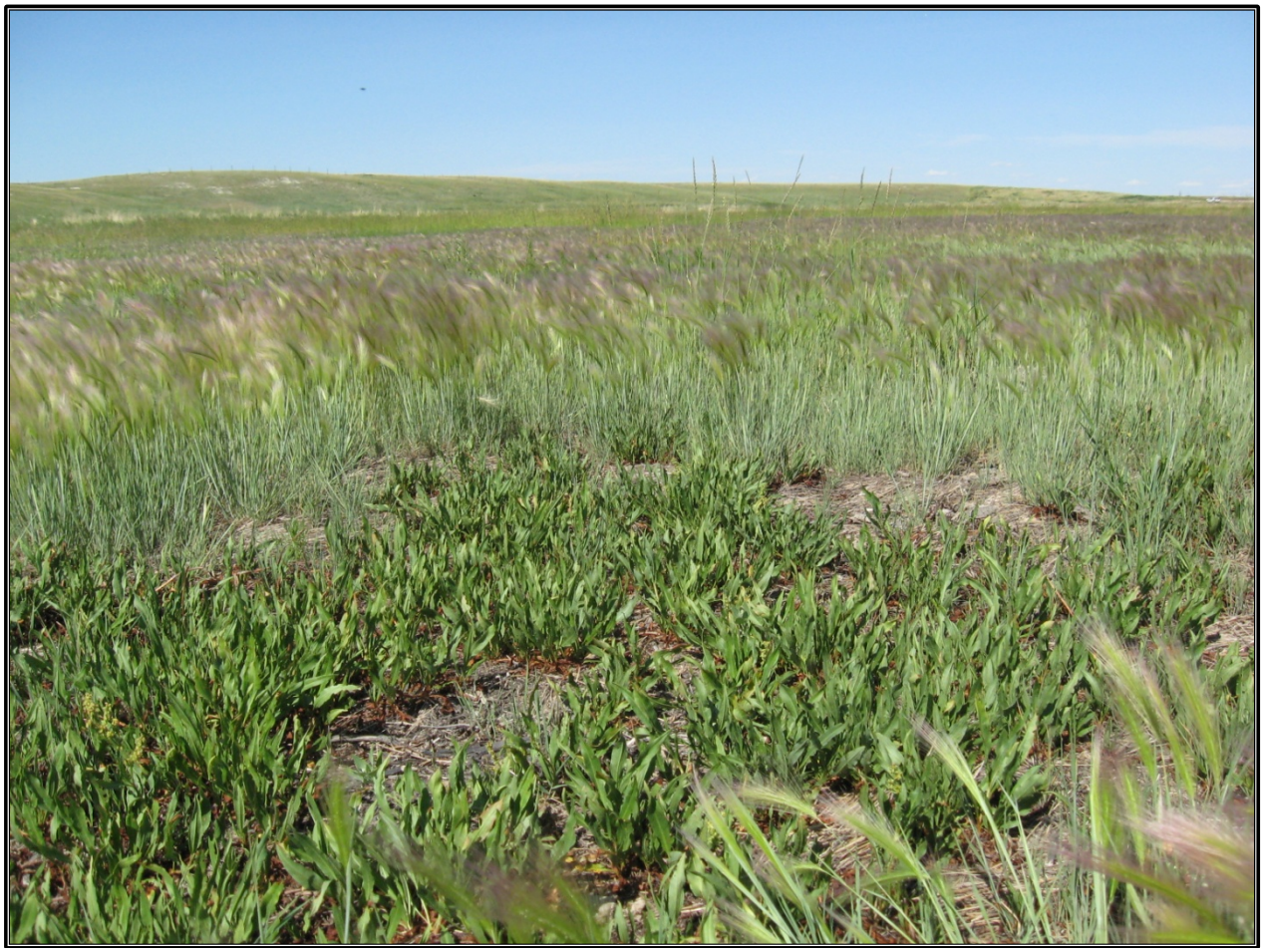
MONTANA DEPARTMENT OF TRANSPORTATION
WETLAND MITIGATION MONITORING REPORT: YEAR 2009

Perry Ranch
Glacier County, Montana



Prepared for:

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December 2009

PBS&J Project No. 0B4308802.04.05

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MDT Project Number NH-0002(232)
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1.0 INTRODUCTION

The Perry Ranch wetland mitigation site was constructed during early summer 2001 to mitigate for wetland impacts associated with Montana Department of Transportation (MDT) projects NH 1-3(12)225F (Browning-Meriwether) and F BRF 1-3(11)219 (Browning East & West). These two projects resulted in a combined projected wetland loss of approximately 14.7 acres.

This report documents the seventh year of monitoring at the Perry Ranch Wetland Mitigation site. The mitigation site is located approximately 13 miles west of Browning and four miles north of U.S. Highway 2 in Glacier County (**Figure 1**). The entire site occurs within the confines of the Tribally-owned Perry Ranch on the Blackfeet Indian Reservation and is within Watershed #8 (Marias).

The intent of the project was to create, via dike placement and shallow excavation, two wetland impoundments within historic oxbows located in the Cut Bank Creek floodplain (**Appendix D**). The Inner Oxbow impoundment, located adjacent to Cut Bank Creek, was designed to provide approximately 6.1 wetland acres with a maximum depth of 2.6 feet. The Outer Oxbow impoundment, located immediately north of the Inner Oxbow, was designed to provide approximately 21.5 wetland acres with a maximum three-foot depth.

Wetland hydrology at the Inner Oxbow would be provided via overbank flood flows, alluvial flow, and precipitation; flood flows and precipitation would source the Outer Oxbow. The site was designed to provide ephemeral surface water. It is anticipated that, over time, vegetation at the Inner Oxbow will be comprised of scrub/shrub and emergent communities with occasional cottonwoods scattered throughout. The Outer Oxbow would likely be dominated by emergent communities.

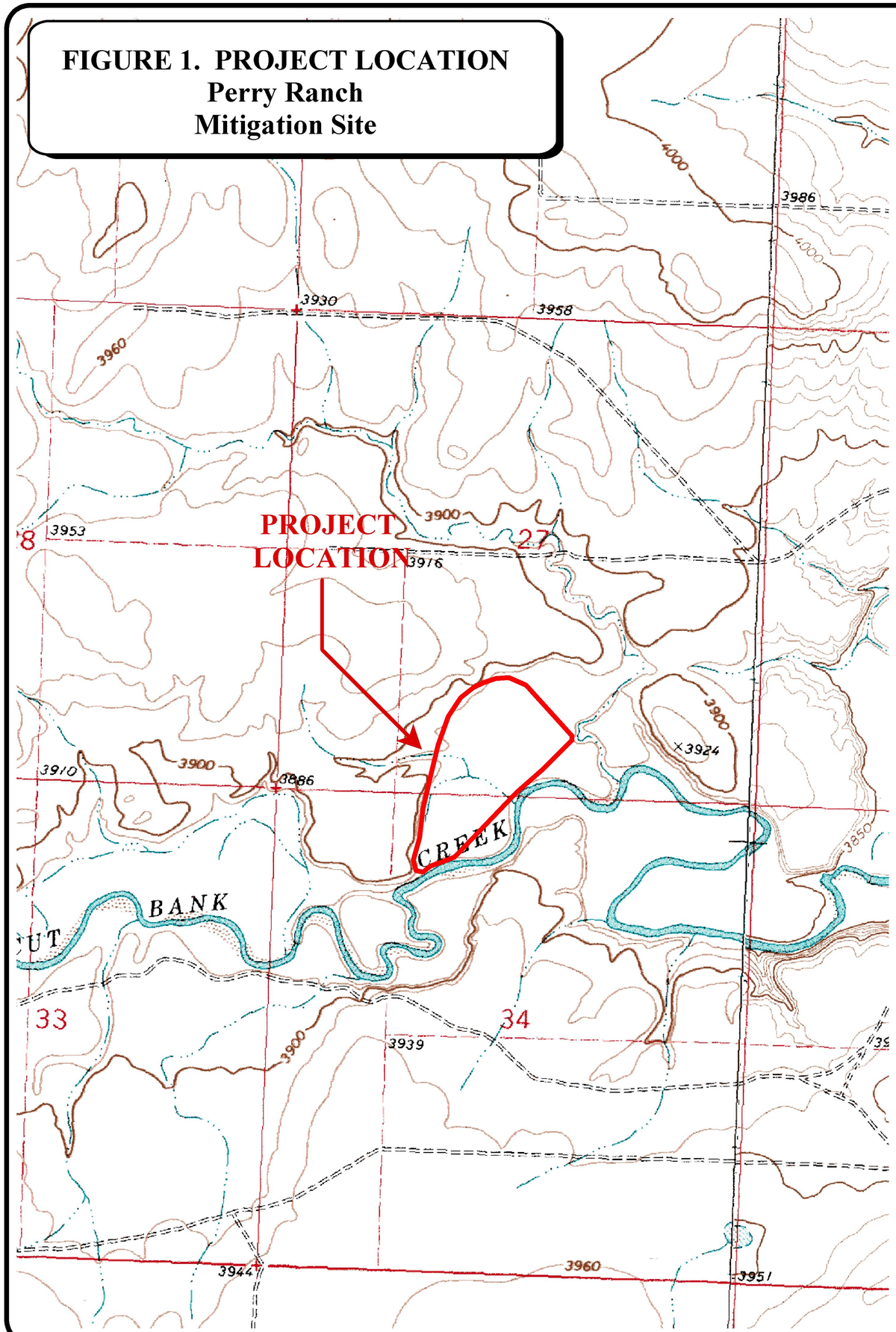
Prior to construction, approximately 2.3 acres of wetland occurred at the Inner Oxbow and approximately 1.1 acres occurred at the Outer Oxbow. The mitigation target of 27.6 acres is inclusive of these 3.4 acres of existing wetlands. This site has been monitored once to twice per year to document wetland and other biological attributes. No performance standards or success criteria were required by the U.S. Army Corps of Engineers (COE), MDT, Blackfeet Tribe, or other agencies. The monitoring area is illustrated in **Figure 2** (**Appendix A**)

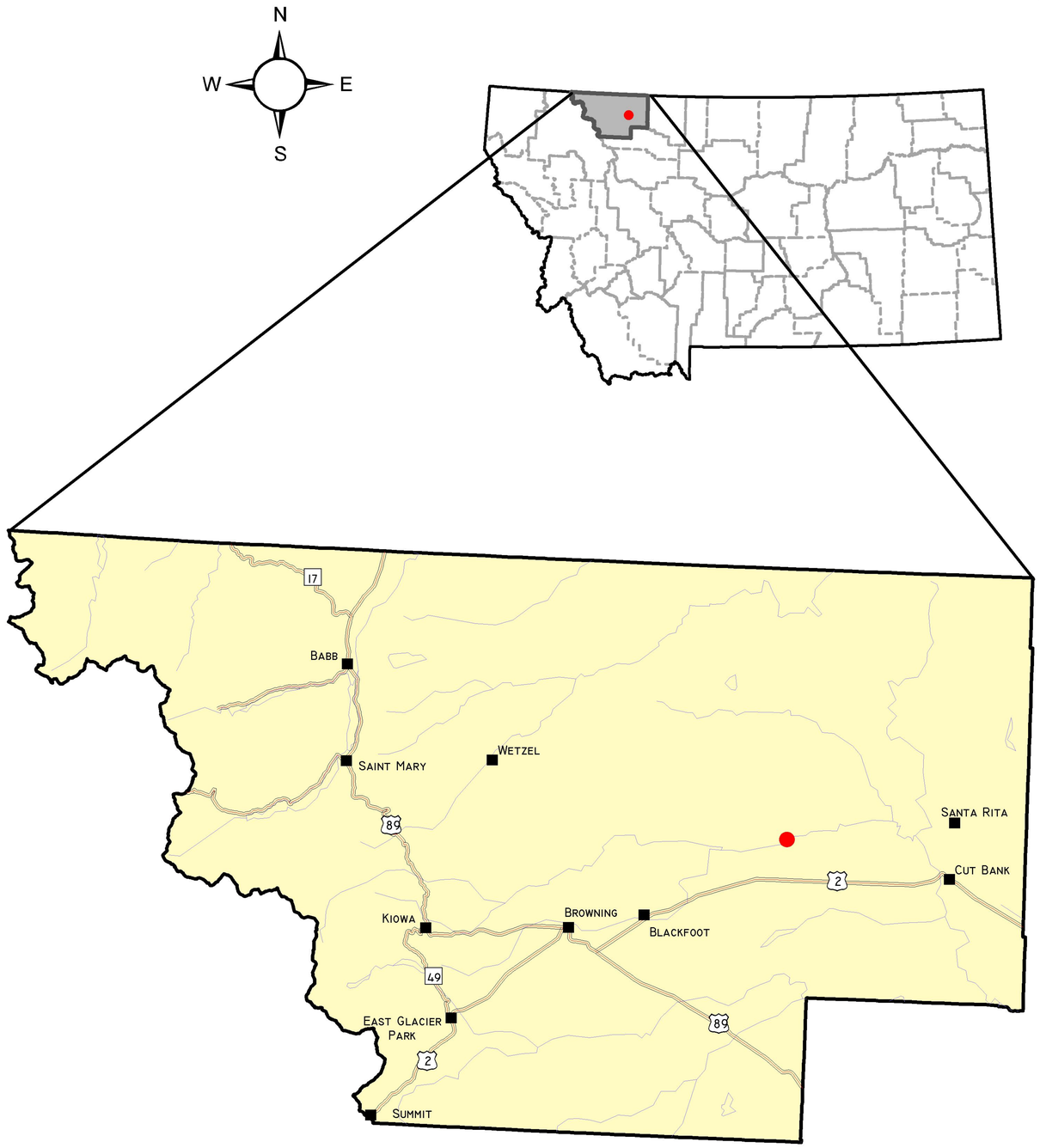
2.0 METHODS

2.1 Monitoring Dates and Activities

The site was visited on July 21st (mid-season) of 2009. As directed by MDT, a spring visit was not conducted this year.

FIGURE 1. PROJECT LOCATION
Perry Ranch
Mitigation Site





800 0 800 1600 Feet

1: 24,000

PROJECT #: 0B4308801
DATE: NOV 2008
LOCATION: GLACIER CO
PROJECT MANAGER: J. BERGLUND
DRAWN BY: B. NOECKER

PBS&J
801 N. Last Chance Gulch
Suite 101
Helena, MT 59601-3360

The mid-season visit was conducted to document vegetation, soil, and hydrologic conditions that are used to map jurisdictional wetlands. All information contained on the Wetland Mitigation Site Monitoring Form (**Appendix B**) was collected at this time. Activities typically conducted and information collected included: wetland delineation; vegetation community mapping; vegetation transect monitoring; soils data collection; hydrology data collection; bird and wildlife use documentation; macroinvertebrate sampling; photopoint sampling; and a non-engineering examination of the site.

2.2 Hydrology

Wetland hydrology at the Inner Oxbow (2.6-foot maximum depth) was to be provided via overbank flood flows, alluvial flow, and precipitation. Wetland hydrology at the Outer Oxbow (3-foot maximum depth) was to be provided via flood flows and precipitation. Impoundment areas are indicated on the proposed project plan sheets (**Appendix D**).

Hydrologic indicators were evaluated during the mid-season visit. Wetland hydrology indicators were recorded using procedures outlined in the COE 1987 Wetland Delineation Manual (Environmental Laboratory 1987). Hydrology data were recorded on COE Routine Wetland Delineation Data Forms (**Appendix B**).

All additional hydrologic data were recorded on the Wetland Mitigation Site Monitoring Form (**Appendix B**). The boundary between wetlands and open water aquatic habitats (no rooted vegetation) was mapped on an aerial photograph and an estimate of the average water depth at this boundary was recorded.

There were no groundwater monitoring wells at the site. Groundwater depths were only documented if they were located within 12 inches of the ground surface in soil pits are dug for purposes of delineating wetlands. Groundwater depths within soils pits were recorded onto COE Routine Wetland Delineation Data Forms (**Appendix B**).

2.3 Vegetation

General dominant species-based vegetation community types were delineated on the 2009 aerial photograph. Standardized community mapping was not employed as many of these systems are geared towards climax vegetation. Estimated percent cover of the dominant species in each community type was recorded on the Wetland Mitigation Site Monitoring Form (**Appendix B**). Plants observed were identified using *Flora of the Pacific Northwest* (Hitchcock and Conquist 1975) and *Plants of Montana* (Dorn 1984). Nomenclature follows that of Dorn (1984).

A single 10-foot wide belt transect was sampled during the mid-season visit to represent the range of current vegetation conditions (**Figure 2** in **Appendix A**). Percent cover was estimated for each vegetative species encountered within the “belt” within each community type using the following values: + (<1%); 1 (1-5%); 2 (6-10%); 3 (11-20%); 4 (21-50%); and 5 (>50%). Photographs of the transect were taken from both ends. No monitoring of planted species was conducted as no woody species were planted at the site.

2.4 Soils

Soils were evaluated during the mid-season visit in accordance with procedures outlined in the COE 1987 Wetland Delineation Manual. Soil data were recorded for each wetland determination point on the COE Routine Wetland Delineation Data Form (**Appendix B**). The most current NRCS terminology was used to describe hydric soils (USDA 1998). The 1980 Glacier Area soil survey was consulted relative to mapped soil units at the site.

2.5 Wetland Delineation

A wetland delineation was conducted during the mid-season visit in accordance with the 1987 COE Wetland Delineation Manual. In July 2008, consultation with the COE (Steinle pers. comm.) confirmed that, where the 1987 manual was used to establish baseline wetland conditions at MDT wetland mitigation sites, it should continue to be applied at such sites for the duration of the monitoring period. Consequently, application of the new *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (COE 2008) was not required or undertaken at this site in 2008 or 2009.

Wetland and upland areas within the monitoring area were investigated for the presence of wetland hydrology, hydrophytic vegetation, and hydric soils. The indicator status of vegetation was derived from the *National List of Plant Species that Occur in Wetlands: Northwest Region 9* (Reed 1988). The information was recorded onto COE Routine Wetland Delineation Data Forms (**Appendix B**).

In 2002, the wetland/upland boundaries were delineated using a GPS unit in conjunction with hand-mapping onto the aerial photograph. In 2009, wetland mapping revisions were accomplished using a combination of GPS coordinates and hand-mapping onto the 2008 and 2009 aerial photographs. Wetland delineation data collected during 2009 were compared to pre-construction estimates in an effort to calculate additional wetland development since project construction.

2.6 Fish and Wildlife

Mammal, reptile, and amphibian species observations and other positive indicators of use, such as vocalizations, were recorded onto the Wetland Mitigation Site Monitoring Form during the site visit (**Appendix B**). Indicators of indirect use, such as tracks, scat, burrows, eggshells, skins, and bones were also recorded. Observations were recorded as the observer traversed the site while conducting other required activities. Direct sampling methods such as snap traps, live traps, and pitfall traps, were not implemented. A comprehensive list of wildlife species observed was compiled.

2.7 Birds

Bird observations were recorded without the use of formal census plots, spot mapping, point counts, or strip transects. During the 2001 through 2008 spring visits, observations were

recorded in compliance with the Bird Survey Protocol (**Appendix E**). During the 2002 to 2009 mid-season visits, bird observations were recorded incidental to other monitoring activities. During all visits, observations were categorized by species, activity code, and general habitat association on the Bird Survey Field Data Sheet (**Appendix B**). A comprehensive bird list was compiled using these observations. No birdhouses were installed at the site.

2.8 Macroinvertebrates

A macroinvertebrate sample was collected during the mid-season visit in years when surface water was present in the Outer Oxbow (**Figure 2** in **Appendix A**). In 2009, surface water was absent and no macroinvertebrate sample was collected. When collected, samples were preserved according to the Macroinvertebrate Sampling Protocol. Laboratory analysis and reporting of the sample were conducted by Rhithron Associates, Inc. in Missoula, Montana.

2.9 Functional Assessment

From 2001 through 2007, the functional assessment for each delineated wetland was conducted using the 1999 MDT Montana Wetland Assessment Method (Berglund 1999). In 2008 and 2009 the 2008 MDT Montana Wetland Assessment Method (Berglund and McEldowney 2008) was applied. Field data necessary for this assessment were collected during the mid-season site visits. Separate Functional Assessment Forms were completed for the Inner Oxbow, Outer Oxbow, and Northern Excavated Area (**Appendix B**).

2.10 Photographs

Photographs were taken showing the current land use surrounding the site, upland buffer, monitored area, and the vegetation transect (**Appendix C**). Three photograph points were established and shot each year from 2002 to 2009 (**Figure 2** in **Appendix A**). Panoramic type photographs were taken at these three photograph points (**Appendix C**). In 2007, MDT/Blackfoot Tribe established permanent photo points for monitoring noxious weed populations. Photographs at three of these weed photo points were taken during the mid-season visit in 2009. Aerial photographs from 2002 through 2009 were also compiled into the report (**Appendix C**).

2.11 GPS Data

During 2002 and 2006 through 2009, a resource grade GPS unit was used to mark the following locations: vegetation transect start and end, photograph points, wetland boundaries, soil pits, noxious weed populations, and reference landmarks. Procedures used for GPS mapping and aerial photography referencing are included in **Appendix E**.

2.12 Maintenance Needs

The dike along the east boundary was examined during the 2009 site visits for obvious signs of breaching, damage, or other problems. This did not constitute an engineering-level structural

inspection, but rather a cursory examination. Current or future potential problems were documented.

3.0 RESULTS

3.1 Hydrology

Hydrology at the Perry Ranch Mitigation Site is determined by flow in Cut Bank Creek and by direct precipitation. These water sources interact with groundwater, which ultimately will drive wetland development. Inferences regarding hydrology at the site were made from a gauging station on Cut Bank Creek near Browning and at a weather station in Cut Bank.

It was assumed that precipitation levels measured at the Cut Bank FAA Airport would serve as an indicator of precipitation received at the mitigation site. The total precipitation received at this station from January through July of 2009 was 4.22 inches (in) (WRCC 2009). This represents 54% of the mean precipitation (7.84 in) recorded between January and July from 1903 to July 2009. This period in 2009 was significantly drier than the same period in 2008 (9.84 in), and 2005 (9.21 in). On the contrary, this period in 2009 was comparable or wetter than the same period in 2007 (1.17 in), 2006 (2.70 in), 2004 (4.57 in), and 2003 (2.63 in) (WRCC 2009).

Flow data in Cut Bank Creek near Browning (USGS 06098500) have been used to indicate hydrology at the Perry Ranch mitigation site. The USGS gauging station was in operation from April 1918 through September 2007. Therefore 2008 and 2009 flow data were unavailable. Based on the 2009 site visit and aerial photograph, it appeared that little of the site was inundated from flows in Cut Bank Creek. The entire site was dry on July 21st; where water in the inlet often pools, aquatic plants were exposed.

3.2 Vegetation

Vegetation community types are based on topography, hydrology, and plant composition. Since 2002 a comprehensive plant species list has been maintained for the Perry Ranch Mitigation Site (**Table 1**; **Monitoring Form** in **Appendix B**). At Perry Ranch, shifts in plant composition have been observed annually in several of the vegetation types. During 2009, six vegetation community types were identified and mapped: Type 1 - *Juncus balticus/Carex praegracilis*, Type 2 - *Eleocharis palustris/Polygonum amphibium*, Type 3 - *Upland Floodplain*, Type 4- *Salix*/*Hordeum jubatum*/*Equisetum*, Type 5 – *Hordeum*, and Type 6 – *Upland* (**Figure 3** in **Appendix A**).

Despite the contrast in the amount of surface water present in 2008 versus 2009, wetland habitat maintained itself. In general, plant composition and wetland boundaries remained similar. However, the height and density of plants dramatically changed. In 2008 *Alopecurus* and *Phalaris* grasses grew to 6 feet tall while *Eleocharis* and *Rumex* grew to 2 or 3 feet tall. In 2009 the *Alopecurus* and *Phalaris* grasses grew only to 3 feet in height while *Eleocharis* and *Rumex* only attained 6 to 12 inches. Despite the short stature, these plants did flower and cured earlier in the growing season. Also of note, a new wetland plant was identified in 2009. *Artemisia*

biennis was present during the wet 2008 growing season, and in 2009 was scattered throughout the Inner and Outer Oxbows and Northern Excavated Area.

