Mitigation Monitoring Annual Report Template

1. Mitigation Monitoring Report Cover Sheet

1: *Project Name* W&M Butler Farm Mitigation Bank Identifiers:

DSL Permit # 46986 Corps Permit # 46986- RF Permittee: Wes and Marybell Butler Farm LLC
County- Washington Report Date: 11/2018 Monitoring Year : 1 2 **3** 4 5
Date Removal-Fill Activity Completed: 9/2012, 7/3013, 9/2014, 10/2015.
Date mitigation was completed: Grading 9/2012, 7/3013, 9/2014, 10/2015
Planting 12/2012, 3/2013, 3/2014, ongoing
Date(s) of data collection: 6/22/2018-6/25/2018
Report prepared by: Wendy Kral, & Kadie Robinson, Ash Creek Forest Management

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**.
- **X** **Mitigation Bank** Report
- ☐ Other _____

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

	Performance standards (verbatim from permit)		Fully Met? (Y/N)	Comments/Reason for shortfall (mark NA if doesn't apply this year)
1.	**Herbaceous wetlands**- native species cover is > 60%	Phase 1	N/A	Final monitoring of Phase 1 complete July 2017
		Phase 2	Y	Average was 83% (+/- 6; 80% CI).
2.	**Herbaceous wetlands**- invasive species cover is no more than 10%	Phase 1	N/A	Final monitoring of Phase 1 complete July 2017
		Phase 2	Y	None considered invasive
3.	**Herbaceous wetlands**- Bare substrate is no more than 20%	Phase 1	N/A	Final monitoring of Phase 1 complete July 2017
		Phase 2	N	Average was 25% (+/- 4; 80% CI). Bare ground cover less than year two, but thatch cover greater due to grass establishment. Since this report, mowing, grazing and burning have been employed to reduce thatch on the site.

4.	**Herbaceous wetlands**- After year 3,at least 10 different native species (defined as 5% cover or occur in 10% of plots and have a prevalence index ≤ 3)	Phase 1	N/A	Final monitoring of Phase 1 complete July 2017
		Phase 2	Y	Twenty-four FAC or wetter species occurred in at least 10% of the plots.
5.	**Herbaceous wetlands**- Non-grass species must comprise at least 30% of total vegetative cover.	Phase 1	N/A	Final monitoring of Phase 1 complete July 2017
		Phase 2	Y	Non-grass cover was 32% (+/-7; 80% CI).
6.	**Shrub/Forested wetlands**- native species cover is > 60% *		N/A	Final monitoring of Phase 1 complete July 2017
7.	**Shrub/Forested wetlands**- cover of invasive herbaceous species <10%		N/A	Final monitoring of Phase 1 complete July 2017
8.	**Shrub/forested wetlands**- cover of invasive trees and shrub species is no more than 10%		N/A	Final monitoring of Phase 1 complete July 2017
9.	**Shrub/forested wetlands**- Cover of bare substrate is no more than 20%		N/A	Final monitoring of Phase 1 complete July 2017
10.	**Shrub/Forested wetlands**- By year 3, at least 6 different native woody species (defined as 5% cover or occur in 10% of plots and have a prevalence index ≥ 3)		N/A	Final monitoring of Phase 1 complete July 2017
11.	**Shrub/Forested wetlands**- native shrub and tree stem density is ≥ 1600/acre		N/A	Final monitoring of Phase 1 complete July 2017
12.	**Upland buffers**- cover of native species is at least 60%		Y	Average cover was 64% (+/- 10; 80% CI). This includes cover of herbaceous and woody natives
13.	**Upland buffers**- cover of invasive species is no more than 10%		Y	Average cover was 2% (+/- 2; 80% CI).
14.	**Upland buffers**- stocking of woody plants ≥ 1,800 stems/acre		Y	Density was 3400 (+/- 763; 80% CI) plants/acre.
15.	**Upland Prairie**- native species cover is > 60%		Y	Average cover was 76% (+/- 7; 80% CI).
16.	**Upland Prairie**- invasive species cover is no more than 10%		Y	No species encountered were considered invasive.
17.	**Upland Prairie**- Bare substrate is no more than 20%		Y	Average bare ground was 17% (+/- 1; 80% CI).
18.	**Upland Prairie**- After year 3, at least 4 different native species, 2 of which are non-grass have significant cover (defined as 5% cover or occur in 10% of plots)		Y	Ten native species occurred in at least 10% of the plots; 5 of which were non-grass species.

4: Further Actions:

Remedial work recommended Yes ☐ No **x**

Deed Restriction or other protection instrument attached Yes ☐ No **x**

Final Monitoring Report? Yes ☐ No **x**
Requesting release or partial release of financial security? Yes ☐ No **x**

Ongoing management includes weed maintenance, infill planting of bare root shrubs and trees in buffer and forested shrub wetlands as necessary to ensure density targets, and continued addition of non-grass, native, herbaceous material to achieve diversity targets.

W&M Butler Mitigation Bank Mitigation

Permittee: Jay Hoffman
Monitoring and Report Completed by: Ash Creek Forest Management
Contact: Wendy Kral (wkral@ashcreekforestry.com)
or George Kral (gkral@ashcreekforestry.com)

Year 3 of 5 for Phase 2

2. Plan Purpose and Overview

A. Location.
The mitigation site is located at: Township 2S Range 2W, Tax Lot 2S2110000200, Latitude 45 degrees, 24' 38.55" N (45.410708) and Longitude 122 degrees, 54' 18.04" W (-122.905011). The bank is located at 22242 SW Scholls Ferry Road, near the city of Beaverton, Oregon.

B. Mitigation goals and objectives.
The primary goals of the W&M Butler Mitigation Bank are to create, enhance, and restore emergent, scrub, and forested wetlands. Specific objectives include reducing non-native weed cover, broadening of the riparian fringe along the Tualatin River, establishment of protective buffers, and development of a mosaic of emergent wetland, mesic prairie and scrub habitats supporting a rich diversity of native plants and animals.

Wetland restoration, enhancement, and creation at Butler generate wetland credits that provide compensatory mitigation for unavoidable impacts to waters of the United States or waters of the states that result from activities authorized under Section 404 of the Clean Water Act, Section 10 of the Rivers and Harbors Act, Oregon's Removal-Fill Law (ORS) 196.800-196.990 and OAR 141-085 or to resolve enforcement cases resulting from activities subject to these regulations.

Targets for Butler Wetland functions and values are tabulated in Table 1. The project is broken into two phases. Table 1 shows the total expected results of both phases. Phase 1 is substantially complete, including all earthwork and structures, seeding, planting and monitoring. Phase 2 work completed to date includes earthwork, grading, weed control, seeding and planting.

Table 1.

