

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

**Block 1: Report Information**

DSL Permit Number: 35866-RF	COE Permit Number: <i>Nationwide Permit 27 - 200400726</i>	
Permittee: <i>Gilmour</i>		
County: <i>Benton</i>	Report Date: <i>9/21/09</i>	Monitoring Year <i>2</i>
Date Removal-Fill Activity Completed:		
Date mitigation was completed Grading: <i>8/06</i> Planting: <i>4/07</i>		
Report submitted by: <i>Marvin and Cindy Gilmour (Mid-Valley Phase 2)</i>		

**Block 2: Monitoring Report Purpose**

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

- Compensatory **freshwater** 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 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.**
- Mitigation Bank** Report
- Other: \_\_\_\_\_

**Block 3: Results**

	Success Criteria	Met? (Y/N)	Comments/Reasons for Failure*
1.	Emergent Vegetation	3 of 3 requirements	
2.	Wetgrass Prairie	7 of 8 requirements	The moisture index is 1.92 slightly wetter than the 2-3 goal.
3.	Buffer	2 of 2 requirements	
4.	Hydrology - Water Monitoring Tubes	1 of 1 requirements	
5.	Hydrology - Delineation	1 of 1 requirements	

Remedial work recommended	Yes	No <input checked="" type="checkbox"/>
Deed Restriction or other protection instrument attached (noted: if a filed deed restriction was a required as a permit condition, please attach a copy: <i>previously submitted</i> )	Yes <input checked="" type="checkbox"/>	No
Final Monitoring Report?	Yes	No <input checked="" type="checkbox"/>
Requesting release or partial release of bond/credits	Yes <input checked="" type="checkbox"/>	No

\*see report for detailed information

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## LIST OF ATTACHMENTS

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Attachment	2	Hydrology Monitoring Point Location Map
Attachment	3	Sample Plot Monitoring Data
Attachment	4	Monitoring Point Location Map
Attachment	5	Photo Monitoring Point Photos
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## 1.0 REGULATORY BACKGROUND

The purpose of this report is to summarize the progress of Phase 2 of the Mid-Valley Wetland Mitigation Bank (Bank). The Bank is located approximately one mile east of Independence Highway and one and one-half miles south of Springhill Drive in T10S, R4W, Sec. 15, Tax Lot 800. The letter of approval for the Bank was signed in January 2007 and is permitted as ACOE permit #2004-000726 and DSL Permit Number: 35866-RF. Phase 2 of the Bank consists of 12.22 acres.

Development of the Bank was through a combination of restoration of previously drained wetlands (7.61 acres) and buffer management (4.61 acres). Anticipated Bank credits:

<u>Type of Credit</u>	<u>Acres</u>	<u>Ratio</u>	<u>Credits</u>
Cropped Wetland Enhancement	7.61	1:1	3.805
Buffer Management	<u>4.61</u>	5:1	<u>0.922</u>
Total	12.22 acres		4.727 credits

## 2.0 WORK SUMMARY

Project initiation began in July 2005 with the final grass seed crop being removed from the site. The entire farmed acreage was sprayed out in August, followed by spraying the reed canary grass infested slough in September.

In spring 2006, the site was sprayed out several times to deplete non-native seed bank. Earthwork was completed in August, followed by tilling the site to create a good seed bed. The site was planted in September with a diversity of wetland species, targeting different moisture regimes with complementing species.

Grasses established well in the fall 2006, but western manna grass was beginning to form monotypic stands in many areas. In order to provide a more diverse prairie habitat, the site was sprayed out in spring 2007 and all but 5% was immediately re-planted. Grasses were up in two weeks with western manna grass down to 10% cover. The entire prairie area was weed wiped several times throughout the spring targeting annual ryegrass. The site was also spot sprayed repeatedly throughout the spring and summer for non-native species, and received a broadleaf herbicide treatment in late spring.

Work began in the fall (August) 2007 with continued site prep of unplanted wet prairie (5%) areas. In September, all borders and buffers were spot herbicide treated for non-natives. The entire prairie area was burned utilizing a 40-ft propane flamer in September. All existing wet prairie areas received a broadleaf herbicide application in October. All remaining unplanted areas were no-till planted in October just prior to fall rains.