Table 1: ***Vegetation species observed from 2002 to 2009 at the Perry Ranch Wetland Mitigation Site.***

Scientific Name	Region 9 (Northwest) Wetland Indicator	Scientific Name	Region 9 (Northwest) Wetland Indicator
Achillea millefolium	FACU	***Hippurus vulgaris***	**OBL**
Agropyron intermedium	--	*Hordeum jubatum*	FAC+
Agropyron repens	FACU	*Juncus balticus*	OBL
Agropyron smithii	FACU	*Kochia scoparia*	FAC
Agropyon trachycaulum	FAC	*Koeleria pyramidata*	--
Agrostis alba	FACW	*Medicago sativa*	--
Alopecurus pratensis	FACW	*Melilotus alba*	FACU
Amaranthus retroflexus	FACU+	*Melilotus officinalis*	FACU
Artemisia biennis	**FACW**	*Mentha arvensis*	FAC
Artemisia frigida	--	*Opuntia polyacantha*	--
Artemisia ludoviciana	--	*Phalaris arundinacea*	FACW
Aster pansus	FAC+	*Phleum pratense*	FACU
Atriplex spp.	--	*Plantago hirtella*	FACW
Bouteloua gracilis	--	*Plantago major*	FAC+
Brassica kaber	--	*Poa annua*	FAC-
Bromus inermis	--	*Poa pratensis*	FACU+
Cardaria draba	--	*Polygonum amphibium*	OBL
Carex lanuginosa	OBL	*Potentilla anserina*	OBL
Carex praegracilis	FACW	*Potentilla* (*gracilis*)	(FAC)
Chenopodium album	FAC	***Ranunculus* spp.**	**---**
Cirsium arvense	FACU+	*Rosa arkansana*	NI
Cynoglossum officinale	--	*Rumex crispus*	FACW
Dactylis glomerata	FACU	*Rumex maritimus*	FACW
Descurainia pinnata	--	*Salix amygdaloides*	FACW
Distichlis spicata	FAC+	*Salix exigua*	OBL
Eleocharis acicularis	OBL	*Salix lutea*	OBL
Eleocharis palustris	OBL	*Sisymbrium altissimum*	FACU-
Epilobium ciliatum	FACW-	*Solidago canadensis*	FACU
Equisetum arvense	FAC	*Smilacina stellata*	FAC-
Equisetum hyemale	FACW	*Spartina pectinata*	OBL
Euphorbia esula	--	*Stipa viridula*	--
Gaillardia aristata	---	*Symphoricarpos occidentalis*	--
Glyceria elata	FACW+	*Taraxacum officinale*	FACU
Glycyrrhiza lepidota	FAC+	*Thlaspi arvense*	NI
Grindelia squarrosa	FACU	*Triglochin maritimum*	OBL
		Typha latifolia	OBL

Bolded species were observed or identified for the first time in 2009.

Vegetation Community Type 1 occurs in the Inner Oxbow, and in recent years has decreased in size (**Figure 3** in **Appendix A**). A portion of the area has dried out and been invaded by noxious weeds (**Photo 5** in **Appendix C**). The remaining wetland still contains a prevalence of *Juncus balticus* and *Carex praegracilis*, but contains greater percentages of other wetland plants (**Monitoring Form-Page 2** in **Appendix B**) (**Photo 11** in **Appendix C**).

Vegetation Community Type 2 occupied deeper wetland areas that retain surface water for longer durations. The Type 2 plant community is found within the Inner and Outer Oxbows (**Figure 3** in **Appendix A**). The Type 2 community has always been a stronghold for obligate wetland plants (e.g. *Polygonum amphibium*, *Potentilla anserina*, and *Eleocharis palustris*) because groundwater provides soil saturation, even in dry years. In 2009, surface water was nearly absent and aquatic plants, like *Hippuris*, were exposed to the dry air (**Photo 7** in **Appendix C**). Wetland plants including *Phalaris*, *Alopecurus*, *Polygonum*, and *Eleocharis* grew densely from moist, but not saturated soils (**Photos 6**, **9**, **10**, and **12-14** in **Appendix C**).

Vegetation Community Type 3 is upland floodplain habitat (**Figure 3** in **Appendix A**). It is dominated by *Symphoricarpos occidentalis*, *Rosa*, *Bromus inermis*, *Agropyron repens*, *Euphorbia esula*, and *Cirsium arvense.* Upland islands in the Inner Oxbow have gradually succumbed to wetland soils in 2008 and 2009.

Vegetation Community Type 4 occurs within excavated portions of the Inner Oxbow, and is characterized by wetland plants colonizing mudflat (**Figure 3** in **Appendix A**). Prior to 2006 the plant community was dominated by *Equisetum arvense* and *Hordeum jubatum*. Since 2006 the plant community has consistently been comprised of these plants plus *Salix exigua*, *S. lutea*, *Potentilla anserina*, and *Phalaris arundinacea*. In 2009 Type 4 continued to develop as a scrub-shrub \ emergent wetland community (**Photo 8** and **17** in **Appendix C**). This community and the bottom of the inlet channel had the only saturated soils found in 2009. Of note this year was an abundance of willow catkins (**Photo 17** in **Appendix C**). Despite the wetland development, leafy spurge and Canada thistle are present within and along the Type 4 community.

The Northern Excavated Area has fluctuated the most in plant community development (**Figure 3** in **Appendix A**). Hydrology drives the type of plant community development. In 2002 and 2003 it was mapped as Open Water / Mudflat. In 2004 it became upland though *Hordeum jubatum* began to colonize. In 2005 it reverted to Open Water/Mudflat because the inundation drowned the *Hordeum* grassland. In 2006 and 2007 the *Hordeum* community developed as a marginal wetland with minimal soil saturation. A ring of *Salix* whips has developed over the years. Based on annual soil pits it appears that groundwater flow may be becoming more shallow. In 2008 the area was inundated, ringed by *Salix* whips, and occupied by *Hordeum*, two *Eleocharis* species, and stressed *Cirsium arvense*. In 2009 the wetland plants remained and the *Cirsium arvense* grew well under the dry soil conditions (**Photos 4** and **21** in **Appendix C**). The island remained dominated by *C. arvense*.

Vegetation Community Type 6 is upland habitat that occupies the slopes north and west of the project area (**Figure 3** in **Appendix A**). These adjacent slopes are primarily colonized by native species, such as phlox (*Phlox* spp.), prickly pear (*Opuntia polyacantha*), blanket flower (*Gaillardia aristata*), lupine (*Lupinus* spp.), and blue grama (*Bouteloua gracilis*).

Three noxious weed species were found on the Perry Ranch Wetland Mitigation site in 2009: *Cirsium arvense* (Canada thistle), *Euphorbia esula* (leafy spurge), and *Cynoglossum officinale* (hound's-tongue). Their populations were partially mapped (**Figure 3** in **Appendix A**). All species rate as Category 1 noxious weeds (Porkorny and Mangold 2008). In 2007 MDT and the Blackfeet Tribe released bio-control and created four photo points to monitor their effect on the

Canada thistle and leafy spurge (**Figure 2** in **Appendix A**). Blackfeet weed control personnel are trying to avoid the use of herbicides at this site due to its proximity to Cut Bank Creek. Canada thistle has been common throughout the site. It is primarily found in the Type 3 community where soils are drier. The Canada thistle stem mining weevil (*Hadroplontus litura*) was released at two areas within the mitigation site in mid-September 2007. Young larvae hatch on young leaves and stem tissue and bore into the main stem of the plant; older larvae feed on the stem, crown, and root (Integrated Weed Control 2007). Research completed in Canada showed that a rust fungus disease, fatal for the thistle, more than doubled on plants where this weevil was present (Integrated Weed Control 2007). A photograph was taken at Weed Photo Point 1 to monitor the effectiveness of the bio-control (**Figure 2** in **Appendix A**; **Photos 18-21** in **Appendix C**).

Leafy spurge was first documented as a small occurrence in Community Type 4 in 2005. In 2006 it was commonly found in Community Types 1, 3, and 4 within the southern half of the project area; since 2007 it has remained abundant. It appears on **Figure 2** as bright yellow-green plants (**Appendix B**). Leafy Spurge Flea Beetles (*Aphthona* spp.) were released on July 19, 2007 at two locations within and at two locations outside the Perry Ranch Mitigation Site (Bandel pers. comm.). Adult flea beetles feed on foliage during the summer while larvae feed on root hairs and young roots, which compromise the plant's ability to take up water and nutrients (Integrated Weed Control 2007). In late July, the MDT Wetland Mitigation Specialist visited the site and found spurge hawk-moth caterpillars (*Hyles euphorbiae*) feeding on the leafy spurge plants in a few areas (Urban pers. comm.). Larvae of the spurge hawk-moth have been used as biological pest control for leafy spurge (Wikipedia 2008). Since 2007 photographs have been taken at Weed Photo Points 2 and 3 to monitor the effectiveness of the bio-control (**Figure 2** in **Appendix A**; **Photos 22-29** in **Appendix C**).

In 2007, two hound's-tongue (*Cynoglossum officinale*) plants were found on the boundary of Community Types 2 and 3. The above ground biomass was destroyed with a shovel in 2007. A quick survey in 2008 and 2009 did not re-locate the plants. In 2009 two tall plants were found growing in a snowberry patch in Type 3 along the inlet channel (**Figure 3** in **Appendix A**).

From 2002 to 2009, vegetation data have been recorded from the same transect (**Monitoring Data Forms** in **Appendix B**), summarized in tabular format (**Table 2**), and graphically illustrated (**Charts 1** and **2)**. Photographs were taken at the start and end of the transect (**Photos 15 - 16** in **Appendix C**). In 2009 the transect traversed through Type 3 – *Upland Floodplain*, Type 2 – *Eleocharis palustris/Polygonum amphibium* Wetland, and Type 6 – *Hillside Upland* habitats (**Chart 1**). Overall total upland habitat increased slightly while wetland habitat decreased slightly (**Table 2**). However, *Upland Floodplain* and *Eleocharis palustris/Polygonum amphibium Wetland* each occupied 261 linear feet on Transect 1 (**Chart 2**). When compared to 2008, the increase in upland and decrease in wetland is attributed to very dry soil in 2009. In 2008 the site was flooded for a long duration, which resulted in the largest gain in wetland habitat measured along the transect since 2002 (**Table 2**).

Table 2: ***Data summary for Transect 1 at the Perry Ranch Wetland Mitigation Site.***

Monitoring Year	2002	2003	2004	2005	2006	2007	2008	2009
Transect Length (feet)	532	532	532	532	532	532	532	532
# Vegetation Community Transitions along Transect	4	5	5	4	4	4	4	5
# Vegetation Communities along Transect	3	3	3	4	4	4	3	3
# Hydrophytic Vegetation Communities along Transect	0	0	0	1	1	1	1	1
Total Vegetative Species	18	25	20	26	28	30	26	28
Total Hydrophytic Species	6	14	10	13	15	11	16	15
Total Upland Species	12	11	10	13	13	19	10	13
Estimated % Total Vegetative Cover	35	45	90	80	90	95	75	91
% Transect Length Comprised of Hydrophytic Vegetation Communities	0	0	0	22	23	23	60	49
% Transect Length Comprised of Upland Vegetation Communities	40	50	100	78	77	77	40	51
% Transect Length Comprised of Unvegetated Open Water	0	0	0	0	0	0	0	0
% Transect Length Comprised of Bare Substrate	60	50	0	0	0	0	0	0

Chart 1: ***Transect maps showing vegetation types of Transect 1 from start (0 feet) to end (532 feet) for each year monitored.***

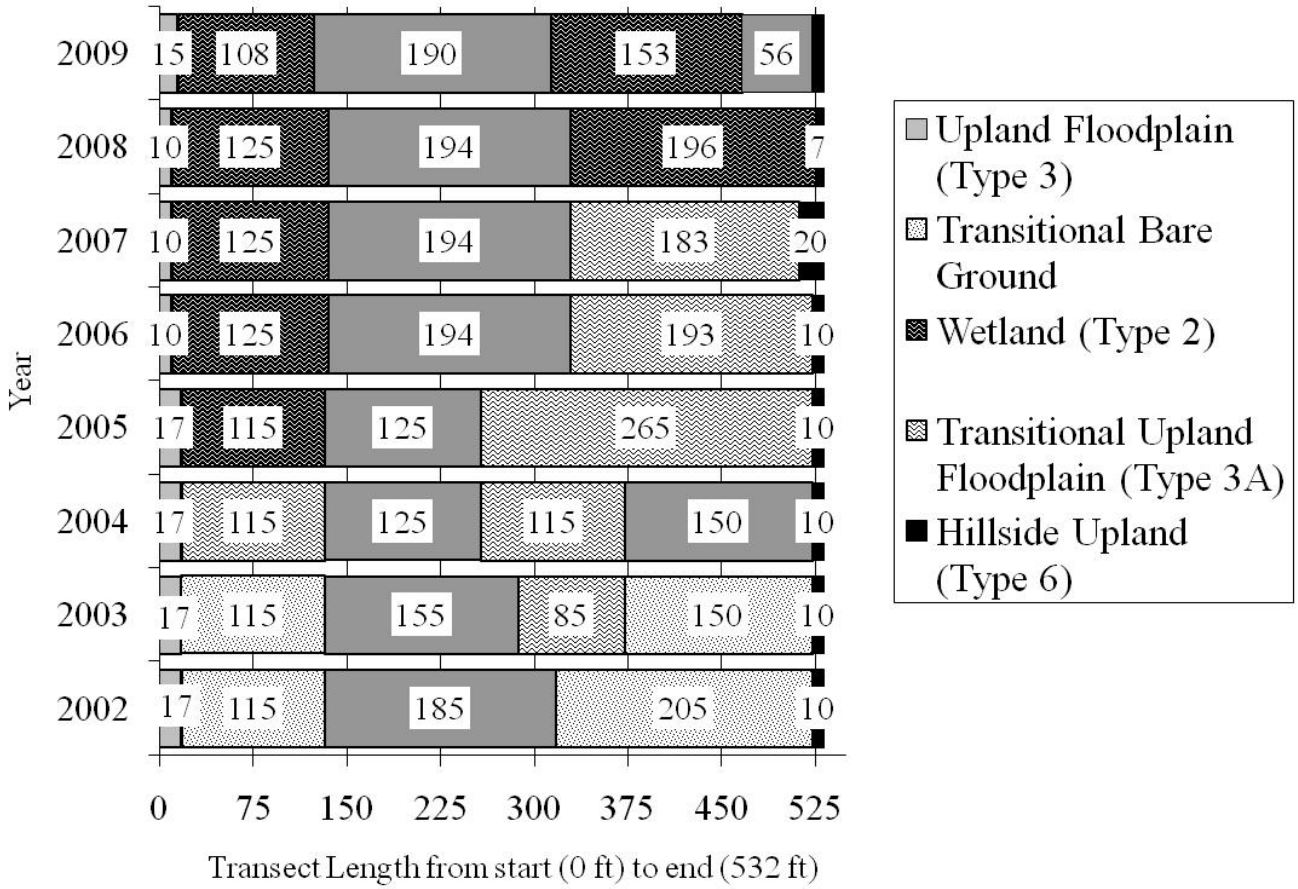
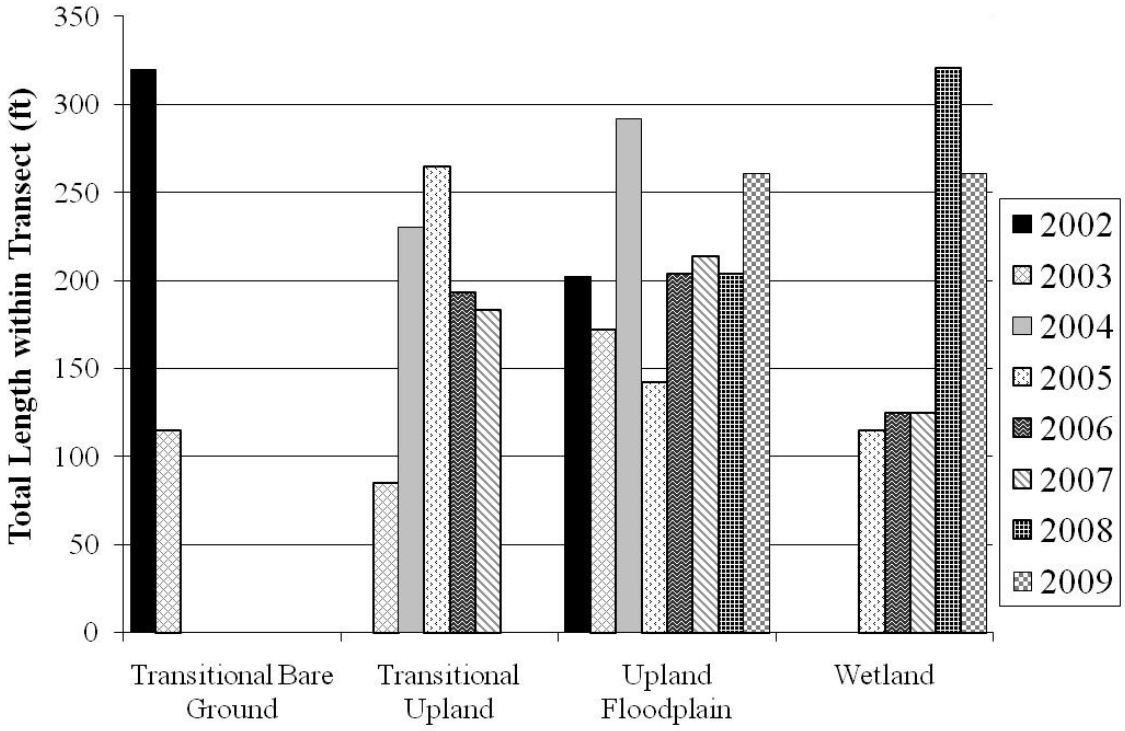


Chart 2: ***Total length of each vegetation community within Transect 1 from 2002 to 2009.***



3.3 Soils

Soils on the vast majority of the site were mapped as Kiwanis fine sandy loam, 0-2 percent slopes (NRCS 1980). This well drained soil typically occurs on terraces and is subject to flooding as a result of winter ice jams (NRCS 1980). The Kiwanis soil type is generally considered non-hydric by the NRCS (NRCS 2006).

Matrix soil colors and textures in the Inner Oxbow and Northern Excavated Area have remained somewhat stable during the eight years of monitoring. Matrix soil colors in the Outer Oxbow became slightly darker since 2008. The B Horizon soils in wetland portions of the project area ranged from silty clay loam to sandy clay loam with a matrix color ranging from 2.5Y3/1, 2.5Y4/2, to 10YR3/2 (**COE Forms** in **Appendix B**). Mottles in the matrix soil indicate a fluctuating water table. Mottles of 10YR4/6 and 7.5YR4/6 were present in vegetation communities Type 1, Type 2, Type 4, and Type 5 (**COE Forms** in **Appendix B**).

Since 2002, soil matrix colors in the Type 2 community along Transect 1 have developed very slowly. Soil matrix colors from 2002 to 2004 remained as 10YR3/2. From 2005 to 2007, soil matrix colors did not change, but the presence of oxidized rhizospheres were observed. Oxidized rhizospheres indicate that the soil had been flooded with water long enough that the plants transported oxygen from the leaves to the roots. In 2009 oxidized rhizospheres re-appeared with soil matrix colors of 2.5Y4/2 to 10YR2/1 to 2.5Y3/2 (**COE Forms** in **Appendix B**).

3.4 Wetland Delineation

Wetland boundaries were re-delineated in 2009, based upon vegetation, soil, and hydrological data taken from 9 soil pit locations (**Figure 3** in **Appendix A**; **COE Forms** in **Appendix B)**. The aerial extent of all aquatic and wetland habitats has been mapped and summarized annually (**Table 3**).

Table 3. ***Aerial coverage of aquatic habitats prior to construction and from 2002 to 2009 at the Perry Ranch Wetland Mitigation Site.***

AQUATIC HABITAT	ACREAGE								
	Pre-Construction	2002	2003	2004	2005	2006	2007	2008	2009
Wetland	3.40	10.09	12.41	12.33	13.65	18.97	19.96	22.41	21.04
Open Water / Mudflat	0.00	7.83	6.20	0.00	6.39	0.00	0.00	0.00	0.00
TOTAL	**3.40**	**17.92**	**18.61**	**12.33**	**20.04**	**18.97**	**19.96**	**22.41**	**21.01**

Since 2002, wetland habitat has slowly increased (**Table 3**). Wetland development has advanced the most during wet years (i.e., 2002, 2005, and 2008). In 2009, approximately 21 acres of wetland habitat has developed within the Inner Oxbow, Outer Oxbow, and Northern Excavated Area.

Approximately 3.4 acres of wetland occurred at the site prior to construction (**Table 3**). The 27.6-acre mitigation goal is inclusive of these 3.4 acres of pre-existing wetlands. Consequently, the net goal for this project is to create 24.2 wetland acres. As of 2009 the site has netted 21.01 wetland acres, or 87% of the project target.

3.5 Fish and Wildlife

A comprehensive list of wildlife species (or their sign) observed at the project site has been compiled from 2002 through 2009 (**Table 4**). The site provides habitat for many types of wildlife. More wildlife species (and the only reptile observation) were observed during 2008 than any other year since 2002. In 2009, white-tailed deer and several bird species were observed (**MDT Monitoring Form** in **Appendix B**).

From 2002 through 2008, between ten and 29 bird species have been observed at the Perry Ranch mitigation site (**Table 4**). The record of 29 bird species occurred in 2008 when the site was inundated. In contrast only six bird species were observed in or flying above the site in 2009 (**Table 4**; **Bird Survey Forms** in **Appendix B**).

The northern leopard frog (*Rana pipiens*) is globally ranked as a G5 indicating it is globally common, widespread, and abundant. In Montana, this species has been assigned the rank of S1 (critically imperiled) (MTNHP 2009). The Inner and Outer Oxbows are considered documented primary habitat for this species because the areas consistently yield sightings during wet years and represent good breeding habitat. Casual observations documented 6-8 frogs in 2002, four frogs in 2005, one frog in 2006, and at least three frogs in 2008. The northern leopard frog as also been observed in 2006 near the Northern Excavated Area; however, it is only suspected that

this area serves as primary habitat because breeding habitat is not as developed as in the Inner and Outer Oxbows. Frogs were not observed in 2009.

Table 4: ***Fish and wildlife species observed on the Perry Ranch Mitigation Site from 2002 to 2009.***

FISH None	
AMPHIBIAN Northern Leopard Frog (*Rana pipiens*)	 Western Chorus Frog (*Pseudacris triseriata*)
REPTILE Western Terrestrial Garter Snake (*Thamnophis elegans*)	
BIRD American Avocet (*Recurvirostra americana*) American Goldfinch (*Carduelis tristis*) American Robin (*Turdus migratorius*) **American White Pelican (*Pelecanus erythrorhynchos*)** Bank Swallow (*Riparia riparia*) Barn Swallow (*Hirundo rustica*) Black Tern (*Chlidonias niger*) Blue-winged Teal (*Anas discors*) Brewer's Blackbird (*Euphagus cyanocephalus*) Canada Goose (*Branta Canadensis*) Chukar (*Alectoris chukar*) Cinnamon Teal (*Anas cyanoptera*) Cliff Swallow (*Petrochelidon pyrrhonota*) Common Nighthawk (*Chordeiles minor*) Common Snipe (*Gallinago gallinago*) **Dark-eyed Junco (*Junco hyemalis*)** Double-crested Cormorant (*Phalacrocorax auritus*) Eastern Kingbird (*Tyrannus tyrannus*) Franklin's Gull (*Larus pipixcan*) Gadwall (*Anas strepera*) Great Blue Heron (*Ardea herodias*) Greater Scaup (*Aythya marila*) Green-winged Teal (*Anas crecca*) Gray Partridge (*Perdix perdix*) Horned Lark (*Eremophila alpestris*)	 Killdeer (*Charadrius vociferous*) Lesser Scaup (*Aythya affinis*) Long-billed Dowitcher (*Limnodromus scolopaceus*) Longspur spp. (*Calcarius* spp.) Mallard (*Anas platyrhynchos*) **Northern Harrier (*Circus cyaneus*)** Northern Rough-winged Swallow (*Stelgidopteryx serripennis*) Northern Shoveler (*Anas clypeata*) **Red-winged Blackbird (*Agelaius phoeniceus*)** Red-tailed Hawk (*Buteo jamaicensis*) Savannah Sparrow (*Passerculus sandwichensis*) Semipalmated Plover (*Charadrius semipalmatus*) **Sandpiper (species unknown)** Solitary Sandpiper (*Tringa solitaria*) Spotted Sandpiper (*Actitis macularia*) Tree Swallow (*Tachycineta bicolor*) Vesper Sparrow (*Pooecetes gramineus*) **Western Meadowlark (*Sturnella neglecta*)** Western Sandpiper (*Calidris mauri*) Willet (*Catoptrophorus semipalmatus*) Wilson's Phalarope (*Phalaropus tricolor*) Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*) Yellowlegs species (*Tringa* spp.)
MAMMAL American Badger (*Taxidea taxus*) Coyote (*Canis latrans*) Deer (*Odocoileus* spp.) Fox (species unknown)	 Raccoon (*Procyon lotor*) Richardson's Ground Squirrel (*Spermophilus richardsonii*) **White-tailed Deer (*Odocoileus virginianus*)**

Bolded species were observed during 2009.

3.6 Macroinvertebrates

Macroinvertebrates have been sampled during years when the Outer Oxbow has been inundated: 2002, 2005, and 2008. Conversely, macroinvertebrates could not be sampled during the drier years of 2003, 2004, 2006, 2007, and 2009.

3.7 Functional Assessment

Functional assessment forms were completed for the Inner Oxbow, Outer Oxbow, and Northern Excavated Areas (**Appendix B)** and the results were summarized (**Table 5**). As wetlands have developed within the oxbows and Northern Excavated Area, so have their associated functions and values. The pre-construction and 2009 conditions were assessed using different versions of the MDT Montana Wetland Assessment Method (MWAM). Thus, only a comparison of general trends in wetland functional development can made (**Table 5**). In 2009, the Inner Oxbow continued to rate as Category II site; although, functional units decreased due to acreage decline (**Table 5**). Both scrub-shrub (willow) and emergent wetland habitats continue to develop within the Inner Oxbow; in addition, the unconsolidated bottom has transitioned to emergent wetland (**Functional Assessment Form** in **Appendix B**). In 2009, the Outer Oxbow rated as a Category III wetland, providing emergent wetland habitat. The Northern Excavated Area continued to rate as a Category III wetland, also providing emergent wetland habitat (**Table 5**).