Plant Community	TOTALS	Restoration	Enhancement	Creation	Buffers
PEM (emergent wetland and wet prairie)	47.01	13.80	12.80	21.40	

Acres					
PFO Acres	6.54	3.50	0.69	2.40	
PSS Acres	2.70	1.68	0.19	0.81	
Forested buffers	14.20			33.70	33.70
TOTAL ACRES	**90.97**	**18.98**	**13.68**	**24.61**	**33.70**
Credit Ratio		1:1	2:1	1.5:1	10:1
Credits Expected	**TOTAL**	**Restoration**	**Enhancement**	**Creation**	**Buffers**
	45.60	18.98	6.84	16.41	3.37

** Until the post-project delineation has been completed, fill in 'pending'.*

C. Maintenance and management actions.
In the past year, the following activities were conducted:

2/2018- 6,400 woody plants installed to create shrub buffer along northern boundary of Phase 2.
6/2018 - Spot sprayed and hand-pulled throughout for clover, curly dock, thistle, reed canary grass, trefoil, pennyroyal.
7/2018- Spot sprayed and hand-pulled throughout for trefoil, pennyroyal and clover; hand pulled wild carrot throughout Phase 2 and parentucellia from Phase 2 upland prairie.
7/2018 - Mowed and removed hay from 15 ac of Phase 2.
7/2018- Grazed 7 acres of Phase 1 upland buffer.
8/2018- Grazed 28 acres of Phase 1 comprised of upland buffer, wet prairie and emergent wetland to remove thatch, and manage prairie (see more detail below).
9/2017- Grazed 10 acres of Phase 2 wet prairie.
11-2018 - Burned sections of Phase I and II to reduce grass thatch and prepare sites for seeding.
11/2018- Seeded non-grass, native herbaceous species in Phase 2 (124 lbs) and select grazed area of Phase 1 (85 lbs).
11/2018 - Planted 5000 wapato bulbs in upper pond.

Grazing:
In collaboration with the Tualatin Soil and Water conservation district, we used carefully managed, prescribed cattle grazing to decrease thatch and biomass and create space for the introduction of broadleaf forbs to increase diversity on both Phase 1 and Phase 2.

In July we created a 7-acre pasture in the southern shrub buffer of Phase 1, where 10 yearling cattle grazed for three weeks. In August these cows were moved into an adjacent, 28-acre pasture in the established native prairie of Phase 1. Ten additional yearlings were added at this time and the herd of 20 grazed the area from August 10-August 30, 2018. This pasture included areas seeded and established as herbaceous wetland and shrub buffer.

In June and September, we conducted the first year of a multi-year, multi-site grazing study sponsored by the Tualatin Soil and Water Conservation District and designed by Stillwater Sciences. Two polygons were established in the Phase 2 wet prairie, a 4-acre control and a 10-acre study pasture. Pre-grazing, baseline vegetation data was taken at 50 fixed monitoring points in each polygon using a 1 x 1 meter square. Using visual estimation from an aerial view of the plot, we assessed Daubenmire cover class for each species present within the plot, as well as the cover class of bare ground and thatch. These plots will be monitored each year before Phase 2 is grazed to assess the impact of the previous year's grazing. This year, study

data were collected in June, and the 10-acre study plot was grazed using 19 yearling cattle from August 30 - September 10.

D. Monitoring methods

Vegetation monitoring followed the same protocol as in previous reports following the routine methods specified in the DSL Removal-Fill Monitoring Guidelines with the following exceptions:

1. Monitoring plots associated with Phase 1 were not monitored this year as it achieved standards in 2017.

2. The existing riparian forest buffer was not sampled this year as it has met standards already.

3. We ran an additional transect (90 degrees) across the upland buffer in Phase 2 to add three more plots to capture additional data in the newly planted shrub buffer.

E. Monitoring data locations

Monitoring plot locations were repeat sampled using GIS and existing permanent markers. In the original set-up as explained in the Mitigation Bank Instrument, a systematic sampling methodology was utilized in order to produce representative data and avoid bias. A permanent baseline has been established between two fixed points on the site. The first point is the center of a large marked oak tree, located 10 feet NE of transect 1 plot 6 (see map 3.0). The second point is the southwest corner of the water control structure, which is located approximately 60' NE of transect 6 plot 2 (see map 3.0). Transects are positioned perpendicular to this baseline, 265 feet apart. A random starting point between 0 and 25 is selected to determine the number of feet along the baseline west of the oak tree where the first transect should begin. Each subsequent transect is located 265 feet NE along the baseline from the last. Monitoring plots in the herbaceous wetland units are located 300 feet apart from each other, with the first point's number of feet from the baseline being determined by using a number randomly selected between 0 and 50. Each subsequent point is 300 feet along that transect until reaching forested buffers or until reaching the mitigation bank boundary. When forested buffers are encountered, the distance between monitoring plots was reduced to 150 feet. Herbaceous data was collected from two, one meter quadrants placed on the NW and SE corners of each plot. Tree and shrub data was collected in 11.8 foot diameter circles around center of the plot.

Table 2. Plots and Acres

Habitat	Number of herbaceous plots	Number of woody plots
PEM	28	0
PFO**	--	--
Upland Planted Buffers	20	10
Existing Riparian Buffer**	--	--
Upland Prairie	12	0
TOTAL	**60**	**10**

** Existing riparian buffer and Phase 1 (including all PFO plots) not surveyed as they have met criteria.

4. Results

We sampled a total of 40, one-meter-square plots for herbaceous vegetation in the mitigation bank (Butler- Phase 2). Within these plots we detected a total of 68 species. Fifty-one were

native and 17 were non-native. No invasive species were present within the monitoring plots. The vast majority of the vegetative cover in the plots was made up of native species.

Herbaceous Wetlands

Performance Standard 1. The cover of native species is at least 60%.

This standard was fully met. The average cover of native herbaceous species was 83% (+/- 6; 80% CI).

Performance Standard 2. The cover of invasive species is no more than 10%.

This standard was fully met with no invasive species recorded.

Performance Standard 3. Bare substrate represents no more than 20% cover.

This standard was not met. The average cover of bare substrate was 25% (+/- 4; 80% CI) after the second growing season post-seeding.

Performance Standard 4. By Year 3 and thereafter, there are at least 10 different native species. To qualify, a species must have at least 5% average cover in the habitat class, **or** occur in at least 10% of the plots sampled with a Prevalence Index > 3.

This standard was fully met. Twenty-four species were present that met the criteria for diversity.

Performance Standard 5. Non-grass species must comprise at least 30% of total vegetative cover.

This standard was fully met with 32% cover by non-grass species.

Shrub Dominated and Forested Wetlands

Performance Standard 6 - 11.

Shrub dominated and forested wetland zones not monitored this year having achieved standards in 2017.

Upland Buffers

Performance Standard 12. The cover of native species is at least 60%

This standard is fully met with average native cover of 64% (+/- 10; 80% CI). This percentage includes both woody and herbaceous cover.

Performance Standard 13. The cover of invasive species is no more than 10%. After the site has matured to the stage when desirable canopy species reach 50% cover, the cover of invasive understory species may increase but may not exceed 30%.

This standard was fully met. The average cover of invasive species was low, at 2% (+/-2; 80% CI) due to blackberry in one plot.

Performance Standard 14. In years 3 to 5 in all woody buffer types, stocking meets or exceeds 1,800 stems per acre stocking of all woody species.

