2008 Monitoring Report: Muddy Creek Wetland Mitigation Bank, Monroe, Oregon.

I. ***Project Overview***:

(1) ACOE permit # 2005-714
(2) Katie Arhangelsky, Turnstone Environmental Consultants, 5/28/2008 and 7/21/2008
(3) Muddy Creek Wetland Mitigation Bank is 108 acres that will generate 60.33 mitigation credits when fully restored. 101 acres are projected to become wet prairie and palustrine emergent habitats. 7 acres are riparian forest-shrub habitat.
(4) The bank in located west of hwy 99 between McFarland and Dawson Roads, 3 miles north of Monroe, in Benton County. Legal description for Bank location is T14 R5W Section 9, tax lot 300.
(5) Bank was authorized by Division of State Lands to sell credits August 17, 2007.
(6) This is year 1 monitoring report.
(7) Vegetation monitoring summaries (section 3) for wet prairie, planted forest and existing forest habitats show the Bank meeting most of the performance standards laid out for the above habitats for years 1 and 2.
(8) This is the first monitoring report submission. There are no additional, or corrective activities to report.
(9) There have been no corrective or remedial actions associated with the Bank.

II. ***Monitoring requirements and performance standards***:

Bank Hydrologic Performance:

Hydrology monitoring data is collected to validate compliance with 1987 manual soil saturation standard. 25 saturation-monitoring wells were established at the Bank, focusing on the higher elevation ground that is the focus of creation efforts, 20 of the 25 wells are located in areas previously delineated as uplands in the 2006 wetland delineation, (map of monitoring wells included in section IV). An additional well, #26, was established in 2008 because of variable ground water condition within that upland.

Vegetation Performance:

Vegetation monitoring protocol uses stratified systematic plot method with a series of baselines; each with transects running perpendicular from the baseline across each sampling area. Baselines are established in each habitat type and section of the bank site, with enough baselines to encompass the entire area of the site. Care has been taken to ensure that a baseline runs along each habitat type that will be created on site, with a total of six baselines established. Permanent transects will be established along each baseline. The number and design of transects established will vary per habitat type. For all types of survey plots, all species will be listed along with percent cover and nativity designation. For forested wetland plots, surveyors will also count the number of stems at ground level for each tree species recorded in the plot, in order to calculate percent survival.

For **wetgrass prairie** and **emergent wetlands**, transect lines will be placed 250' apart along the baseline with 10 1m² sample plots per transect. A total of 12 transect lines are anticipated for these two habitats, with a total of 120 survey plots. The location of the first sample plot along the transect line will be randomly placed, and then the remaining sample positions will follow at 30 m apart along the right side of the transect line.

For **planted forested wetlands,** nine randomly located 50-feet diameter circular plots within the expected habitat will record tree and shrub information: also within each plot herbaceous vegetation will be recorded from a randomly located 1m2 quadrat. Within the **enhanced forested wetlands** four randomly located plots of similar size will record herbaceous, tree, and shrub information.

Vegetation Performance Standards:

Wet Prairie Habitat

1. Percent Vegetative Cover- At least 50% of the relative plant cover (including bare soil) is comprised of native species for Years 1 and 2 after revegetation; raises to 60% cover in Years 3-5.
2. Tufted hair grass is represented by at least 25% relative plant cover.
3. At least 2 native grass species and 1 native forb with 5% cover each in the native cover matrix for Years 1 & 2, raises to 5 native species with at least 5% cover for each species in Years 3-5.
4. No more than 15% of relative plant cover is comprised of non-native invasive species*.
5. Wet prairie vegetation moisture index is between 2 and 3.
6. No more than 5% relative plant cover by trees or shrubs.
7. By Year 5, presence of at least 10 wet prairie cohort species and no more than twice the percent cover of bare soil present at the reference site.

Emergent Wetland Habitat

1. A minimum of 55% relative plant cover is comprised of native species.
2. Native grass or grass-like species (i.e. Juncus, Carex, or Eleocharis species) represent at least 25% of relative plant cover.
3. A minimum of 3 herbaceous species is represented in Years 1 &2, increasing to a minimum of 5 species in Years 3-5.
4. Less than 15% relative plant cover is comprised of non-native invasive species*
5. The moisture index is less than 3.0.