Since pre-construction, the entire project has gained 107.04 functional units as of 2009 (**Table 5**). The Inner and Outer Oxbows have achieved a net gain of about 19 and 51 functional units, respectively. The Northern Excavated Area had no pre-existing wetlands, but has developed wetlands and about 36 functional units.

3.8 Photographs

A 2009 aerial photograph was taken by MDT and used as the base photograph for **Figures 2** and **3** (**Appendix A**). Representative panoramic and single frame photographs were taken from established photo-points, at each soil sampling site, and in each habitat (**Appendix C)**. Aerial photographs from 2002 through 2009 are in **Appendix C**.

3.9 Maintenance Needs/Recommendations

Several dike problems were noted during the 2002 summer visit, repaired during 2003, and have been stable into 2009. The Blackfeet Tribe and MDT have developed a weed plan for the Perry Ranch site. Bio-control was established for leafy spurge and Canada thistle and has been monitored through aerial photograph assessments and at three established Weed Photo Points. Leafy spurge is fairly apparent on the 2006 through 2009 aerial photographs as bright yellow-green patches. Canada thistle populations cannot be interpreted based on color or texture on the aerial photographs.

Table 5: ***Summary of baseline and 2009 wetlands function/value ratings and functional points at the Perry Ranch Mitigation Project.***

Function and Value Parameters from the MDT Montana Wetland Assessment Method[1]	Pre-Construction (1997 method)		Post-Construction (2008 method)		
	Inner Oxbow	Outer Oxbow	2009 Inner Oxbow	2009 Outer Oxbow	2009 Northern Excavated Area
Listed/Proposed TE Species Habitat	Low (0.1)	Low (0.1)	Low (0.1)	Low (0.1)	Low (0.1)
MTNHP Species Habitat	None (0.0)	None (0.0)	High (1.0)	High (0.8)	Mod (0.8)
General Wildlife Habitat	Mod (0.4)	Low (0.1)	Mod (0.7)	Mod (0.7)	Mod (0.4)
General Fish/Aquatic Habitat	NA	NA	NA	NA	NA
Flood Attenuation	Mod (0.5)	Low (0.2)	High (0.9)	Mod (0.6)	Mod (0.6)
Short and Long Term Surface Water Storage	--	--	High (0.9)	High (0.9)	High (0.9)
Sediment/Nutrient/Toxicant Removal	Mod (0.5)	Mod (0.5)	High (1.0)	High (1.0)	Mod (0.7)
Sediment/Shoreline Stabilization	NA	NA	NA	NA	NA
Production Export/Food Chain Support	Mod (0.7)	Mod (0.6)	Mod (0.4)	Mod (0.5)	Mod (0.5)
Groundwater Discharge/Recharge	High (1.0)	Low (0.1)	Mod (0.7)	Mod (0.7)	Mod (0.7)
Uniqueness	Low (0.3)	Low (0.2)	Mod (0.4)	Mod (0.4)	Mod (0.4)
Recreation/Education Potential	Low (0.1)	Low (0.1)	Low (0.05)	Low (0.05)	Low (0.05)
Actual Points/Possible Points	4.4 / 10	2.7 /10	6.15 / 9	5.75 / 9	5.15 / 9
% of Possible Score Achieved	44%	27%	68%	64%	57%
Overall Category	III	IV	II	III	III
Total Acreage of Assessed Wetlands and Other Aquatic Habitats within Site Boundaries (ac)	**2.30**	**1.10**	**4.87**	**9.45**	**6.96**
Functional Units (acreage x actual points)	**10.12**	**2.97**	**29.95**	**54.34**	**35.84**
Net Acreage Gain (ac)	**NA**	**NA**	4.87 – 2.30 = **2.57**	9.45 – 1.10 = 8.35	6.96 - 0.00 = **6.96**
Net Functional Unit Gain (fu)	**NA**	**NA**	29.95-10.12 = **19.83**	54.34 – 2.97 = **51.37**	35.84 – 0.00 = **35.84**
Total Functional Unit Gain	**107.04**				

[1] See completed MDT functional assessment forms in **Appendix B** for further detail.

3.10 Current Credit Summary

No specific performance criteria were required to be met at this site in order to document its success. In general, the site appears to be developing as designed, subject to the limitations of dry and wet years.

Approximately 21.3 acres of wetlands presently occur on the site (**Table 3**; **Figure 3** in **Appendix A**). Approximately 3.4 acres of wetland occurred at the site prior to construction (**Table 3**). The 27.6-acre mitigation goal is inclusive of these 3.4 acres of pre-existing wetlands. Consequently, the net goal for this project is to create 24.2 acres. As of 2009 the site has netted about 17.9 wetland acres, or 74% of the 24.2-acre project target.

In addition, the site contains a substantive preserved upland buffer between grazed uplands and created wetlands and between grazed uplands and Cut Bank Creek within approximately 18,450 linear feet of fencing (based on MDT plan quantities). Assigning an average 50 foot-wide buffer

width over this length of fencing equates to approximately 21.18 acres. Applying a 5:1 ratio to this buffer area would then equate to approximately 4.24 acres of upland buffer credit. Subject to COE's approval, adding this 4.24 acres of potential credit to the net 17.9 acres of creation would equate to 22.14 credit acres, bringing the total to within 91% of the target. Additionally, if enhancement credit (based on functional assessment improvement) was applied to the pre-existing 3.4 acres of wetlands at a 3:1 ratio, this could yield an additional 1.13 acres of credit, bringing the total to 23.27 acres of credit, or 96% of the target. The Inner and Outer Oxbows have achieved a net gain of about 19 and 51 functional units, respectively (**Table 5**). This potential credit addition would also be subject to the COE's approval.

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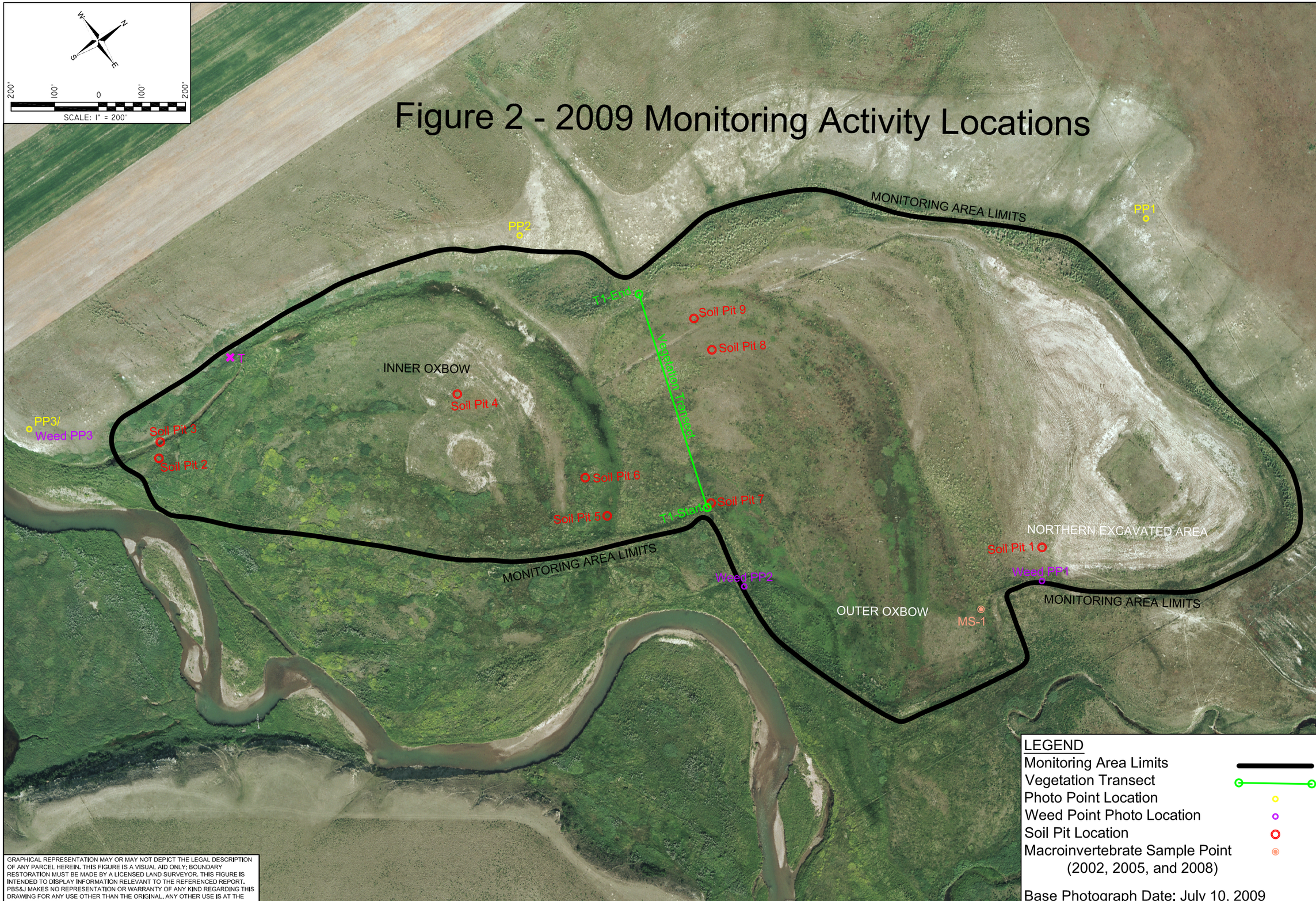
Appendix A

FIGURES 2 & 3

MDT Wetland Mitigation Monitoring
Perry Ranch
Glacier County, Montana

Figure 2 - 2009 Monitoring Activity Locations



GRAPHICAL REPRESENTATION MAY OR MAY NOT DEPICT THE LEGAL DESCRIPTION OF ANY PARCEL HEREIN. THIS FIGURE IS A VISUAL AID ONLY; BOUNDARY RESTORATION MUST BE MADE BY A LICENSED LAND SURVEYOR. THIS FIGURE IS INTENDED TO DISPLAY INFORMATION RELEVANT TO THE REFERENCED REPORT. PBS&J MAKES NO REPRESENTATION OR WARRANTY OF ANY KIND REGARDING THIS DRAWING FOR ANY USE OTHER THAN THE ORIGINAL. ANY OTHER USE IS AT THE USER'S SOLE RISK.

PERRY RANCH WETLAND MITIGATION SITE

2009 MONITORING ACTIVITY LOCATIONS

DRAWN: JR
PROJ MGR: J. BERGLUND
CHECKED: AP
APPV'D: JB
PLOTTED: Nov/24/2009

PROJ NO: 0B4308802 04.05
LOCATION: CUT BANK, MT
SCALE: NOTED
FILE NAME: BASE 2009.dwg

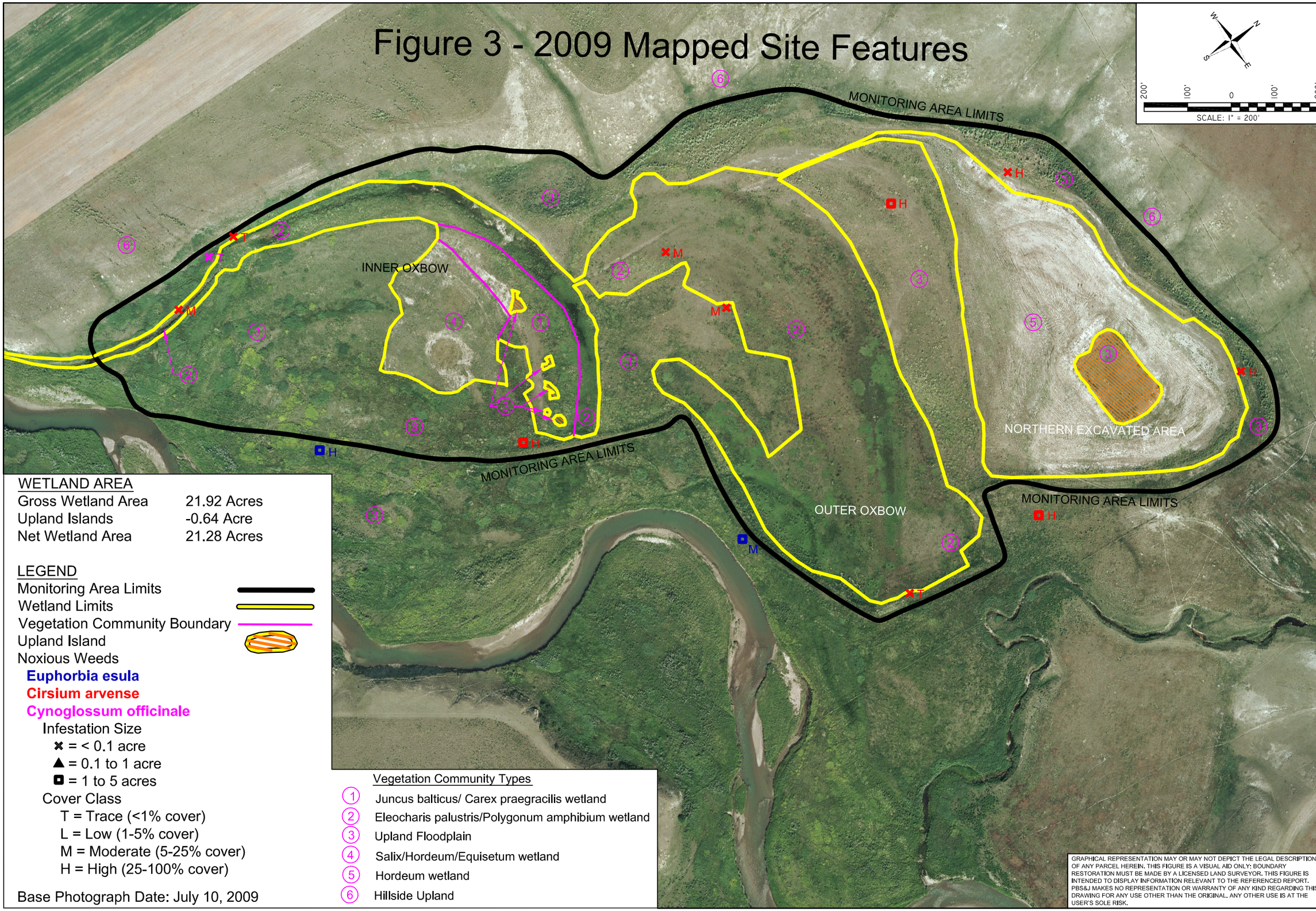
PBSJ
801 N. Last Chance Gulch
Suite 101
Helena, MT 59601

FIGURE
2

REV -

DATE 09/30/2009

Figure 3 - 2009 Mapped Site Features



WETLAND AREA

Gross Wetland Area	21.92 Acres
Upland Islands	-0.64 Acre
Net Wetland Area	21.28 Acres

LEGEND

Monitoring Area Limits

Wetland Limits

Vegetation Community Boundary

Upland Island

Noxious Weeds

Euphorbia esula

Cirsium arvense

Cynoglossum officinale

Infestation Size

✖ = < 0.1 acre

▲ = 0.1 to 1 acre

◘ = 1 to 5 acres

Cover Class

T = Trace (<1% cover)

L = Low (1-5% cover)

M = Moderate (5-25% cover)

H = High (25-100% cover)

Base Photograph Date: July 10, 2009

Vegetation Community Types

1. Juncus balticus/ Carex praegracilis wetland
2. Eleocharis palustris/Polygonum amphibium wetland
3. Upland Floodplain
4. Salix/Hordeum/Equisetum wetland
5. Hordeum wetland
6. Hillside Upland

GRAPHICAL REPRESENTATION MAY OR MAY NOT DEPICT THE LEGAL DESCRIPTION OF ANY PARCEL HEREIN. THIS FIGURE IS A VISUAL AID ONLY; BOUNDARY RESTORATION MUST BE MADE BY A LICENSED LAND SURVEYOR. THIS FIGURE IS INTENDED TO DISPLAY INFORMATION RELEVANT TO THE REFERENCED REPORT. PBS&J MAKES NO REPRESENTATION OR WARRANTY OF ANY KIND REGARDING THIS DRAWING FOR ANY USE OTHER THAN THE ORIGINAL. ANY OTHER USE IS AT THE USER'S SOLE RISK.

PERRY RANCH WETLAND MITIGATION SITE

2009 MAPPED SITE FEATURES

DRAWN: JR
PROJ MGR: J. BERGLUND
CHECKED: AP
APPV'D: JB
PLOTTED: Nov/24/2009

PROJ NO: 0B4308802 04.05
LOCATION: CUT BANK, MT
SCALE: NOTED
FILE NAME: BASE 2009.dwg

PBSJ
801 N. Last Chance Gulch
Suite 101
Helena, MT 59601

FIGURE 3

REV -

DATE 11/13/2009

Appendix B

2009 WETLAND MITIGATION SITE MONITORING FORM
2009 BIRD SURVEY FORM
2009 COE WETLAND DELINEATION FORMS
2009 FUNCTIONAL ASSESSMENT FORMS

MDT Wetland Mitigation Monitoring
Perry Ranch
Glacier County, Montana

PBS&J / MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name: **Perry Ranch** Project Number: **0B4308802-04.05**
Assessment Date: **July 21, 2009** Person(s) conducting the assessment: **A. Pipp**
Location: **Cut Bank Creek** MDT District: **Great Falls** Milepost: _____
Legal Description: T **34N** R **8W** Section **27, 34**
Weather Conditions: **sunny, 80's deg., calm wind** Time of Day: **0800-1700**
Initial Evaluation Date: **May 15, 2002** Monitoring Year: **8** # Visits in Year: **2**
Size of evaluation area: **30 acres** Land use surrounding wetland: **rangeland and Cut Bank Creek**

HYDROLOGY

Surface Water Source: **seasonal flooding via Cut Bank Creek**
Inundation: **Absent** Average Depth: **0.0 feet** Range of Depths: _____
Percent of assessment area under inundation: **0%**
Depth at emergent vegetation-open water boundary: **NA feet**
If assessment area is not inundated then are the soils saturated within 12 inches of surface: _
Other evidence of hydrology on the site (ex. – drift lines, erosion, stained vegetation, etc.):
drift lines, matted vegetation, tracks

Groundwater Monitoring Wells: **Absent**
Record depth of water below ground surface (in feet):

Well Number	Depth	Well Number	Depth	Well Number	Depth

Additional Activities Checklist:
☒ Map emergent vegetation-open water boundary on aerial photograph.
☒ Observe extent of surface water during each site visit and look for evidence of past surface water elevations (drift lines, erosion, vegetation staining, etc.)
☐ Use GPS to survey groundwater monitoring well locations, if present.

COMMENTS / PROBLEMS:
As per MDT direction, PBS&J did not conduct a spring visit. The site was relatively dry during the summer visit. Areas that normally show saturated soils (i.e. inner oxbow) exhibited moist soils. Only two of nine soil pits exhibited saturated soils. Within the inlet channel of the Inner Oxbow are several depressions. Usually these depressions are inundated, but during the summer visit the depressions had aquatic plants exposed to no surface water. Wetland plants, though obviously dominant in the wetland communities, were considerably shorter in 2009 (when compared to the lush growth exhibited in 2008 by the prolonged saturated and inundated soils).

VEGETATION COMMUNITIES

Community Number: **1** Community Title (main spp): **Juncus balticus / Carex praegracilis**

Dominant Species	% Cover	Dominant Species	% Cover
Juncus balticus	3 = 11-20%	Hordeum jubatum	2 = 6-10%
Carex praegracilis	3 = 11-20%	Agropyron repens	1 = 1-5%
Potentilla anserina	4 = 21-50%	Eleocharis palustris	1 = 1-5%
Artemisia ludoviciana	1 = 1-5%	Phalaris arundinacea	3 = 11-20%
Equisetum arvense	2 = 6-10%	Salix exigua	1 = 1-5%
Glycyrrhiza lepidota	2 = 6-10%	Alopecurus pratensis	3 = 11-20%

Comments / Problems: **This wetland community is slowly drying out and shrinking. By 2009 a portion of this community has reverted to upland. The remaining community is wetland, but is dominated not by Carex and Juncus, but by Alopecurus, Phalaris, Hordeum, and Glycyrrhiza.**

Community Number: **2** Community Title (main spp): **Eleocharis palustris / Polygonum amphibium**

Dominant Species	% Cover	Dominant Species	% Cover
Eleocharis palustris	3 = 11-20%	Hordeum jubatum	3 = 11-20%
Polygonum amphibium	3 = 11-20%	Typha latifolia	+ = < 1%
Alopecurus pratensis	4 = 21-50%	Rumex crispus	2 = 6-10%
Rumex maritimus	2 = 6-10%	Juncus balticus	1 = 1-5%
Phalaris arundinacea	2 = 6-10%	Agropryon trachycaulum	2 = 6-10%
Equisteum arvense	2 = 6-10%	Potentilla anserina	2 = 6-10%

Comments / Problems: **Soils appear to remain saturated or inundated enough that the community flourishes. In 2008 & 2009 Alopecurus pratensis dominated in portions that were saturated, but not inundated.**

Community Number: **3A** Community Title (main spp): **Transitional Upland Floodplain**

Dominant Species	% Cover	Dominant Species	% Cover
Agropyron trachycaulum	1 = 1-5%	Rumex maritimus	1 = 1-5%
Agropyron intermedium	2 = 6-10%	Hordeum jubatum	5 = > 50%
Agropyron repens	1 = 1-5%	Alopecurus pratensis	3 = 11-20%
Artemisia ludoviciana	1 = 1-5%	Aster pansus	1 = 1-5%
Symphoricarpos occidentalis	1 = 1-5%	Salix exigua	+ = < 1%
Rumex crispus	1 = 1-5%	Poa pratensis	+ = < 1%

Comments / Problems: **This is a transitional upland/wetland. In 2007, this community was dominated with H. jubatum and scattered with upland and wetland plants; soils were dry; plants east of the channel were brown and cured while those west of the channel were still green and fruiting. In 2008, this plant community was inundated partially, saturated completely, exhibited hydric soils, and was dominated by wetlands plants; hence, it was mapped as Type 2. In 2009 soils were saturated earlier in the growing season and a dominance of wetland plants remained; however, wetland plants were very short and soils were dry by the July visit.**

VEGETATION COMMUNITIES (continued)

Community Number: **4** Community Title (main spp): **Salix/Hordeum/Equisteum Wetland**

Dominant Species	% Cover	Dominant Species	% Cover
Equisetum arvense	4 = 21-50%	Salix amygdaloides	3 = 11-20%
Hordeum jubatum	4 = 21-50%	Agropyon intermedium	1 = 1-5%
Alopecurus pratensis	2 = 6-10%	Carex praegracilis	1 = 1-5%
Rumex crispus	1 = 1-5%	Eleocharus palustris	1 = 1-5%
Potentilla anserina	3 = 11-20%	Phalaris arundinacea	2 = 6-10%
Salix exigua	4 = 21-50%	Typha latifolia	+ = < 1%
Salix exigua	4 = 21-50%	Typha latifolia	+ = < 1%

Comments / Problems: **In 2009, Salix, Equisetum, Potentilla, and Hordeum continued to flourish around the excavated ponds. A portion of Type 4 converted to Type 2 in 2008. Cirsium arvense and Ephorbia esula are increasing on the boundaries and present within the community.**

Community Number: **3** Community Title (main spp): **Upland Floodplain**

Dominant Species	% Cover	Dominant Species	% Cover
Agropyron trachycaulum	3 = 11-20%	E. esula & C. arvense (EACH)	4 = 21-50%
Agropyron smithii	3 = 11-20%	Symphoricarpos occidentalis	4 = 21-50%
Agropyron intermedium	3 = 11-20%	Bromus inermis	2 = 6-10%
Hordeum jubatum	4 = 21-50%	Aster pansus	3 = 11-20%
Rosa arkansas	3 = 11-20%	Bromus inermis	1 = 1-5%

Comments / Problems: **Occupies the flood prone area.**

Community Number: **6** Community Title (main spp): **Hillside Upland**

Dominant Species	% Cover	Dominant Species	% Cover
Stipa viridula	5 = > 50%	Koeleria macranta (K. cristata)	2 = 6-10%
Agropyron smithii	4 = 21-50%	Symphoricarpos occidentale	3 = 11-20%
Agropyron intermedia	4 = 21-50%	Rosa arkansana	3 = 11-20%
Artemisia frigida	3 = 11-20%	Bromus inermis	1 = 1-5%
Grindelia squarrosa	3 = 11-20%	Bouteloua gracilis	2 = 6-10%
Opuntia spp.	2 = 6-10%		

Comments / Problems: **Consists of native upland plants on hillsides, outside of the floodplain and cultivated fields.**

Community Number: **5** Community Title (main spp): **Hordeum jubatum**

Dominant Species	% Cover	Dominant Species	% Cover
Hordeum jubatum	5 = > 50%	Salix lutea	1 = 1-5%
Salix exigua	3 = 11-20%	Cirsium arvense	2 = 6-10%
Rumex maritimus	+ = < 1%	Alopecurus pratensis	+ = < 1%
Rumex crispus	+ = < 1%	Equisetum arvense	+ = < 1%
Lactuca serriola	+ = < 1%	Eleocharis palustris	1 = 1-5%
Thlaspi arvense	+ = < 1%		

Comments / Problems: **In 2008, wetland quality increased from marginal to good. Plant diversity is still low and C. arvense was stressed, but still threatens plant community. E. palustris was present in patches for the 1st time. In 2009, plant composition remained the same, but soils were dry.**

Additional Activities Checklist:

☒ Record and map vegetative communities on aerial photograph.