This standard was fully met. The average density of plants per acre was 3,400 (+/- 763; 80% CI) plants/acre.

Existing Riparian Buffers

Performance Standard. In existing riparian stands, Himalayan blackberry will be reduced by a minimum of 80% to less than 5% of the total area, and treated areas replanted to initial stocking densities prior to the first credit release.

The standards for existing riparian buffers refer to the threshold of blackberry in the understory and have been met in years past. Therefore, we were asked to not include these plots in the upland buffer stratum. We did not sample these plots in 2017 or 2018.

Upland Prairie

Performance Standard 15. The cover of native species is at least 60%

This standard was fully met. Average cover was 76% (+/- 7; 80% CI).

Performance Standard 16. The cover of invasive species is no more than 10%.

This standard was fully met, no species encountered were considered invasive.

Performance Standard 17. Bare substrate is no more than 20%

This standard was fully met. Average bare ground was 17% (+/- 1; 80% CI).

Performance Standard 18. After year 3, at least 4 different native species, 2 of which are non-grass have significant cover (defined as 5% cover or occur in 10% of plots).

This standard was fully met. Ten species met the standard for diversity and 5 were non-grass species.

4. Conclusions and Recommendations

A. Project status

Phase 2:

This was the second year of monitoring herbaceous wetland and upland prairie acres after seeding Phase 2. The 2016 seeding, supplementary 2017 seeding and plug planting, and weed control has proved extremely successful and a diverse suite of native herbaceous species have established. As predicted last year, an increasing presence of grass species, sedges and rushes continues to develop on Phase 2. After the completion of monitoring this year we began implementing a regimen of grazing, haying, burning and overseeding to reduce grass cover and encourage a diversity of native forbs. The woody buffer installation occurred February, 2018.

B. Recommendations

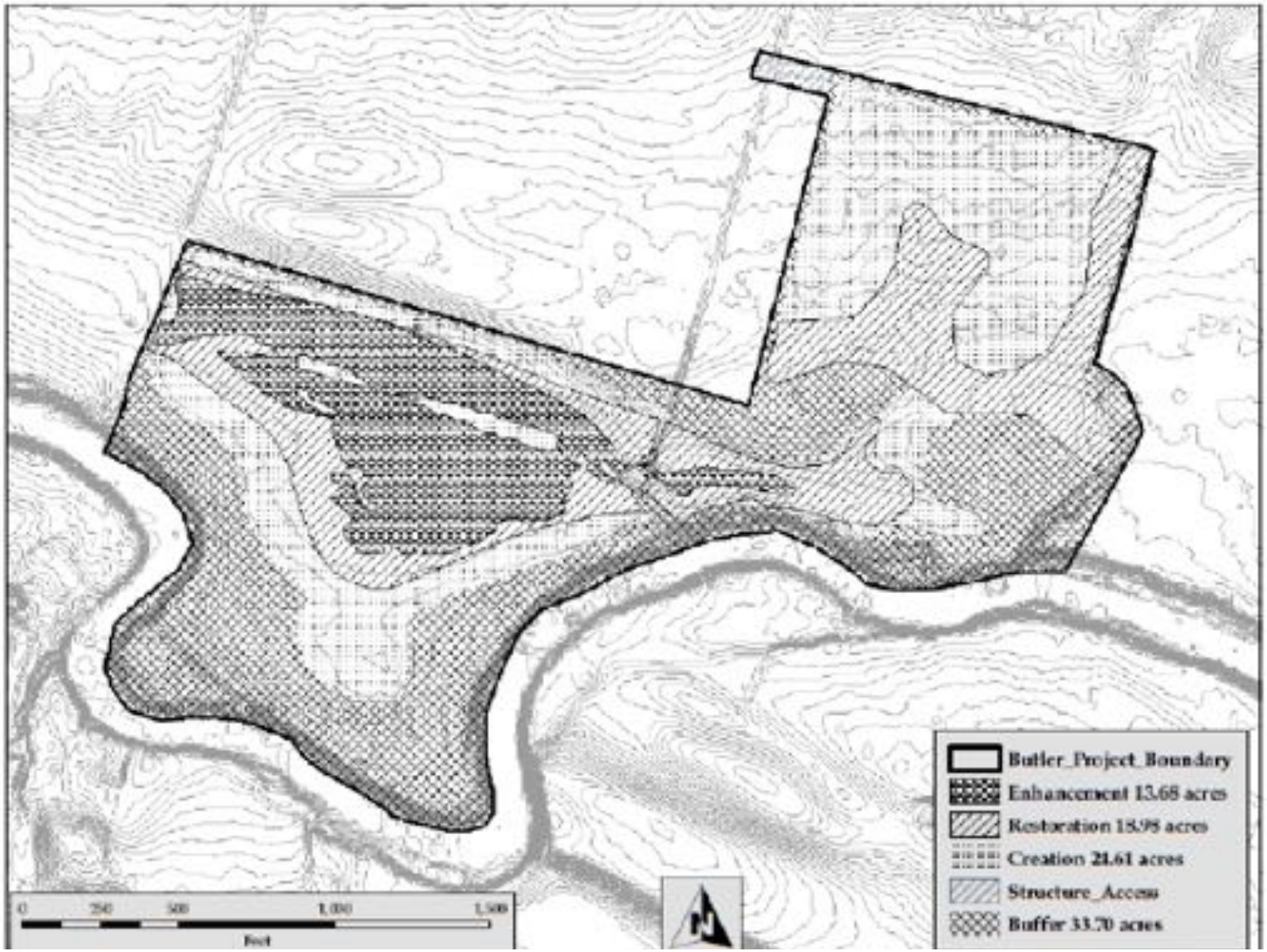
While non-native cover is low, continuing to aggressively control non-native species throughout the project area will be an important follow-up action over the coming year.

