paired plots will be evaluated using soil probes or pits. This will be done to document that wetland hydrology has been achieved throughout the site. In addition to plot data, these areas will be visually documented with photographs to show a dominance of wetland species. The wetland boundary will then be displayed on a site map to confirm acreage achieving the performance standard.

#### **4.3 RESULTS**

This provision has been met for at least three years and is no longer being monitored

## 5.0 VEGETATION PERFORMANCE STANDARDS, METHODOLOGY AND RESULTS

### 5.1 Performance Standards

#### Emergent Herbaceous

1. A minimum of 55% of the relative plant cover (including bare soil) is comprised of native species.
2. No more that 15% of the relative plant cover is comprised of non-native invasive species as define below.
3. The wetland's moisture index is less than 3.0.

\*Non-native invasive species to be included: reed canary grass (*Phalaris arundinacea*), purple loosestrife (*Lythrum salicaria*), Himalayan blackberry (*Rubus discolor*), and Japanese knotweed (*Polygonum cuspidatum*), Eurasian water milfoil (*Myriophyllum spicatum*), climbing nightshade (*Solanum dulcamara*) (and yellow-flag iris (*Iris pseudacorus*), Anne's lace (*Daucus carota*), Canadian thistle (*Cirsium arvense*), bull thistle (*Cirsium vulgare*), orchard grass (*Dactylis glomerata*) and annual ryegrass (*Lolium multiflorum*) or others as determined by the MBRT.

#### Wetland Prairie

The above performance standard along with the following:

1. At least 10 wetgrass prairie species are present as listed in "Species Composition for Willamette Valley Vegetation Types" by Kathy Pendergrass, August 2003, supplied by John Marshall (USFWS) author of "Draft Guidance on Vegetation Performance Standard and Monitoring Protocols for Reference Sites and Mitigation Sites" to enhance Appendix II of this document.
- 2. Tufted hairgrass (*Deschampsia cespitosa*) is represented by 25% or greater relative plant cover.
- 3. At least 50% of the relative plant cover (including bare soil) is comprised of native species.
4. No more that 15% of the relative plant cover is comprised of non-native invasive species as define above.
5. The prairie's moisture index is between 2.0 and 3.0.
6. No more than 5% relative plant cover by shrubs or trees.

#### Shrub and Forest - Restoration

By the end of the second growing season, the newly planted shrub and forest component of the wetland will meet or exceed 75% of the species richness of the reference site (excluding non-native invasive species). The plant density in forested and shrub/scrub wetlands will be at least 80% of the reference site, of species that are rated FAC or wetter, excluding FAC- species. This must be achieved by the end of the second growing season following planting and maintained through the end of the monitoring period until trees and shrubs are established and free to grow. There will be no more than 15% aerial coverage of non-native invasive species\*. These densities will be a combination of planted individuals and natural recruitment.

In addition, the herbaceous layer in the forest and shrub areas, will meet or exceed the performance standards for emergent herbaceous wetlands as stated above.

#### Forest and scrub/shrub - Enhanced

Year five performance standard for the enhanced forested wetland will be to maintain the existing wetland forest and scrub/shrub layers while managing for no more than 15% of non-native invasive species\*.

### 5.2 Methodology

A stratified, systematic plot method was used to conduct vegetation sampling in all areas except the enhanced forest. Vegetation data was collected at each of 103 sample points that had been pre-determined and plotted along 6 transects. The monitoring point location map is included as Attachment 2. Each transect crosses the entire wetland (north to south) and they are located approximately 400 feet apart (north-south). Sampling plots were then located at 200 foot intervals along each transect. Herbaceous data was collected using 1-meter

quadrants on the NW corner of each plot, and tree and shrub data was collected in 30' diameter around plots. In the enhanced forest areas, four 50 ft square plots were marked, with the percent cover of non-native invasive species determined. The four plots were picked at random, two on each side of the Evergreen Creek. Extensive knowledge of the forested areas by the monitoring crew confirms that these four plots were representative of the entire area.