COMPREHENSIVE VEGETATION LIST

Plant Species	Vegetation Community Number (s)	Plant Species	Vegetation Community Number (s)
Achillea millefolium	3, 6	Medicago sativa	3, 6
Agropyron intermedium	1, 3, 4, 5, 6	Melilotus alba	3, 6
Agropyron repens	3	Melilotus officinalis	3, 6
Agropyron smithii	3, 6	Mentha arvensis	3
Agropyron trachycaulum	1, 2, 3, 3A	Opuntia polyacantha	6
Agrostis alba	2, 3	Phalaris arundinacea	1, 2, 4, 6
Alopecurus pratensis	2, 3, 4, 5	Phleum pratense	3, 6
Amaranthus retroflexus	3, 6	Plantago hirtella	1
Artemisia biennis	2, 5	Plantago major	1, 2
Artemisia frigida	6	Poa annua	(2), 3, (3A), (4)
Artemisia ludoviciana	1, 3, 3A	Poa pratensis	3, 6
Aster (pansus)	3, 6	Polygonum amphibium	1, 2
Atriplex spp.	3, 6	Populus (angustifolia)	5
Bouteloua gracilis	6	Potentilla (gracilis)	1, 3
Brassica kaber	6	Potentilla anserina	1, 2, 3, 4
Bromus inermis	3, 6	Ranunculus cymbalaria	4
Cardaria draba	6	Rosa arkansana	1, 3, 6
Carex lanuginosa	1, 2	Rumex crispus	2, 3, 4, 5
Carex praegracilis	1, 3, 4	Rumex maritimus	2, 3, 3A, 5
Chenopodium album	3, 6	Salix amygdaloides	3, 4
Cirsium arvense (N)	3, 4, 6	Salix exigua	2, 3, 3A, 4, 5
Cynoglossum officinale (N)	3	Salix lutea	2, 3, 3A, 4, 5
Dactylis glomerata	3	Sisymbium altissimum	3
Descurainia pinnata	3, 6	Smilacina stellata	1
Distichlis spicata	1	Solidago canadensis	1, 3
Eleocharis acicularis	2	Spartina pectinata	1, 2
Eleocharis palustris	1, 2, 3, 4, 5	Stipa viridula	6
Epilobium ciliatum	1	Symphoricarpos occidentalis	1, 3, 6
Equisetum arvense	1, 2, 3, 4	Taraxacum officinale	3, 6
Equisetum hyemale	2	Thlaspi arvense	3, 5, 6
Euphorbia esula (N)	1, 3, 4	Triglochin maritimum	1, 2
Glyceria elata	2	Typha latifolia	2, 4
Glycyrrhiza lepidota	1, 3		
Grindelia squarrosa	3, 6		
Hordeum jubatum	1, 2, 3/3A,4, 5		
Juncus balticus	1		
Kochia scoparia	3		
Koeleria macrantha	6		

Comments / Problems: <u>Parenthesis placed around specific epithets indicates an uncertainty in the species identification. (N) indicates a Montana State Noxious plant.</u>

PLANTED WOODY VEGETATION SURVIVAL

Plant Species	Number Originally Planted	Number Observed	Mortality Causes
N/A			

Comments / Problems: **<u>No species were planted.</u>**

WILDLIFE

Birds

Were man-made nesting structures installed? **No**
If yes, type of structure: _____ How many? _____
Are the nesting structures being used? **NA**
Do the nesting structures need repairs? _____

Mammals and Herptiles

Mammal and Herptile Species	Number Observed	Indirect Indication of Use			
		Tracks	Scat	Burrows	Other
White-tailed Deer	4	☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	

Additional Activities Checklist:
No Macroinvertebrate Sampling (if required)

Comments / Problems: The site was dry (no surface water); therefore, no macroinvertebrate sample was collected.

PHOTOGRAPHS

Using a camera with a 50mm lens and color film take photographs of the following permanent reference points listed in the check list below. Record the direction of the photograph using a compass. When at the site for the first time, establish a permanent reference point by setting a ½ inch rebar or fencepost extending 2-3 feet above ground. Survey the location with a resource grade GPS and mark the location on the aerial photograph.

Photograph Checklist:

- ☒ One photograph for each of the four cardinal directions surrounding the wetland.
- ☒ At least one photograph showing upland use surrounding the wetland. If more than one upland exists then take additional photographs.
- ☒ At least one photograph showing the buffer surrounding the wetland.
- ☒ One photograph from each end of the vegetation transect, showing the transect.

Location	Photograph Frame #	Photograph Description	Compass Reading (°)
		See Photo Sheets	

Comments / Problems: **<u>See Photograph Sheets in Appendix C of the 2009 report.</u>**

GPS SURVEYING

Using a resource grade GPS survey the items on the checklist below. Collect at least 3 location points set at a 5 second recording rate. Record file numbers for site in designated GPS field notebook.

GPS Checklist:

- ☒ Jurisdictional wetland boundary.
- ☒ 4-6 landmarks that are recognizable on the aerial photograph.
- ☒ Start and End points of vegetation transect(s).
- ☒ Photograph reference points.
- ☐ Groundwater monitoring well locations.

Comments / Problems: **Communities and boundaries were mapped using the GPS and some hand-mapping onto the 2009 aerial photograph.**

WETLAND DELINEATION

(attach COE delineation forms)

At each site conduct these checklist items:

- ☒ Delineate wetlands according to the 1987 Army COE manual.
- ☒ Delineate wetland – upland boundary onto aerial photograph.
- **Yes** Survey wetland – upland boundary with a resource grade GPS survey.

Comments / Problems: **The GPS unit and hand-mapping onto the aerial photograph were used to delineate wetland boundaries.**

FUNCTIONAL ASSESSMENT

(Complete and attach full MDT Montana Wetland Assessment Method field forms.)
(Also attach any completed abbreviated field forms, if used)

Comments / Problems: _____

MAINTENANCE

Were man-made nesting structure installed at this site? **No**
If yes, do they need to be repaired? **NA**
If yes, describe the problems below and indicate if any actions were taken to remedy the problems.

Were man-made structures built or installed to impound water or control water flow into or out of the wetland? **Yes**
If yes, are the structures working properly and in good working order? **Yes**
If no, describe the problems below.

Comments / Problems: _____

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Perry Ranch** Date: **July 21, 2009** Examiner: **A. Pipp**
Transect Number: **1** Approximate Transect Length: **532 feet** Compass Direction from Start: **288˚** Note: _____

Vegetation Type A: **Type 3 - Upland Floodplain**	
Length of transect in this type: 0-15 feet	
Plant Species	**Cover**
Hordeum jubatum (not seen in 2008-2009)	
Kochia scoparia (not seen in 2009)	
Alopecurus pratensis	2 = 6-10%
Medicago sativa	2 = 6-10%
Agropyron intermedium	3 = 11-20%
Thlaspi arvense	
Aster pansus	3 = 11-20%
Agropyron trachycaulum	2 = 6-10%
Rumex maritimus	+ = < 1%
Bromus inermis	2 = 6-10%
Total Vegetative Cover:	90%

Vegetation Type B: **Type 2 - E. palustris / P. amphibium Wetland**	
Length of transect in this type: 15-123 feet	
Plant Species	**Cover**
Cirsium arvense & Salix exigua	1 = 1-5%
Hordeum jubatum	4 = 21-50%
Alopecurus pratensis & Agropyron repens EACH	3 = 11-20%
Potentilla anserina	1 = 1-5%
Rumex maritimus & Equisetum arvense EACH	+ = < 1%
Melilotus alba	+ = < 1%
Juncus balticus & Glycyrrhiza lepidota ABSENT	
Carex lanuginosa & Agropyron trachycaulum ABSENT	
Eleocharis palustris & Phalaris arundinacea	1 = 1-5%
Taraxacum officinale & Thlaspi arvense ABSENT	
Descurainia pinnata & Chenopodium album ABSENT	
Total Vegetative Cover:	90%

Vegetation Type C: **Type 3 - Upland Floodplain**	
Length of transect in this type: 123-313 feet	
Plant Species	**Cover**
Agropyron trachycaulum & A. intermedium TOGETHER	4 = 21-50%
Bromus inermis & Cirsium arvense EACH	2 = 6-10%
Hordeum jubatum	4 = 21-50%
Thlaspi arvense (not seen in 2009)	
Descurainia pinnata & Lactuca serriola ABSENT 2008-2009	
Chenopodium album & Phalaris arundinacea ABSENT 2008-2009	
Taraxacum officinale	1 = 1-5%
Artemisia biennis	2 = 6-10%
Aster pansus	1 = 1-5%
Alopecurus pratensis & Agropyron smithii EACH	2 = 6-10%
Rumex maritimus & Equisetum arvense EACH	+ = < 1%
Total Vegetative Cover:	100%

Vegetation Type D: **Type 2 - E. palustris / P. amphibium Wetland**	
Length of transect in this type: 313 - 466 feet	
Plant Species	**Cover**
Hordeum jubatum	4 = 21-50%
Agropyron trachycaulum & A. intermedium EACH	2 = 6-10%
Rumex maritimus & R. crispus TOGETHER	+ = < 1%
Alopecurus pratensis	4 = 21-50%
Descurainia pinnata, Artemisia ludoviciana, Lactuca serriola, Grindelia squarrosa ABSENT 2008-2009	
Salix exigua & S. lutea EACH	1 = 1-5%
Artemisia biennis	2 = 6-10%
Cirsium arvense	1 = 1-5%
Poa pratensis & Eleocharis palustris EACH	+ = < 1%
Phalaris arundinacea	1 = 1-5%
Agropyron repens	1 = 1-5%
Total Vegetative Cover:	90%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Perry Ranch** Date: **July 21, 2009** Examiner: **A. Pipp**
Transect Number: **1** Approximate Transect Length: **532 feet** Compass Direction from Start: **288˚** Note: _____

Vegetation Type E: **Type 3 - Upland Floodplain**	
Length of transect in this type: 466-522 feet	
Plant Species	**Cover**
Rumex maritimus & R. crispus TOGETHER	1 = 1-5%
Alopecurus pratensis	1 = 1-5%
Agropyron smithii	4 = 21-50%
Hordeum jubatum	2 = 6-10%
Elymus cinereus	1 = 1-5%
Melilotus alba	1 = 1-5%
Poa pratensis & Kochia scoparia EACH	1 = 1-5%
Total Vegetative Cover:	85%

Vegetation Type F: **Type 6 - Hillside**	
Length of transect in this type: 522-532 feet	
Plant Species	**Cover**
Cirsium arvense ABSENT 2008-2009	
Rumex maritimus & R. crispus TOGETHER	1 = 1-5%
Thlaspi arvense & Descurainia pinnata ABSENT 2008-2009	
Alopecurus pratensis	+ = < 1%
Salix lutea & S. exigua ABSENT 2008-2009	
Mentha arvensis ABSENT 2008-2009	2 = 6-10%
Aster pansus & Poa pratensis & Kochia scoparia EACH	1 = 1-5%
Agropyron smithii & Hordeum jubatum	1 = 1-5%
Family Onagraceae ABSENT 2008-2009	
Phalaris arundinacea & Carex sp. ABSENT 2008-2009	
Potentilla anserina ABSENT 2008-2009	
Elymus cinereus	2 = 6-10%
Melilotus alba	2 = 6-10%
Artemisia frigida	1 = 1-5%
Total Vegetative Cover:	85%

Vegetation Type G:	
Length of transect in this type: feet	
Plant Species	**Cover**
Total Vegetative Cover:	%

Vegetation Type H:	
Length of transect in this type: feet	
Plant Species	**Cover**
Total Vegetative Cover:	%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Cover Estimate		**Indicator Class**	**Source**
+ = < 1%	3 = 11-10%	+ = Obligate	P = Planted
1 = 1-5%	4 = 21-50%	- = Facultative/Wet	V = Volunteer
2 = 6-10%	5 = > 50%	0 = Facultative	

Percent of perimeter developing wetland vegetation (excluding dam/berm structures): **75%**

Establish transects perpendicular to the shoreline (or saturated perimeter). The transect should begin in the upland area. Permanently mark this location with a standard metal fencepost. Extend the imaginary transect line towards the center of the wetland, ending at the 3 foot depth (in open water), or at the point where water depths or saturation are maximized. Mark this location with another metal fencepost.

Estimate cover within a 10 foot wide "belt" along the transect length. At a minimum, establish a transect at the windward and leeward sides of the wetland. Remember that the purpose of this sampling is to monitor, not inventory, representative portions of the wetland site.

Comments: _____

BIRD SURVEY – FIELD DATA SHEET

Site: **Perry Ranch** Date: **7/21/09**
Survey Time: **7:40 am** to **5:00 pm**

Bird Species	#	Behavior	Habitat	Bird Species	#	Behavior	Habitat
Red-winged Blackbird	2	N F F	MA				
Northern Harrier	3	F FO	UP MA				
Dark-eyed Junco	2	F L	UP MA				
Western Meadowlark	1	L	UP				
Sandpiper	1	FO	UP MA				
Am. White Pelican	3	FO	MA UP				

BEHAVIOR CODES
BP = One of a breeding pair
BD = Breeding display
F = Foraging
FO = Flyover
L = Loafing
N = Nesting

HABITAT CODES
AB = Aquatic bed
FO = Forested
I = Island
MA = Marsh
MF = Mud Flat
OW = Open Water
SS = Scrub/Shrub
UP = Upland buffer
WM = Wet meadow
US = Unconsolidated shore

Weather: **In the sixties warming to the low eighties. Winds 0-5 mph. Blue Sky.**

Notes: **Site was dry. Surface water present in one of three small ponds within the inner oxbow and inlet channel. Aquatic plants found, but exposed to air (not surface water). Gate was open and had been opened for a long time. No domestic animals observed within the site.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Perry Ranch Wetland Mitigation Site 2009	**Project No:**	**Date:** 21-Jul-2009	
Applicant/Owner: -Montana Department of Transportation-		**County:** Glacier	
Investigators: andrea pipp		**State:** Montana	
		Plot ID: Soil Pit 1	

Do Normal Circumstances exist on the site?	(Yes) No	**Community ID:** Emergent
Is the site significantly disturbed (Atypical Situation:)?	Yes (No)	**Transect ID:**
Is the area a potential Problem Area?	Yes (No)	**Field Location:**
(If needed, explain on the reverse side)		Type 5; Northern Excavated Area

VEGETATION (USFWS Region No. 9)

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
Hordeum jubatum	Herb	FAC+	*Artemisia biennis*	Herb	FACW
Barley,Fox-Tail			Wormwood,Biennial		
Alopecurus pratensis	Herb	FACW	*Cirsium arvense*	Herb	FACU+
Foxtail,Meadow			Thistle,Creeping		

Percent of Dominant Species that are OBL, FACW or FAC: (excluding FAC-) 3/4 = 75.00%	**FAC Neutral:** 2/3 = 66.67% **Numeric Index:** 11/4 = 2.75

Remarks:

HYDROLOGY

NO **Recorded Data(Describe in Remarks):**
- N/A **Stream, Lake or Tide Gauge**
- N/A **Aerial Photographs**
- N/A **Other**

YES **No Recorded Data**

Field Observations

Depth of Surface Water:	N/A *(in.)*
Depth to Free Water in Pit:	N/A *(in.)*
Depth to Saturated Soil:	> 14 *(in.)*

Wetland Hydrology Indicators

Primary Indicators
- NO **Inundated**
- NO **Saturated in Upper 12 Inches**
- NO **Water Marks**
- NO **Drift Lines**
- NO **Sediment Deposits**
- NO **Drainage Patterns in Wetlands**

Secondary Indicators
- YES **Oxidized Root Channels in Upper 12 Inches**
- NO **Water-Stained Leaves**
- NO **Local Soil Survey Data**
- YES **FAC-Neutral Test**
- NO **Other(Explain in Remarks)**

Remarks:
Site conditions (see report) probably allowed soils to be saturated for at least 17 consecutive days earlier in the growing season.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Perry Ranch Wetland Mitigation Site 2009	**Project No:**	**Date:** 21-Jul-2009	
Applicant/Owner: -Montana Department of Transportation-		**County:** Glacier	
Investigators: andrea pipp		**State:** Montana	
		Plot ID: Soil Pit 1	

SOILS

Map Unit Name (Series and Phase): Kiwanis fine sandy loam
Map Symbol: KS **Drainage Class:** well drained **Mapped Hydric Inclusion?**
Taxonomy (Subgroup): Mixed Frigid Typic Ustifluvents **Field Observations Confirm Mapped Type?** Yes (No)

Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
0-7	A	2.5Y4/2	7.5YR4/6	Few	Distinct	Silty clay loam
7-12	B	2.5Y3/2	7.5YR4/4	Few	Distinct	Silty clay loam
12-14	B	2.5Y3/2	2.5Y5/3 7.5YR4/4	N/A Few	N/A Distinct	Silty clay loam

Hydric Soil Indicators:

NO **Histosol**	NO **Concretions**
NO **Histic Epipedon**	NO **High Organic Content in Surface Layer in Sandy Soils**
NO **Sulfidic Odor**	NO **Organic Streaking in Sandy Soils**
NO **Aquic Moisture Regime**	NO **Listed on Local Hydric Soils List**
NO **Reducing Conditions**	NO **Listed on National Hydric Soils List**
YES **Gleyed or Low Chroma Colors**	NO **Other (Explain in Remarks)**

Remarks:
From 12-14 inches the matrix colors are 2.5Y 3/2 (75%) and 2.5Y 5/3 (15%) with mottles of 7.5YR 4/4 (10%).

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes) No	Is the Sampling Point within the Wetland? (Yes) No
Wetland Hydrology Present?	(Yes) No	
Hydric Soils Present?	(Yes) No	

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Perry Ranch Wetland Mitigation Site 2009	**Project No:**	**Date:** 21-Jul-2009
Applicant/Owner: -Montana Department of Transportation-		**County:** Glacier
Investigators: andrea pipp		**State:** Montana
		Plot ID: Soil Pit 2

Do Normal Circumstances exist on the site?	(Yes) No	**Community ID:** Emergent
Is the site significantly disturbed (Atypical Situation:)?	Yes (No)	**Transect ID:**
Is the area a potential Problem Area? (if needed, explain on the reverse side)	Yes (No)	**Field Location:** Former area of wetland along channel.

VEGETATION (USFWS Region No. 9)

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
Aster pansus	Herb	FAC+	*Achillea millefolium*	Herb	FACU
Aster,Many-Flowered			Yarrow,Common		
Smilacina stellata	Herb	FAC-	*Bromus inermis*	Herb	NI
False-Solomon's-Seal,Starry			Brome, smooth		
Juncus balticus	Herb	OBL	*Rosa arkansana*	Herb	NI
Rush,Baltic			Rose,Prairie		
Artemisia ludoviciana	Herb	UPL			
Sagebrush,White					

Percent of Dominant Species that are OBL, FACW or FAC: (excluding FAC-) 2/5 = 40.00%

FAC Neutral: 1/3 = 33.33%
Numeric Index: 16/5 = 3.20

Remarks:

HYDROLOGY

NO **Recorded Data(Describe in Remarks):**
- N/A **Stream, Lake or Tide Gauge**
- N/A **Aerial Photographs**
- N/A **Other**

YES **No Recorded Data**

Field Observations

Depth of Surface Water: N/A *(in.)*

Depth to Free Water in Pit: N/A *(in.)*

Depth to Saturated Soil: > 13 *(in.)*

Wetland Hydrology Indicators

Primary Indicators
- NO **Inundated**
- NO **Saturated in Upper 12 Inches**
- NO **Water Marks**
- NO **Drift Lines**
- NO **Sediment Deposits**
- NO **Drainage Patterns in Wetlands**

Secondary Indicators
- YES **Oxidized Root Channels in Upper 12 Inches**
- NO **Water-Stained Leaves**
- NO **Local Soil Survey Data**
- NO **FAC-Neutral Test**
- NO **Other(Explain in Remarks)**

Remarks:
Dry (soil crumbles) at 13 inches.

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DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Perry Ranch Wetland Mitigation Site 2009	**Project No:**	**Date:** 21-Jul-2009
Applicant/Owner: -Montana Department of Transportation-		**County:** Glacier
Investigators: andrea pipp		**State:** Montana
		Plot ID: Soil Pit 2

SOILS

Map Unit Name (Series and Phase): Kiwanis fine sandy loam
Map Symbol: KS **Drainage Class:** well drained **Mapped Hydric Inclusion?**
Taxonomy (Subgroup): Mixed Frigid Typic Ustifluvents **Field Observations Confirm Mapped Type?** Yes (No)

Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
0-5	A	10YR3/2	N/A	N/A	N/A	Clay loam
5-13	B	10YR3/2	N/A	N/A	N/A	Clay loam, Oxidized rhizospheres

Hydric Soil Indicators:
- NO **Histosol**
- NO **Histic Epipedon**
- NO **Sulfidic Odor**
- NO **Aquic Moisture Regime**
- NO **Reducing Conditions**
- NO **Gleyed or Low Chroma Colors**
- NO **Concretions**
- NO **High Organic Content in Surface Layer in Sandy Soils**
- NO **Organic Streaking in Sandy Soils**
- NO **Listed on Local Hydric Soils List**
- NO **Listed on National Hydric Soils List**
- NO **Other (Explain in Remarks)**

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes (No)	Is the Sampling Point within the Wetland? Yes (No)
Wetland Hydrology Present?	Yes (No)	
Hydric Soils Present?	Yes (No)	

Remarks:

WetForm™

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Perry Ranch Wetland Mitigation Site 2009 **Applicant/Owner:** -Montana Department of Transportation- **Investigators:** andrea pipp	**Project No:**	**Date:** 21-Jul-2009 **County:** Glacier **State:** Montana **Plot ID:** Soil Pit 3

Do Normal Circumstances exist on the site?	(Yes) No	**Community ID:** Emergent
Is the site significantly disturbed (Atypical Situation:)?	Yes (No)	**Transect ID:**
Is the area a potential Problem Area? (If needed, explain on the reverse side)	Yes (No)	**Field Location:** Type 2; Inlet Channel.

VEGETATION (USFWS Region No. 9)

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
Polygonum amphibium	Herb	OBL	*Eleocharis palustris*	Herb	OBL
Smartweed,Water			Spikerush,Creeping		
Phalaris arundinacea	Herb	FACW	*Salix exigua*	Shrub	OBL
Grass,Reed Canary			Willow,Sandbar		
Typha latifolia	Herb	OBL			
Cattail,Broad-Leaf					

Percent of Dominant Species that are OBL, FACW or FAC: (excluding FAC-) 5/5 = 100.00%
FAC Neutral: 5/5 = 100.00%
Numeric Index: 6/5 = 1.20

Remarks:

HYDROLOGY

NO **Recorded Data(Describe in Remarks):**
- N/A **Stream, Lake or Tide Gauge**
- N/A **Aerial Photographs**
- N/A **Other**

YES **No Recorded Data**

Field Observations

Depth of Surface Water: N/A *(in.)*
Depth to Free Water in Pit: = 5.0 *(in.)*
Depth to Saturated Soil: = 0.0 *(in.)*

Wetland Hydrology Indicators
Primary Indicators
- NO **Inundated**
- YES **Saturated in Upper 12 Inches**
- NO **Water Marks**
- NO **Drift Lines**
- NO **Sediment Deposits**
- NO **Drainage Patterns in Wetlands**

Secondary Indicators
- NO **Oxidized Root Channels in Upper 12 Inches**
- NO **Water-Stained Leaves**
- NO **Local Soil Survey Data**
- YES **FAC-Neutral Test**
- NO **Other(Explain in Remarks)**

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Perry Ranch Wetland Mitigation Site 2009 **Applicant/Owner:** -Montana Department of Transportation- **Investigators:** andrea pipp	**Project No:**	**Date:** 21-Jul-2009 **County:** Glacier **State:** Montana **Plot ID:** Soil Pit 3

SOILS

Map Unit Name (Series and Phase): Kiwanis fine sandy loam
Map Symbol: KS **Drainage Class:** well drained **Mapped Hydric Inclusion?**
Taxonomy (Subgroup): Mixed Frigid Typic Ustifluvents **Field Observations Confirm Mapped Type?** Yes (No)

Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance	Mottle Contrast	Texture, Concretions, Structure, etc
0-1.5	Oi	10YR2/1	N/A	N/A	N/A	Mucky mineral
1.5-4.5	A	2.5Y4/2	N/A	N/A	N/A	Sandy clay loam, gravels
4.5-12	B	2.5Y4/2	10R4/6	Common	Prominent	Sandy clay loam

Hydric Soil Indicators:
- NO **Histosol**
- NO **Histic Epipedon**
- NO **Sulfidic Odor**
- NO **Aquic Moisture Regime**
- NO **Reducing Conditions**
- YES **Gleyed or Low Chroma Colors**
- NO **Concretions**
- NO **High Organic Content in Surface Layer in Sandy Soils**
- NO **Organic Streaking in Sandy Soils**
- NO **Listed on Local Hydric Soils List**
- NO **Listed on National Hydric Soils List**
- NO **Other (Explain in Remarks)**

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes) No	Is the Sampling Point within the Wetland? (Yes) No
Wetland Hydrology Present?	(Yes) No	
Hydric Soils Present?	(Yes) No	

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Perry Ranch Wetland Mitigation Site 2009 **Project No:**
Applicant/Owner: -Montana Department of Transportation-
Investigators: andrea pipp

Date: 21-Jul-2009
County: Glacier
State: Montana
Plot ID: Soil Pit 4

Do Normal Circumstances exist on the site? (Yes) No
Is the site significantly disturbed (Atypical Situation:)? Yes (No)
Is the area a potential Problem Area? Yes (No)
(If needed, explain on the reverse side)

Community ID: Emergent - Scrub/Shrub
Transect ID:
Field Location:
Western depression of Type 4.