Beginning in early March 2008, efforts concentrated on covering all wet 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, annual ryegrass, and any other non-natives encountered.

As spring moved on focus shifted towards spot treating and weed wiping fall planted areas and patrolling the emergent draw down zones for optimistic species such as spatula-leaf loosestrife, and penny royal. All older prairie areas were broadleaf herbicide treated during spring when conditions were favorable.

The entire prairie area was mowed in July 2008. Following mowing, the site was periodically walked through the fall to look for weeds such as thistles, dandelions, and prickly lettuce that may have taken advantage of the mowing. September, all borders and buffers were spot herbicide treated for non-natives.

Beginning in early March 2009, efforts once again concentrated on covering all wet 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, annual ryegrass, and any other non-natives encountered. Although this type of management is time consuming and tedious, every year that non-natives are prevented from re-seeding, the native balance becomes more sustainable. The site was broad-leaf herbicide sprayed in patches where weeds were problematic

**Table 1. Restoration Activities Summary Mid-Valley Mitigation Bank (Phase 2)  
August 2005 – June 2009**

<b>Activity</b>	<b>Location</b>
August 2005 through July 2007	
Site Preparation	Entire site
Earth work/Tillage	Entire site
Prairie seeding	All except 5% due to spring moisture
Emergent seeding	100% of restored emergent areas
Spot weed control	100% of mitigation bank area (on going)
Broadleaf weed control	100% of Wet Prairie
Weed wiping	100% wet prairie
August 2007 through June 2008	
Site Preparation	Ongoing on borders
Prairie seeding	Remaining 5% of WP areas, and camas bulbs
Spot weed control	100% of mitigation bank area (on going)
Broadleaf weed control	100% of Wet Prairie
Weed wiping	New prairie plantings (5%)
July 2008 through June 2009	
Site Preparation	Ongoing on borders
Spot weed control	100% of mitigation bank area (on going)
Broadleaf weed control	60% of Wet Prairie
Mowing	Wet Prairie areas

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

The as-built plans were submitted in June 2006. **The as-built was submitted prior to the final Bank approval.**

### **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 Wetlands Delineation Manual (1987 Wetland Delineation Manual), will be present in 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 soil indicators will not be interpreted as disqualifying a plot as wetland.

### 4.2 Methodology:

Water Monitoring Tubes: Three groundwater monitoring tubes were constructed and monitored to show the duration of saturation. Tube monitoring data was collected at least three times between approximately March 1 and May 30 to demonstrate sufficient duration of wetness to meet the 1987 Wetland Delineation Manual. The precipitation data for the monitoring period from the nearest recording station is included in Section 4.3. The hydrology data hole photos, showing the vegetation are included as Attachment 1, the Hydrology Monitoring Point Location Map is included as Attachment 2, and the wetland delineation data is included in attachment 6.

Delineation: Paired plots concentrating along any high areas will be utilized to show that all areas of the Bank are wetland. In addition to plot data, these areas were visually documented with photographs to show a dominance of wetland species.

### 4.3 Results

**Water Monitoring Tubes**: Three monitoring tubes were installed and monitored beginning in February 2007. The results of monitoring indicate that 100% of the planned Bank area is meeting wetland hydrology criteria with the entire Bank area having saturated soils. Saturation levels were determined by digging 18" pits adjacent to each monitoring tube. Each pit was then evaluated for the saturation level in it.

**Table 2 - 2009 Hydrology Monitoring Results**

Date	Well #1		Well #2		Well #3	
	Depth to Free Water*	Depth to Saturation	Depth to Free Water*	Depth to Saturation	Depth to Free Water*	Depth to Saturation
3/2/09	-3"	Surface	2"	Inundated	+1"	Inundated
3/23/09	-2"	Surface	1"	Inundated	surface	surface
4/2/09	-4"	-1"	2"	Inundated	-4"	-1.5"

\*measured from ground surface

Required: Three monitoring dates to be used to demonstrate sufficient duration of wetness to meet the 1987 Wetland Delineation Manual.-- **Met** – wetland hydrology was met in three consecutive years of monitoring tubes data analysis.