### 5.3 VEGETATION MONITORING RESULTS

Vegetation monitoring was conducted by Ray Fiori and Marvin Gilmour. On May 29, 2010 all WP, PFO, PSS, and existing forested areas we monitored. The PEMC was monitored on July 31, 2010 to allow for significant plant growth following an extremely wet spring. Attachment 2 includes spread sheets with the results of the sampling. The spread sheets include a complete listing of all plant species identified in the monitoring plots. 103 monitoring plots were examined. The data spread sheets include the botanical names, common names, indicator status, origin (native or non-native), moisture index, and percent cover for each species. During the 2007 monitoring, 48 plant species were identified in the Bank, with 43 natives. During the 2008 monitoring, 55 plant species were identified within the plots and of these 50 were native. In 2009 55 plant species were identified within the plots and of these 52 were native. In 2010 60 plant species were identified within the plots and of these 57 were native. The low occurrence and cover of invasive and non-native species on site is a reflection of the continued effectiveness of site preparation, monitoring, establishment, care and spot treatment that the Bank sponsors continue.

#### 5.3.1 Emergent Vegetation

The native herbaceous cover (including open water) averaged 97.92% in 2009 and slightly decreased to 97.29% in 2010. There were no non-native, invasive species and only 2.29% non-native cover. The amount of open water decreased since last year when it averaged 3.8% and this year decreased to 1.7% and bare ground decreased from 3.33% in 2009 to 0.42 % in 2010. The open water/bareground percentages will vary widely depending on the timing of the monitoring and spring precipitation timing and intensity.

All three of the performance criteria for **emergent herbaceous** vegetation were met.

Required: At least 55% of the relative plant cover (including bare soil) is comprised of native species -- **Met**, with 97.29% of the relative plant cover including bare soil being native species.

Required: No more than 15% of the relative plant cover is comprised of non-native invasive species --**Met** with no non-native invasive species.

Required: The wetland's moisture index is less than 3 --**Met** with an average weighted moisture index of 1.20.

#### 5.3.2 Wetland Prairie

Native herbaceous cover averaged 99.2% (including bareland) throughout the wet prairie area and of the vegetation itself, 99.15% were native species in 2009. In 2010 native herbaceous cover averaged 94.8% (including bareland) throughout the wet prairie area and of the

vegetation itself, 98.49% were native species. Bareland represented 4.5% cover in 2010, slightly up from the 4.3% cover in 2009. There was no non-native, invasive cover, while other non-natives represented 0.70%.

The performance criteria for **wetland prairie** were met for 5 of the 6 requirements. The only requirement not met was the weighted moisture index which was slightly below the target at 1.96. This was the first year that the weighted moisture index was utilized which slightly raised it. The moisture index issue is partially related to the mapping of habitat types by John Marshall and Ray Fiori. Due to the size and topographical diversity of the site, and only mapping areas with visible water as emergent marsh on one site visit, mapping didn't take into account all the micro habitats that support obligate wetland species, thus lowering the moisture index. In addition, many of the species on the prairie cohort list are either obligate or facultative wetland species, so it seems that a more appropriate target moisture index would be 1.5-2.5 as if your approaching 3, your species composition would contain many facultative upland species.

Required: At least 10 wetgrass prairie species are present as listed in "Species Composition for Willamette Valley Vegetation Types" by Kathy Pendergrass. In conversations with John Marshall (USF&W) (Date, 2008) it was agreed upon to include the vernal pool species from this same source in the 10 required species, and this is reflected in the wetland prairie cohort species list as well. **Met.** *Fifteen wet grass prairie and vernal pool species were identified within the prairie plots.*

Required: Tufted hairgrass (*Deschampsia cespitosa*) is represented by 25% or greater relative plant cover. **Met.** *Tufted hairgrass represented an average cover of 41.56%.*

Required: At least 50% of the relative plant cover (including bare soil) is comprised of native species. **Met.** *Non-natives and non-native invasives combined for 0.70%, bare soil was 4.50%, with native cover at 94.8%.*

Required: No more than 15% of the relative plant cover is comprised of non-native invasive species. **Met,** *with no non-native invasive species.*

Required: The wetland prairie moisture index is between 2.0 and 3.0. **Not Met.** *The average weighted moisture index of the prairie plots ranged from 1.58 to 2.6, the average moisture index is slightly low at 1.96. This can partially be explained by the way habitat types are displayed, the numerous microhabitats within the prairie, the lack of facultative upland species (only 1), .and the presence of obligate prairie cohort species.*

Required: No more than 5% relative plant cover is comprised of shrubs or trees. **Met.** *Plots # 51 and #82 both contained planted and volunteer tree and shrub species. Both of these plots are at the edge of the wet prairie and forested portions so the forested area fell within the 30ft diameter tree/shrub sampling.*