VEGETATION (USFWS Region No. 9)

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
Salix exigua	Shrub	OBL	*Equisetum arvense*	Herb	FAC
Willow,Sandbar			Horsetail,Field		
Alopecurus pratensis	Herb	FACW	*Potentilla anserina*	Herb	OBL
Foxtail,Meadow			Silverweed		

Percent of Dominant Species that are OBL, FACW or FAC:
(excluding FAC-) 4/4 = 100.00%

FAC Neutral: 3/3 = 100.00%
Numeric Index: 7/4 = 1.75

Remarks:
Also present, but not dominant: Carex praegracilis and Ranunculus (cymbalaria).

HYDROLOGY

NO **Recorded Data(Describe in Remarks):**
N/A **Stream, Lake or Tide Gauge**
N/A **Aerial Photographs**
N/A **Other**

YES **No Recorded Data**

Field Observations

Depth of Surface Water: N/A *(in.)*
Depth to Free Water in Pit: N/A *(in.)*
Depth to Saturated Soil: = 6.0 *(in.)*

Wetland Hydrology Indicators
Primary Indicators
NO **Inundated**
YES **Saturated in Upper 12 Inches**
NO **Water Marks**
NO **Drift Lines**
NO **Sediment Deposits**
NO **Drainage Patterns in Wetlands**
Secondary Indicators
NO **Oxidized Root Channels in Upper 12 Inches**
NO **Water-Stained Leaves**
NO **Local Soil Survey Data**
YES **FAC-Neutral Test**
NO **Other(Explain in Remarks)**

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Perry Ranch Wetland Mitigation Site 2009 **Project No:**
Applicant/Owner: -Montana Department of Transportation-
Investigators: andrea pipp

Date: 21-Jul-2009
County: Glacier
State: Montana
Plot ID: Soil Pit 4

SOILS

Map Unit Name (Series and Phase): Kiwanis fine sandy loam
Map Symbol: KS **Drainage Class:** well drained **Mapped Hydric Inclusion?**
Taxonomy (Subgroup): Mixed Frigid Typic Ustifluvents **Field Observations Confirm Mapped Type?** Yes (No)
Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
0-6	A	2.5Y4/1	10YR4/6	Common	Prominent	Silty clay loam
6-13	B	2.5Y4/1	10YR4/6	Common	Prominent	Sandy loam

Hydric Soil Indicators:
NO **Histosol**
NO **Histic Epipedon**
NO **Sulfidic Odor**
NO **Aquic Moisture Regime**
NO **Reducing Conditions**
YES **Gleyed or Low Chroma Colors**
NO **Concretions**
NO **High Organic Content in Surface Layer in Sandy Soils**
NO **Organic Streaking in Sandy Soils**
NO **Listed on Local Hydric Soils List**
NO **Listed on National Hydric Soils List**
NO **Other (Explain in Remarks)**

Remarks:
From 6-13 inches the texture is very sandy.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? (Yes) No

Is the Sampling Point within the Wetland? (Yes) No

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Perry Ranch Wetland Mitigation Site 2009	**Project No:**	**Date:** 21-Jul-2009
Applicant/Owner: -Montana Department of Transportation-		**County:** Glacier
Investigators: andrea pipp		**State:** Montana
		Plot ID: Soil Pit 5

Do Normal Circumstances exist on the site?	(Yes) No	**Community ID:** Emergent
Is the site significantly disturbed (Atypical Situation:)?	Yes (No)	**Transect ID:**
Is the area a potential Problem Area? (If needed, explain on the reverse side)	Yes (No)	**Field Location:** Type 2; Inner Oxbow.

VEGETATION (USFWS Region No. 9)

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
Polygonum amphibium	Herb	OBL	*Alopecurus pratensis*	Herb	FACW
Smartweed,Water			Foxtail,Meadow		

Percent of Dominant Species that are OBL, FACW or FAC: (excluding FAC-) 2/2 = 100.00%

FAC Neutral: 2/2 = 100.00%
Numeric Index: 3/2 = 1.50

Remarks:

HYDROLOGY

NO **Recorded Data(Describe in Remarks):**
- N/A **Stream, Lake or Tide Gauge**
- N/A **Aerial Photographs**
- N/A **Other**

YES **No Recorded Data**

Field Observations

Depth of Surface Water: N/A *(in.)*

Depth to Free Water in Pit: N/A *(in.)*

Depth to Saturated Soil: > 13 *(in.)*

Wetland Hydrology Indicators

Primary Indicators
- NO **Inundated**
- NO **Saturated in Upper 12 Inches**
- NO **Water Marks**
- NO **Drift Lines**
- NO **Sediment Deposits**
- YES **Drainage Patterns in Wetlands**

Secondary Indicators
- NO **Oxidized Root Channels in Upper 12 Inches**
- NO **Water-Stained Leaves**
- NO **Local Soil Survey Data**
- YES **FAC-Neutral Test**
- NO **Other(Explain in Remarks)**

Remarks:
Soil was very moist, but not saturated. Inner oxbow is a depression that holds ground and surface waters early in the growing season. Site conditions (see report) probably allowed soils to be saturated for at least 17 consecutive days earlier in the growing season.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Perry Ranch Wetland Mitigation Site 2009	**Project No:**	**Date:** 21-Jul-2009
Applicant/Owner: -Montana Department of Transportation-		**County:** Glacier
Investigators: andrea pipp		**State:** Montana
		Plot ID: Soil Pit 5

SOILS

Map Unit Name (Series and Phase): Kiwanis fine sandy loam
Map Symbol: KS **Drainage Class:** well drained **Mapped Hydric Inclusion?**
Taxonomy (Subgroup): Mixed Frigid Typic Ustifluvents **Field Observations Confirm Mapped Type?** Yes (No)

Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
0-12	A	10YR3/1	10YR4/4	Common	Distinct	Clay loam

Hydric Soil Indicators:
- NO **Histosol**
- NO **Histic Epipedon**
- NO **Sulfidic Odor**
- NO **Aquic Moisture Regime**
- NO **Reducing Conditions**
- YES **Gleyed or Low Chroma Colors**
- NO **Concretions**
- NO **High Organic Content in Surface Layer in Sandy Soils**
- NO **Organic Streaking in Sandy Soils**
- NO **Listed on Local Hydric Soils List**
- NO **Listed on National Hydric Soils List**
- NO **Other (Explain in Remarks)**

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes) No	Is the Sampling Point within the Wetland? (Yes) No
Wetland Hydrology Present?	(Yes) No	
Hydric Soils Present?	(Yes) No	

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Perry Ranch Wetland Mitigation Site 2009	**Project No:**	**Date:** 21-Jul-2009	
Applicant/Owner: -Montana Department of Transportation-		**County:** Glacier	
Investigators: andrea pipp		**State:** Montana	
		Plot ID: Soil Pit 6	

Do Normal Circumstances exist on the site?	(Yes) No	**Community ID:** Emergent
Is the site significantly disturbed (Atypical Situation:)?	Yes (No)	**Transect ID:**
Is the area a potential Problem Area? (If needed, explain on the reverse side)	Yes (No)	**Field Location:** Type 1 of Inner Oxbow.

VEGETATION (USFWS Region No. 9)

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
Alopecurus pratensis	Herb	FACW	*Glycyrrhiza lepidota*	Herb	FAC+
Foxtail,Meadow			Licorice,American		
Potentilla anserina	Herb	OBL	*Carex praegracilis*	Herb	FACW
Silverweed			Sedge,Clustered Field		
Juncus balticus	Herb	OBL			
Rush,Baltic					

Percent of Dominant Species that are OBL, FACW or FAC: (excluding FAC-) 5/5 = 100.00%

FAC Neutral: 4/4 = 100.00%
Numeric Index: 9/5 = 1.80

Remarks:

HYDROLOGY

NO **Recorded Data(Describe in Remarks):**
- N/A **Stream, Lake or Tide Gauge**
- N/A **Aerial Photographs**
- N/A **Other**

YES **No Recorded Data**

Field Observations

Depth of Surface Water:	N/A *(in.)*
Depth to Free Water in Pit:	N/A *(in.)*
Depth to Saturated Soil:	> 13 *(in.)*

Wetland Hydrology Indicators

Primary Indicators
- NO **Inundated**
- NO **Saturated in Upper 12 Inches**
- NO **Water Marks**
- NO **Drift Lines**
- NO **Sediment Deposits**
- NO **Drainage Patterns in Wetlands**

Secondary Indicators
- YES **Oxidized Root Channels in Upper 12 Inches**
- NO **Water-Stained Leaves**
- NO **Local Soil Survey Data**
- YES **FAC-Neutral Test**
- NO **Other(Explain in Remarks)**

Remarks:
Soil was dry. Site conditions (see report) probably allowed soils to be saturated for at least 17 consecutive days earlier in the growing season.

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DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Perry Ranch Wetland Mitigation Site 2009	**Project No:**	**Date:** 21-Jul-2009	
Applicant/Owner: -Montana Department of Transportation-		**County:** Glacier	
Investigators: andrea pipp		**State:** Montana	
		Plot ID: Soil Pit 6	

SOILS

Map Unit Name (Series and Phase): Kiwanis fine sandy loam
Map Symbol: KS **Drainage Class:** well drained **Mapped Hydric Inclusion?**
Taxonomy (Subgroup): Mixed Frigid Typic Ustifluvents **Field Observations Confirm Mapped Type?** Yes (No)

Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
0-5	A	10YR3/1	N/A	N/A	N/A	Clay loam, Oxidized rhizospheres
5-12	B	2.5Y4/2	10YR4/4	Few	Distinct	Silty clay

Hydric Soil Indicators:

- NO **Histosol**
- NO **Histic Epipedon**
- NO **Sulfidic Odor**
- NO **Aquic Moisture Regime**
- NO **Reducing Conditions**
- YES **Gleyed or Low Chroma Colors**
- NO **Concretions**
- NO **High Organic Content in Surface Layer in Sandy Soils**
- NO **Organic Streaking in Sandy Soils**
- NO **Listed on Local Hydric Soils List**
- NO **Listed on National Hydric Soils List**
- NO **Other (Explain in Remarks)**

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes) No	Is the Sampling Point within the Wetland? (Yes) No
Wetland Hydrology Present?	(Yes) No	
Hydric Soils Present?	(Yes) No	

Remarks:

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DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Perry Ranch Wetland Mitigation Site 2009	**Project No:**	**Date:** 21-Jul-2009
Applicant/Owner: -Montana Department of Transportation-		**County:** Glacier
Investigators: andrea pipp		**State:** Montana
		Plot ID: Soil Pit 7

Do Normal Circumstances exist on the site?	(Yes) No	**Community ID:** Emergent
Is the site significantly disturbed (Atypical Situation:)?	Yes (No)	**Transect ID:**
Is the area a potential Problem Area? (if needed, explain on the reverse side)	Yes (No)	**Field Location:** Type 2 of Outer Oxbow; near T1 start.

VEGETATION (USFWS Region No. 9)

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
Salix exigua Willow,Sandbar	Shrub	OBL	*Equisetum arvense* Horsetail,Field	Herb	FAC
Alopecurus pratensis Foxtail,Meadow	Herb	FACW			

Percent of Dominant Species that are OBL, FACW or FAC: (excluding FAC-) 3/3 = 100.00%

FAC Neutral: 2/2 = 100.00%
Numeric Index: 6/3 = 2.00

Remarks:

HYDROLOGY

NO **Recorded Data(Describe in Remarks):**
- N/A **Stream, Lake or Tide Gauge**
- N/A **Aerial Photographs**
- N/A **Other**

YES **No Recorded Data**

Field Observations

Depth of Surface Water: N/A *(in.)*

Depth to Free Water in Pit: N/A *(in.)*

Depth to Saturated Soil: > 13 *(in.)*

Wetland Hydrology Indicators

Primary Indicators
- NO **Inundated**
- NO **Saturated in Upper 12 Inches**
- NO **Water Marks**
- NO **Drift Lines**
- NO **Sediment Deposits**
- NO **Drainage Patterns in Wetlands**

Secondary Indicators
- YES **Oxidized Root Channels in Upper 12 Inches**
- NO **Water-Stained Leaves**
- NO **Local Soil Survey Data**
- YES **FAC-Neutral Test**
- NO **Other(Explain in Remarks)**

Remarks:
Soil was moist, but not saturated at 13 inches.

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DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Perry Ranch Wetland Mitigation Site 2009	**Project No:**	**Date:** 21-Jul-2009
Applicant/Owner: -Montana Department of Transportation-		**County:** Glacier
Investigators: andrea pipp		**State:** Montana
		Plot ID: Soil Pit 7

SOILS

Map Unit Name (Series and Phase): Kiwanis fine sandy loam
Map Symbol: KS **Drainage Class:** well drained **Mapped Hydric Inclusion?**
Taxonomy (Subgroup): Mixed Frigid Typic Ustifluvents **Field Observations Confirm Mapped Type?** Yes (No)

Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
0-5	A	2.5Y4/2	N/A	N/A	N/A	Clay loam, Oxidized rhizospheres
5-11	B	2.5Y4/1	10YR4/6	Common	Distinct	Clay loam
5-11	B	10YR2/1	10YR4/6	N/A	N/A	Clay loam
11-13	B	2.5Y4/2	10YR4/6	Common	Distinct	Sandy clay loam

Hydric Soil Indicators:
- NO **Histosol**
- NO **Histic Epipedon**
- NO **Sulfidic Odor**
- NO **Aquic Moisture Regime**
- NO **Reducing Conditions**
- YES **Gleyed or Low Chroma Colors**
- NO **Concretions**
- NO **High Organic Content in Surface Layer in Sandy Soils**
- NO **Organic Streaking in Sandy Soils**
- NO **Listed on Local Hydric Soils List**
- NO **Listed on National Hydric Soils List**
- NO **Other (Explain in Remarks)**

Remarks:
From 5-11 inches, soil matrix colors were 70% 2.5Y 4/1 and 20% 10YR 2/1 with 10% 10YR 4/6 mottles.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes) No	Is the Sampling Point within the Wetland? (Yes) No
Wetland Hydrology Present?	(Yes) No	
Hydric Soils Present?	(Yes) No	

Remarks:

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DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Perry Ranch Wetland Mitigation Site 2009	**Project No:**	**Date:** 21-Jul-2009	
Applicant/Owner: -Montana Department of Transportation-		**County:** Glacier	
Investigators: andrea pipp		**State:** Montana	
		Plot ID: Soil Pit 8	

Do Normal Circumstances exist on the site?	(Yes) No	**Community ID:** Emergent
Is the site significantly disturbed (Atypical Situation:)?	Yes (No)	**Transect ID:**
Is the area a potential Problem Area?	Yes (No)	**Field Location:**
(If needed, explain on the reverse side)		Type 2 of Outer Oxbow; West of channel.

VEGETATION (USFWS Region No. 9)

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
Artemisia biennis	Herb	FACW	*Eleocharis palustris*	Herb	OBL
Wormwood,Biennial			Spikerush,Creeping		
Hordeum jubatum	Herb	FAC+	*Alopecurus pratensis*	Herb	FACW
Barley,Fox-Tail			Foxtail,Meadow		

Percent of Dominant Species that are OBL, FACW or FAC: (excluding FAC-) 4/4 = 100.00%

FAC Neutral: 3/3 = 100.00%
Numeric Index: 8/4 = 2.00

Remarks:

HYDROLOGY

NO **Recorded Data(Describe in Remarks):**
- N/A **Stream, Lake or Tide Gauge**
- N/A **Aerial Photographs**
- N/A **Other**

YES **No Recorded Data**

Field Observations

Depth of Surface Water:	N/A *(in.)*
Depth to Free Water in Pit:	N/A *(in.)*
Depth to Saturated Soil:	> 13 *(in.)*

Wetland Hydrology Indicators

Primary Indicators
- NO **Inundated**
- NO **Saturated in Upper 12 Inches**
- NO **Water Marks**
- NO **Drift Lines**
- NO **Sediment Deposits**
- NO **Drainage Patterns in Wetlands**

Secondary Indicators
- NO **Oxidized Root Channels in Upper 12 Inches**
- NO **Water-Stained Leaves**
- NO **Local Soil Survey Data**
- YES **FAC-Neutral Test**
- YES **Other(Explain in Remarks)**

Remarks:
Soil is dry, though soil moisture increases with depth. Site conditions (see report) probably allowed soils to be saturated for at least 17 consecutive days earlier in the growing season.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Perry Ranch Wetland Mitigation Site 2009	**Project No:**	**Date:** 21-Jul-2009	
Applicant/Owner: -Montana Department of Transportation-		**County:** Glacier	
Investigators: andrea pipp		**State:** Montana	
		Plot ID: Soil Pit 8	

SOILS

Map Unit Name (Series and Phase): Kiwanis fine sandy loam
Map Symbol: KS **Drainage Class:** well drained **Mapped Hydric Inclusion?**
Taxonomy (Subgroup): Mixed Frigid Typic Ustifluvents **Field Observations Confirm Mapped Type?** Yes (No)

Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
0-5	A	2.5Y3/1	10YR4/6	Few	Distinct	Silty clay loam
5-13	B	2.5Y3/2	10YR4/6	Few	Distinct	Silty clay loam

Hydric Soil Indicators:
- NO **Histosol**
- NO **Histic Epipedon**
- NO **Sulfidic Odor**
- NO **Aquic Moisture Regime**
- NO **Reducing Conditions**
- YES **Gleyed or Low Chroma Colors**
- NO **Concretions**
- NO **High Organic Content in Surface Layer in Sandy Soils**
- NO **Organic Streaking in Sandy Soils**
- NO **Listed on Local Hydric Soils List**
- NO **Listed on National Hydric Soils List**
- NO **Other (Explain in Remarks)**

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes) No	Is the Sampling Point within the Wetland? (Yes) No
Wetland Hydrology Present?	(Yes) No	
Hydric Soils Present?	(Yes) No	

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Perry Ranch Wetland Mitigation Site 2009	**Project No:**	**Date:** 21-Jul-2009	
Applicant/Owner: -Montana Department of Transportation-		**County:** Glacier	
Investigators: andrea pipp		**State:** Montana	
		Plot ID: Soil Pit 9	

Do Normal Circumstances exist on the site?	(Yes) No	**Community ID:** Emergent
Is the site significantly disturbed (Atypical Situation:)?	Yes (No)	**Transect ID:**
Is the area a potential Problem Area?	Yes (No)	**Field Location:**
(If needed, explain on the reverse side)		Type 2 of Outer Oxbow; East of channel.

VEGETATION (USFWS Region No. 9)

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
Artemisia biennis	Herb	FACW	*Agropyron smithii*	Herb	FACU
Wormwood,Biennial			Wheatgrass,Western		
Hordeum jubatum	Herb	FAC+	*Rumex maritimus*	Herb	FACW+
Barley,Fox-Tail			Dock,Golden		
Potentilla anserina	Herb	OBL	*Eleocharis palustris*	Herb	OBL
Silverweed			Spikerush,Creeping		

Percent of Dominant Species that are OBL, FACW or FAC: (excluding FAC-) 5/6 = 83.33%

FAC Neutral: 4/5 = 80.00%
Numeric Index: 13/6 = 2.17

Remarks:
Also present, but not dominant was a Salix exigua seedling.

HYDROLOGY

NO **Recorded Data(Describe in Remarks):**
- N/A **Stream, Lake or Tide Gauge**
- N/A **Aerial Photographs**
- N/A **Other**

YES **No Recorded Data**

Field Observations

Depth of Surface Water:	N/A *(in.)*
Depth to Free Water in Pit:	N/A *(in.)*
Depth to Saturated Soil:	> 13 *(in.)*

Wetland Hydrology Indicators

Primary Indicators
- NO **Inundated**
- NO **Saturated in Upper 12 Inches**
- NO **Water Marks**
- NO **Drift Lines**
- NO **Sediment Deposits**
- NO **Drainage Patterns in Wetlands**

Secondary Indicators
- YES **Oxidized Root Channels in Upper 12 Inches**
- NO **Water-Stained Leaves**
- NO **Local Soil Survey Data**
- YES **FAC-Neutral Test**
- NO **Other(Explain in Remarks)**

Remarks:
From 0-3 inches soil was very dry; from 3-13 inches soil had a tad bit of moisture. Site conditions (see report) probably allowed soils to be saturated for at least 17 consecutive days earlier in the growing season.

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DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Perry Ranch Wetland Mitigation Site 2009	**Project No:**	**Date:** 21-Jul-2009	
Applicant/Owner: -Montana Department of Transportation-		**County:** Glacier	
Investigators: andrea pipp		**State:** Montana	
		Plot ID: Soil Pit 9	

SOILS

Map Unit Name (Series and Phase): Kiwanis fine sandy loam
Map Symbol: KS **Drainage Class:** well drained **Mapped Hydric Inclusion?**
Taxonomy (Subgroup): Mixed Frigid Typic Ustifluvents **Field Observations Confirm Mapped Type?** Yes (No)

Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
0-6	A	2.5Y3/2	N/A	N/A	N/A	Silty clay loam
6-13	B	2.5Y3/1	N/A	N/A	N/A	Silty clay loam, Oxidized rhizospheres

Hydric Soil Indicators:

- NO **Histosol**
- NO **Histic Epipedon**
- NO **Sulfidic Odor**
- NO **Aquic Moisture Regime**
- NO **Reducing Conditions**
- YES **Gleyed or Low Chroma Colors**
- NO **Concretions**
- NO **High Organic Content in Surface Layer in Sandy Soils**
- NO **Organic Streaking in Sandy Soils**
- NO **Listed on Local Hydric Soils List**
- NO **Listed on National Hydric Soils List**
- NO **Other (Explain in Remarks)**

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes) No	Is the Sampling Point within the Wetland? (Yes) No
Wetland Hydrology Present?	(Yes) No	
Hydric Soils Present?	(Yes) No	

Remarks:

WetForm™

MDT MONTANA WETLAND ASSESSMENT FORM (revised March 2008)

1. Project Name: Perry Ranch **2. MDT Project #:** NH 0002(232) **3. Control #:** 0703

3. Evaluation Date: July 21, 2009 **4. Evaluator(s):** Andrea Pipp **5. Wetland/Site #(s):** Inner Oxbow

6. Wetland Location(s): Township 34 N, Range 8 W, Section 27, 34; Township ___N, Range ___E, Section _____

Approximate Stationing or Roadposts: NA

Watershed: 8 - Marias **County:** Glacier _ _ _____

7. Evaluating Agency: MDT

Purpose of Evaluation:

- ☐ **Wetland potentially affected by MDT project**
- ☐ **Mitigation wetlands; pre-construction**
- ☒ **Mitigation wetlands; post-construction**
- ☐ **Other** _____

8. Wetland Size (acre): _____ (visually estimated)
4.87 (measured, e.g. GPS)

9. Assessment Area (AA) Size (acre): _____ (visually estimated)
(see manual for determining AA) 4.87 (measured, e.g. GPS)

10. CLASSIFICATION OF WETLAND AND AQUATIC HABITATS IN AA (See manual for definitions.)

HGM Class (Brinson)	Class (Cowardin)	Modifier (Cowardin)	Water Regime	% OF AA
Riverine	Emergent Wetland	Excavated	Seasonal / Intermittent	70
Riverine	Scrub-Shrub Wetland	Excavated	Seasonal / Intermittent	30
Riverine	Unconsolidated Bottom	Excavated	Seasonal / Intermittent	0

Comments: The unconsolidated bottom of the inlet channel has colonized with emergent and aquatic plants. Aquatic plants occupy less than 0.5% of the area; they occur where water pools annually.

11. ESTIMATED RELATIVE ABUNDANCE (of similarly classified sites within the same Major Montana Watershed Basin; see manual.)
common

12. GENERAL CONDITION OF AA

i. Disturbance: Use matrix below to select the appropriate response; see manual for Montana listed noxious weed and aquatic nuisance vegetation species lists.

