
MONTANA DEPARTMENT OF TRANSPORTATION WETLAND MITIGATION MONITORING REPORT: 2004

*Perry Ranch
Glacier County, Montana*



Prepared for:

MONTANA DEPARTMENT OF TRANSPORTATION
2701 Prospect Avenue
Helena, MT 59620-1001

Prepared by:

LAND & WATER CONSULTING
~ A DIVISION OF **PBS&J**
P.O. Box 239
Helena, MT 59624

June 2005

Project No: B4054.00 - 0306



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1.0 INTRODUCTION

The Perry Ranch wetland mitigation site was constructed during early summer 2001 to mitigate 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. Constructed in Watershed #8 (Marias) within the MDT Great Falls District, the mitigation site is located approximately 13 miles west of Browning and 4 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.

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 (see plan sheets in **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 and west of the creek, was designed to provide approximately 21.5 wetland acres with a maximum three-foot depth.

Wetland hydrology at the inner oxbow is to be provided via overbank flood flows, alluvial flow, and precipitation; flood flows and precipitation will 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 will likely be dominated by emergent communities.

Approximately 2.3 acres of wetland occurred at the inner oxbow prior to construction, while approximately 1.1 acres occurred at the outer oxbow. The 27.6-acre target mitigation figure is inclusive of these 3.4 acres of existing wetlands.