### 5.3.3 Forest Enhanced

Required: Year five performance standard. The existing stem density of the native wetland forest and shrub species will be maintained. *On-track no native wetland trees or shrubs have been removed.*

Required: Year five performance standard. There will be no more than 15% aerial coverage of non-native invasive species. *On-track with no non-native invasive species.*

### 5.3.4 Shrub and Forest Restoration

Species richness for woody plants exceeded the reference site. Eleven species were found in the reference site and 13 were found in the restoration area. Ponderosa pine (*Pinus ponderosa*) exists on site, however, it does not show up in a monitoring plots.

The reference site stem density is 635 trees and shrubs per acre. The planted plots showed an average stem density of 5.4 trees per plot and 13.16 shrubs per plot (Fac or wetter). This equates to a stocking density of 1144 stems per acre. Plot 13 was added to the scrub/shrub sampling in 2009, as the small area (.25 acres) around this plot is being managed for that habitat (mapped out this last year) to increase the habitat complexity on the site. This plot is 95% aerial coverage of Pacific willow, which equates to a stem count of 150 which skews the overall stem count. If this plot is left out of the equation, average shrubs per plot drops to 7.46 which equates to an overall stocking density of 793 stems per acre (Fac or wetter).

This is a significant overall increase from the 2008 monitoring. It should be noted, that many plots contained seedling trees and shrubs in 2008. During the 2008 site visit it was discussed that these seedlings should not be counted until they are at least 18" tall (2-3 years old), which some reached that point this year and were counted.

Required: The shrub and forest component will meet or exceed 75% of the species richness of the reference site (excluding non native invasive species). *Met with 13 overstory and shrub species identified in the bank compared to 11 in the reference site.*

Required: Plant density will be at least 80% of the reference site with FAC or wetter. *Met, fac or wetter woody stem density is 793 stems per acre, (excluding #13) which exceeds 80% of the reference site which has 635 stems per acre ( $635 \times 80\% = 508$ ).*

Required: There will be no more than 15% aerial coverage of non-native invasive species. *Met, with 0% of non-native invasive species.*

The herbaceous layer in the shrub and forest restoration area will meet or exceed the emergent habitat performance standards.

Required: At least 55% of the relative plant cover (including bare soil) is comprised of native species. *Met with an average of 88.9% native herbaceous plant cover. Bare ground represented 8.2% this year*

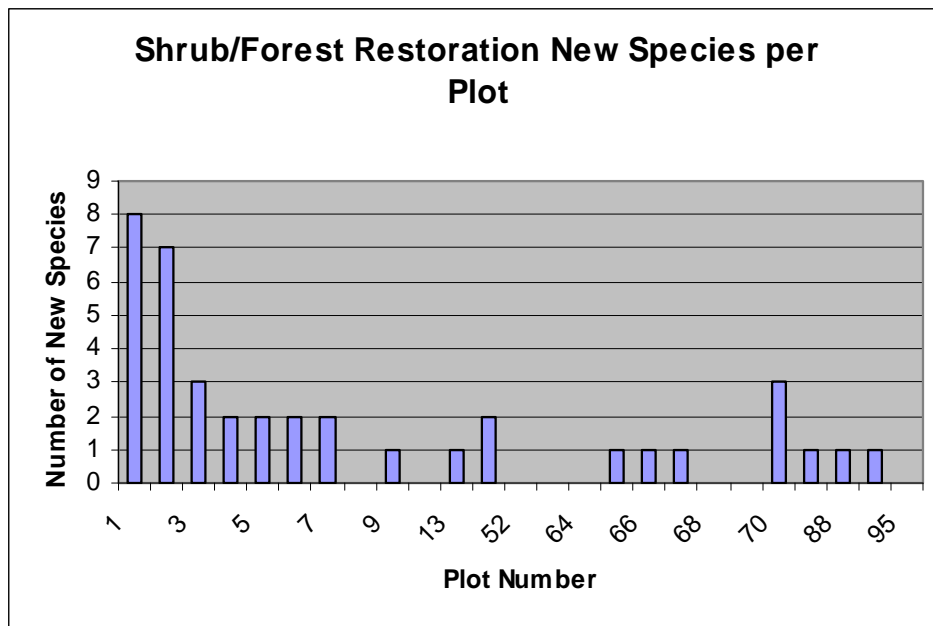
Required: No more than 15% of the relative plant cover is comprised of non-native invasive species. **Met** with 0% of non-native invasive species.