Conditions within AA	Predominant Conditions Adjacent to (within 500 feet of) AA		
	Managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or buildings; and noxious weed or ANVS cover is ≤15%.	Land not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to minor clearing; contains few roads or buildings; noxious weed or ANVS cover is ≤30%.	Land cultivated or heavily grazed or logged; subject to substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >30%.
AA occurs and is managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or occupied buildings; and noxious weed or ANVS cover is ≤15%.	---	low disturbance	---
AA not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to relatively minor clearing, fill placement, or hydrological alteration; contains few roads or buildings; noxious weed or ANVS cover is ≤30%.	---	---	---
AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >30%.	---	---	---

Comments (types of disturbance, intensity, season, etc.)**:** _____

ii. Prominent noxious, aquatic nuisance, and other exotic vegetation species: Cirsium arvense, Euphorbia esula, Melilotus officinale, Bromus inermis, & Cynoglossum officinale observed in 2009.

iii. Provide brief descriptive summary of AA and surrounding land use/habitat: Agricultural fields and grazing lands. Cut Bank River is adjacent to site.

13. STRUCTURAL DIVERSITY (Based on number of "Cowardin" ***vegetated*** classes present [do not include unvegetated classes]; see #10 above.)

Existing # of "Cowardin" Vegetated Classes in AA	Initial Rating	Is current management preventing (passive) existence of additional vegetated classes?		Modified Rating
≥3 (or 2 if one is forested) classes	---	NA	NA	NA
2 (or 1 if forested) classes	mod	NA	NA	NA
1 class, but not a monoculture	---	←NO	YES→	---
1 class, monoculture (1 species comprises ≥90% of total cover)	---	NA	NA	NA

Comments: _____

Wetland/Site #(s): Inner Oxbow

14A. HABITAT FOR FEDERALLY LISTED OR PROPOSED THREATENED OR ENDANGERED PLANTS OR ANIMALS

i. AA is Documented (D) or Suspected (S) to contain: Check box based on definitions in manual.

Primary or critical habitat (**list species**) ☐ D ☐ S _____
Secondary habitat (**list species**) ☐ D ☐ S _____
Incidental habitat (**list species**) ☐ D ☒ S Piping Plover
No usable habitat ☐ S

ii. Rating: Based on the strongest habitat chosen in 14A(i) above, select the corresponding functional point and rating.

Highest Habitat Level	Doc/Primary	Sus/Primary	Doc/Secondary	Sus/Secondary	Doc/Incidental	Sus/Incidental	None
Functional Point/Rating	---	---	---	---	---	.1L	---

Sources for documented use (e.g. observations, records): _____

14B. HABITAT FOR PLANTS OR ANIMALS RATED S1, S2, OR S3 BY THE MONTANA NATURAL HERITAGE PROGRAM
Do not include species listed in 14A above.

i. AA is Documented (D) or Suspected (S) to contain: Check box based on definitions in manual.

Primary or critical habitat (**list species**) ☒ D ☐ S Northern Leopard Frog
Secondary habitat (**list species**) ☐ D ☐ S _____
Incidental habitat (**list species**) ☐ D ☐ S _____
No usable habitat ☐ S

ii. Rating: Based on the strongest habitat chosen in 14A(i) above, select the corresponding functional point and rating.

Highest Habitat Level	Doc/Primary	Sus/Primary	Doc/Secondary	Sus/Secondary	Doc/Incidental	Sus/Incidental	None
S1 Species Functional Point/Rating	1H	---	---	---	---	---	---
S2 and S3 Species Functional Point/Rating	---	---	---	---	---	---	---

Sources for documented use (e.g. observations, records): Northern leopard frogs have been observed in 2008, 2006, 2005, and 2002. From 1 to 8 individuals have been observed during these years.

14C. GENERAL WILDLIFE HABITAT RATING

i. Evidence of Overall Wildlife Use in the AA: Check substantial, moderate, or low based on supporting evidence.

☐ ***Substantial:*** Based on any of the following [check].
- ☐ observations of abundant wildlife #s or high species diversity (during any period)
- ☐ abundant wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☐ presence of extremely limiting habitat features not available in the surrounding area
- ☐ interview with local biologist with knowledge of the AA

☐ ***Minimal:*** Based on any of the following [check].
- ☐ few or no wildlife observations during peak use periods
- ☐ little to no wildlife sign
- ☐ sparse adjacent upland food sources
- ☐ interview with local biologist with knowledge of AA

☒ ***Moderate:*** Based on any of the following [check].
- ☐ observations of scattered wildlife groups or individuals or relatively few species during peak periods
- ☐ common occurrence of wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☐ adequate adjacent upland food sources
- ☐ interview with local biologist with knowledge of the AA

ii. Wildlife Habitat Features: Working from top to bottom, check appropriate AA attributes in matrix to arrive at rating. Structural diversity is from #13. For class cover to be considered evenly distributed, the most and least prevalent **vegetated** classes must be within 20% of each other in terms of their percent composition of the AA (see #10). Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; and A = absent [see manual for further definitions of these terms].

Structural Diversity (see #13)	☐ **High**								☒ **Moderate**								☐ **Low**			
Class Cover Distribution (all vegetated classes)	☐ **Even**				☐ **Uneven**				☐ **Even**				☒ **Uneven**				☐ **Even**			
Duration of Surface Water in ≥ 10% of AA	**P/P**	**S/I**	**T/E**	**A**	**P/P**	**S/I**	**T/E**	**A**	**P/P**	**S/I**	**T/E**	**A**	**P/P**	**S/I**	**T/E**	**A**	**P/P**	**S/I**	**T/E**	**A**
☒ **Low Disturbance** at AA (see #12i)	---	---	---	---	---	---	---	---	---	---	---	---	---	H	---	---	---	---	---	---
☐ **Moderate Disturbance** at AA (see #12i)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
☐ **High Disturbance** at AA (see #12i)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

iii. Rating: Use the conclusions from i and ii above and the matrix below to select the functional point and rating.

Evidence of Wildlife Use (i)	**Wildlife Habitat Features Rating (ii)** ☐ **Exceptional**	☒ **High**	☐ **Moderate**	☐ **Low**
☐ **Substantial**	---	---	---	---
☒ **Moderate**	---	.7M	---	---
☐ **Minimal**	---	---	---	---

Comments: In 2009 several species of migratory birds were observed foraging and/or singing and several white-tailed deer were observed bedded in the site. Observations of wildlife uses were less in 2009 then in 2008 because the site lacked surface water.

Wetland/Site #(s): Inner Oxbow

14D. GENERAL FISH HABITAT ☒ **NA** (proceed to 14E)

If the AA is not used by fish, fish use is not restorable due to habitat constraints, or is not desired from a management perspective [such as fish entrapped in a canal], then check the NA box and proceed to 14E.

Assess this function if the AA is used by fish or the existing situation is "correctable" such that the AA could be used by fish [i.e., fish use is precluded by perched culvert or other barrier].

Type of Fishery: ☐ Cold Water (**CW**) ☐ Warm Water (**WW**) **Use the CW or WW guidelines in the manual to complete the matrix.**

i. Habitat Quality and Known / Suspected Fish Species in AA: Use matrix to select the functional point and rating.

Duration of Surface Water in AA	☐ **Permanent / Perennial**						☐ **Seasonal / Intermittent**						☐ **Temporary / Ephemeral**					
Aquatic Hiding / Resting / Escape Cover	☐ **Optimal**		☐ **Adequate**		☐ **Poor**		☐ **Optimal**		☐ **Adequate**		☐ **Poor**		☐ **Optimal**		☐ **Adequate**		☐ **Poor**	
Thermal Cover: optimal / suboptimal	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**
FWP Tier I fish species	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FWP Tier II or **Native Game** fish species	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FWP Tier III or **Introduced Game** fish	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FWP Non-Game Tier IV or **No** fish species	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Sources used for identifying fish spp. potentially found in AA: _____

ii. Modified Rating: NOTE: Modified score cannot exceed 1.0 or be less than 0.1.

a) Is fish use of the AA significantly reduced by a culvert, dike, or other man-made structure or activity, ***or*** *is the waterbody included on the current final MDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support,* ***or*** *do aquatic nuisance plant or animal species (see* ***Appendix E****) occur in fish habitat?* ☐ **YES**, reduce score in **i** by 0.1 = __ or ☐ **N0**

b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area; specify in comments) for native fish or introduced game fish? ☐ **YES**, add to score in **i** or **iia** 0.1 = __ or ☐ **N0**

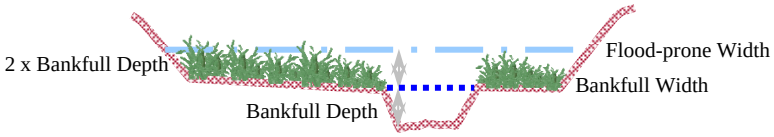
iii. Final Score and Rating: _ **Comments:** _____

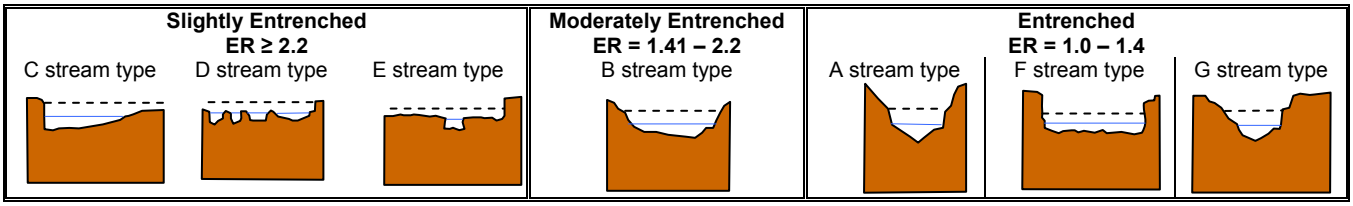
14E. FLOOD ATTENUATION ☐ **NA** (proceed to 14F)

Applies only to wetlands that are subject to flooding via in-channel or overbank flow.
If wetlands in AA are not flooded from in-channel or overbank flow, check the NA box and proceed to 14F.

Entrenchment Ratio (ER) Estimation (see manual for additional guidance). Entrenchment ratio = (flood-prone width) / (bankfull width).
Flood-prone width = estimated horizontal projection of where 2 X maximum bankfull depth elevation intersects the floodplain on each side of the stream.

_____ / _____ = _____
flood prone width / bankfull width = entrenchment ratio





i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating.

Estimated or Calculated Entrenchment (Rosgen 1994, 1996)	☒ Slightly Entrenched C, D, E stream types			☐ Moderately Entrenched B stream type			☐ Entrenched A, F, G stream types		
Percent of Flooded Wetland Classified as Forested and/or Scrub/Shrub	☐ 75%	☒ 25-75%	☐ <25%	☐ 75%	☐ 25-75%	☐ <25%	☐ 75%	☐ 25-75%	☐ <25%
AA contains **no outlet or restricted outlet**	---	.9H	---	---	---	---	---	---	---
AA contains **unrestricted outlet**	---	---	---	---	---	---	---	---	---

ii. Are ≥10 acres of wetland in the AA subject to flooding AND are man-made features which may be significantly damaged by floods located within 0.5 mile downstream of the AA? ☐ YES ☒ NO **Comments:** _____

Wetland/Site #(s): Inner Oxbow

14F. SHORT AND LONG TERM SURFACE WATER STORAGE ☐ **NA** (proceed to 14G)

Applies to wetlands that flood or pond from overbank or in-channel flow, precipitation, upland surface flow, or groundwater flow.
If no wetlands in the AA are subject to flooding or ponding, then check the NA box and proceed to 14G.

i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating. Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; and T/E = temporary/ephemeral [see manual for further definitions of these terms].

Estimated Maximum Acre Feet of Water Contained in Wetlands within the AA that are Subject to Periodic Flooding or Ponding	☒ **>5 acre feet**			☐ **1.1 to 5 acre feet**			☐ **≤1 acre foot**		
Duration of Surface Water at Wetlands within the AA	☐ **P/P**	☒ **S/I**	☐ **T/E**	☐ **P/P**	☐ **S/I**	☐ **T/E**	☐ **P/P**	☐ **S/I**	☐ **T/E**
Wetlands in AA flood or pond **≥ 5 out of 10 years**	---	.9H	---	---	---	---	---	---	---
Wetlands in AA flood or pond **< 5 out of 10 years**	---	---	---	---	---	---	---	---	---

Comments: Site floods when water levels in Cut Bank Creek exceed a certain threshold. Site acts as a backwater channel for Cut Bank Creek.

14G. SEDIMENT / NUTRIENT / TOXICANT / RETENTION AND REMOVAL ☐ **NA** (proceed to 14H)

Applies to wetland with potential to receive sediments, nutrients, or toxicants through influx of surface or ground water or direct input.
If no wetlands in the AA are subject to such input, check the NA box and proceed to 14H.

i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating.

Sediment, Nutrient, and Toxicant Input Levels within AA	**AA receives or surrounding land use has potential to deliver sediments, nutrients, or compounds at levels such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.**				**Waterbody is on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants or AA receives or surrounding land use has potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.**			
% Cover of Wetland Vegetation in AA	☒ **≥ 70%**		☐ **< 70%**		☐ **≥ 70%**		☐ **< 70%**	
Evidence of Flooding / Ponding in AA	☒ **Yes**	☐ **No**	☐ **Yes**	☐ **No**	☐ **Yes**	☐ **No**	☐ **Yes**	☐ **No**
AA contains **no or restricted outlet**	1H	---	---	---	---	---	---	---
AA contains **unrestricted outlet**	---	---	---	---	---	---	---	---

Comments: Site can receive sediment and nutrients from Cut Bank Creek.

14H. SEDIMENT / SHORELINE STABILIZATION ☒ **NA** (proceed to 14I)

Applies only if AA occurs on or within the banks of a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body which is subject to wave action.
If 14H does not apply, check the NA box and proceed to 14I.

% Cover of Wetland Streambank or Shoreline by Species with Stability Ratings of ≥6 (see Appendix F).	**Duration of Surface Water Adjacent to Rooted Vegetation**		
	☐ **Permanent / Perennial**	☐ **Seasonal / Intermittent**	☐ **Temporary / Ephemeral**
☐ **≥ 65%**	---	---	---
☐ **35-64%**	---	---	---
☐ **< 35%**	---	---	---

Comments: _____

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT

i. Level of Biological Activity: Synthesis of wildlife and fish habitat rates (select).

General Fish Habitat Rating (14Diii)	**General Wildlife Habitat Rating (14Ciii)**		
	☐ **E/H**	☒ **M**	☐ **L**
☐ **E/H**	---	---	---
☐ **M**	---	---	---
☐ **L**	---	---	---
☒ **NA**	---	M	---

ii. Rating: Working from top to bottom, use the matrix below to select the functional point and rating. Factor A = acreage of vegetated wetland component in the AA; Factor B = level of biological activity rating from above (14Ii); Factor C = whether or not the AA contains a surface or subsurface outlet; the final three rows pertain to the duration of surface water in the AA, where P/P, S/I, and T/E were previously defined, and A = "absent" [see manual for further definitions of these terms].

A	☐ **Vegetated Component >5 acres**						☒ **Vegetated Component 1-5 acres**						☐ **Vegetated Component <1 acre**					
B	☐ **High**		☐ **Moderate**		☐ **Low**		☐ **High**		☒ **Moderate**		☐ **Low**		☐ **High**		☐ **Moderate**		☐ **Low**	
C	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**
P/P	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
S/I	---	---	---	---	---	---	---	---	---	.3L	---	---	---	---	---	---	---	---
T/E/A	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Wetland/Site #(s): Inner Oxbow

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT (continued)

iii. Modified Rating: Note: Modified score cannot exceed 1.0 or be less than 0.1.

Vegetated Upland Buffer: Area with ≥ 30% plant cover, ≤ 15% noxious weed or ANVS cover, AND that is not subjected to periodic mechanical mowing or clearing (unless for weed control).
Is there an average ≥ 50-foot wide vegetated upland buffer around ≥ 75% of the AA's perimeter? ☒ **YES**, add 0.1 to score in **ii =** ___ ☐ **NO**

iv. Final Score and Rating: .4M **Comments:** Upland buffer contains substantial amounts of leafy spurge and Canada thistle.

14J. GROUNDWATER DISCHARGE / RECHARGE
Check the appropriate indicators in i and ii below.

i. Discharge Indicators
- ☐ The AA is a slope wetland.
- ☐ Springs or seeps are known or observed.
- ☐ Vegetation growing during dormant season/drought.
- ☐ Wetland occurs at the toe of a natural slope.
- ☐ Seeps are present at the wetland edge.
- ☐ AA permanently flooded during drought periods.
- ☐ Wetland contains an outlet, but no inlet.
- ☒ Shallow water table and the site is saturated to the surface.
- ☒ Other: Alluvial flow enters into site.

ii. Recharge Indicators
- ☐ Permeable substrate present without underlying impeding layer.
- ☐ Wetland contains inlet but no outlet.
- ☐ Stream is a known 'losing' stream. Discharge volume decreases.
- ☐ Other: _____

iii. Rating: Use the information from i and ii above and the table below to select the functional point and rating.

Criteria	Duration of Saturation at AA Wetlands ***FROM GROUNDWATER DISCHARGE*** or ***WITH WATER THAT IS RECHARGING THE GROUNDWATER SYSTEM***			
	☐ **P/P**	☒ **S/I**	☐ **T**	☐ **None**
☒ **Groundwater Discharge or Recharge**	---	.7M	---	---
☐ **Insufficient Data/Information**	---			

Comments: _____

14K. UNIQUENESS

i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating.

Replacement Potential	**AA contains fen, bog, warm springs or mature (>80 yr-old) forested wetland** OR **plant association listed as "S1" by the MTNHP**			**AA does not contain previously cited rare types** AND **structural diversity (#13) is high** OR **contains plant association listed as "S2" by the MTNHP**			**AA does not contain previously cited rare types** OR **associations** AND **structural diversity (#13) is low-moderate**		
Estimated Relative Abundance (#11)	☐ Rare	☐ Common	☐ Abundant	☐ Rare	☐ Common	☐ Abundant	☐ Rare	☒ Common	☐ Abundant
☒ **Low Disturbance** at AA (#12i)	---	---	---	---	---	---	---	.4M	---
☐ **Moderate Disturbance** at AA (#12i)	---	---	---	---	---	---	---	---	---
☐ **High Disturbance** at AA (#12i)	---	---	---	---	---	---	---	---	---

Comments: _____

14L. RECREATION / EDUCATION POTENTIAL ☐ NA (proceed to Overall Summary and Rating page)
Affords 'bonus' points if AA provides a recreational or educational opportunity.

i. Is the AA a known or potential recreational or educational site? ☒ **YES**, go to ii. ☐ **NO**, check the NA box.

ii. Check categories that apply to the AA: ☒ Educational/Scientific Study ☐ Consumptive Recreational ☐ Non-consumptive recreational
☐ Other: _____

iii. Rating: Use the matrix below to select the functional point and rating.

Known or Potential Recreational or Educational Area	Known	Potential
Public ownership or public easement with general public access (no permission required)	---	---
Private ownership with general public access (no permission required)	---	---
Private or public ownership without general public access, or requiring permission for public access	---	.05L

Comments: Tribal ownership restricts access.

15. GENERAL SITE NOTES: _____

Wetland/Site #(s): Inner Oxbow

Function & Value Variables	Rating – Actual Functional Points	Possible Functional Points	Functional Units: Actual Points x Estimated AA Acreage	Indicate the Four Most Prominent Functions with an Asterisk
A. Listed / Proposed T&E Species Habitat	low 0.10	1.00		
B. MT Natural Heritage Program Species Habitat	high 1.00	1.00		*
C. General Wildlife Habitat	mod 0.70	1.00		*
D. General Fish Habitat	NA	---		
E. Flood Attenuation	high 0.90	1.00		*
F. Short and Long Term Surface Water Storage	high 0.90	1.00		
G. Sediment / Nutrient / Toxicant Removal	high 1.00	1.00		*
H. Sediment / Shoreline Stabilization	NA	---		
I. Production Export / Food Chain Support	mod 0.40	1.00		
J. Groundwater Discharge / Recharge	mod 0.70	1.00		
K. Uniqueness	mod 0.40	1.00		
L. Recreation / Education Potential (bonus point)	low 0.05			
Total Points	**6.15**	**9.0**	**Total Functional Units**	
Percent of Possible Score 68% (round to nearest whole number)				

Category I Wetland: (must satisfy **one** of the following criteria; otherwise go to Category II)
- ☐ Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; **or**
- ☐ Score of 1 functional point for Uniqueness; **or**
- ☐ Score of 1 functional point for Flood Attenuation **and** answer to Question 14E.ii is "yes"; **or**
- ☐ Percent of possible score > 80% (round to nearest whole #).

Category II Wetland: (Criteria for Category I not satisfied **and** meets any **one** of the following criteria; otherwise go to Category IV)
- ☒ Score of 1 functional point for MT Natural Heritage Program Species Habitat; **or**
- ☐ Score of .9 or 1 functional point for General Wildlife Habitat; **or**
- ☐ Score of .9 or 1 functional point for General Fish Habitat; **or**
- ☐ "High" to "Exceptional" ratings for **both** General Wildlife Habitat **and** General Fish/Aquatic Habitat; **or**
- ☐ Score of .9 functional point for Uniqueness; **or**
- ☒ Percent of possible score > 65% (round to nearest whole #).

☐ **Category III Wetland:** (Criteria for Categories I, II, or IV not satisfied)

Category IV Wetland: (Criteria for Categories I or II are not satisfied and all of the following criteria are met; if not go to Category III)
- ☐ "Low" rating for Uniqueness; **and**
- ☐ Vegetated wetland component < 1 acre (do not include upland vegetated buffer); **and**
- ☐ Percent of possible score < 35% (round to nearest whole #).

OVERALL ANALYSIS AREA (AA) RATING: Check the appropriate category based on the criteria outlined above.

☐ **I** ☒ **II** ☐ **III** ☐ **IV**

MDT MONTANA WETLAND ASSESSMENT FORM (revised March 2008)

1. Project Name: Perry Ranch **2. MDT Project #:** NH 0002(232) **3. Control #:** 0703

3. Evaluation Date: July 21, 2009 **4. Evaluator(s):** Andrea Pipp **5. Wetland/Site #(s):** Outer Oxbow

6. Wetland Location(s): Township 34 N, Range 8 W, Section 27, 34; Township ___N, Range ___E, Section _____

Approximate Stationing or Roadposts: NA

Watershed: 8 - Marias **County:** Glacier _ _ _____

7. Evaluating Agency: MDT

Purpose of Evaluation:

- ☐ **Wetland potentially affected by MDT project**
- ☐ **Mitigation wetlands; pre-construction**
- ☒ **Mitigation wetlands; post-construction**
- ☐ **Other** _____

8. Wetland Size (acre): _____ (visually estimated)
9.45 (measured, e.g. GPS)

9. Assessment Area (AA) Size (acre): _____ (visually estimated)
(see manual for determining AA) 9.45 (measured, e.g. GPS)

10. CLASSIFICATION OF WETLAND AND AQUATIC HABITATS IN AA (See manual for definitions.)

HGM Class (Brinson)	Class (Cowardin)	Modifier (Cowardin)	Water Regime	% OF AA
Riverine	Emergent Wetland	Excavated	Seasonal / Intermittent	100

Comments: _____

11. ESTIMATED RELATIVE ABUNDANCE (of similarly classified sites within the same Major Montana Watershed Basin; see manual.)
common

12. GENERAL CONDITION OF AA

i. Disturbance: Use matrix below to select the appropriate response; see manual for Montana listed noxious weed and aquatic nuisance vegetation species lists.

Conditions within AA	Predominant Conditions Adjacent to (within 500 feet of) AA		
	Managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or buildings; and noxious weed or ANVS cover is ≤15%.	Land not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to minor clearing; contains few roads or buildings; noxious weed or ANVS cover is ≤30%.	Land cultivated or heavily grazed or logged; subject to substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >30%.
AA occurs and is managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or occupied buildings; and noxious weed or ANVS cover is ≤15%.	---	low disturbance	---
AA not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to relatively minor clearing, fill placement, or hydrological alteration; contains few roads or buildings; noxious weed or ANVS cover is ≤30%.	---	---	---
AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >30%.	---	---	---

Comments (types of disturbance, intensity, season, etc.)**:** _____

ii. Prominent noxious, aquatic nuisance, and other exotic vegetation species: Cirsium arvense, Melilotus officinale, & Bromus inermis.

iii. Provide brief descriptive summary of AA and surrounding land use/habitat: Agricultural fields and grazing land; Cut Bank Creek flows adjacent to the site.

13. STRUCTURAL DIVERSITY (Based on number of "Cowardin" ***vegetated*** classes present [do not include unvegetated classes]; see #10 above.)

Existing # of "Cowardin" Vegetated Classes in AA	Initial Rating	Is current management preventing (passive) existence of additional vegetated classes?		Modified Rating
≥3 (or 2 if one is forested) classes	---	NA	NA	NA
2 (or 1 if forested) classes	---	NA	NA	NA
1 class, but not a monoculture	mod	←NO	YES→	---
1 class, monoculture (1 species comprises ≥90% of total cover)	---	NA	NA	NA

Comments: _____

Wetland/Site #(s): Outer Oxbow

14A. HABITAT FOR FEDERALLY LISTED OR PROPOSED THREATENED OR ENDANGERED PLANTS OR ANIMALS

i. AA is Documented (D) or Suspected (S) to contain: Check box based on definitions in manual.

Primary or critical habitat (**list species**) ☐ D ☐ S _____
Secondary habitat (**list species**) ☐ D ☐ S _____
Incidental habitat (**list species**) ☐ D ☒ S Piping Plover
No usable habitat ☐ S

ii. Rating: Based on the strongest habitat chosen in 14A(i) above, select the corresponding functional point and rating.