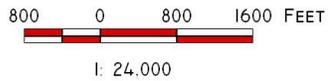
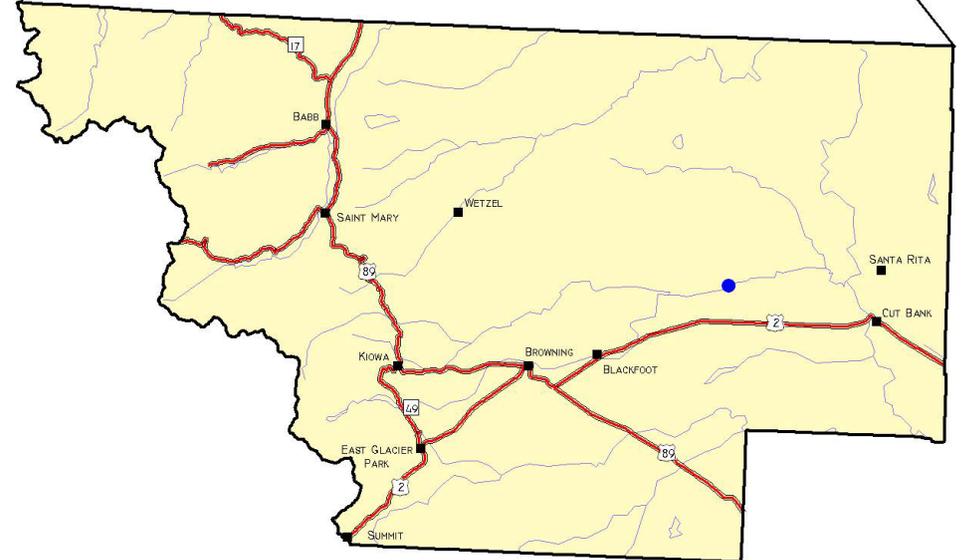
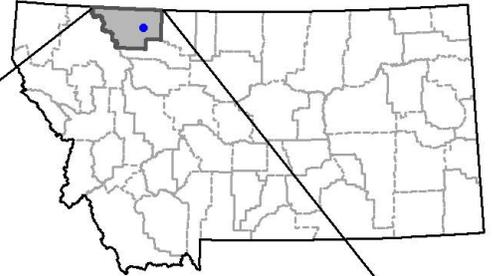
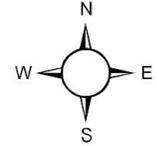
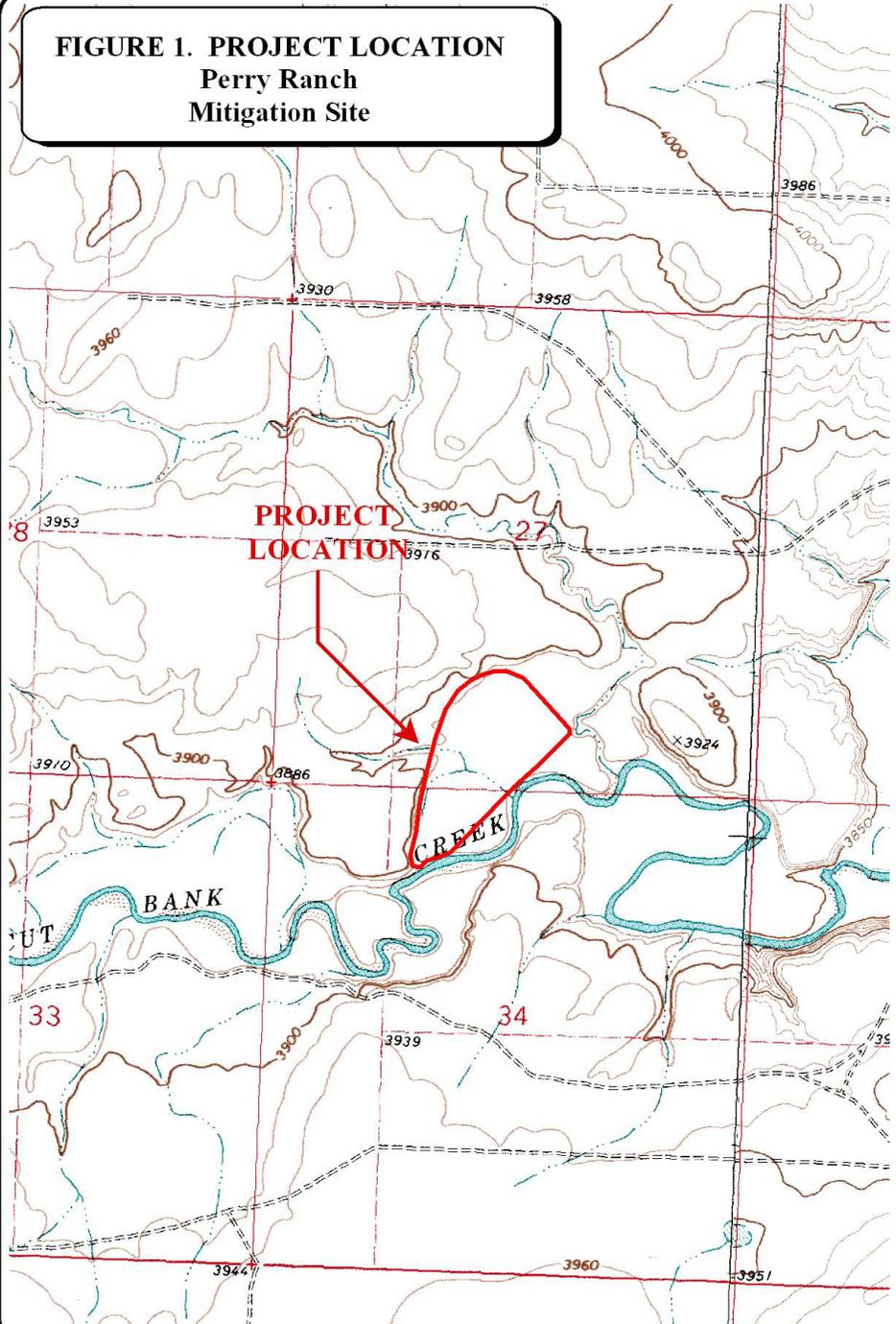
The 2004 monitoring episode was the third conducted at the site since its construction in 2001. This site will be monitored twice per year over the remainder of the monitoring period to document wetland and other biological attributes. No performance standards or success criteria were required by the U.S. Army Corps of Engineers (COE), MDT, Blackfeet Tribe, or other agencies. The monitoring area is illustrated in **Figure 2, Appendix B**.

2.0 METHODS

2.1 Monitoring Dates and Activities

The site was visited on May 25 (spring) and July 27 (mid-season) 2004. The primary purpose of the spring visit was to conduct a bird/general wildlife reconnaissance.

FIGURE 1. PROJECT LOCATION
Perry Ranch
Mitigation Site



PROJECT #: 130091.020
 DATE: DEC 2002
 LOCATION:
 PROJECT MANAGER: J. BERGLUND
 DRAWN BY: B. NOECKER

LAND & WATER CONSULTING, INC.
 1120 CEDAR PO BOX 8254 MISSOULA, MT 59807

The mid-season visit was conducted in July to document vegetation, soil, and hydrologic conditions used to map jurisdictional wetlands. All information contained on the Wetland Mitigation Site Monitoring Form (**Appendix B**) was collected at this time. Activities and information conducted/collected included: wetland delineation; wetland/open water aquatic habitat boundary mapping; vegetation community mapping; vegetation transect; soils data; hydrology data; bird and general wildlife use; photograph points; functional assessment; and (non-engineering) examination of dike structures.