Forested Wetland Habitat- Planted

1. A minimum of 2 tree species planted to a density of 200 stems per acre (number of planted trees derived by calculating an 80% estimate of trees in the six reference plots
2. A minimum of 55% relative plant cover is comprised of native species.
3. A minimum of 3 native shrub species with 240 stems per acre (number derived from 80% of stem count in reference plots.
4. Less than 15% relative plant cover is comprised of non-native invasive species.
5. Moisture index is less than 3.0

Forested Wetland Habitat- Enhanced

1. A minimum of 2 native shrub species with 240 stems per acre.
2. A minimum of 20% relative plant cover slough sedge (*Carex obnupta*).
3. Less than 30% relative plant cover of non-native invasive species*.

4. A minimum of 55% relative plant cover is comprised of native species.

III. ***Summary data: included with document***

IV. ***Maps and plans: included with document***

V. ***Conclusions:***

Credit Sales:

A total of 14,152 sq. ft. of Bank land was sold in 2008.

Date	DSL Permit #	ACOE Permit #	Enforcement File #	Total of Land Sold
9/17/2008	40986FP	NWP 2008-416		11,586.96 sq.ft.
10/14/2008	40986FP	NWP 2008-416		1,539 sq.ft.
9/5/2008	33384	200400723	6734	1,026 sq.ft.

Management activities:
In the spring of 2008 all phase 2 land was sprayed with herbicide. Phase 1 land was selectively sprayed for non-native grasses and forbs. Selective spraying on phase 1 continued into the summer. In the enhanced forested wetland habitat selective spraying for non-native vegetation occurred over the course of the spring, and all English hawthorn was cut and piled for burning.

Over the winter of 2007-2008 there was considerable planting loss to waterfowl foraging. That ground (roughly 15 acres) was replanted to the original wet prairie matrix mix of slender hair grass, tufted hair grass, water foxtail, meadow barley, and American slough grass in the spring of 2008.

In the summer of 2008 approximately 1,200 cubic yards of fill excavated out of phase 1 uplands was used to plug the drainage ditch that bordered the eastern edge of phase 1. With this action complete, all construction actions for phase 1 are complete. An as-built diagram was not done for this phase of restoration awaiting the final wetland delineation.

In the fall of 2008 all of phase 1 ground planted to herbaceous vegetation was mowed.

In the fall of 2008, 22.2 acres of phase 2 wetland delineated ground were seeded to the wet prairie matrix mix of slender hair grass, tufted hair grass, water foxtail, meadow barley, and American slough grass. To discourage waterfowl predation 6,000 bamboo stakes with plastic flagging were placed on newly planted ground.

Hydrology Performance:
Well log data summary (in section III) shows all phase 1 wells located on previously delineated wetland ground meeting 1987 manual saturation standards. On upland wells, 3 of the 9 monitored for phase 1 met the saturation standard for the entire monitoring period. 5 of the 9 upland wells meet saturation standards for 15 consecutive days. Wells # 2,5, and 26 (see map)

never met the saturation standard. These areas were where we excavated for fill to complete the filling in of the drainage ditch.

Vegetation Performance:
All phase 1 wetland delineated ground was planted to a mix of native wet prairie grasses in the fall of 2007. In areas where we anticipated longer inundation we added the wetland obligate grass western mannagrass (*Glyceria occidentalis*) and creeping spike-rush (*Eleocharis palustris*), to the mix. As we are uncertain as to whether we can establish palustrine emergent vegetation at the Bank given the shallow water levels we have taken the approach that all ground will be planted to a matrix of native grass and forb seeds and that establishment (and likely dominance) of appropriate vegetation will ultimately establish the respective habitat. It is for this reason that we have lumped wet prairie and palustrine emergent monitoring data into one table.