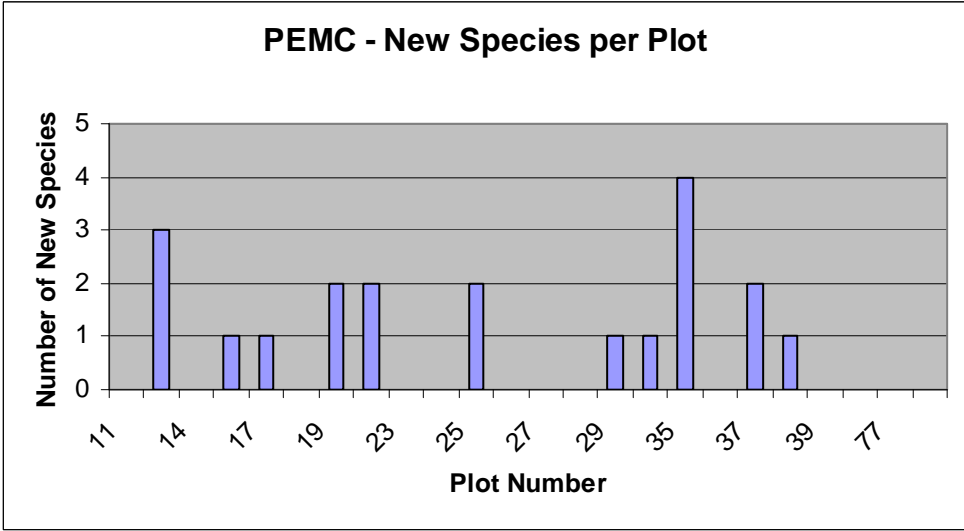
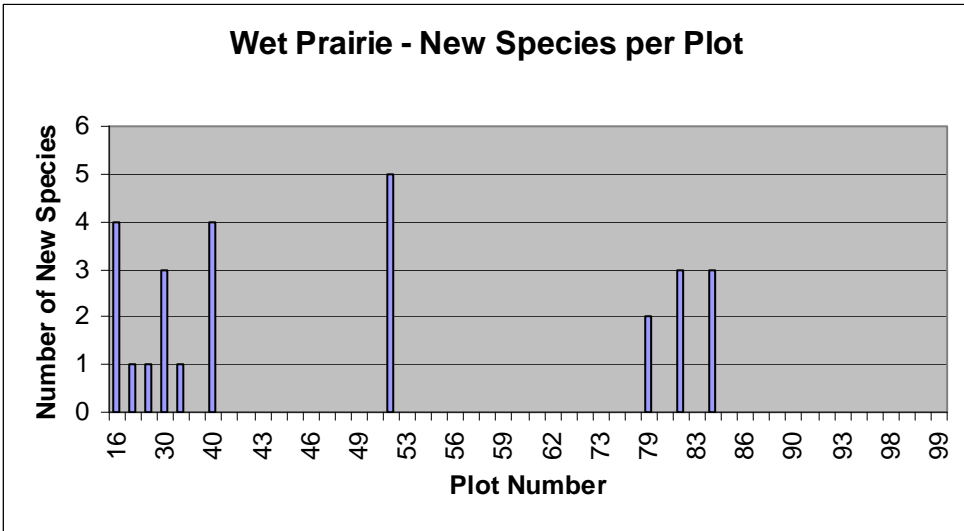
Required: The wetland's moisture index is less than 3. **Met** with an average weighted moisture index of 1.91.

## 6.0 SPECIES AREA CURVE

The species area curves for each of the major wetland types are included. It was the original plan to develop the species area curve for each of the habitat types and then analyze the data. The evaluating criteria was that after the curve flattens out it would be deemed a sufficient number of plots when there are three plots in a row, with one or fewer new species. A minimum of 50 plots were established.

The data on the 103 monitoring plots indicates that there is extensive plant diversity on the site. The curves for all habitat types is flattening out towards the end, which means there is a sufficient number of plots.





**7.0 PHOTO POINT MONITORING**

Photos from the photo points are included as Attachment 3; a map of photo point locations is located in Attachment 1. Photos were taken on 5/22/2010.