2.2 Hydrology

Wetland hydrology at the inner oxbow (2.6-foot maximum depth) is to be provided via overbank flood flows, alluvial flow, and precipitation; flood flows and precipitation will be the source for the outer oxbow (3-foot maximum depth). Impoundment areas are indicated on the proposed project plan sheets in **Appendix D**.

Hydrologic indicators were primarily 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 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 are no groundwater monitoring wells at the site. If located within 18 inches of the ground surface (soil pit depth for purposes of delineation), groundwater depths were documented on the routine wetland delineation data form at each data point.

2.3 Vegetation

General dominant species-based vegetation community types were delineated on a 2002 aerial photograph during the mid-season visit. 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 site monitoring form (**Appendix B**).

A single 10-foot wide belt transect was sampled during the mid-season monitoring event to represent the range of current vegetation conditions. 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%).

The transect location is depicted on **Figure 2 (Appendix A)**. All data were recorded on the mitigation site monitoring form. Photographs of the transect were taken from both ends during the mid-season visit. 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 according to 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

Wetland delineation was conducted during the mid-season visit according to the 1987 COE Wetland Delineation Manual. 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 on COE Routine Wetland Delineation Data Forms (**Appendix B**). In 2002, the wetland/upland boundary was delineated using a GPS unit in conjunction with hand-mapping onto an aerial photograph. In 2004, wetland mapping revisions were accomplished by hand using the 2003 aerial photograph. The wetland/upland boundary in combination with any wetland/open water habitat boundary was used to calculate the wetland area developed on the site.

Wetland delineation data collected during 2004 was compared to this pre-construction estimate in an effort to calculate additional wetland development since project construction.

2.6 Mammals, Reptiles, and Amphibians

Mammal, reptile, and amphibian species observations and other positive indicators of use, such as vocalizations, were recorded on the wetland monitoring form during each site visit. Indirect use indicators, including tracks; scat; burrows; eggshells; skins; bones; etc., were also recorded. Observations were recorded during all visits 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 during both visits. No formal census plots, spot mapping, point counts, or strip transects were conducted. During the spring visit, observations were recorded in compliance with the bird survey protocol in **Appendix E**. During the mid-season visit, bird observations were recorded incidental to other monitoring activities. During all visits, observations were categorized by species, activity code, and general habitat association (see field data forms in **Appendix B**). A comprehensive bird list was compiled using these observations. No birdhouses are currently located on the site.

2.8 Macroinvertebrates

One macroinvertebrate sample was collected during the mid-season site visit at the outer oxbow in 2002. However, no surface water was present during the mid-season visit in 2003 or 2004. Consequently, no macro-invertebrate sample was collected at the site in 2003 or 2004.

2.9 Functional Assessment

Functional assessment was completed using the 1999 MDT Montana Wetland Assessment Method. Field data necessary for this assessment were primarily collected during the mid-season site visit. The remainder of the functional assessment was completed in the office.

2.10 Photographs

Photographs were taken showing the current land use surrounding the site, the upland buffer, the monitored area, and the vegetation transect. Three photograph points were established and shot during 2002, and again shot in 2003 and 2004. The approximate locations of these photo points are shown on **Figure 2 (Appendix A)**. All photographs were taken using a 50 mm lens. A description and compass direction for each photograph was recorded on the wetland monitoring form.

2.11 GPS Data

During the 2002 monitoring season, a variety of survey points were collected with a resource grade GPS unit. These included vegetation transect beginning and ending locations, all photograph locations and the wetland boundary. No GPS data were collected during 2004 monitoring.

2.12 Maintenance Needs

The dike along the east edge of the site was examined during the 2002 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

Based on the period of record between 1903 and 2004, the mean annual precipitation in Cut Bank is 11.5 inches. The mean total precipitation from January through July is 8 inches. The precipitation totals for 2003 and 2004 were substantially below these two means. The total (minus October, for which data was lacking) precipitation for 2003 and 2004, respectively, was 4.7 inches and 7.65 inches, substantially less than the annual mean. The total precipitation from January through July 2003 and 2004, respectively, was 3.63 inches and 3.57 inches, both less

than half of the mean total for this period between 1903 and 2004. This lack of precipitation was largely responsible for the decreased inundation extent at the site in 2004 and 2003 compared to 2002. Precipitation data for 2002 are unavailable.