Despite considerable waterfowl depredation of the fall 2007 grass planting the site recovered and is making good progress towards meeting its vegetation performance standards. For the combined phase 1 wet prairie and palustrine emergent habitats we are meeting the five-year standard for 5 of the 7 standards, excepting minimum cover of tufted hair grass, and moisture index of less than 2. We replanted tufted hair grass in the fall of 2008 for the entire anticipated wet prairie habitat. As to raising the moisture index to 2, or higher; we are hoping that when we plant our forb seeds, several of which are facultative, we will raise the index. We also expect the index to rise as the FACW grasses gain dominance throughout the habitat.

The planted forested wetland habitat was not planted to tree and shrub rootstock until the winter of 2009. The wet prairie grass matrix planted in 2007 is progressing nicely as grassland. Our intention was not to plant this habitat to tree and shrub rootstock until we had a good cover of grasses. At the time of last years monitoring we had quite a bit of Lythrum portula throughout this habitat, we sprayed with Amine herbicide last summer and were able to eliminate most of it. That, and continuing spread of grasses seems to have reduced its presence.

The enhanced forested wetland habitat is slated for planting to rootstock and herbaceous species listed in the Bank's instrument in the spring of 2009 when the water levels drop to where we think the planted stock can survive. Last year we spent considerable time spot spraying for reed canary grass and climbing nightshade and feel confident that they are now largely eliminated and this ground is ready for planting.

Section III

Vegetation Performance standards	Yrs 1 &2	Meeting	Yrs 3-5	Meeting
Wet Prairie Standards		Standard ?		Standard?
1. relative plant cover	50% veg cover	yes	60% or greater	yes
2. tufted hair grass cover	25% or greater	no	25% or greater	no
3. Native Grass & forb species matrix mix	2 grass 1 forb	yes	5 species or more	yes
4. Relative plant cover invasive species	no more than 15%	yes	no more than 15%	n/a
5. Vegetation moisture index	between 2 & 3	no	between 2 & 3	n/a
6. Plant cover of trees & shrubs	no more than 5%	yes	no more than 5%	n/a
7. By yr 5, at least 10 wet prairie cohort species	10 praire cohorts	yes	10 prairie cohorts	yes
Forested Wetland Habitat-Planted				
1. Min. of 2 tree species, 200 stems per acre	trees-density	no	trees density	n/a
2. 55% relative plant cover native species	native cover 55% +	yes	native cover 55% +	yes
3. Min. 3 native shrubs, 240 stems per acre	shrubs-density	no	shrubs density	n/a
4. Relative plant cover invasive species	no more than 15%	yes, barely	no more than 15%	n/a
5. Vegetation moisture index	less than 3	yes	less than 3	n/a
Forested Wetland Habitat-Enhanced				
1. Min 2 native shrubs @ 240/acre	srubs-density	no	shrubs density	n/a
2. Min 20% relative cover Carex obnupta	carex- density	no	carex density	n/a
3. Relative plant relative cover invasive species	less than 30%	yes	less than 30%	n/a
4. Min. 55% relative cover native species	native cover 55% +	yes	native cover 55% +	yes

Section III

Summary of wet prairie vegetation sampled on 5/28/09 and 7/21/08. Data sets combined after conversation with Dana Field, 2/06/09.