C. Financial Security status

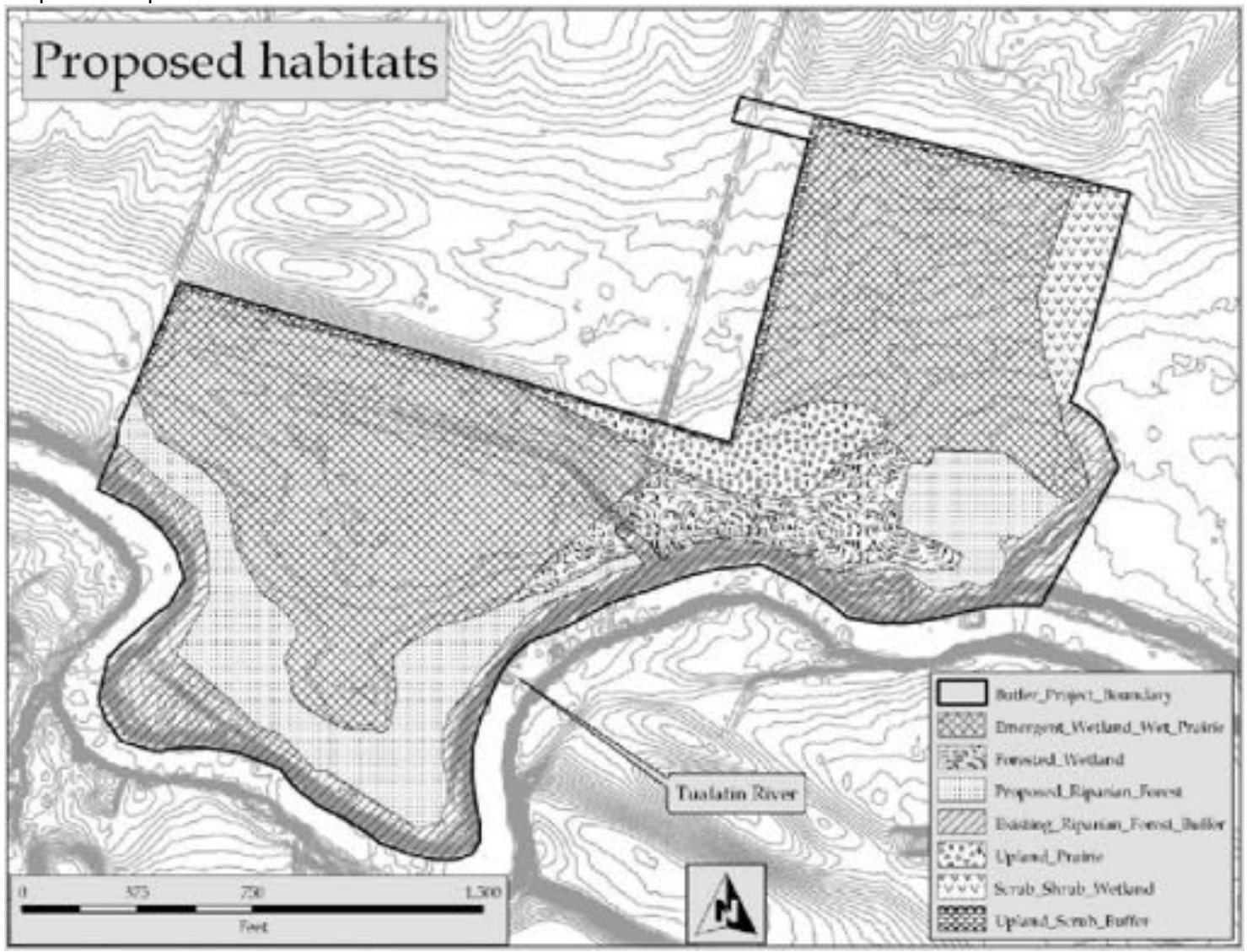
A (performance bond/ Letter of Credit/ other security) in the amount of $255,000 was established at permit issuance. As of June 2018, the remaining bond amount was $45,404.

5. Maps and Figures

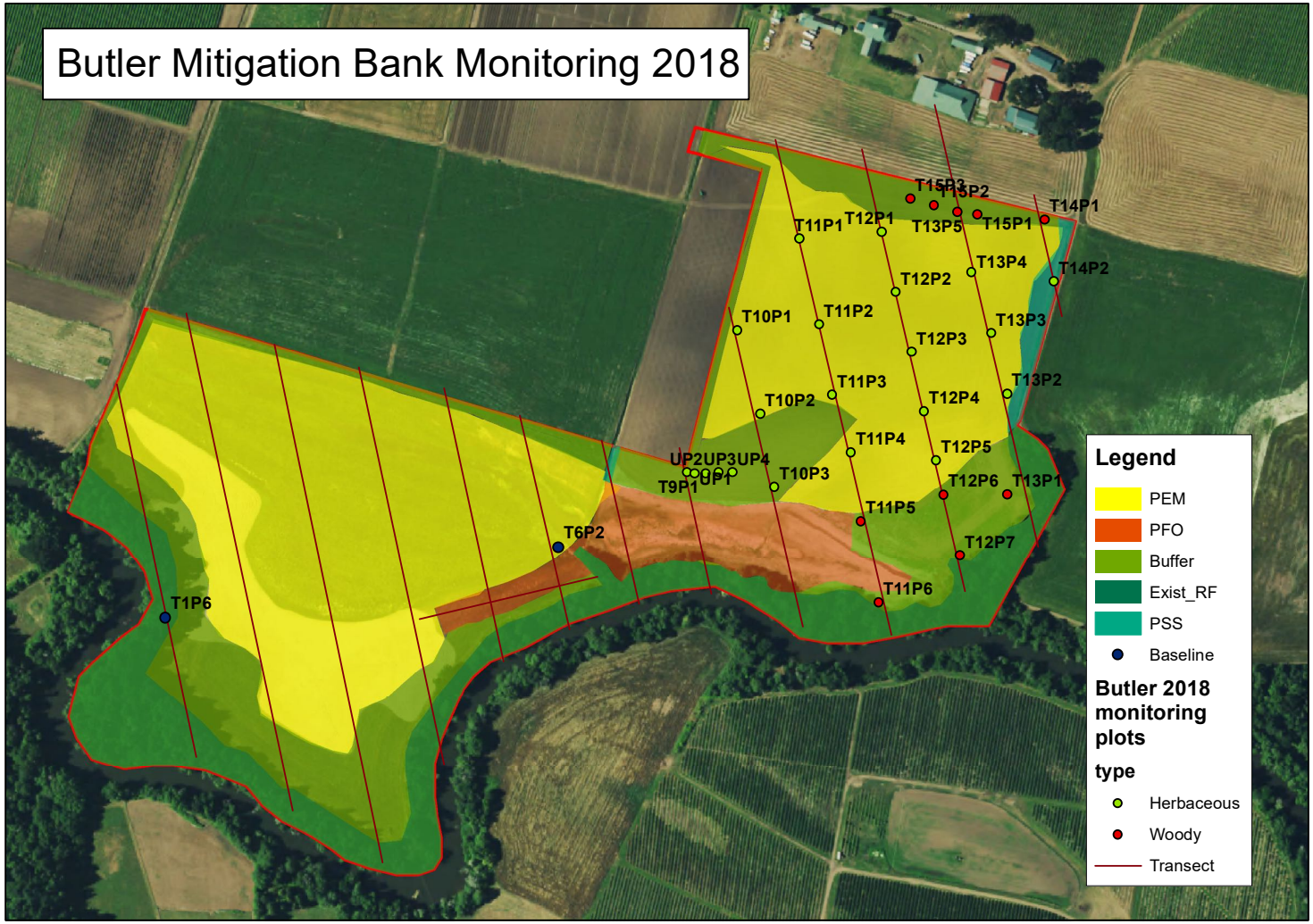
Map 1.0- Mitigation Plan



Map 2.0- Proposed Habitat Units



Map 3.0- Vegetation monitoring plot layout.