Only the “native” inlet channel and one of the two small circular depressions in the inner oxbow **Figure 3 (Appendix A)** were inundated during the May 25 visit. None of the outer oxbow was inundated during this period. During the mid-season visit, virtually none of the monitoring site was inundated. Only scattered patches of the delivery ditch for a few hundred feet downstream of the creek were inundated. However, there was evidence (recent scour marks) to suggest that the site may have flooded briefly between the two visits.

A groundwater component appears to contribute to this site in association with pre-existing wetland areas in the inner and possibly the outer oxbow during “normal precipitation” spring periods.

3.2 Vegetation

Vegetation species identified on the site are presented in **Table 1** and on the attached data form. Three wetland community types were identified and mapped on the mitigation area (**Figure 3, Appendix A**) during 2003. These included Type 1: *Juncus balticus/Carex praegracilis*, Type 2: *Eleocharis palustris/Polygonum amphibium*, and Type 4: *Equisetum/Transitional Mudflat*. Type 3: *Upland Floodplain*, occurs on the valley floor between all wetland and open water areas on the site. During 2004, *Hordeum jubatum* was also added to the Type 4 community title, as this species had increased substantially within this community. Dominant species within each of these communities are listed on the attached data form (**Appendix B**).

Type 1 occurs primarily at the inner oxbow around the fringes of deeper wetland and open water areas. These areas flood, but surface water does not appear to remain in these areas as long as it does in Type 2 communities. Type 2 occurs in the deeper wetland areas of the inner oxbow, but had been replaced by the drier Type 4 in the “center” portion of the outer oxbow within and adjacent to pre-existing wetland areas in 2004. Type 2 areas may flood more frequently and for longer duration than the areas supporting Type 1 communities. Groundwater may also influence vegetation development in the Type 2 areas.

The Type 4 community occurs primarily within excavated portions of the inner oxbow, and replaced the wetter Type 2 in the outer oxbow in 2004. This area, mapped only as *Transitional Mudflat* in 2002, is filling in with wetland species, including horsetail, foxtail barley, curly dock, and meadow foxtail. In the inner oxbow, Type 4 communities are beginning to support significant growth of sandbar (*Salix exigua*) and peachleaf willow (*Salix amygdaloides*) seedlings.

The extreme northern portion of the outer oxbow (which contains the designed island), mapped as open water/mudflat in 2003, appeared to receive no water in 2004 and, as such, was mapped as upland floodplain. These area can develop into wetlands if adequate hydrology is provided. Some additional areas mapped as *Upland Floodplain* are considered transitional, but were neither inundated for sufficient duration or supporting enough wetland vegetation to be mapped

as aquatic habitats during 2003 or 2004. Such areas were generally disturbed by construction, and pioneering upland weedy vegetation in these was largely drowned out in 2002. Some are starting to revegetate with *Hordeum*, while some are revegetating with weedier species such as *Kochia scoparia*.

Adjacent upland communities are comprised of upland floodplain and foothills rangeland habitats. Common species include smooth brome (*Bromus inermis*), quackgrass (*Agropyron repens*), timothy (*Phleum pratense*), intermediate wheatgrass (*Agropyron intermedium*), yellow sweet clover (*Melilotus officinalis*), and kochia (*Kochia scoparia*).

Table 1: 2002-2004 Perry Ranch vegetation species list.