		moisture	wetland	t1-p2	t1-p3	t1-p4	t1-p9	t1-p12	t2-p1	t2-p3	t2-p4	t2-p5	t2-p11	t2-p12	t2-p13
Herbaceous plants	Origin	index	status												
Anthemis cotula	non-native	4	FACU									1%			
Boisduvalia densiflorum	native	2	FACW-												
Bidens cernua	native	2	FACW+												
Castilleja tenuis	native	4	FACU-												
Downingia elegens	native	1	OBL						1%						
Eleocharis acicularis	native	1	OBL												
Eleocharis palustris	native	1	OBL												
Epilobium ciliatum	native	2	FACW-	1%		1%									
Gnaphalium uliginosum L	native	2	FACW	1%	1%	15%	5%	5%	35%		2%	2%	10%	2%	10%
Juncus bufonius	native	2	FACW	60%	1%	60%		50%			50%	50%			30%
Lotus pinnatus	native	2	FACW												
Lythrum portula	invasive	1	OBL	5%	1%	35%	2%	20%	2%	10%	3%	3%	20%	20%	30%
Matricaria discoidea	non-native		NOL			1%						1%			1%
Myosotis discolor	non-native	2	FACW												
Myosotis laxa	native	1	OBL					1%							
Navarretia intertexta	native	2	FACW									1%			2%
Parentucellia viscosa	non-native	3	FAC-								1%				
Plagiobothrys figuratus	native	2	FACW												
Plagiobothrys scouleri	native	2	FACW		1%	1%			1%	5%		5%			10%
Polygonum hydropiperoides	native	1	OBL	1%		1%	7%	2%	5%						1%
Polygonum persicaria	native	2	FACW						2%	3%					
Ranunculus orthorhynchus	native	2	FACW-	1%		1%									
Rorippa curvisiliqua	native	1	OBL	20%	1%	10%	5%	5%			25%				2%
Sonchus asper	non-native	3	FAC-	1%		1%									1%
Veronica peregrina	native	1	OBL	10%				5%	3%	10%		1%	2%		5%
Grasses															
Agrostis exarata	native	2	FACW											1%	
Alopecurus aequalis	native	1	OBL												
Alopecurus geniculatus	native	1	OBL	30%	1%	1%	60%	15%	15%		5%	5%	5%	15%	
Beckmannia syzigachne	native	1	OBL					2%	3%	1%					
Deschampsia caespitosa	native	2	FACW												
Deschampsia elongata	native	2	FACW-	15%		15%	25%	5%	15%	70%	5%	20%	50%	35%	

Echinchola crus-galli	non-native	2	FACW												
Glyceria occidentalis	native	1	OBL			1%					15%		25%	5%	
Hordeum brachyantherum	native	2	FACW-					1%	10%	1%					
Lolium multiflorum	invasive		NOL												
Panicum capilare	native	4	FACU+												
Poa annua	non-native	3	FAC	1%		1%		2%				2%			
Poa palustris L	non-native	3	FAC						2%						
Poa pratensis	non-native	3	FAC	2%				2%							
% cover native herbaceous species				139%	5%	106%	102%	89%	90%	90%	103%	84%	92%	58%	60%
% cover non-native species				4%	0%	3	0	4	2	0	0	4	0	0	2
% cover MBRT-listed invasive species				5%	1%	35	2	20	2	10	3	3	20	20	30
% cover bare ground and/or water				0%	94%	0	0	0	0	0	0	9	0	0	0
moisture index				1.63	2.00	1.67	1.29	1.62	1.71	1.98	2.43	1.91	2.31	1.48	1.59