Highest Habitat Level	Doc/Primary	Sus/Primary	Doc/Secondary	Sus/Secondary	Doc/Incidental	Sus/Incidental	None
Functional Point/Rating	---	---	---	---	---	.1L	---

Sources for documented use (e.g. observations, records): _____

14B. HABITAT FOR PLANTS OR ANIMALS RATED S1, S2, OR S3 BY THE MONTANA NATURAL HERITAGE PROGRAM
Do not include species listed in 14A above.

i. AA is Documented (D) or Suspected (S) to contain: Check box based on definitions in manual.

Primary or critical habitat (**list species**) ☐ D ☒ S Northern Leopard Frog
Secondary habitat (**list species**) ☐ D ☐ S _____
Incidental habitat (**list species**) ☐ D ☐ S _____
No usable habitat ☐ S

ii. Rating: Based on the strongest habitat chosen in 14A(i) above, select the corresponding functional point and rating.

Highest Habitat Level	Doc/Primary	Sus/Primary	Doc/Secondary	Sus/Secondary	Doc/Incidental	Sus/Incidental	None
S1 Species Functional Point/Rating	---	.8H	---	---	---	---	---
S2 and S3 Species Functional Point/Rating	---	---	---	---	---	---	---

Sources for documented use (e.g. observations, records): Northern leopard frogs have been observed in the Inner Oxbow and in the uplands around the Northern Excavated Area and it is suspected that primary/critical habitat is provided at the Outer Oxbow. The frogs have been observed in 2008, 2006, 2005, and 2002. From 1 to 8 individuals have been observed during these years.

14C. GENERAL WILDLIFE HABITAT RATING

i. Evidence of Overall Wildlife Use in the AA: Check substantial, moderate, or low based on supporting evidence.

☐ ***Substantial:*** Based on any of the following [check].
- ☐ observations of abundant wildlife #s or high species diversity (during any period)
- ☐ abundant wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☐ presence of extremely limiting habitat features not available in the surrounding area
- ☐ interview with local biologist with knowledge of the AA

☐ ***Minimal:*** Based on any of the following [check].
- ☐ few or no wildlife observations during peak use periods
- ☐ little to no wildlife sign
- ☐ sparse adjacent upland food sources
- ☐ interview with local biologist with knowledge of AA

☒ ***Moderate:*** Based on any of the following [check].
- ☒ observations of scattered wildlife groups or individuals or relatively few species during peak periods
- ☒ common occurrence of wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☒ adequate adjacent upland food sources
- ☐ interview with local biologist with knowledge of the AA

ii. Wildlife Habitat Features: Working from top to bottom, check appropriate AA attributes in matrix to arrive at rating. Structural diversity is from #13. For class cover to be considered evenly distributed, the most and least prevalent **vegetated** classes must be within 20% of each other in terms of their percent composition of the AA (see #10). Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; and A = absent [see manual for further definitions of these terms].

Structural Diversity (see #13)	☐ **High**								☒ **Moderate**								☐ **Low**			
Class Cover Distribution (all vegetated classes)	☐ **Even**				☐ **Uneven**				☒ **Even**				☐ **Uneven**				☐ **Even**			
Duration of Surface Water in ≥ 10% of AA	**P/P**	**S/I**	**T/E**	**A**	**P/P**	**S/I**	**T/E**	**A**	**P/P**	**S/I**	**T/E**	**A**	**P/P**	**S/I**	**T/E**	**A**	**P/P**	**S/I**	**T/E**	**A**
☒ **Low Disturbance** at AA (see #12i)	---	---	---	---	---	---	---	---	---	H	---	---	---	---	---	---	---	---	---	---
☐ **Moderate Disturbance** at AA (see #12i)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
☐ **High Disturbance** at AA (see #12i)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

iii. Rating: Use the conclusions from i and ii above and the matrix below to select the functional point and rating.

Evidence of Wildlife Use (i)	**Wildlife Habitat Features Rating (ii)** ☐ **Exceptional**	☒ **High**	☐ **Moderate**	☐ **Low**
☐ **Substantial**	---	---	---	---
☒ **Moderate**	---	.7M	---	---
☐ **Minimal**	---	---	---	---

Comments: Wildlife use was observed to be moderate in 2009.

Wetland/Site #(s): Outer Oxbow

14D. GENERAL FISH HABITAT ☒ **NA** (proceed to 14E)

If the AA is not used by fish, fish use is not restorable due to habitat constraints, or is not desired from a management perspective [such as fish entrapped in a canal], then check the NA box and proceed to 14E.

Assess this function if the AA is used by fish or the existing situation is "correctable" such that the AA could be used by fish [i.e., fish use is precluded by perched culvert or other barrier].

Type of Fishery: ☐ Cold Water (**CW**) ☐ Warm Water (**WW**) **Use the CW or WW guidelines in the manual to complete the matrix.**

i. Habitat Quality and Known / Suspected Fish Species in AA: Use matrix to select the functional point and rating.

Duration of Surface Water in AA	☐ **Permanent / Perennial**						☐ **Seasonal / Intermittent**						☐ **Temporary / Ephemeral**					
Aquatic Hiding / Resting / Escape Cover	☐ **Optimal**		☐ **Adequate**		☐ **Poor**		☐ **Optimal**		☐ **Adequate**		☐ **Poor**		☐ **Optimal**		☐ **Adequate**		☐ **Poor**	
Thermal Cover: optimal / suboptimal	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**
FWP Tier I fish species	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FWP Tier II or **Native Game** fish species	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FWP Tier III or **Introduced Game** fish	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FWP Non-Game Tier IV or **No** fish species	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Sources used for identifying fish spp. potentially found in AA: _____

ii. Modified Rating: NOTE: Modified score cannot exceed 1.0 or be less than 0.1.

a) Is fish use of the AA significantly reduced by a culvert, dike, or other man-made structure or activity, ***or*** *is the waterbody included on the current final MDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support,* ***or*** *do aquatic nuisance plant or animal species (see* ***Appendix E****) occur in fish habitat?* ☐ **YES**, reduce score in **i** by 0.1 = __ or ☐ **N0**

b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area; specify in comments) for native fish or introduced game fish? ☐ **YES**, add to score in **i** or **iia** 0.1 = __ or ☐ **N0**

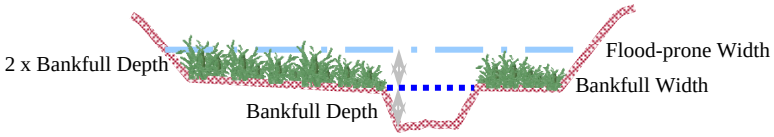
iii. Final Score and Rating: _ **Comments:** _____

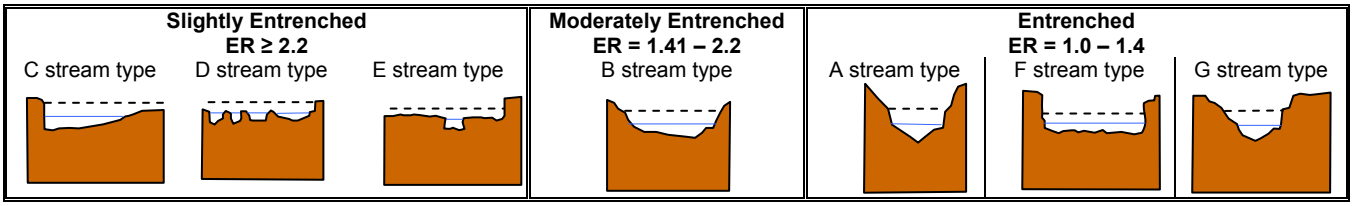
14E. FLOOD ATTENUATION ☐ **NA** (proceed to 14F)

Applies only to wetlands that are subject to flooding via in-channel or overbank flow.
If wetlands in AA are not flooded from in-channel or overbank flow, check the NA box and proceed to 14F.

Entrenchment Ratio (ER) Estimation (see manual for additional guidance). Entrenchment ratio = (flood-prone width) / (bankfull width).
Flood-prone width = estimated horizontal projection of where 2 X maximum bankfull depth elevation intersects the floodplain on each side of the stream.

_____ / _____ = _____
flood prone width / bankfull width = entrenchment ratio





i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating.

Estimated or Calculated Entrenchment (Rosgen 1994, 1996)	☒ Slightly Entrenched C, D, E stream types			☐ Moderately Entrenched B stream type			☐ Entrenched A, F, G stream types		
Percent of Flooded Wetland Classified as Forested and/or Scrub/Shrub	☐ 75%	☐ 25-75%	☒ <25%	☐ 75%	☐ 25-75%	☐ <25%	☐ 75%	☐ 25-75%	☐ <25%
AA contains **no outlet or restricted outlet**	---	---	.6M	---	---	---	---	---	---
AA contains **unrestricted outlet**	---	---	---	---	---	---	---	---	---

ii. Are ≥10 acres of wetland in the AA subject to flooding AND are man-made features which may be significantly damaged by floods located within 0.5 mile downstream of the AA? ☐ YES ☒ NO **Comments:** _____

Wetland/Site #(s): Outer Oxbow

14F. SHORT AND LONG TERM SURFACE WATER STORAGE ☐ **NA** (proceed to 14G)

Applies to wetlands that flood or pond from overbank or in-channel flow, precipitation, upland surface flow, or groundwater flow.
If no wetlands in the AA are subject to flooding or ponding, then check the NA box and proceed to 14G.

i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating. Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; and T/E = temporary/ephemeral [see manual for further definitions of these terms].

Estimated Maximum Acre Feet of Water Contained in Wetlands within the AA that are Subject to Periodic Flooding or Ponding	☒ **>5 acre feet**			☐ **1.1 to 5 acre feet**			☐ **≤1 acre foot**		
Duration of Surface Water at Wetlands within the AA	☐ **P/P**	☒ **S/I**	☐ **T/E**	☐ **P/P**	☐ **S/I**	☐ **T/E**	☐ **P/P**	☐ **S/I**	☐ **T/E**
Wetlands in AA flood or pond ≥ **5 out of 10 years**	---	.9H	---	---	---	---	---	---	---
Wetlands in AA flood or pond **< 5 out of 10 years**	---	---	---	---	---	---	---	---	---

Comments: Site floods when water levels in Cut Bank Creek exceed a certain threshold. Site acts as a backwater channel for Cut Bank Creek.

14G. SEDIMENT / NUTRIENT / TOXICANT / RETENTION AND REMOVAL ☐ **NA** (proceed to 14H)

Applies to wetland with potential to receive sediments, nutrients, or toxicants through influx of surface or ground water or direct input.
If no wetlands in the AA are subject to such input, check the NA box and proceed to 14H.

i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating.

Sediment, Nutrient, and Toxicant Input Levels within AA	**AA receives or surrounding land use has potential to deliver sediments, nutrients, or compounds at levels such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.**				**Waterbody is on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants or AA receives or surrounding land use has potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.**			
% Cover of Wetland Vegetation in AA	☒ **≥ 70%**		☐ **< 70%**		☐ **≥ 70%**		☐ **< 70%**	
Evidence of Flooding / Ponding in AA	☒ **Yes**	☐ **No**	☐ **Yes**	☐ **No**	☐ **Yes**	☐ **No**	☐ **Yes**	☐ **No**
AA contains **no or restricted outlet**	1H	---	---	---	---	---	---	---
AA contains **unrestricted outlet**	---	---	---	---	---	---	---	---

Comments: Site can receive sediment and nutrients from Cut Bank Creek.

14H. SEDIMENT / SHORELINE STABILIZATION ☒ **NA** (proceed to 14I)

Applies only if AA occurs on or within the banks of a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body which is subject to wave action.
If 14H does not apply, check the NA box and proceed to 14I.

% Cover of Wetland Streambank or Shoreline by Species with Stability Ratings of ≥6 (see Appendix F).	**Duration of Surface Water Adjacent to Rooted Vegetation**		
	☐ **Permanent / Perennial**	☐ **Seasonal / Intermittent**	☐ **Temporary / Ephemeral**
☐ **≥ 65%**	---	---	---
☐ **35-64%**	---	---	---
☐ **< 35%**	---	---	---

Comments: _____

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT

i. Level of Biological Activity: Synthesis of wildlife and fish habitat rates (select).

General Fish Habitat Rating (14Diii)	**General Wildlife Habitat Rating (14Ciii)**		
	☐ **E/H**	☒ **M**	☐ **L**
☐ **E/H**	---	---	---
☐ **M**	---	---	---
☐ **L**	---	---	---
☒ **NA**	---	M	---

ii. Rating: Working from top to bottom, use the matrix below to select the functional point and rating. Factor A = acreage of vegetated wetland component in the AA; Factor B = level of biological activity rating from above (14Ii); Factor C = whether or not the AA contains a surface or subsurface outlet; the final three rows pertain to the duration of surface water in the AA, where P/P, S/I, and T/E were previously defined, and A = "absent" [see manual for further definitions of these terms].

A	☒ **Vegetated Component >5 acres**						☐ **Vegetated Component 1-5 acres**						☐ **Vegetated Component <1 acre**					
B	☐ **High**		☒ **Moderate**		☐ **Low**		☐ **High**		☐ **Moderate**		☐ **Low**		☐ **High**		☐ **Moderate**		☐ **Low**	
C	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**
P/P	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
S/I	---	---	---	.4M	---	---	---	---	---	---	---	---	---	---	---	---	---	---
T/E/A	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Wetland/Site #(s): Outer Oxbow

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT (continued)

iii. Modified Rating: Note: Modified score cannot exceed 1.0 or be less than 0.1.

Vegetated Upland Buffer: Area with ≥ 30% plant cover, ≤ 15% noxious weed or ANVS cover, AND that is not subjected to periodic mechanical mowing or clearing (unless for weed control).
Is there an average ≥ 50-foot wide vegetated upland buffer around ≥ 75% of the AA's perimeter? ☒ **YES**, add 0.1 to score in **ii =** ___ ☐ **NO**

iv. Final Score and Rating: .5M **Comments:** Upland buffer contains substantial amounts of leafy spurge and Canada thistle.

14J. GROUNDWATER DISCHARGE / RECHARGE
Check the appropriate indicators in i and ii below.

i. Discharge Indicators
- ☐ The AA is a slope wetland.
- ☐ Springs or seeps are known or observed.
- ☐ Vegetation growing during dormant season/drought.
- ☐ Wetland occurs at the toe of a natural slope.
- ☐ Seeps are present at the wetland edge.
- ☐ AA permanently flooded during drought periods.
- ☐ Wetland contains an outlet, but no inlet.
- ☒ Shallow water table and the site is saturated to the surface.
- ☒ Other: Alluvial flow enters into site.

ii. Recharge Indicators
- ☐ Permeable substrate present without underlying impeding layer.
- ☐ Wetland contains inlet but no outlet.
- ☐ Stream is a known 'losing' stream. Discharge volume decreases.
- ☐ Other: _____

iii. Rating: Use the information from i and ii above and the table below to select the functional point and rating.

Criteria	Duration of Saturation at AA Wetlands ***FROM GROUNDWATER DISCHARGE*** or ***WITH WATER THAT IS RECHARGING THE GROUNDWATER SYSTEM***			
	☐ **P/P**	☒ **S/I**	☐ **T**	☐ **None**
☒ **Groundwater Discharge or Recharge**	---	.7M	---	---
☐ **Insufficient Data/Information**	---			

Comments: _____

14K. UNIQUENESS

i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating.

Replacement Potential	**AA contains fen, bog, warm springs or mature (>80 yr-old) forested wetland** OR **plant association listed as "S1" by the MTNHP**			**AA does not contain previously cited rare types** AND **structural diversity (#13) is high** OR **contains plant association listed as "S2" by the MTNHP**			**AA does not contain previously cited rare types** OR **associations** AND **structural diversity (#13) is low-moderate**		
Estimated Relative Abundance (#11)	☐ Rare	☐ Common	☐ Abundant	☐ Rare	☐ Common	☐ Abundant	☐ Rare	☒ Common	☐ Abundant
☒ **Low Disturbance** at AA (#12i)	---	---	---	---	---	---	---	.4M	---
☐ **Moderate Disturbance** at AA (#12i)	---	---	---	---	---	---	---	---	---
☐ **High Disturbance** at AA (#12i)	---	---	---	---	---	---	---	---	---

Comments: _____

14L. RECREATION / EDUCATION POTENTIAL ☐ NA (proceed to Overall Summary and Rating page)
Affords 'bonus' points if AA provides a recreational or educational opportunity.

i. Is the AA a known or potential recreational or educational site? ☒ **YES**, go to ii. ☐ **NO**, check the NA box.

ii. Check categories that apply to the AA: ☒ Educational/Scientific Study ☐ Consumptive Recreational ☐ Non-consumptive recreational
☐ Other: _____

iii. Rating: Use the matrix below to select the functional point and rating.

Known or Potential Recreational or Educational Area	Known	Potential
Public ownership or public easement with general public access (no permission required)	---	---
Private ownership with general public access (no permission required)	---	---
Private or public ownership without general public access, or requiring permission for public access	---	.05L

Comments: Tribal ownership restricts access.

15. GENERAL SITE NOTES: _____

Wetland/Site #(s): Outer Oxbow

Function & Value Variables	Rating – Actual Functional Points	Possible Functional Points	Functional Units: Actual Points x Estimated AA Acreage	Indicate the Four Most Prominent Functions with an Asterisk
A. Listed / Proposed T&E Species Habitat	low 0.10	1.00		
B. MT Natural Heritage Program Species Habitat	high 0.80	1.00		*
C. General Wildlife Habitat	mod 0.70	1.00		
D. General Fish Habitat	NA	---		
E. Flood Attenuation	mod 0.60	1.00		
F. Short and Long Term Surface Water Storage	high 0.90	1.00		*
G. Sediment / Nutrient / Toxicant Removal	high 1.00	1.00		*
H. Sediment / Shoreline Stabilization	NA	---		
I. Production Export / Food Chain Support	mod 0.50	1.00		*
J. Groundwater Discharge / Recharge	mod 0.70	1.00		
K. Uniqueness	mod 0.40	1.00		
L. Recreation / Education Potential (bonus point)	low 0.05			
Total Points	**5.75**	**9.0**	**Total Functional Units**	
Percent of Possible Score 64% (round to nearest whole number)				

Category I Wetland: (must satisfy **one** of the following criteria; otherwise go to Category II)
- ☐ Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; **or**
- ☐ Score of 1 functional point for Uniqueness; **or**
- ☐ Score of 1 functional point for Flood Attenuation **and** answer to Question 14E.ii is "yes"; **or**
- ☐ Percent of possible score > 80% (round to nearest whole #).

Category II Wetland: (Criteria for Category I not satisfied **and** meets any **one** of the following criteria; otherwise go to Category IV)
- ☐ Score of 1 functional point for MT Natural Heritage Program Species Habitat; **or**
- ☐ Score of .9 or 1 functional point for General Wildlife Habitat; **or**
- ☐ Score of .9 or 1 functional point for General Fish Habitat; **or**
- ☐ "High" to "Exceptional" ratings for **both** General Wildlife Habitat **and** General Fish/Aquatic Habitat; **or**
- ☐ Score of .9 functional point for Uniqueness; **or**
- ☐ Percent of possible score > 65% (round to nearest whole #).

☒ **Category III Wetland:** (Criteria for Categories I, II, or IV not satisfied)

Category IV Wetland: (Criteria for Categories I or II are not satisfied and all of the following criteria are met; if not go to Category III)
- ☐ "Low" rating for Uniqueness; **and**
- ☐ Vegetated wetland component < 1 acre (do not include upland vegetated buffer); **and**
- ☐ Percent of possible score < 35% (round to nearest whole #).

OVERALL ANALYSIS AREA (AA) RATING: Check the appropriate category based on the criteria outlined above.

☐ **I** ☐ **II** ☒ **III** ☐ **IV**

Appendix C

2009 REPRESENTATIVE PHOTOGRAPHS
2002 TO 2009 AERIAL PHOTOGRAPHS

MDT Wetland Mitigation Monitoring
Perry Ranch
Glacier County, Montana

Photo Point 1: Panoramic view showing the Northern Excavated Area (foreground) and Outer Oxbow (background) on July 21, 2009. View is south.

Photo Point 2: Panoramic view showing the Outer Oxbow (photo left) and Inner Oxbow (photo right) on July 21, 2009. View is southeast.

Photo Point 3: Panoramic view showing the southwestern end of the site on July 21, 2009. Delivery ditch is in the foreground. Cut Bank Creek is on photo right. View is east.

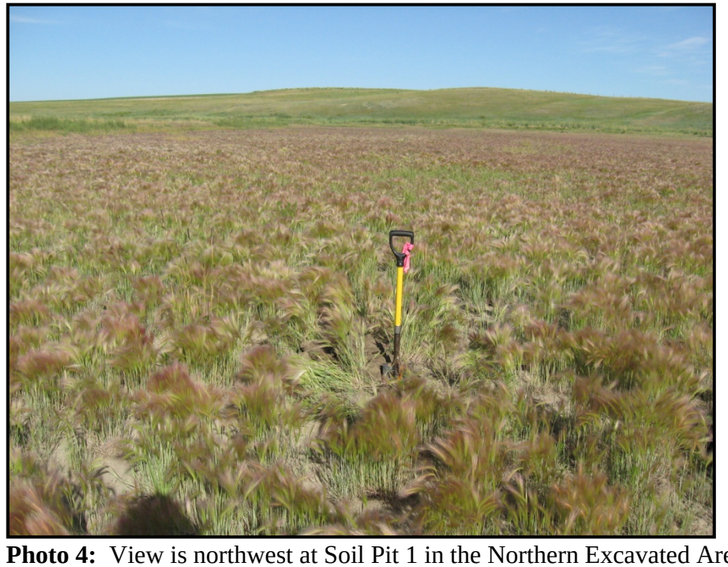


Photo 4: View is northwest at Soil Pit 1 in the Northern Excavated Area (Type 5).

Photo 5: View is northwest at Soil Pit 2. This area has slowly converted from Type 1 wetland to upland.

Photo 6: View is west at Soil Pit 3 in the inlet channel (Type 2).

Photo 7: *Hippuris vulgaris*, an aquatic plant, drying in the inlet channel (Type 2).

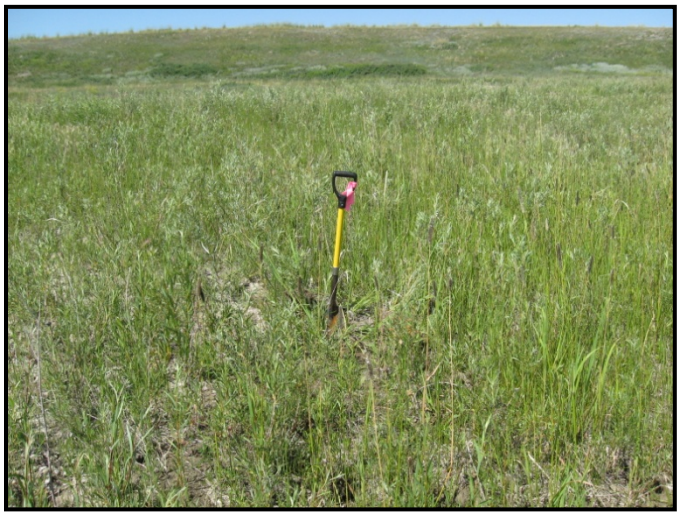


Photo 8: View is west-northwest at Soil Pit 4 in the western depression of Type 4.

Photo 9: View is northwest at Soil Pit 5 in the Inner Oxbow (Type 2).

Photo 10: At the east end of dike facing west into the Inner Oxbow.

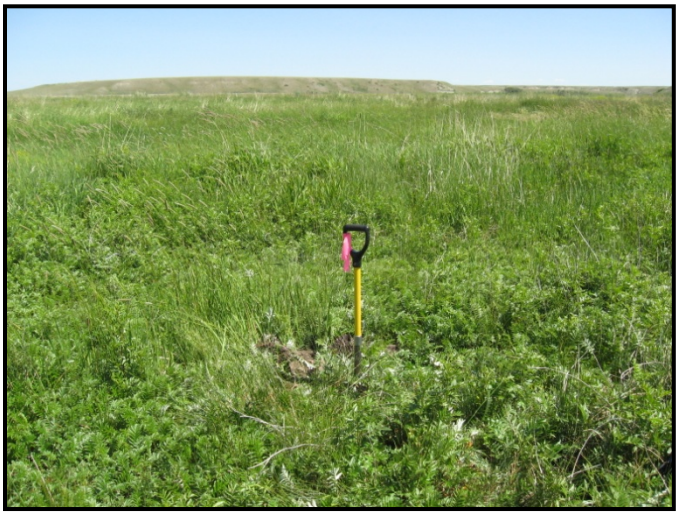


Photo 11: View is east at Soil Pit 6 in the Inner Oxbow (Type 1).