Scientific Name	Region 9 (Northwest) Wetland Indicator
<i>Achillea millefolium</i>	FACU
<i>Agropyron intermedium</i>	--
<i>Agropyron repens</i>	FACU
<i>Agropyron smithii</i>	--
<i>Agrostis alba</i>	FACW
<i>Alopecurus pratensis</i>	FACW
<i>Amaranthus retroflexus</i>	FACU+
<i>Artemisia frigida</i>	--
<i>Aster spp.</i>	--
<i>Bouteloua gracilis</i>	--
<i>Brassica kaber</i>	--
<i>Bromus inermis</i>	--
<i>Cardaria draba</i>	--
<i>Carex lanuginosa</i>	OBL
<i>Carex praegracilis</i>	FACW
<i>Chenopodium album</i>	FAC
<i>Cirsium arvense</i>	FAC-
<i>Dactylis glomerata</i>	FACU
<i>Descurainia pinnata</i>	--
<i>Distichlis spicata</i>	FAC+
<i>Eleocharis palustris</i>	OBL
<i>Epilobium ciliatum</i>	FACW-
<i>Equisetum arvense</i>	FAC
<i>Equisetum hyemale</i>	FACW
<i>Glyceria elata</i>	FACW+
<i>Glycyrrhiza lepidota</i>	FAC+
<i>Grindelia squarrosa</i>	--
<i>Hordeum jubatum</i>	FAC+
<i>Juncus balticus</i>	OBL
<i>Kochia scoparia</i>	FAC
<i>Koeleria pyramidata</i>	--
<i>Medicago sativa</i>	--
<i>Melilotus alba</i>	FACU
<i>Melilotus officinalis</i>	FACU
<i>Opuntia sp.</i>	--
<i>Phalaris arundinacea</i>	FACW
<i>Phleum pratense</i>	FAC-
<i>Poa annua</i>	FAC-
<i>Poa pratensis</i>	FACU+
<i>Polygonum amphibium</i>	OBL

Table 1 (continued): 2002-2004 Perry Ranch vegetation species list.

Scientific Name	Region 9 (Northwest) Wetland Indicator
<i>Potentilla anserine</i>	OBL
<i>Rosa arkansana</i>	NI
<i>Rumex crispus</i>	FACW
<i>Rumex maritima</i>	OBL
<i>Salix amygdaloides</i>	FACW
<i>Salix exigua</i>	OBL
<i>Salix lutea</i>	OBL
<i>Sisymbrium altissimum</i>	--
<i>Solidago canadensis</i>	FACU
<i>Spartina pectinata</i>	OBL
<i>Stipa viridula</i>	--
<i>Symphoricarpos occidentalis</i>	--
<i>Taraxacum officinale</i>	FACU
<i>Thlaspi arvense</i>	--
<i>Triglochin maritimum</i>	OBL
<i>Typha latifolia</i>	OBL

Bolded species indicate those documented in the analysis area for the first time in 2004.

Vegetation transect results are detailed in the attached data form (**Appendix B**), and are summarized in **Charts 1 and 2** and **Table 2** below. As of 2004, the transect still traverses no wetlands. However, it does traverse two currently “transitional” upland floodplain areas, in which formerly drowned out upland vegetation has been replaced by wetter species. These areas may transition to wetlands if they receive adequate hydrology. These areas were largely bare in 2003, and had revegetated in 2004, but were still not considered wetlands. The number of hydrophytic species along the transect decreased between 2003 and 2004, presumably due to the drought (**Table 2**).

Table 2: Transect 1 data summary.

Monitoring Year	2002	2003	2004
Transect Length (feet)	532	532	532
# Vegetation Community Transitions along Transect	4	5	5
# Vegetation Communities along Transect	3	3	3
# Hydrophytic Vegetation Communities along Transect	0	0	0
Total Vegetative Species	18	25	20
Total Hydrophytic Species	6	14	10
Total Upland Species	12	11	10
Estimated % Total Vegetative Cover	35	45	90
% Transect Length Comprised of Hydrophytic Vegetation Communities	0	0	0
% Transect Length Comprised of Upland Vegetation Communities	40	50	100
% Transect Length Comprised of Unvegetated Open Water	0	0	0
% Transect Length Comprised of Bare Substrate	60	50	0

Chart 1: Transect map showing vegetation types of Transect 1 from start (0 feet) to end (532 feet) for 2004.