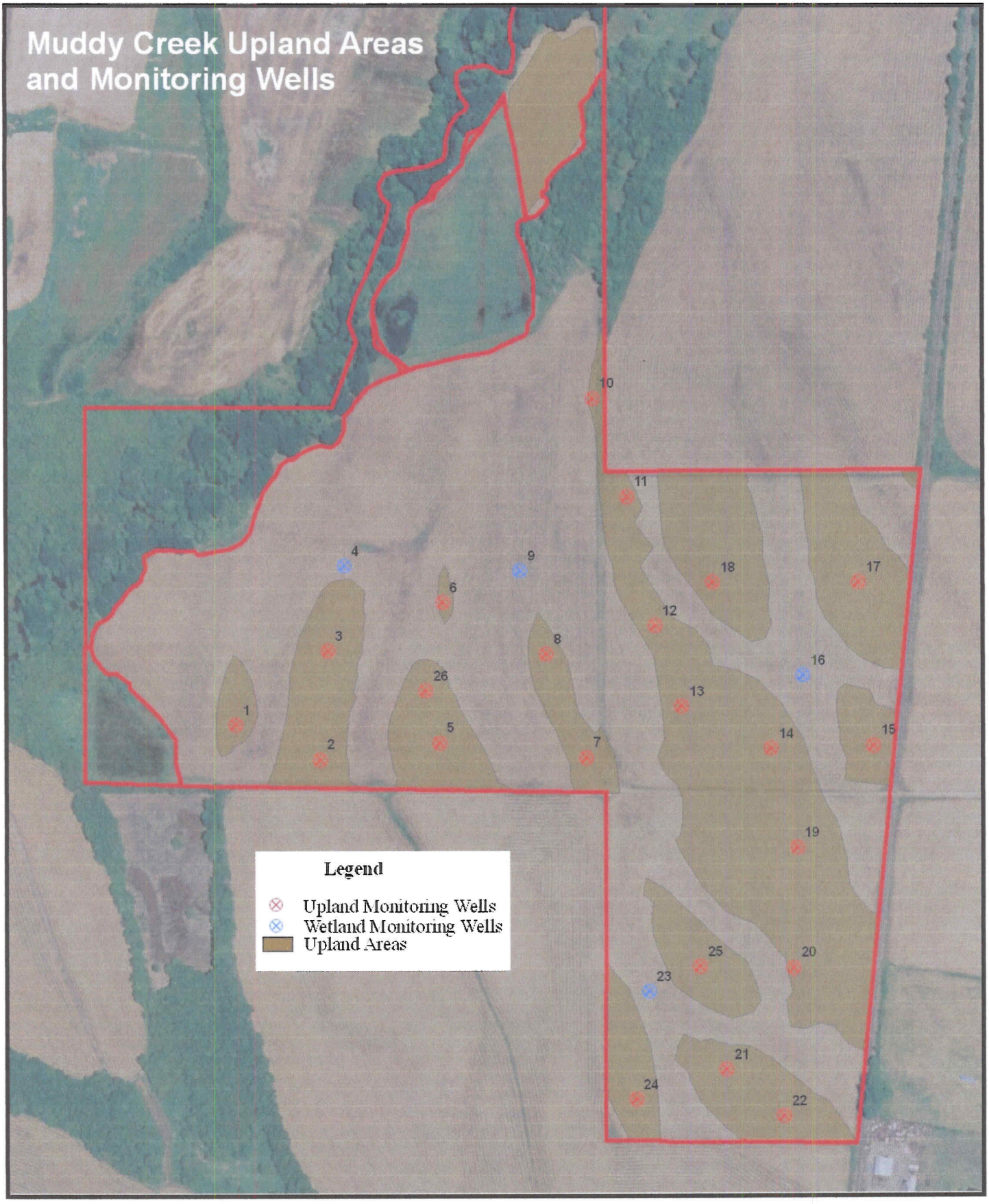
t3-p1	t3-p2	t3-p3	t3-p5	t3-p7	t3-p8	t4-p1	t4-p2	t4-p5	t4-p6	t5-p2	t5-p3	t5-p4	t5-p5	t5-p6	
													10%		0.34%
													20%		0.04%
										1%	2%		1%	5%	0.16%
						1%							1%		0.04%
														1%	0.04%
											1%		1%		0.07%
														2%	0.07%
														1%	0.09%
			10%	10%	10%	15%	20%	15%	10%	35%	2%		1%	10%	8.30%
90%	70%	95%		50%		70%			6%	2%	10%	35%	80%	15%	28.48%
													1%		0.04%
	5%		5%	10%	20%	10%		15%	1%			25%			8.59%
															0.07%
									1%						0.04%
													1%		0.04%
	5%								1%				10%		0.70%
3%															0.04%
	1%														0.04%
5%	10%	5%		10%	10%	5%			20%			35%	15%		5.11%
							1%	5%	2%	60%	3%	25%	3%	15%	4.85%
				1%						5%	1%	5%		3%	0.74%
															0.07%
			1%	3%	1%		1%		5%	1%	3%	5%	2%	1%	3.37%
									1%				15%		0.70%
	1%					5%									1.55%
															0.04%
										10%				3%	0.48%
5%	10%	5%			5%	10%			5%	15%	30%	10%	50%	40%	12.48%
	3%			5%								1%	1%		0.59%
						3%			5%				1%	3%	0.44%
			20%	30%	20%	1%	15%	15%	20%				15%		14.48%