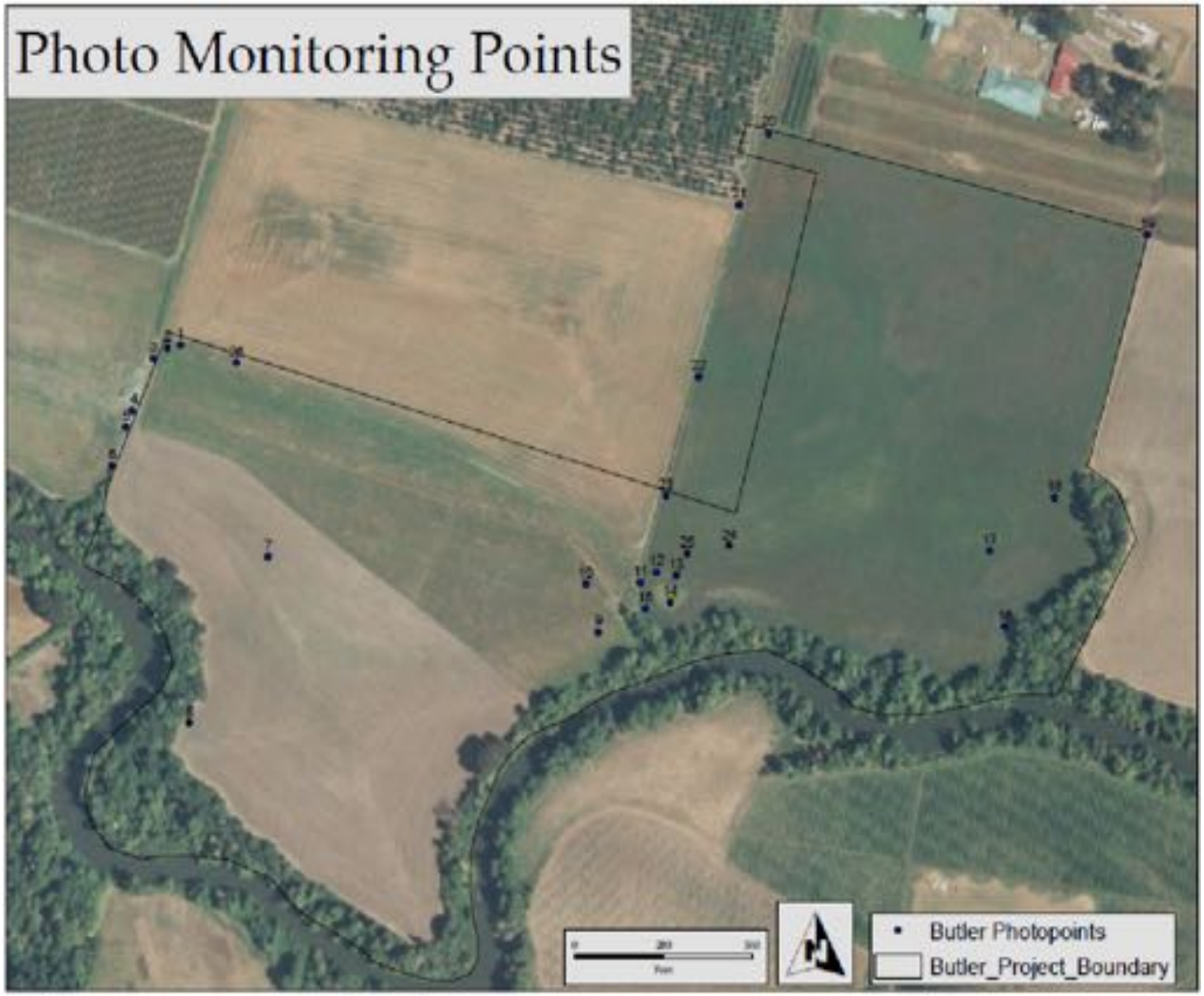
Ash Creek FOREST MANAGEMENT

500 250 0 500 Feet

N

2014 Aerial Photo

Map 4.0- Photo monitoring points



6. Appendices

Table 1- Baseline and transect layout details
Table 2. Data for Herbaceous Wetland Habitat Sampling Areas Phase 2
Table 3. Data for Upland Prairie Herbaceous Phase 2
Table 4. Data for Upland Buffer Habitat Sampling Areas Phase 2
Photo monitoring Phase 1 and 2
Treatment photos, Phase 1 and 2

Table 1. Baseline and Transect Layout Details Phase 1

	Closest Feature/Plot	End/intersection	Longitude	Latitude
Baseline	Oak Tree	Western end	122°54'36.45" W	45°24'35.16"N
	Water Control Structure	Eastern End	122°54'18.17" W	45°24'37.85"N
Transect 1	Plot 6	Baseline	122°54'36.82" W	45°24'35.14"N
Transect 2	Plot 4	Baseline	122°54'33.05" W	45°24'35.64"N
Transect 3	Plot 3	Baseline	122°54'29.44" W	45°24'36.21"N
Transect 4	Plot 3	Baseline	122°54'25.92" W	45°24'36.69"N
Transect 5	Plot 3	Baseline	122°54'22.15" W	45°24'37.20"N
Transect 6	Plot 2	Baseline	122°54'18.64" W	45°24'37.68"N
Transect 7	Plot 3	Transect 5	122°54'21.84" W	45°24'36.47"N

Table 2. Data for Herbaceous Wetland Habitat (PEM) Sampling Areas Phase 2

Instructions: Use this sheet for *Herbaceous Wetlands*. Add or delete columns and rows to reflect the data collected. Review formulas in highlighted cells (green) and fix formulas as needed.

After completing, use the Summary Information to evaluate site performance against the specific standards found in your authorization. These standards and the Summary Information should be filled into the Monitoring Report Cover Sheet.

Print this worksheet and include it in Section 3 of the monitoring report.