**Delineation:** A hydrology delineation was conducted on March 23, 2009 by Ray Fiori and Marvin Gilmour with assistance from Patrick S. Thompson Consulting. The delineation involved digging holes in the higher areas of the Bank including the top of each berm, to ascertain that wetland hydrology was present throughout the entire site. The data holes were visually documented with photographs showing a dominance of wetland species.

**Table 3 - Delineation Data Points Hydrology Data, March 23, 2008**

Point #	Depth to Free Water	Depth to Saturation
1	-7"	-5.5"
2	-2"	surface
3	-10"	-7"

**Required:** One time hydrology and vegetation delineation will be completed, documented with plot data, photos, and climate information and displayed on a map.-- *Met – hydrology delineation indicted all high areas met wetland hydrology criteria. Plot data, photos, climate data and map locations are all included.*

**Climate Data:** Precipitation data for this location was obtained through the AgriMet agricultural weather network, run by the Bureau of Reclamation in Corvallis, Oregon. Records indicate it was a below average precipitation year, with normal water year precipitation being 34.12" for this location through March, but only 21.19" was recorded.

Although overall rainfall was below average, isolated high intensity precipitation events were frequent throughout the spring, and early hydrology monitoring was close to normal. Heavy late spring precipitation events resulted in near steady free water/saturation levels throughout the monitoring period, which typically starts to taper off by mid-April.

Below is a table depicting the monthly average precipitation data from the WETS data with the actual precipitation received, and the precipitation for the day of and the 2 weeks immediately preceding the delineation.

	Corvallis- AgriMet Corvallis Station	WETS Tables
<b>January</b>	3.00 inches	6.46 inches
<b>February</b>	3.24 inches	5.71 inches
<b>March</b>	3.42 inches	4.49 inches
<b>March 23rd</b>	0.10 inches	
<b>March 8th-22nd</b>	1.67 inches	

## 5.0 VEGETATION PERFORMANCE STANDARDS AND METHODOLOGY

### 5.1. Performance Standards

#### Emergent Herbaceous

1. A minimum of 55% of the relative plant cover is comprised of native species.
2. No more than 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*), 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.

#### Wetgrass Prairie

The above performance measures 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, (cited as Appendix II of the Instrument) by John Marshall (USFWS), December 19, 2004 author of "Draft Guidance on Vegetation Planning and Monitoring in Western Oregon Wetlands and Riparian Areas.
2. Tufted hairgrass (*Deschampsia cespitosa*) is represented by 25% or greater relative plant cover.
3. At least 50% of the relative plant cover is comprised of native species.
4. No more than 15% of the relative plant cover is comprised of non-native invasive species as defined above.
5. The prairie's moisture index is between 2.0 and 3.0.
6. No more than 5% relative plant cover is composed of shrubs or trees.

#### Buffer Area

1. No more than 15% of the relative plant cover is comprised of non-native invasive species as define above.
2. Excluding open water, at least 50% of the relative plant cover is comprised of native species.

### 5.2 Methodology

**Emergent and Wetgrass Prairie** - Monitoring within the herbaceous portions was conducted using a stratified systematic plot method for the sampling points. Transects were laid out in a stratified arrangement along one baseline with equal distance between each transect (approximately 250'). The transects will cross the entire wetland and buffer areas. The sampling plots will be predetermined and systematically plotted on each transect at 100-foot intervals from each other. The herbaceous sample plots were one meter quadrants, located at the northwest corner of each point nested within a ten-foot square shrub sampling plot starting at the same point. When needed, a 30-foot diameter forest sample plot was placed with

its center at the plot center point encompassing both the herbaceous and shrub sampling plots. The starting point of the sample plots on each transect line was staggered in order to cover a broader area. The sampling points were evaluated and it was determined that an additional emergent monitoring plot was needed so plot #5a was included in the monitoring. The sample plots are permanently identified and were plotted on a site map.