## 8.0 CREDIT SALES SUMMARY

An initial 25.4 credits (30%) were released in February 2007, due to meeting all the requirements for Release #1.

*Release 1 (Fall/Winter 2006): Up to 30 percent upon submission of the grading as-built, submission of a copy of the financial assurance, Restrictive Covenant, submission of financial assurance and the MBRT conducts a field inspection.*

*Release 2 (Spring/Summer 2007): Up to 20 percent upon demonstration of all performance measures being achieved and delineation of acreage meeting the 1987 Wetland Delineation Manual hydrology (if weather conditions are close to normal).*

*Release 3 (Spring/Summer 2008): Up to 20 percent upon demonstration of all performance measures being.*

An additional 29.62 credits (35%) were released in September 2008, due to meeting all the requirements for a total release of 55.02 credits (65%).

*Release 4 (Spring/Summer 2009): Up to 20 percent upon demonstration of all performance measures being.*

An additional 21.05 credits (25%) were released in March 2010, due to meeting all the requirements for a total release of 76.07 credits (90%).

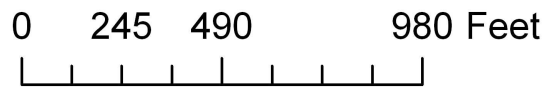
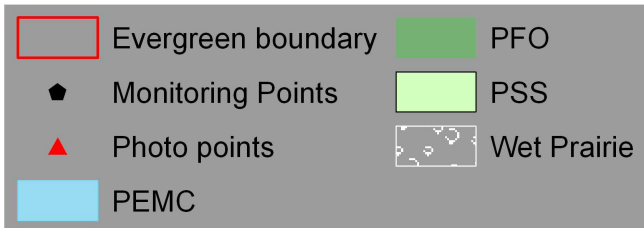
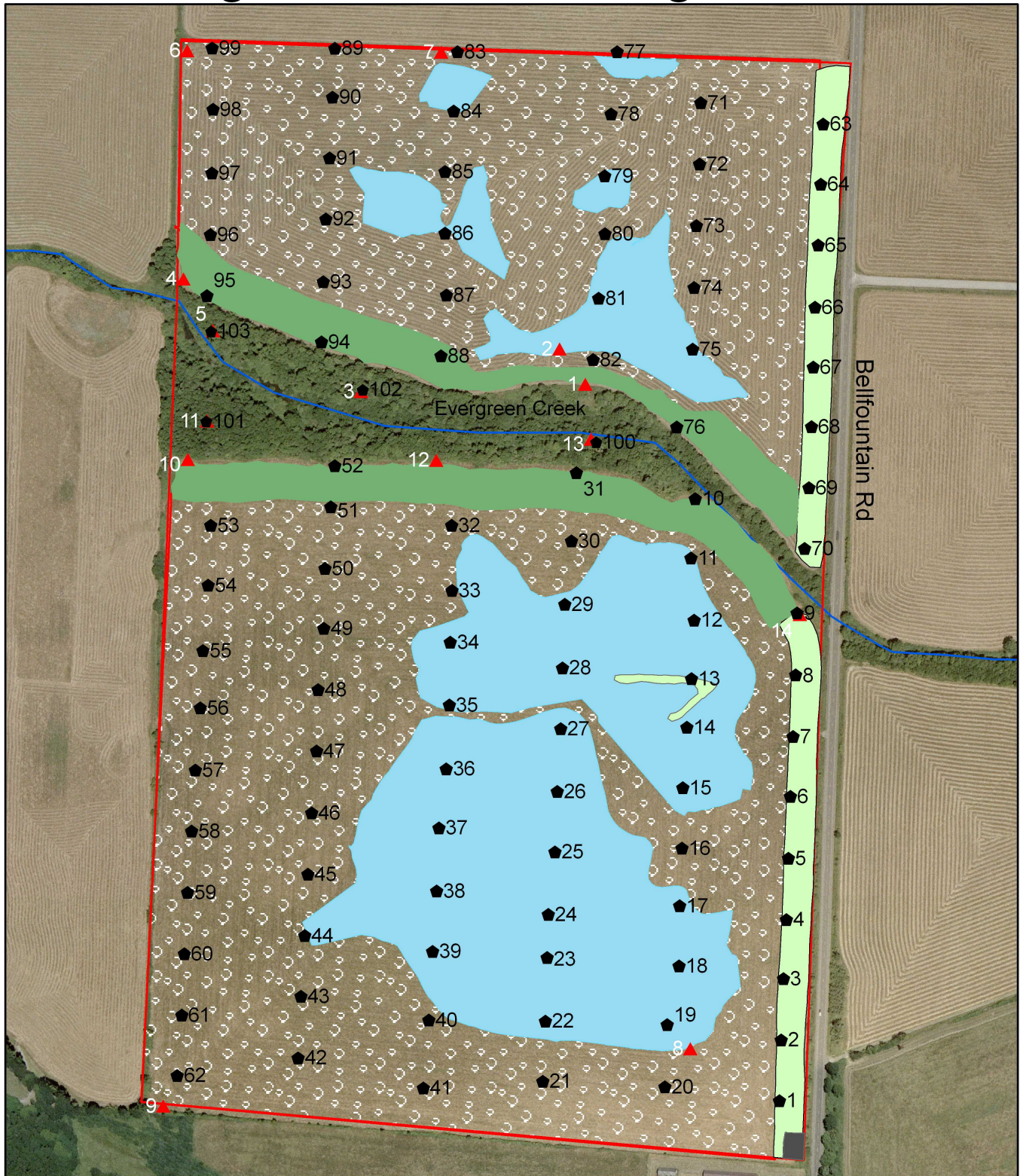
*Release 5 (End of 5<sup>th</sup> year monitoring or 5 years after replanting for those areas replanted): All remaining credits (10%) upon demonstration of all performance standards being achieved. In addition, the long term management plan and funding must be received and approved by the MBRT.*