Site: W&M Butler Farms Mitigation Bank	**Sample Date(s):6/22-6/25/2018**																					
Herbaceous Wetland Habitat Unit																						
Transect/Plot number			**t10p1a**	**t10p1b**	**t10p2a**	**t10p2b**	**t11p1a**	**t11p1b**	**t11p2a**	**t11p2b**	**t11p3a**	**t11p3b**	**t11p4a**	**t11p4b**	**t12p1a**	**t12p1b**	**t12p2a**	**t12p2b**	**t12p3a**	**t12p3b**	**t12p4a**	**t12p4b**	**t12p5a**
Species	Origin (N, NN, I)	Wetland Status (1 - 5)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Native Herbaceous Species																							
Agrostis exarata	N	2	5	6	5	20	20	50	5	10	30	40					15	10	15	40	1		15
Alisma plantago aquatica	N	1											3	2								6	
Alopecurus geniculatus	N	1																					
Beckmannia syzigachne	N	1							3	1	1	1						1	1		10	2	
Bidens cernua	N	1											1										
Bidens frondosa	N	2												1					1		1		
Boisduvalia densiflora	N	2					1	5	1	1									1		2	1	
Carex imm	N	2					1												1				
Carex scoparia	N	2			2							1											
Carex pachystachya	N	3			10							1							1				
Carex unilateralis	N	2																3			2		
Carex vulpinoidea	N	1																			20	15	
Clarkia amoena																							
Danthonia californica	N	3		1	10	3	2	5	2	5		5					1	2	2	4			1
Deschampsia cespitosa	N	2	50	40	10	40	5	5	40	40	40	30					75	50	25	30	5		40
Deschampsia elongata	N	2	30	30		40	5	5	20	30	20						2	2	5	10	20		10
Downingia elegans	N	1													15	20							
Eleocharis ovata	N	1											5	15	10						4	3	
Eleocharis palustris	N	1											3	4	55	70						35	
Epilobium ciliatum	N	2																					
epilobium watsoni	N	2										1									3		
Eriophylum lanatum	N	5																					
Galium trifforum	N	4																					
Gnaphalium palustre	N	2											4	3									
Grindelia integrifolia	N	2				1	25	7	1	2							1	10		1			
Hordeum brachyantherum	N	2	5					1		5		1						1		2			15
Juncus articulatus	N	1									3	3											
juncus accumuniatus	N	1									1	1											
Juncus bufonius	N	2																					
Juncus ensifolius	N	2																					
Juncus oxymeris	N	2																					
juncus spp.	N	2																					
Juncus tenuis	N	3																					
Leersia oryzoides	N	1									2												
Lotus purshianus	N	4	15	20	50	5	25		15	8	15	20					1	1	10	7			1
Ludwigia palustris	N	1																					
Lupinus polyphyllus	N	3										1											
lupinus sp	N	3																					
Microsteris gracilis	N	4					1	2															
Panicum aciculare	N	4												1									
Plagiobothrys scouleri	N	2											1	2									
Potentilla gracilis	N	3					1																1
Prunella vulgaris	N	4			5	1	5																
Psilocarphus eliator	N	2																					
Ranunculus orthoryncus	N	2								1													
Rorippa curvisiliqua	N	1			3				1	1			1						1				
Rumex salicifolius	N	2			15	3	1				1					1			1				
Sanguisorba annua	N	2					1																
Torreyochloa pallida	N	1																					
Typha latifolia	N	1													5						1	15	
Veronica peregrina	N	2											2										
Non-Native Herbaceous Species																							
Spergula arvensis	NN																						
Trifolium pratenses	NN	4																					
Anthimus cortula	NN																						
Daucus carota	NN																						
Echinochloa	NN												1										
Festuca myuros	NN																						
Gnaphalium uliginosum	NN												4	3									
Kickxia	NN								2	1				1									
Lactuca seriola	NN						1																
Leontodon taraxacoides	NN	4																			2		
Lolium perenne	NN																				5		
Lythrum portula	NN												4	2								3	
Persecaria spp.	NN																						
Plantago major	NN																						
Poa trivialis	NN																						
polygonum aveculare	NN												1	1									
Parentucellia viscosa	NN																						
Trifolim arvense	NN							3															
Unknown grass	NN																						
Misopates orontium	NN																						
Bare Substrate																							
bare soil			1	2	2	20	5	5	5	5			60	60	15	15	5	2	2	2	20	2	2
thatch			20	20	10		15	10	15	15	15	20	10	10	5		15	20	10	15	5	30	20
open water																							
Summary Information			**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**
Cover of Native Herbaceous Species			105	97	110	113	93	80	88	104	113	105	20	28	85	91	95	80	64	94	69	77	83
Lower CI (80%)																							
Upper CI (80%)																							
Cover of Invasive Herbaceous Species			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lower CI (80%)																							
Upper CI (80%)																							
Bare Substrate			21	22	12	20	20	15	20	20	15	20	70	70	20	15	20	22	12	17	25	32	22
Lower CI (80%)																							
Upper CI (80%)																							
Cover of Non-Grass			15	20	85	10	61	15	21	19	21	30	20	27	85	91	2	16	17	10	43	77	17
Native Diversity			5	4	5																		
Prevalence Index			2	2	3	2	3	2	2	2	2	2	1	1	1	1	2	2	2	2	1	1	2
Weighted Prevalence Index			240	235	313	241	248	169	204	227	246	239	18	27	85	92	193	163	146	206	97	78	167
Sum of plant cover			105	97	110	113	94	83	90	105	113	105	30	35	85	91	95	80	64	94	76	80	83

t12p5b	t13p2a	t13p2b	t13p3a	t13p3b	t13p4a	t13p4b						
22	23	24	25	26	27	28	Row Average	Row Sums	frequency in plots	diversity	in 10% of plots	5% cover
30			60	50			15.25	427	19	0.6786	1	1
	25	10					1.64	46	5	0.1786	1	
							0.00	0	0	0		
	8		2	1			1.11	31	11	0.3929	1	
							0.04	1	1	0.0357		
	1	1					0.18	5	5	0.1786	1	
							0.43	12	7	0.25	1	
				2			0.14	4	3	0.1071	1	
							0.11	3	2	0.0714		
							0.43	12	3	0.1071	1	
					1		0.21	6	3	0.1071	1	
							1.25	35	2	0.0714		
							0.00	0	0	0		
2				1			1.64	46	15	0.5357	1	
40			25	30			22.14	620	19	0.6786	1	1
10					40	60	12.11	339	17	0.6071	1	1
		2					1.32	37	3	0.1071	1	
	8	10					1.96	55	7	0.25	1	
	10	10					6.68	187	7	0.25	1	1
					1		0.04	1	1	0.0357		
			1				0.18	5	3	0.1071	1	
							0.00	0	0	0		
					1		0.04	1	1	0.0357		
							0.25	7	2	0.0714		
							1.71	48	8	0.2857	1	
2			1				1.18	33	9	0.3214	1	
			2	1			0.32	9	4	0.1429	1	
			1	1			0.14	4	4	0.1429	1	
							0.00	0	0	0		1
							0.00	0	0	0		
							0.00	0	0	0		
							0.00	0	0	0		
			1	1			0.07	2	2	0.0714		
	2						0.14	4	2	0.0714		
1			3	10			7.39	207	17	0.6071	1	1
		2					0.07	2	1	0.0357		
							0.04	1	1	0.0357		
							0.00	0	0	0		
							0.11	3	2	0.0714		
							0.04	1	1	0.0357		
	1	1					0.18	5	4	0.1429	1	1
							0.07	2	2	0.0714		
							0.39	11	3	0.1071	1	
							0.00	0	0	0		
							0.04	1	1	0.0357		
			1			1	0.32	9	7	0.25	1	
7			1				1.07	30	8	0.2857	1	
							0.04	1	1	0.0357		
							0.00	0	0	0		
	20	30					2.54	71	5	0.1786	1	
	1	1					0.14	4	3	0.1071	1	
											26	7
							0.00	0	0	0		
			1		15	15	1.11	31	3	0.1071	1	
							0.00	0	0	0		
					2		0.07	2	1	0.0357		
							0.04	1	1	0.0357		
					2		0.07	2	1	0.0357		
							0.25	7	2	0.0714		
					1		0.18	5	4	0.1429	1	
							0.04	1	1	0.0357		
		1				15	0.64	18	3	0.1071	1	
					1	8	0.50	14	3	0.1071	1	
	1						0.36	10	4	0.1429	1	
							0.00	0	0	0		
					3		0.11	3	1	0.0357		
					5		0.18	5	1	0.0357		
							0.07	2	2	0.0714		
					1	1	0.07	2	2	0.0714		
							0.11	3	1	0.0357		
							0.00	0	0	0		
							0.00	0	0	0		
2	20	5	1	1	2	2	9.39	263	26	0.9286		
20	20	50	20	20	20	20	16.07	450	26	0.9286		
							0.00	0	0	0		
22	**23**	**24**	**25**	**26**	**27**	**28**	**Habitat Average**					
92	76	67	98	97	43	61	83		SD		SE	CI
							79		23.63882	5.2915	4.467	5.725096
							88					
0	0	0	0	0	0	0	0		SD		SE	
							0		0	5.2915	0	
							0					
22	40	55	21	21	22	22	25		SD		SE	CI
							23		15.14982	5.2915	2.863	3.669143
							28					
10	74	67	13	16	3	1	32		SD		SE	CI
									28.45037	5.2915	5.377	6.890408
									diversity index			
2	1	1	2	2	1	1	2					
188	79	70	193	212	84	121	164					
92	77	68	99	97	73	100	87					