									1%	3%	5%		1%	1%	0.37%
	1%			1%					1%	5%	75%	5%		10%	5.33%
									3%						0.55%
													3%		0.11%
											1%				0.04%
	1%					5%			5%						0.63%
															0.07%
					1%										0.18%
100%	101%	105%	31%	110%	46%	110%	37%	35%	78%	134%	128%	121%	203%	114%	91.33%
3	1	0	0	0	1	5	0	0	8	3	5	0	26	1	2.55%
0	5	0	5	10	20	10	0	15	1	0	0	25	3	0	9.07%
0	0	0	65	0	33	0	63	50	14	0	10	0	0	5	12.70%
2.04	1.82	2.05	1.83	1.84	1.63	1.86	1.94	1.61	1.88	1.33	1.18	1.51	1.89	1.34	1.75

Existing Forest Data Summary								
		moisture	wetland	Plot #				Grand
Herbaceous species %cove	origin	index	status	79	80	81	82	Total
Alopecurus geniculatus	native	1	OBL	1%				0.25%
Alopecurus pratensis	non-native	2	FACW				1%	0.25%
Brodiaea elegans	native	4	FACU				1%	0.25%
Cardamine oligosperma	native	3	FAC	5%				1.25%
Carex obnupta	native	1	OBL	20%	5%	40%		16.25%
Dryopteris expansa	native	3	FAC-				1%	0.25%
Galium aparine	non-native	4	FACU				1%	0.25%
Galium trifidum	native	2	FACW+		5%	1%		1.50%
Geum macrophyllum	native	2	FACW-		1%		1%	0.50%
Lapsana communis	non-native		NOL		1%			0.25%
Mentha pulegium	invasive	1	OBL	1%				0.25%
Oenanthe sarmentosa	native	1	OBL		1%			0.25%
Phalaris arundinacea	invasive	2	FACW+	1%	1%	10%	1%	3.25%
Ranunculus uncinatus	native	3	FAC-		5%		15%	5.00%
Rumex crispus	non-native	2	FACW			1%		0.25%
Rumex obtusifolius	non-native	3	FAC	1%	1%		1%	0.75%
Solanum dulcamara	invasive	3	FAC	5%		1%	1%	1.75%
Veronica americana	native	1	OBL	1%	3%	1%		1.25%
Shrub & tree seedling %cover								
Crataegus monogyna	non-native	4	FACU+				1%	0.25%
Fraxinus latifolia	native	2	FACW				10%	2.50%
Rosa pisocarpa	native	3	FAC+				10%	2.50%
Rubus discolor	invasive	3	FAC+				1%	0.25%
Rubus ursinus	native	4	FACU				40%	10.00%
Tree species % cover /stem count								
Fraxinus latifolia	native	2	FACW	85% / 10	90%/17	80%/26	85%/3	85.00%
% cover native species				112%	110	122	163	126.75%
% cover non-native species				1%	2	1	4	2.00%
% cover MBRT invasive species				7%	1	11	3	5.50%
moisture index				2.12	1.88	1.85	2.66	2.13