Prior to concluding monitoring, the number of sample plots were evaluated to determine if this number of plots was sufficient, using a species area curve. Using the plot data, the species-area curve was developed. It was predetermined 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.

Established site photo points were established, and will continue to be used in each of the monitoring years to provide a visual record of the overall health and diversity of the wetland vegetation. Four photo station locations are included on the Site Plan (attachment 4).

**Buffer** – Three monitoring points are included within the buffer and were monitored as above. There are also two photo points in the buffer to visually monitor the decrease in the reed canary grass and increase in native shrub and herbaceous layers.

### 5.3 Vegetation Monitoring Results

Vegetation monitoring was conducted on June 10, 2009 by Marvin Gilmour and Ray Fiori. Attachment 3 includes the monitoring results. The Monitoring Plot Location Map is included as Attachment 4. A total of 18 monitoring plots were examined, 11 in the wet prairie, 4 in emergent areas and 3 in the buffer. Both the botanical and common names are included as well as the indicator status, origin (native or non-native) and moisture index.

During the June 2009, monitoring, 22 plant species were identified in the Bank. Wet prairie portions of the Bank were dominated by grass species, the most abundant species being tufted hairgrass (*Deschampsia cespitosa*), slender hairgrass (*Deschampsia elongata*), and meadow barley (*Hordeum brachyantherm*). The emergent area was dominated by ovoid spike rush (*Eleocharis ovata*), water foxtail (*Alopecurus geniculatus*), and American sloughgrass (*Beckmania syzigachne*). As with Phase 1 of the Bank, Phase 2 is also dominated by native species.

#### 5.3.1 Emergent Vegetation

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

Required: A minimum of 55% of the relative plant cover is comprised of native species.--**Met.** *Plots 4, 5a, 8 and 12 are the planned emergent vegetation plots, which have 92.5% relative plant cover of native species.*



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

Required: The wetland's moisture index is less than 3.0. --**Met** with an average moisture index of 1.30.

### 5.3.2 Wetgrass Prairie

The performance criteria for **wetgrass prairie** were met for 7 of the 8 requirements.

Required: At least 50% of the relative plant cover is comprised of native species. --**Met**. The land cover is 88% native species, 6.36% bareland and 5.45% non-native.

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: 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) (April, 2008) it was agreed upon to include the vernal pool species from this same source in the 10 required species. -- **Met**. Ten wet grass prairie/vernal pool species were identified within the prairie plots, with 2 additional species in the emergent plots.

Required: Tufted hairgrass (*Deschampsia cespitosa*) is represented by 25% or greater relative cover.--**Met**. Tufted hairgrass represented 26.82% relative cover.

Required: The prairie's moisture index is between 2.0 and 3.0.--**Not met**. average moisture index of the prairie plots is 1.92, slightly below the target.

Required: No more than 5% relative plant cover is composed of shrubs or trees. -- **Met**. In the 11 prairie plots there were no trees. This standard will be more closely reviewed as the shrub and tree components begin to grow and age.

### 5.3.3 Buffer

The performance criteria for **buffer** were met for 2 of the 2 requirements.

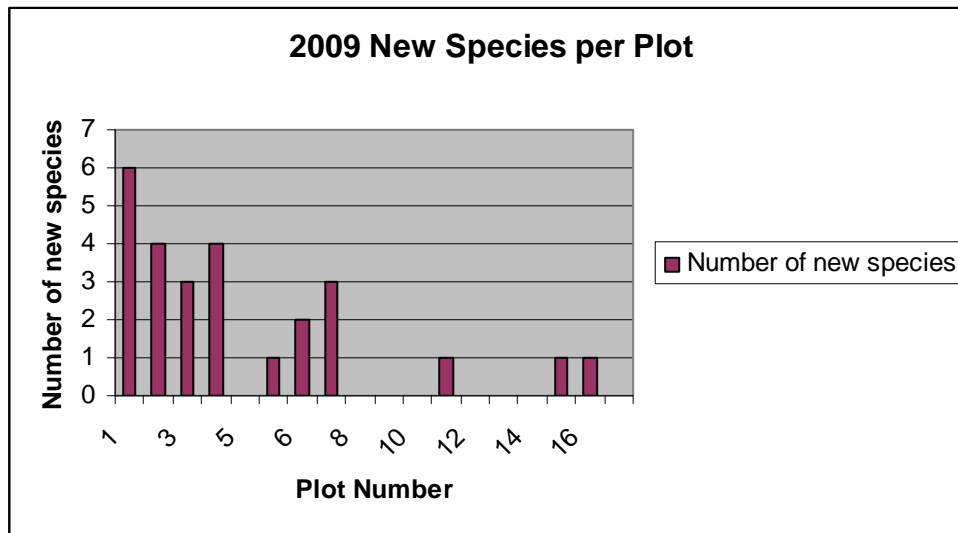
Required: No more than 15% of the relative plant cover is comprised of non-native invasive species as define above. -- **Met**. There are no non-native invasive species.