Table 3. Data for Upland Prairie Habitats Phase 2

Instructions: Use this sheet for *Herbaceous Wetlands*. Add or delete columns and rows to reflect the data collected. Review formulas in highlighted cells (green) and fix formulas as needed.

After completing, use the Summary Information to evaluate site performance against the specific standards found in your authorization. These standards and the Summary Information should be filled into the Monitoring Report Cover Sheet.

Print this worksheet and include it in Section 3 of the monitoring report.

Site: W&M Butler Farms Mitigation Bank	**Sample Date(s): 6/22 - 6/25/18**																		
Herbaceous Wetland Habitat Unit																			
Transect/Plot number			**t9p1a**	**t9p1b**	**t10p3a**	**t10p3b**	**UP1a**	**UP1b**	**UP2a**	**UP2b**	**UP3a**	**UP3b**	**UP4a**	**UP4b**					
Species	Origin (N, NN, I)	Wetland Status (1 - 5)	1	2	3	4	5	6	7	8	9	10	11	12	Row Average	Row Sums	frequency in plots	diversity	in 10% plots	>5% cover
Native Herbaceous Species																				
Achillilea millefolium	N	4	1	5	1		2	2	1	1	3	1	10	2	2.42	29	11	0.9167	1	
Agrostis exarata	N	2		5	3		1				2		3	1	1.25	15	6		1	
Bromus sitchensis	N				5	1									0.50	6	2		1	
Carex imm.	N	2									1				0.08	1	1			
Collomia grandiflora	N			1		1	1	1	1		1	1	1	1	0.75	9	9	0.75	1	
Danthonia californica	N	3	1	1	1	1	1	1	1		1	1	1	2	1.00	12	11	0.9167	1	
Deschampsia cespitosa	N	2	7	8	10	30	4	8	10	15	7		6		8.75	105	10	0.8333	1	1
Deschampsia elongata	N	2	50	30	30	5	40	50	25	20	25	60	30	20	32.08	385	12	1	1	1
Elymus glaucus	N	4					1								0.08					
Epilobium ciliatum	N	2									1	1			0.17					
Epilobium watsoni	N	2			2	1				1					0.33	4	3	0.25	1	
Eriophylum lanatum	N	5	10	5	5	5	5	3	5	7	15	5	4	25	7.83	94	12	1	1	1
festuca romeri	N		1			1	5	3	5	5		2			1.83					
Grindelia integrifolia	N	2												1	0.08					
Hordeum brachyantherum	N	2				1									0.08	1	1	0.0833		
iris tenax	N				1										0.08					
Juncus bufonius	N	2													0.00	0	0	0		
juncus tenuis	N	3				1					1				0.17					
Lotus purshianus	N	4	25	20	5	4	4	4	25	15	15	3	20	70	17.50	210	12	1	1	1
lupinus micranthus	N									5					0.42	5	1	0.0833		
Lupinus polyphillus	N	3			1										0.08					
luzula comosa	N	3					1								0.08					
Plagiobothrys scouleri	N	2													0.00	0	0	0		
Prunella vulgaris	N	4											1		0.08					
Rorippa curvisiliqua	N	1				1					1				0.17					
Rumex salicifolius	N	2													0.00	0	0	0		
Sanguisorba annua	N	2													0.00	0	0	0		
solidago canadensis	N	4													0.00	0	0	0		
Veronica peregrina	N	2													0.00	0	0	0		
																825			10	4
Non-Native Herbaceous Species																				
Spergula rubra	NN									1	1			1	0.25					
Trifolium pratenses	NN			1					1	1		1			0.33					
Anthimus cortula	NN			2	1			1		1	1				0.50					
Daucus carota	NN														0.00					
Gnaphalium uliginosum	NN														0.00					
Kickxia	NN														0.00					
Lactuca seriola	NN				1						1				0.17					
Lolium perenne	NN														0.00					
polygonum aveculare	NN														0.00					
Sonchus spp.	NN														0.00					
Bare Substrate																				
bare soil				5	2	2	2	2	5	2	2	2	2		2.17					
thatch			15	15	15	20	20	15	15	10	15	15	15	10	15.00					
open water															0.00					
Summary Information			**1**	**2**	**3**	**4**	**5**	**6**	**7**	**1**	**2**	**10**	**11**	**12**	**Habitat Average**					
Cover of Native Herbaceous Species			95	75	64	52	65	72	73	69	73	74	76	122	76		SD	SE		CI
Lower CI (80%)															71		17.59563	3.4641	5.08	6.509538
Upper CI (80%)															81					
Cover of Invasive Herbaceous Species			0	0	0	0	0	0	0	0	0	0	0	0	0					
Lower CI (80%)															0					
Upper CI (80%)															0					
Bare Substrate			15	20	17	22	22	17	20	12	17	17	17	10	17		SD	SE		CI
Lower CI (80%)															16		3.639014	3.4641	1.05	1.346261
Upper CI (80%)															18					
Cover of Non-Grass			36	31	15	13	13	10	32	29	38	11	36	99	30		SD	SE		CI
																	24.24543	3.4641	7	8.969647
Native Diversity			5	4													diversity index			
Prevalence Index															#DIV/0!					
Weighted Prevalence Index			271	214	145	122	149	158	202	171	226	166	225	463	209					
Sum of plant cover			95	78	66	52	65	73	74	72	76	75	76	123	77					

Table 4. Data for Upland Buffer Habitat Sampling Areas Phase 2

Instructions: Use this sheet for *Upland Buffers*. Add or delete columns and rows to reflect the data collected. Review formulas in highlighted cells (green) and fix formulas as needed. After completing, use the Summary Information to evaluate site performance against the specific standards found in your authorization. These standards and the Summary Information s
Print this worksheet and include it in Section 3 of the monitoring report.