Table 4 is a summary of the credit sales to date.

**Table 4 - Evergreen Credit Sales Summary**

<i>DATE</i>	<i>NAME</i>	<i>LOCATION</i>	<i>DSL</i>	<i>CORP</i>	<i>ADDED</i>	<i>SOLD</i>	<i>BALANCE</i>
<b>2/27/07</b>	<b>CORPS/DSL INITIAL RELEASE- 30%</b>		<b>Permit Number</b>		<b>25.4</b>		<b>25.4</b>
3/20/07	WSS, LLC	Hill Street Subdivision, Albany	37470	2006- 910		3.9	<b>21.5</b>
5/7/07	DR Horton	Benton Woods	37557 -RF	2006- 930		2.5	<b>19</b>
9/27/07	City of Albany	COA 53rd Ave Park	39021 -RF	2007- 751		0.14	<b>18.86</b>
5/10/07	Greater Albany Public School	Knox Butte Road School Site	38849 -RF	2007- 582		1.26	<b>17.6</b>
12/10/0 7	Weirich Drive Development, LLC	Weirich Drive	39237 -RF			0.1	<b>17.503</b>
3/20/08	ODOT	Wren Hill	730	199400 929		1	<b>16.503</b>
3/24/08	Greater Albany Public School	Knox Butte Road School Site	38849 -RF	2007- 0582		0.34	<b>16.163</b>
4/1/08	Greater Albany Public School	Knox Butte Road School Site	38849 -RF	2007- 0582		0.04	<b>16.123</b>
<b>9/8/08</b>	<b>CORPS/DSL 2<sup>nd</sup> &amp; 3<sup>rd</sup> RELEASE- 35%</b>				<b>29.62</b>		<b>45.743</b>
4/29/09	Hyland Business Park LLC	Intersection of 31 <sup>st</sup> St and Commercial St, Springfield	31129 -FP & FP- 7343	1997- 00294		1.9	<b>43.843</b>
9/29/09	Junction City Prison Project	Lane County, ~ 3.5 miles south of Junction City, Oregon	41791 -RF	2008- 378		20	<b>23.843</b>
11/2/09	Lane-Wendson No 1	T18, R 6W, sect 10	43512	2009- 580		0.22	<b>23.623</b>
<b>3/10/10</b>	<b>CORPS/DSL 4<sup>th</sup> RELEASE 25%</b>				<b>21.05</b>		<b>44.673</b>
Total Sold						31.4	