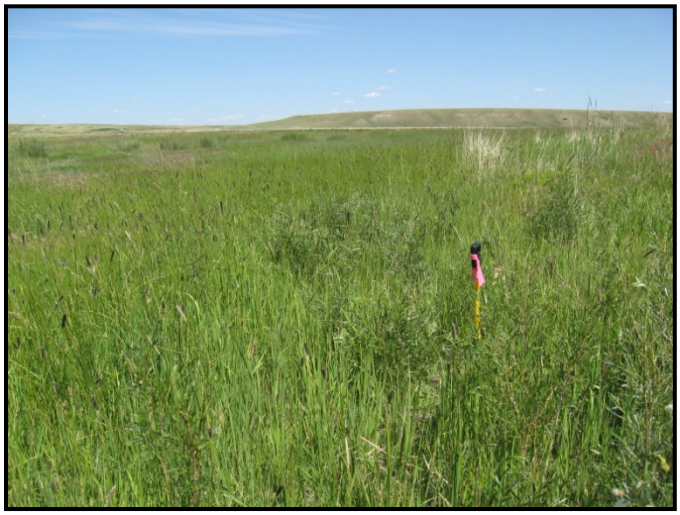


Photo 12: View is north at Soil Pit 7 near the start of Transect 1 in the Outer Oxbow.

Photo 13: View is northeast at Soil Pit 8 in the Outer Oxbow.

Photo 14: View is north at Soil Pit 9 in the Outer Oxbow.

Photo 15: From start of Transect 1 at 288˚.

Photo 16: From end of Transect 1 at 108˚.

Photo 17: Abundant catkin production on a *Salix exigua* (sandbar willow).

PHOTOS 18 - 21:

Weed Photo Point 1. View is northeast at a patch of *Cirsium arvense* (Canada thistle).

Photo 18: June 18, 2007.

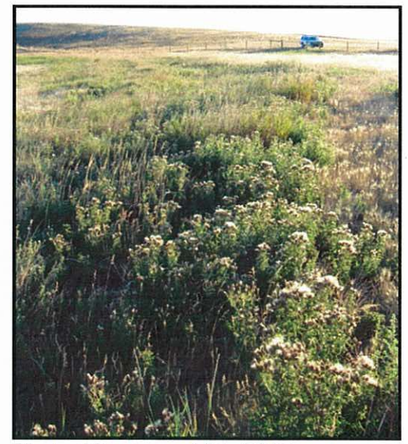


Photo 19: August 21, 2007.

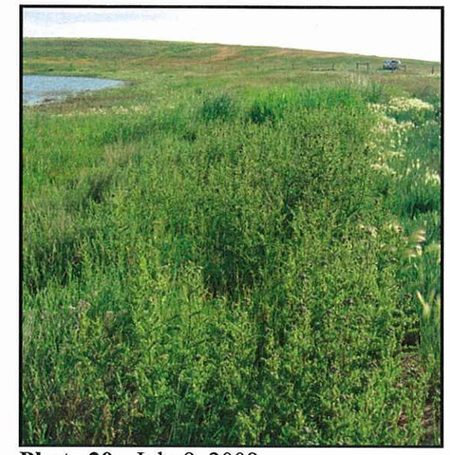


Photo 20: July 9, 2008.

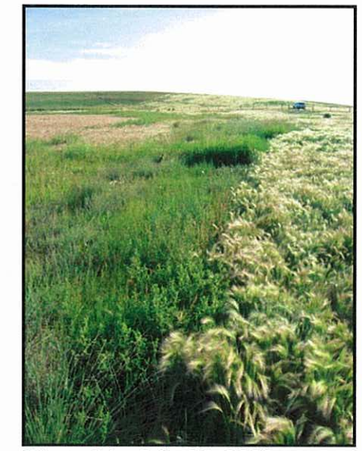


Photo 21: July 21, 2009.

PHOTOS 22 - 25:

Weed Photo Point 2. View is east showing *Euphorbia esula* (leafy spurge) [white arrows].

Photo 22: June 18, 2007.

Photo 23: August 21, 2007.

Photo 24: July 9, 2008.

Photo 25: July 21, 2009.

PHOTOS 26 - 29:

Weed Photo Point 3. View is northeast at the large *Euphorbia esula* (leafy spurge) infestation. Leafy spurge shows up as a brighter yellow-green.

Photo 26: June 18, 2007.

Photo 27: August 21, 2007.

Photo 28: July 9, 2008

Photo 29: July 21, 2009

July 23, 2002

July 27, 2003

July 24, 2004

July 5, 2005

July 7, 2006

July 5, 2007

July 7, 2008

July 10, 2009

Appendix D

MDT PROPOSED PROJECT LAYOUT

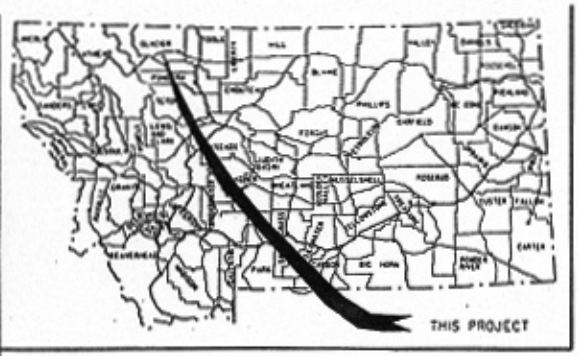
MDT Wetland Mitigation Monitoring
Perry Ranch
Glacier County, Montana

LAND & WATER D-1

~. H. MORSH.K

MONTANA DEPARTMENT OF TRANSPORTATION

FEDERAL AID PROJECT NO. NH 0002(232)
WETLAND MITIGATION
PERRY RANCH
GLACIER COUNTY

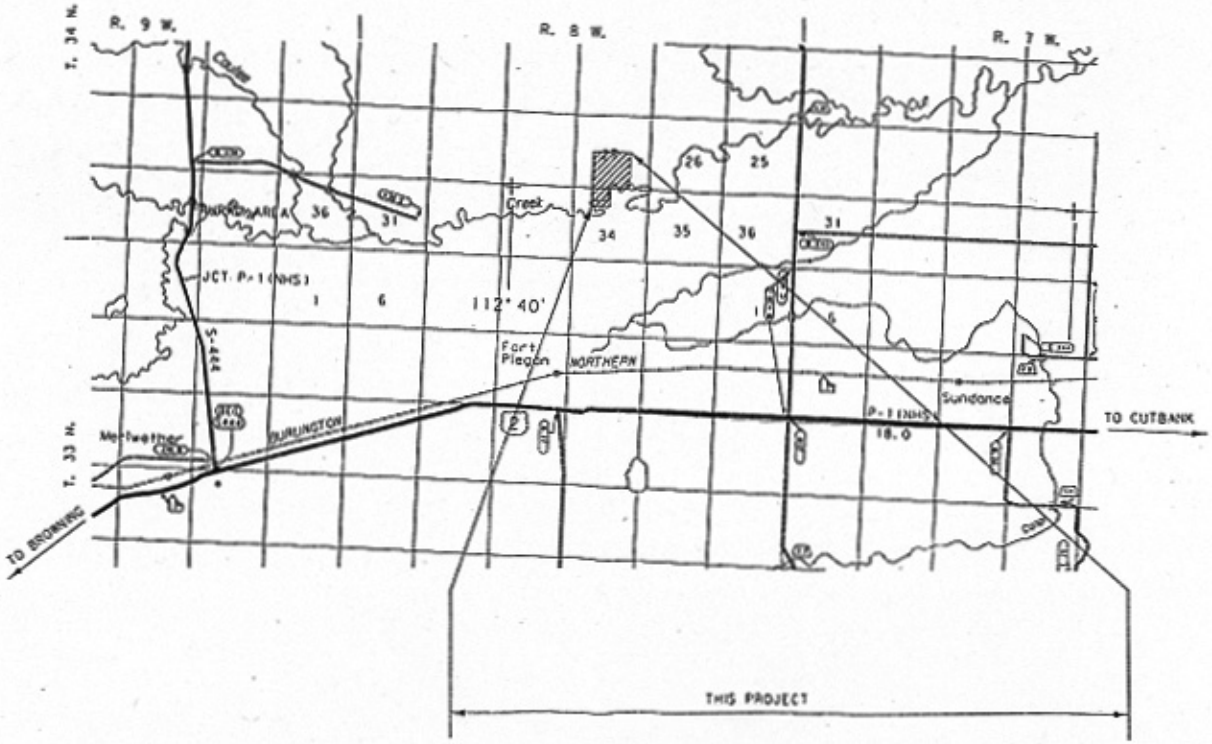


DESIGN DATA
A.D.T. =
A.D.T. =
D.H.V. =
D. =
T. =
V. =
ALL TRUCKS =
EWS by ESAL'S =
GROWTH RATE =

LETTING DATE = _____

LENGTH kilometers

SCALES
VERTICAL: 1 :
HORIZONTAL: 1 :
CROSS SECTION – HORIZONTAL & VERTICAL: 1 :
REDUCED PRINTS APPROXIMATELY 1/2 ORIGINAL SCALE



PRELIMINARY
FOR PLAN IN HAND ONLY

MONTANA DEPARTMENT OF TRANSPORTATION
APPROVED :
_____ W. _____
MARVIN DYE
DIRECTOR OF TRANSPORTATION
BY _____
ADMINISTRATOR HIGHWAY DIVISION - ENGINEERING
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
APPROVED :
_____ _____
DIVISION ADMINISTRATOR DATE

RELATED PROJECTS

ASSOCIATED PROJECT AGREEMENT NUMBERS

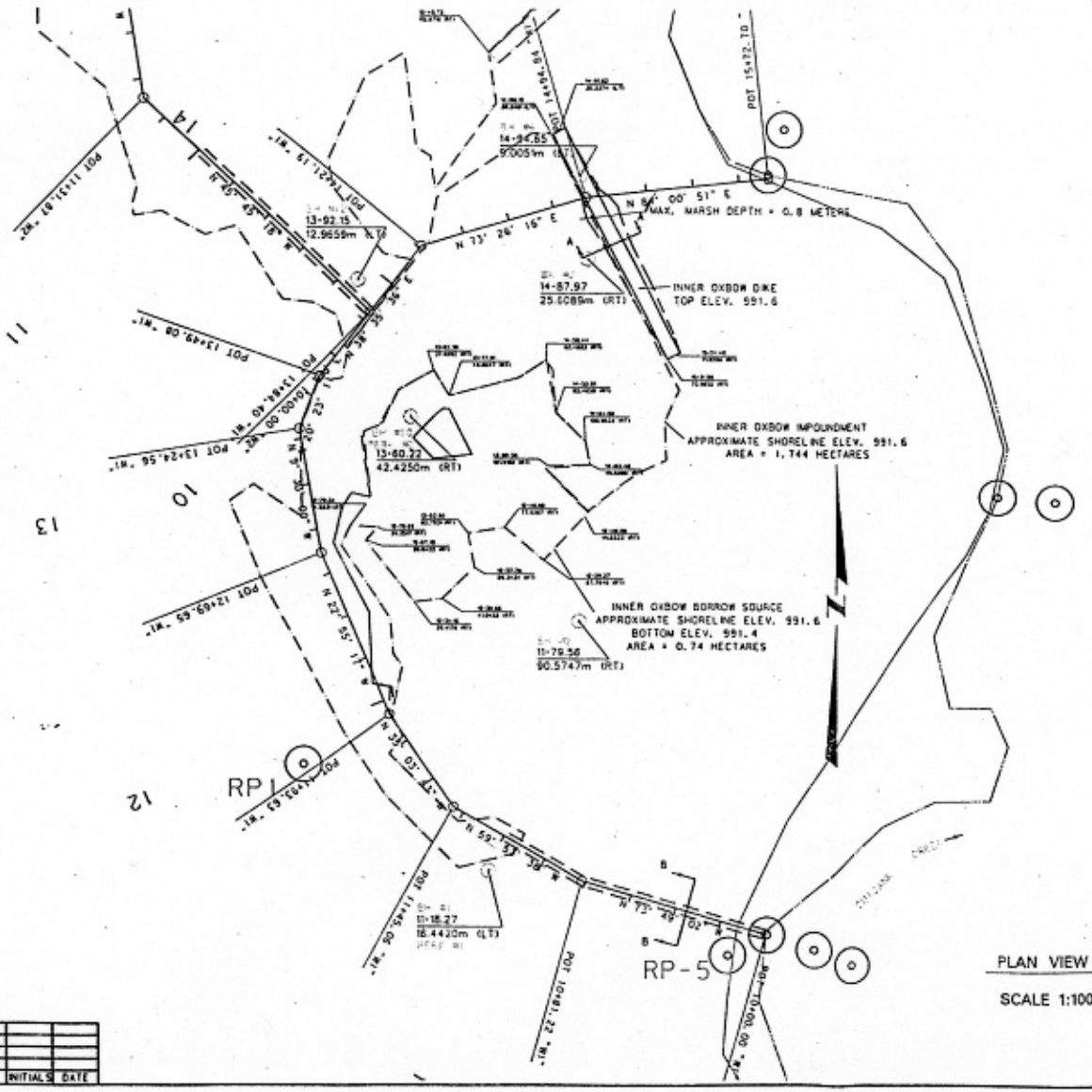
R/W & U.C.	
P.E.	

CONTROL NO.

LAND & WATER D-2

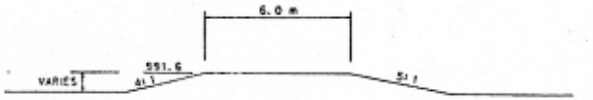
STATE	PROJECT NUMBER	SHEET NO.
MONTANA	NH 0002(232)	6

INNER OXBOW LAYOUT



PLAN VIEW

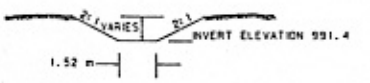
SCALE 1:100



SECTION A-A-SPREDER DIKE TYPICAL SECTION

SCALE 1:10

STA. 10+00 TO STA. 11+20



SECTION B-B-INTAKE WEIR TYPICAL SECTION

SCALE 1:10

DESIGNER		
DRAWN		
CHECKED		
REVISED		
	INITIALS	DATE

INNER OXBOW

LAYOUT DETAIL

ALIGNMENT "W1"

PRELIMINARY

MONTANA DEPARTMENT OF TRANSPORTATION

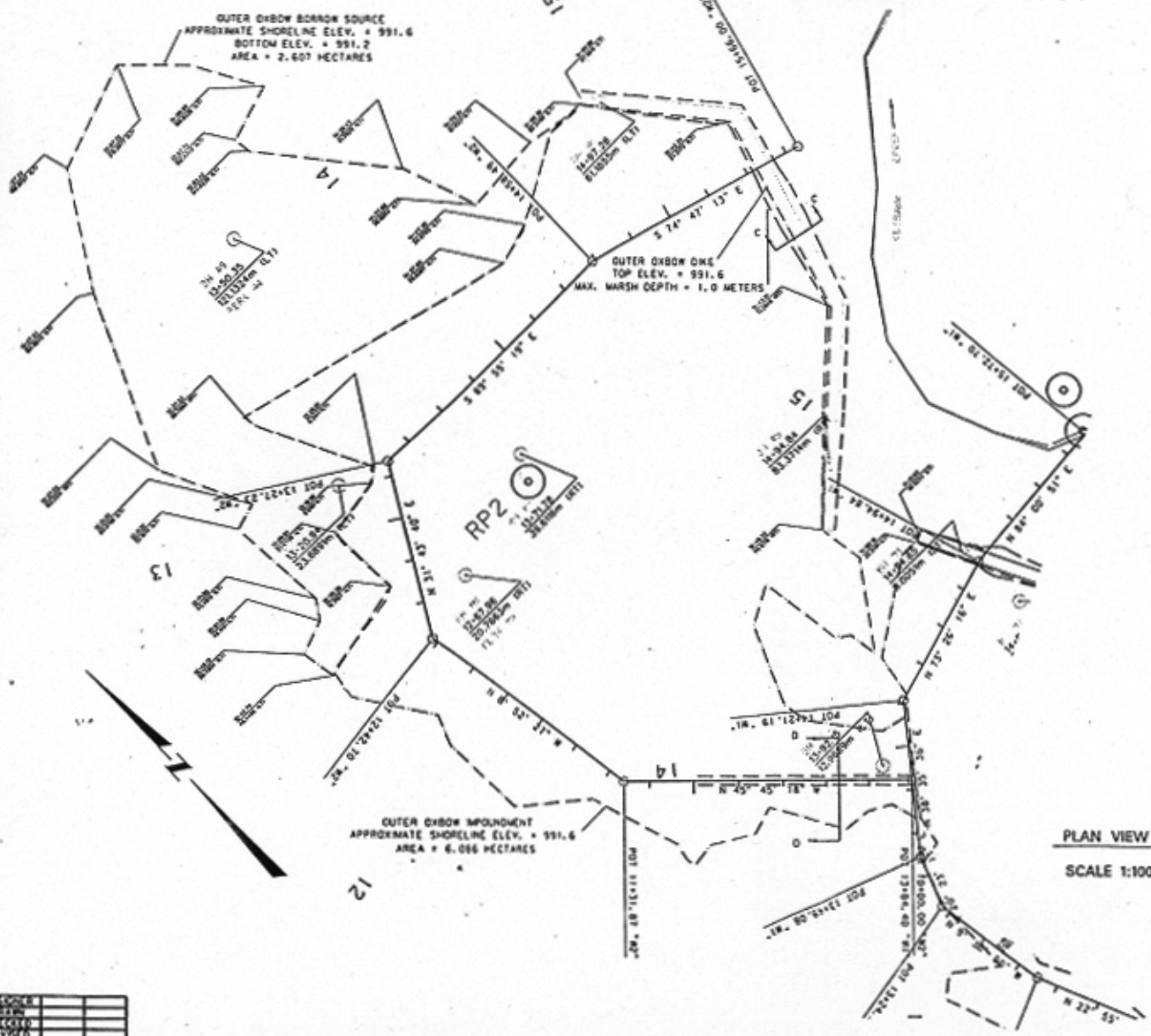
MONTANA CADD

13:37:41 28 JUL 1998 02313

LAND & WATER D-3

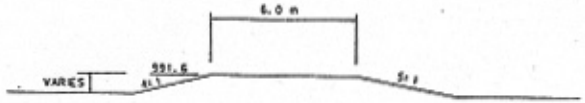
STATE	PROJECT NUMBER	SHEET
MONTANA	NH 0002(232)	2

OUTER OXBOW LAYOUT



PLAN VIEW

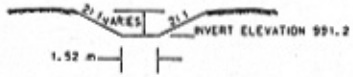
SCALE 1:100



SECTION C-C-SPREDER DIKE TYPICAL SECTION

SCALE 1:10

STA. 10+00 TO STA. 11+00



SECTION D-D-INTAKE WEIR TYPICAL SECTION

SCALE 1:10

OUTER OXBOW
LAYOUT DETAIL
ALIGNMENT "W2"

PRELIMINARY

DESIGNED		
DRAWN		
CHECKED		
REVISED		
	INITIALS	DATE

Appendix E

BIRD SURVEY PROTOCOL
GPS PROTOCOL

MDT Wetland Mitigation Monitoring
Perry Ranch
Glacier County, Montana

BIRD SURVEY PROTOCOL

This protocol was developed by the Montana Department of Transportation (MDT) to monitor bird use within their Wetland Mitigation Sites. Though each wetland mitigation site is vastly different, the bird survey data collection methods were standardized to order to increase repeatability. The protocol uses an "area search within a restricted time frame" to collect data on bird species, density, behavior, and habitat-type use.

Survey Area

Sites that can be entirely walked: Sites where the entire perimeter or area can be walked include, but are not limited to: small ponds, enhanced historic river channels, and wet meadows. If the wetland is not uncomfortably inundated, walk several meandering transects to sufficiently cover the wetland. Meandering transects can be used, even if a small portion of the area is inaccessible (e.g. cannot cross due to inundation). Use binoculars to identify the bird species, to count the number of individuals, and to identify their behavior and habitat type. Data can be recorded directly onto the bird survey form or into a field notebook. The number of meandering transects and their direction (or location) should be recorded in the field notebook and/or drawn onto the aerial photograph or topographic map. Meandering transects are not formal and should not be staked. Each site should be walked and surveyed to the fullest extent within the set time limit.

Sites than cannot be entirely walked: Sites where the entire perimeter or area cannot be walked include, but are not limited to: very large sites (i.e. perimeter of 2-3 miles), and large-bodied waters (i.e. reservoirs), where deep water habitat (> 6 feet) is close to shore. For large-bodied waters where only one area was graded to create or enhance the development of wetland, bird surveys should be walked along meandering transects within or around the graded area (see above.). For sites that cannot be walked, bird surveys should be conducted from many lookout posts, established at key vantage points. The general location of lookout posts should be recorded in the field notebook or drawn onto the aerial photograph or topographic map. Lookout post locations do not need to be staked. Both binoculars and spotting scopes may be used in order to accurately identify and count the birds. Depending upon the size of the open water, more time may be spent viewing the mitigation area from lookout posts than is spent traveling between posts.

Survey Time

Ideally, bird surveys should be conducted in the morning hours when bird activity is often greatest (i.e. sunrise to no later than 11:00 am). Surveys can be completed before 11am if all transects have been walked or all lookout posts have been viewed with no new bird activity observed. For some sites bird surveys may need to be performed in the late afternoon or evening due to traveling constraints or weather. The overall limiting time factor will be the number of budgeted hours for the project.

Data Recording

Bird Species List: Record each bird species observed onto the Bird Survey-Field Data Sheet (or field notebook). Record the bird's common name using the appropriate 4-letter code. The 4-letter code uses the first two letters of the first two word's of the bird's common name or if one name, the first four letters. For example, Mourning Dove is coded as MODO while Mallard is coded as MALL. If an unknown individual is observed, use the 4-letter protocol, but define your

abbreviation at the bottom of the field data sheet. For example, unknown shorebird is UNSB; unknown brown bird is UNBR; unknown warbler is UNWA; and unknown waterfowl is UNWF. For a flyover of a flock of unknown species, use a term that describes the birds' general characteristics and include the approximate flock size in parenthesis; do not fill in the habitat column. For example, a flock of black, medium-sized birds could be coded as UNBB / FO (25).

Bird Density: For each observation record the actual or estimated number of individuals observed per species and per behavior. Totals can be tallied in the office and entered onto the Bird Survey-Field Data Sheet.

Bird Behavior: Bird behavior must be identified by what is known. When a species is observed, the behavior that is immediately exhibited is recorded. Only behaviors that have discreet descriptive terms should be used. The following terms are recommended: breeding pair (BP); foraging (F); flyover (FO); loafing (L), which is defined as sleeping, roosting, or floating with head tucked under wing; and nesting (N). If other behaviors that have a specific descriptive word are observed then it can be used and should later be added to the protocol. Descriptive words or phrases such as "migrating" or "living on site" are unknown behaviors.

Bird Species Habitat Use: When a species is observed, the habitat is also recorded. The following broad habitat categories are used:

- aquatic bed (AB), defined as rooted-floating, floating-leaved, or submergent vegetation.
- marsh (MA), defined as emergent (e.g. cattail, bulrush) vegetation with surface water.
- wet meadow (WM), defined as grasses, sedges, or rushes with little to no surface water.
- scrub-shrub (SS), defined as shrub covered wetland.
- forested (FO), defined as tree covered wetland.
- open water (OW), defined as unvegetated surface water.
- upland (UP), defined as the upland buffer.

Other categories can be used and defined on the data sheet and should later be added to the protocol.

Other Fields

Bird Visit: Each bird survey (i.e. spring, fall, and mid-season) should be completed on separate Bird Survey-Field Data Sheets.

Time: Record the start time and end time on the Bird Survey-Field Data Sheet.

Date: Record the date of the bird survey.

Weather: Record the weather conditions (i.e. temperature, wind, condition).

Notes: Note if a particular individual bird is using a constructed nest box and note the condition of constructed nest box(es). Also record any comments about the site, wildlife, wetland conditions, etc.

GPS MAPPING AND AERIAL PHOTO REFERENCING PROCEDURE

From 2001 through 2006, PBS&J mapped the vegetation community boundaries, photograph points, and other sampling locations in the field using the resource-grade Trimble GEO III GPS (Global Positioning System) unit. The data were collected with a minimum of three positions per feature using Course/Acquisition code. The collected data were then transferred to a personal computer (PC) and differentially corrected to the nearest operating Community Base Station. The corrected data were then exported to ACAD drawings in Montana State Plain Coordinates NAD 83 international feet. The Trimble GEO III GPS unit was also used for some sites in 2007.

The collected and processed Trimble Geo III GPS positions had a 68% accuracy of 7 feet except in isolated areas where accuracy fell to 12 feet. This is within the 1 to 5 meter range listed as the expected accuracy of the mapping grade Trimble GPS.

In 2007 and 2008 sites were mapped using the resource-grade Magellan MobileMapper Office GPS unit. The Magellan GPS unit has a comparable accuracy level to the Trimble Geo III unit.

Each year, MDT photographs each mitigation site from the air. These aerial photographs are not geo-referenced, but serve as a visual aid to map wetland development and vegetation communities, and to show approximate locations for various monitoring activities (i.e. photograph points, transects, or macroinvertebrate sampling). Reference points that are observable on the aerial photo (i.e. road, stream channel, or fence) were also marked with the GPS unit in order to better position the aerial photograph. This positioning did not remove any of the distortion inherent to all photos. All mapped features and community boundaries were reviewed by the wetland biologist, to increase the figure's accuracy.

Any relationship of features located to easement or property lines are not to be construed from these figures. These relationships can only be determined with a survey by a licensed surveyor.