Required: Excluding open water, at least 50% of the relative plant cover is

comprised of native species. -- *Met* with 100% of native vegetation.

## 6.0 SPECIES AREA CURVE

The sample plots were evaluated using a species area curve to show the incidence of new species found within each of the plots. After the curve flattened out it was deemed a sufficient number of plots when there were three plots in a row with one or fewer new species. The last plot with more than 1 new species was plot #7, in the next ten plots there were only 3 additional new species. All wetland types were included in the sample plots.



## 7.0 PHOTO POINT MONITORING

Photo monitoring from the photo points are included as Attachment 5.

## 8.0 CREDIT SUMMARY

Credit release 1 was released on January 5, 2007 for 1.42 credits from both agencies. Credit release 2, 3, and 4 for 2.85 credits was released by the Corps on August 15, 2008. Credit release 2 for 0.95 credits was released by DSL on August 14, 2008. According to the credit release schedule, Phase 2 is now eligible for Release 3 and 4 from DSL.

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

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 and vegetation indicators (if weather conditions are close to normal). **COMPLETED**

Release 3 (Fall 2007): Up to 20 percent upon demonstration of all performance measures being achieved. **REQUESTED**

Release 4 (Spring/Summer 2008): Up to 20 percent upon demonstration of all performance measures being achieved. **REQUESTED**

Release 5 (end of the 5<sup>th</sup> year monitoring or 5 years after replanting for those areas replanted): All buffer credits plus remaining credits (10%) upon demonstration of all performance measures being achieved. In addition, the long term management plan, funding and identification of a suitable long term steward, must be reviewed and approved by the MBRT.

With the submission of this monitoring report, we are requesting releases 3 and 4 for an additional 40% release credit release.