# Evergreen Mitigation Bank Photo and Vegetation Monitoring Points



1 inch equals 471 feet

<b>Evergreen Wetland Mitigation Bank</b>					
<b>Plant Species List</b>					
<b>May 29, 2010</b>					
Includes all species identified in and immediately adjacent to monitoring plots, except does not include					
herbaceous species in the enhanced forest					
Common Name		Status	Origin	Wet Prairie Cohort	Moisture Index
				Species	
<b>Overstory Species</b>					
<i>Alnus rhombifolia</i>	White alder	FAC	native		3
<i>Fraxinus latifolia</i>	Oregon ash	FACW	native		2
<i>Malus fusca</i>	Flowering crabapple	FACW	native		2
<i>Populus trichocarpa</i>	Black cottonwood	FAC	native		3
<b>Scrub/Shrub Species</b>					
<i>Amelanchier alnifolia</i>	Service berry	FACU	native		4
<i>Cornus sericea</i>	Red osier dogwood	FACW	native		2
<i>Douglas spirea</i>	<i>Spiraea douglasii</i>	FAC	native		3
<i>Oemlaria cerasiformis</i>	Indian plum	FACU	native		4
<i>Physocarpus capitatus</i>	Pacific ninebark	FACW	native		2
<i>Rosa nutkana</i>	Nootka rose	FAC	native	Yes	3
<i>Rosa pisocarpa</i>	Clustered rose	FAC	native		3
<i>Salix lasiandra</i>	Pacific willow	FACW	native		2
<i>Symphoricarpos albus</i>	Snowberry	FACU	native		4
<b>Herbaceous Species</b>					
<i>Achillea millefolium</i>	Yarrow	FACU	native		4
<i>Alisma gramineum</i>	Narrow leaf water plantain	OBL	native		1
<i>Alisma triviale</i>	Northern water plantain	OBL	native		1
<i>Bidens cernua</i>	Nodding beggarticks	FACW+	native		2
<i>Camassia quamash</i>	Camas	FACW	native	Yes	2
<i>Carex feta</i>	Green-sheath sedge	FACW	native	Yes	2
<i>Carex unilateralis</i>	One-sided sedge	FACW	native	Yes	2
<i>Eleocharis ovata</i>	Ovate spike rush	OBL	native	Yes	1
<i>Eleocharis palustris</i>	Creeping spike rush	OBL	native		1
<i>Epilobium angustifolium</i>	Fireweed	FACU	native		4
<i>Epilobium ciliatum</i>	Fringed willoweed	FACW-	native	Yes	2
<i>Epilobium ciliatum ssp. watsonii</i>	Watson's willow herb	FACW	native	Yes	2
<i>Epilobium densiflorum</i>	Dense spike-primrose	FACW	native	Yes	2
<i>Eriophyllum lanatum</i>	Oregon sunshine	NOL	native	Yes	
<i>Geum macrophyllum</i>	Large leaf avens	FACW	native		2
<i>Gratiola ebracteata</i>	Bractless hedgehyssop	OBL	native	Yes	1
<i>Gnaphalium palustre</i>	Cudweed	FAC	native	Yes	2
<i>Juncus bufonius</i>	Toad rush	FACW	native	Yes	2
<i>Juncus effusus</i>	Soft rush	FACW	native		2
<i>Juncus tenuis</i>	Slender rush	FACW	native	Yes	2
<i>Kickxia elatine</i>	Sharp point flevellin	NOL	non		
<i>Lupinus bicolor</i>	Two-colored lupine	NOL	native		
<i>Lupinus polyphyllus</i>	Bigleaf lupine	FAC	native	Yes	3
<i>Lythrum portula</i>	Spatulaleaf loosestrife	NI	non		
<i>Madia sativa</i>	Coast tarweed	NOL	native		