Data summary for planted forest habitat. Planted to wet prairie grass mixture in fall of 2007.														
Tree and shrub root stock planted in Feb. 2009														Grand
erbaceous Species-% cov	Status	Origin	Index	#68	69	70	71	72	73	74	75	76	77	78	Total
Castilleja tenuis	FACU-	native	4									1%			0.09%
Cerastium glomeratum	FAC	non-native	3								1%				0.09%
Epilobium ciliatum	FACW-	native	2									1%			0.09%
Galium aparine	FAC-	non-native	3			1%									0.09%
Gnaphalium uliginosum L	FACW	native	2				5%	2%	2%			5%			0.12%
Juncus bufonius	FACW	native	2	90%	30%	15%	10%	10%	25%	80%	75%	80%	75%	5%	45.00%
Lupinus sericeus	FAC	native	3										1%		0.09%
Lythrum portula	OBL	invasive	1	10%	15%	30%	10%	5%	10%	20%	20%	10%	10%		13.63%
Melilotus albus	NOL	non-native		1%				5%		1%					0.54%
Myosotis discolor	FACW	non-native	2			1%	5%	1%			2%	1%		1%	1.00%
Myosotis laxa	OBL	native	1	1%											0.09%
Parentucellia viscosa	FAC-	non-native	3								3%		1%		0.31%
Plagiobothrys figuratus	OBL	native	1											5%	0.45%
Plagiobothrys scouleri	OBL	native	1					2%				2%	3%	10%	1.54%
Polygonum hydropiperoides	OBL	native	1				1%								0.09%
Rorippa curvisiliqua	OBL	native	1						1%						0.09%
Sonchus asper	FAC-	non-native	3		5%	5%	15%					2%			1.54%
Trifolium repens	NOL	non-native											1%		0.08%
Veronica peregrina	OBL	native	1		5%	5%	2%	1%	5%	5%					2.09%
Grasses % Cover															
Alopecurus geniculatus	OBL	native	1	5%	10%	25%	15%	15%	15%	30%	15%	20%	15%	40%	23.18%
Briza minor	FAC	non-native	3			1%	1%								0.18%
Deschampsia elongata	FACW-	native	2	15%	30%	20%	25%	25%	15%	15%	10%	10%	5%	25%	17.27%
Hordeum brachyantherum	FACW	native	2			2%	15%		2%		20%			10%	4.45%
Lolium multiflorum	FAC	invasive	3	1%	5%	5%	2%					1%	2%	3%	1.72%
Poa annua	FAC	non-native	3		3%	2%		5%	5%	1%	3%	2%	3%	5%	2.63%
Poa pratensis	FAC	non-native	3	1%	2%					3%		3%	1%		0.91%
Tree-Shrub % cover															
Fraxinus latifolia	FACW	native	2	3%											0.27%
% cover native herbaceous				112%	75	67	73	60	65	131	120	119	100	95	92.45%
% cover non-native species				1%	10	10	21	6	5	4	9	8	5	6	7.72%
% cover MBRT listed invasive species				10%	20	35	12	5	10	20	20	11	12	3	14.36%
% cover bare ground				0	0	0		30	20	0	0	0	0	0	4.54%
moisture index				1.62	2.11	2.16	1.91	1.5	1.66	2.14	2.11	2.31	2	1.88	1.94

SECTION IV.


Muddy Creek Upland Areas
and Monitoring Wells
Legend
Upland Monitoring Wells
Wetland Monitoring Wells
Upland Areas
1
2
3
4
5
6
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8
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24
25
26

Muddy Creek Mitigation Bank Hydrology Wells Monitoring Data

wells are labeled as up for upland (not meeting hydrology standard during initial wetland delineation) wet- meets standard