Release #3 20% = .95

Release #4 20% = .95

**Total current request: 1.9 credits**

Attachment 1 – Delineation Photos

**Mid-Valley Phase 2 2009 Wetland Delineation  
Photos**

Pit # 1



Pit # 2

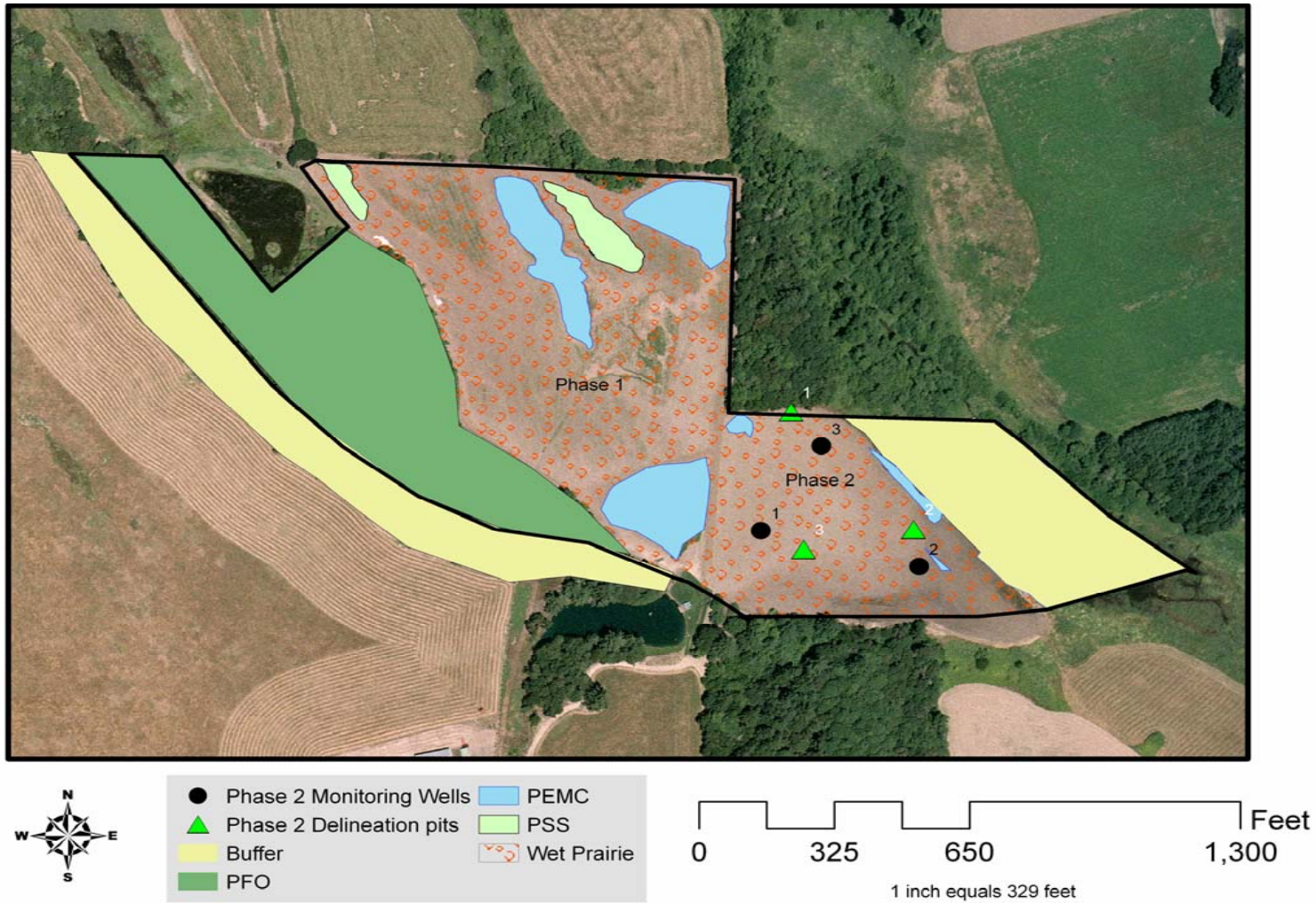


Pit # 3



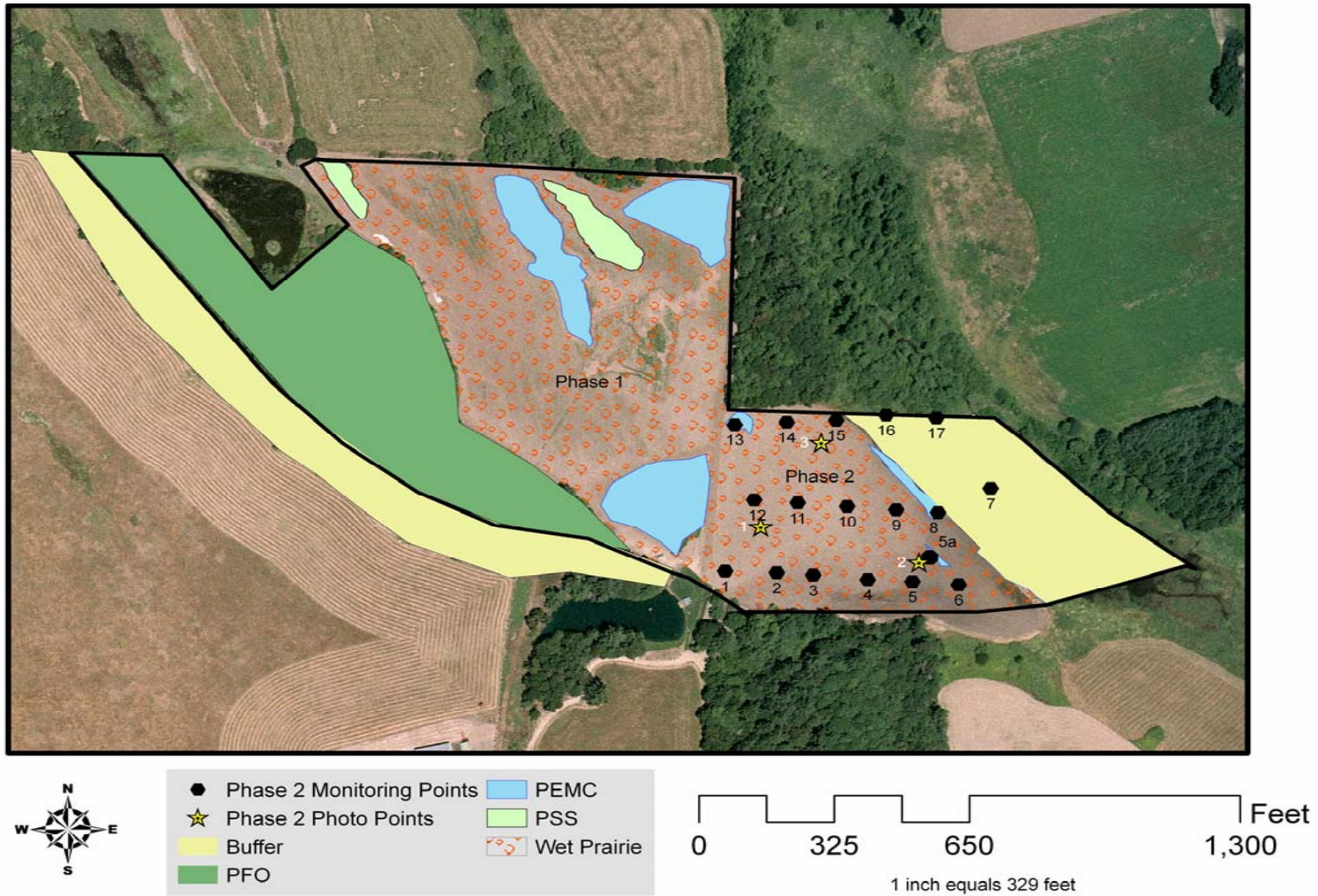


## Mid-Valley Mitigation Bank Phase 2 Hydrological Monitoring Points





# Mid-Valley Mitigation Bank Phase 2 Monitoring Points





# Mid-Valley Phase 2 Mitigation Bank 2009 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 6- Wetland Delineation Data 03/23/09					Pit #		
					1	2	3
<b>Hydrology</b>							
<b>Free Water (in.)</b> (measured from ground surface)					-7	-2	-10
<b>Depth of Saturation (in.)</b>					-5.5	surface	-7
				<b>Moisture</b>			
<b>Common Name</b>	<b>Botanical Name</b>	<b>Status</b>	<b>Origin</b>	<b>Moisture Index</b>			
<b>Grass Species - percent cover</b>							
<i>Agrosis exaraa</i>	Spike bentgrass	FACW	native	2			15
<i>Alopecurus geniculatus</i>	Water foxtail	OBL	native	1	30		
<i>Deschampsia cespitosa</i>	tufted hairgrass	FACW	native	2	50	50	25
<i>Hordeum brachyantherm</i>	Meadow barley	FACW	native	2	20	10	50
<i>Glyceria occidentalis</i>	Western mannagrass	OBL	native	1		30	
Bareground (due to early in the growing season)		<b>Mean=</b>	<b>6.7</b>			10	10
Relative % native canopy cover, includes bareground:		<b>Mean=</b>	<b>93.3</b>		100	90	90
Relative % non-native invasive canopy cover:		<b>Mean=</b>	<b>0</b>		0	0	0
Sample plot average moisture index					1.67	1.67	2.00
Average Moisture Index:	<b>1.8</b>						