## Attachment 2:

<i>Plagiobothrys figuratus</i>	Fragrant popcorn flower	FACW	native	Yes	2
<i>Plagiobothrys scouleri</i>	Scouler's popcorn flower	FACW	native	Yes	2
<i>Polygonum amphibium</i>	Water smartweed	OBL	native		1
<i>Potentilla gracilis</i>	Northwest cinquefoil	FAC	native	Yes	3
<i>Rorippa curvisiliqua</i>	Western yellowcress	OBL	native	Yes	1
<i>Scirpus tabernaemontani</i>	Soft-stem-bulrush	OBL	native		1
<i>Sidalcea campestris</i>	Meadow checkermallow	NI	native		
<i>Sidalcea cusickii</i>	Cusick's checkermallow	NOL	native	Yes	
<i>Sparganium emersum</i>	Simple-stem bur-reed	OBL	native		1
<i>Tellima grandiflora</i>	Fringe cup	NOL	native		
<i>Veronica peregrina var. xalapensis</i>	Hairy purlane speedewell	OBL	native	Yes	1
<b>Grass Species</b>					
<i>Agrostis exarata</i>	Spike bentgrass	FACW	native	Yes	2
<i>Alopecurus aequalis</i>	Short-awned foxtail	OBL	native		1
<i>Alopecurus geniculatus</i>	Water foxtail	OBL	native		1
<i>Beckmania syzigachne</i>	Slough grass	OBL	native	Yes	1
<i>Deschampsia cespitosa</i>	Tufted hairgrass	FACW	native	Yes	2
<i>Deschampsia danthonioides</i>	Annual hairgrass	FACW-	native	Yes	2
<i>Deschampsia elongata</i>	Slender hairgrass	FACW	native	Yes	2
<i>Glyceria borealis</i>	Floating mannagrass	OBL	native		1
<i>Glyceria occidentalis</i>	Western mannagrass	OBL	native		1
<i>Hordeum brachyantherm</i>	Meadow barley	FACW	native	Yes	2
<i>Leersia oryzoides</i>	Rice cut-grass	OBL	native		1
<i>Lolium multiflorum</i>	Annual rye grass	FACU	non		4
<i>Poa trivialis</i>	Rough-stalk bluegrass	FAC	non		3









## Attachment 2:

Evergreen Mitigation Bank								
Existing and Enhanced Shrub/Forest (PFOE) Sample Plot Monitoring Results 2010								
Moisture								
Common Name	Botanical Name	Status	Origin	Index	100 - SE	101 - SW	102 - NE	103 - NW
<b>Overstory Species. - stem count within 50' square</b>								
Douglas Hawthorne	<i>Crataegus douglassi</i>	FAC	native	3	8	2	8	4
Oregon ash	<i>Fraxinus latifolia</i>	FACW	native	2	33	31	14	27
<b>Scrub/Shrub Species -stem count within 50' square</b>								
Cascara	<i>Rhamnus purshiana</i>	FAC-	native	3	3	1		5
Himalayan blackberry	<i>Rubis discolor</i>	FACU	non	4				
Nootka rose	<i>Rosa nutkana</i>	FAC	native	3		1		1
Snowberry	<i>Symphoricarpos albus</i>	FACU	native	4	10	5	10	40
Douglas spiraea	<i>Spirea douglasii</i>	FAC	native	3			4	
Trailing blackberry	<i>Rubus ursinus</i>	NL	native		24	10	30	40

\* Mowing, non-native species control, flooding, and wind damage eliminated some Ash trees, while allowing the shrub layer to prosper.

# Evergreen Mitigation Bank 2010 Photo Monitoring

Photo Point 1 North



Photo Point 1 East



Photo Point 1 South



Photo Point 1 West



Photo Point 2 North



Photo Point 2 East



Photo Point 2 South



Photo Point 2 West



Photo Point 3 North



Photo Point 3 East



Photo Point 3 South



Photo Point 3 West



Attachment 3 – Monitoring Photos

Photo Point 4 North



Photo Point 4 East



Photo Point 4 South



Photo Point 4 West



Photo Point 5 North



Photo Point 5 East



Photo Point 5 South



Photo Point 5 West



Photo Point 6 East



Photo Point 6 Southeast



Photo Point 6 South



Attachment 3 – Monitoring Photos

Photo Point 7 East



Photo Point 7 South



Photo Point 7 West



Photo Point 8 North



Photo Point 8 East



Photo Point 8 South



Photo Point 8 west



Photo Point 9 North



Photo Point 9 East



Photo Point 9 Northeast



Attachment 3 – Monitoring Photos

Photo Point 10 North



Photo Point 10 East



Photo Point 10 South



Photo Point 10 West

Photo Point 11 North



Photo Point 11 East



Photo Point 11 South



Photo Point 11 West

Photo Point 12 North



Photo Point 12 East



Photo Point 12 South



Photo Point 12 West

Attachment 3 – Monitoring Photos

Photo Point 13 North

Photo Point 13 East

Photo Point 13 South

Photo Point 13 West



Photo Point 14 North

Photo Point 14 East

Photo Point 14 South

Photo Point 14 West