Site: W&M Butler Farms																
Mitigation Bank	**Sample Date(s): 6/22-6/25/18**															
Upland Buffer Habitat Unit																
Transect/Plot number			T11P5a	T11P5b	T11P6a	T11P6b	T12P7a	T12P7b	T12P6a	T12P6b	T13P1a	T13P1b	T13P5A	**T13P5B**	**T14P1A**	**T14P1B**
Species	Origin (N, NN, I)	Wetland Status (1 - 5)	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Native Herbaceous Species																
Achillea millefolium													7	1	1	1
Alisma plantago aquatica																
Agrostis exarata	N								15	10			20	10	60	65
Aster sp	N															
Bidens frondosa	N	2														
Boisduvallia densiflorum	N								1							
Bromus sitchensis														3		
Carex stipata																2
Carex imm.															1	1
Danthonia californica	N	3											1	1	2	1
Deschampsia cespitosa	N	2	20	30					4	5	10	5				
Deschampsia elongata	N								2	5	60	10	20	50	15	20
Eleocharis obtusa																
Eleocharis palustris																
Elymus glaucus													5	8		
Epilobium ciliatum	N	2														
Epilobium watsoni													2	1	2	
Erigeron pensylvanicum																
Festuca romeri													1			
Gallium triflorum	N										2					
Gnaphalium palustre																
Grindelia integrifolia	N	2				10										
Hordeum brachyantherum	N	2														
Juncus buphonius																
Lotus purshianus	N	4											1			
Plagiobothrys scouleri																
Potentilla gracilis	N	3														
Prunella vulgaris	N	4														
Psilocarphus elatior																
Rorippa curviseliqua													2	15	1	2
Veronica peregrina																
Invasive Herbaceous Species																
Rubus armeniacus	I						25	10								
Non-Native Herbaceous Species																
Anthemis cotula	NN	3		1												
Agrostis tenuis	NN				5											
Cirsium arvense	NN		2		1											
Crepis setosa	NN								5	10	10	5	1			
Daucas carota	NN				60	25										1
Festuca arundinancea	NN															
Lactuca serriola	NN								20	4				1		
Lapsana	NN						1					2				
Leontodon taraxacoides	NN	4	6	1	20	40				4						
Lolium perenne	NN															
Lythrum portula	NN															
Plantago major																
Poa trivialis	NN		1		5	20	55	70	2							
Serriola sp.	NN															
Sonchus asper	NN	3														
Trifolium pratenses	NN				1								1			1
Kickxia elatine	NN			1						1						1
Verbascum blepharia																
Vicia hirsuta			2	1		5				4						
Bareground			5	5	10	1	1	2	5	10	5	10	5	10	2	5
Litter			40	50	10	20	3	10	20	15	20	20	20	15	20	20
Native Shrub and Tree Species																
Acer circinatum		3														
Cornus serriola	N	2	3		4		7	7			1					
Crataegus douglasii	N	3									1					
Fraxinus latifolia	N	2	1		1		3	2	8	5	4					
Holodiscus discolor	N	4							1				12	1		
Lonicera involucrata	N	3														
Mahonia aquifolium	N	4											3		1	
Malus fusca	N	2			2	2			1		1		2	1	1	
Philadelphus lewisii	N	5	1												10	1
Physocarpus capitatus	N	2	4		9	20	1		14	21						
Populus trichocarpa	N	3							1							
Quercus garryana	N	4					3		1		1		1			
Rhamnus purshiana	N	3			1				2		1	35				
Rosa pisocarpa	N	3	27	5	6		14	30	5	4						
Rubus leucodermis	N	4														
Salix scouleri	N	3							1							
salix piperi	N	2			1											
Salix prolixa	N	2														
Spiraea douglasii	N	2	45		1		5				30					
Symphoricarpus albus	N	4			2.00		12.00		5.00			42.00	3		9	
			count	cover	count	cover	count	cover	count	cover	count	cover	count	cover	count	cover
Routine Performance Standards																
Cover of Native Herbaceous Species			20	30	0	10	0	0	22	20	72	15	50	73	80	89
Lower CI (80%)																
Upper CI (80%)																
Cover of Invasive Herbaceous Species			0	0	0	0	25	10	0	0	0	0	0	0	0	0
Lower CI (80%)																
Upper CI (80%)																
Cover of Native Shrubs and Trees				5		22		39		30		77		2		1
Lower CI (80%)																
Upper CI (80%)																
Count of Native Shrubs and Trees			81		27		45		39		39		21		21	
			8100		2700		4500		3900		3900		2100		2100	

should be filled into the Monitoring Report Cover Sheet.

T15p1a	**T15p1b**	**T15p2a**	**T15p2b**	**T15p3a**	**T15p3b**			
15	16	17	18	19	20	Row Average		
1	3	1				0.75		
			1			0.05		
55	40	60	15	20	10	19.00		
						0.00		
						0.00		
						0.05		
						0.15		
						0.10		
					1	0.15		
2	1			4		0.60		
						3.70		
25	30	25	30	20	40	17.60		
			1		1	0.10		
					1	0.05		
	1					0.70		
		1				0.05		
1	3	1	3	10	10	1.65		
			1			0.05		
						0.05		
						0.10		
					1	0.05		
		3	5			0.90		
						0.00		
			1	2	2	0.25		
1				10		0.60		
		1				0.05		
						0.00		
						0.00		
			1			0.05		
1	1	2	1	1		1.30		
			1			0.05		
						1.75		
1		1	1	1	1	0.30		
						0.25		
						0.15		
						1.55		
					1	4.35		
						0.00		
1			1	1	1	1.45		
						0.15		
					1	3.60		
					2	0.10		
						0.00		
	4		20			1.20		
						7.65		
						0.00		
			1			0.05		
				15		0.90		
1	1	1	1	1	1	0.45		
		1				0.05		
						0.60		
2	10	20	20	20	40	9.40		
20	15	10	10	5	5	17.40		
		1						
2								
				4				
4		4		2	1			
18	1	19	1	7	1			
				6				
count	cover	count	cover	count	cover			
						Habitat Average	**Standard Dev**	**CI**
84	75	91	56	66	66	46	32.8	9.395606
						37		
						55		
0	0	0	0	0	0	2	5.9	1.693739
						-4		
						8		
	1		1		2	18	25.0	10.13606
						-7		
						43		
24		24		19		34	20.5	SD CI
2400		2400		1900		3400		1883.26 763.2139

Photo Monitoring

Photo point 1, August 2018

Photo point 2, August 2018

Photo point 3, August 2018

Photo point 4, August 2018

Photo point 5, August 2018

Photo point 6, August 2018

Photo point 7, August 2018

Photo point 8, August 2018

Photo point 9, August 2018

Photo point 10, August 2018

Photo point 11, August 2018

Photo point 12, August 2018

Photo point 13, August 2018

Photo point 14, August 2018

Photo point 15, August 2018

Photo point 16, August 2018

Photo point 17, August 2018

Photo point 18, August 2018

Photo point 19, August 2018

Photo point 20, August 2018

Photo point 21, August 2018

Photo point 22, August 2018

Treatment Photos