0.0 = water at/or above ground level

	phs-1	phs-1	phs-1	phs-1	phs-1	phs-1	phs-1	phs-1	phs-1	phs-1	phs-1		phs-2	phs-2	phs-2	phs-2
well #	**1-up**	**2-up**	**3-up**	**4-wet**	**5-up**	**6-up**	**7-up**	**8-up**	**9-wet**	**10-up**	**26-up**		**11-up**	**12-up**	**13-up**	**14up**
DATE																
12/1/2006	13.5	21.0	12.5	9.5	20.5	5.0	24.0	18.0	0.0	22.5			6.5	11.0	11.0	16.0
12/19/2006	11.0	23.5	12.0	11.0	21.0	7.0	23.0	19.5	0.0	19.0			8.0	13.0	13.0	18.0
1/4/2007	6.5	9.0	6.5	5.0	7.0	0.0	7.5	3.0	0.0	4.5			4.0	7.0	6.5	10.0
2/2/2007	11.5	dry	13.5	9.5	29.0	11.0	28.0	dry	4.0	24.0			8.5	15.0	15.5	dry
2/20/2007	8.5	21.5	10.0	7.5	22.0	1.0	22.5	15.0	0.0	20.0			7.0	10.5	11.0	15.0
3/6/2007	11.0	22.0	11.5	11.5	20.0	9.0	22.0	18.5	2.5	23.5			7.5	13.5	14.0	16.0
3/8/2007	10.0	25.5	12.0	10.0	24.5	10.0	27.0	dry	2.0	25.5			8.5	13.0	14.5	18.0
3/11/2007	10.0	26.0	11.5	9.0	27.0	9.0	27.0	21.0	3.0	23.5			7.5	13.0	14.5	17.5
3/20/2007	11.0	dry	19.0	11.5	29.0	15.0	27.0	dry	3.0	24.0			9.5	16.0	17.5	dry
12/17/2007	2.5	14.0	0.0	0.0	6.0	0.0	0.0	0.0	0.0	7.5			1.5	9.0	16.5	13.0
1/23/2008	9.0	23.5	10.0	0.0	16.5	7.0	0.0	0.0	0.0	5.5	21.0		14.5	17.0	12.5	dry
3/5/2008	14.0	28.0	12.5	0.0	19.0	12.5	0.0	5.0	0.0	14.0	22.5		10.5	19.0	18.0	20.0
3/25/2008	11.5	20.5	9.0	0.0	13.5	9.0	0.0	0.0	0.0	10.0	24.0		9.5	13.5	14.0	21.5
3/27/2008	7.0	15.5	0.0	0.0	14.5	4.0	0.0	0.0	0.0	7.5	6.5		6.0	9.0	7.5	14.0
4/1/2008	9.5	20.0	6.5	0.0	18.0	9.0	0.0	3.0	0.0	9.0	10.0		9.0	12.0	11.5	dry
4/3/2008	13.5	23.5	10.5	0.0	16.0	9.0	0.0	3.5	0.0	10.0	13.0		10.0	14.0	13.5	dry
4/7/2008	10.0	27.5	10.0	0.0	17.5	13.0	0.0	5.0	0.0	12.0	17.5		8.5	18.0	16.0	dry
4/9/2008.	11.5	27.5	6.0	0.0	16.5	13.0	0.0	4.0	0.0	12.0	17.0		8.0	18.5	17.0	dry
4/24/2008	11.5	26.5	8.0	0.0	21.5	10.5	0.0	6.5	0.0	13.0	20.0		nr	nr	nr	nr
meets criteria	yes	no	yes	yes	no	no	yes	yes	yes	yes	no					

phs-2 15-up	phs-2 16wet	phs-2 17-up	phs-2 18-up	phs-2 19-up	phs-2 20-up	phs-2 21-up	phs-2 22-up	phs-2 23-wet	phs-2 24-up	phs-2 25-up
10.0	0.0	14.5	11.0	8.0	15.5	18.5	15.0	0.0	24.0	24.0
11.0	0.0	15.0	12.0	17.0	19.0	19.0	15.5	0.0	24.0	24.0
4.5	0.0	7.0	5.5	2.0	9.5	12.0	7.5	0.0	13.5	17.0
13.5	0.0	dry	15.0	17.0	dry	21.5	dry	1.0	dry	dry
9.0	0.0	13.0	11.0	9.0	14.5	17.5	13.0	0.0	19.5	dry
10.5	0.0	17.0	12.5	9.5	17.0	20.0	14.5	0.0	dry	dry
10.5	0.0	17.5	13.5	11.0	18.0	21.0	16.5	0.0	dry	dry
11.0	0.0	17.0	12.5	12.5	18.0	20.5	18.0	0.0	dry	dry
12.5	0.0	dry	15.5	dry	18.0	dry	dry	0.0	dry	dry
6.5	6.0	14.0	8.0	6.5	15.0	12.5	11.0	0.0	17.0	18.5
16.0	4.0	22.5	13.0	15.0	18.0	22.5	19.5	2.0	dry	dry
16.5	5.5	dry	dry	dry	19.0	dry	dry	1.5	dry	dry
12.5	4.5	20.0	12.5	14.0	dry	dry	dry	0.0	dry	dry
9.0	1.5	14.5	8.5	9.5	17.0	16.5	12.5	0.0	17.5	dry
11.5	3.0	19.5	11.5	13.0	dry	21.5	15.5	3.0	dry	dry
15.5	6.5	dry	15.5	dry	dry	dry	dry	4.0	dry	dry
15.5	5.5	dry	dry	dry	dry	dry	dry	4.0	dry	dry
14.5	3.5	dry	dry	dry	dry	dry	dry	3.0	dry	dry
nr	nr	nr	nr	nr	nr	nr	nr	nr	nr	nr