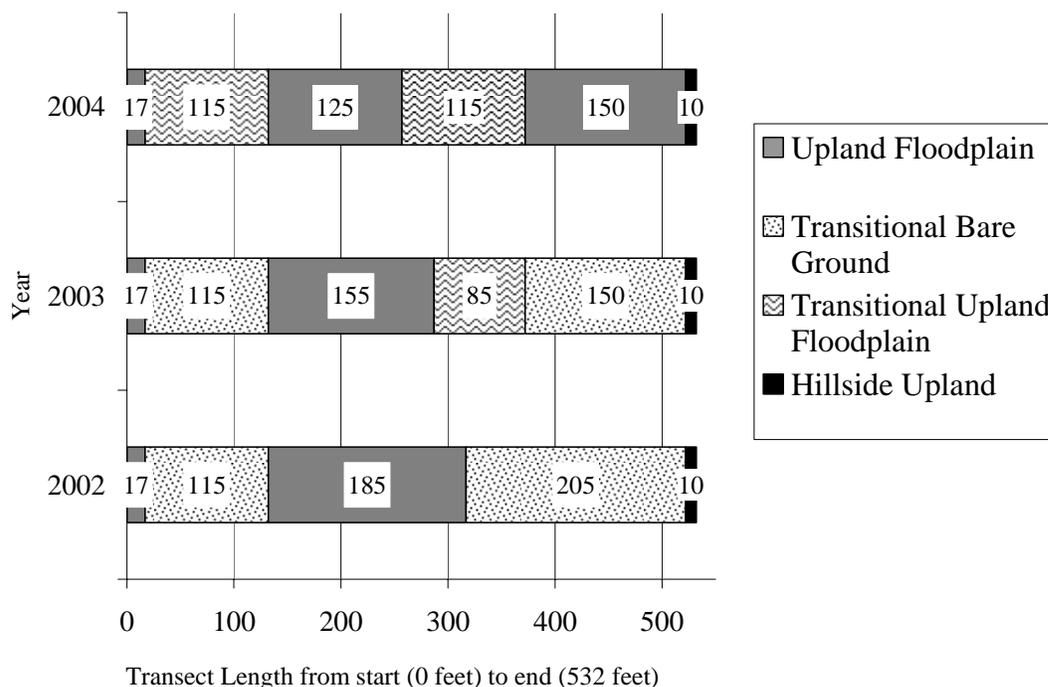
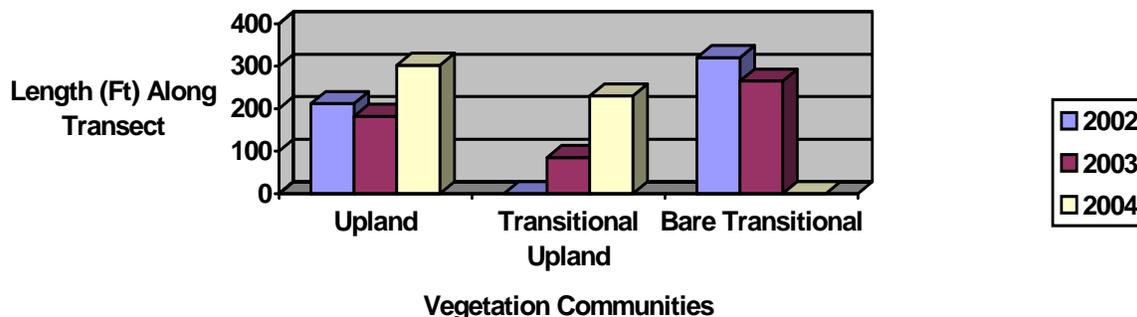


Chart 2: Length of vegetation communities along Transect 1.



3.3 Soils

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

B Horizon soils in wetland portions of the site consisted of silty or sandy clay loam with a matrix color ranging from 2.5Y3/1 to 10YR2/1 and no mottles. These soils may have been hydric historically, and are again periodically receiving water as a result of the project. Soils near the beginning of the transect through the area between the inner and outer oxbows were apparently inundated during spring of 2003, and possibly during 2004, and were slightly darker (2.5Y4/1)

than was observed in 2002 (2.5Y4/2). These soils are considered to be developing hydric characteristics.

Most soils on the site occurring within wetlands were moist within 12 inches of the surface at the time of the mid-season survey.

3.4 Wetland Delineation

Delineated wetland boundaries are illustrated on **Figure 3 (Appendix A)**. Completed wetland delineation forms are included in **Appendix B**. Soils, vegetation, and hydrology are discussed in preceding sections. Delineation results are as follows:

	<u>2002</u>	<u>2003</u>	<u>2004</u>
Delineated Emergent Wetlands:	10.09 acres	12.41 acres	12.33 acres
Open Water / Mudflat areas:	<u>7.83 acres</u>	<u>6.2 acres</u>	<u>0.0 acres</u>
Total Aquatic Habitats:	17.92 acres	18.61 acres	12.33 acres

Approximately 12.33 acres of wetlands presently occur on the site (**Figure 3, Appendix A**). Wetland acreage at the site decreased by approximately 0.08 acre in 2004, while mudflat areas decreased by 6.2 (none were delineated in 2004). This was presumably due to the effects of two consecutive very poor precipitation years.

Shallow open water/mudflat areas were mapped in 2003 as a discrete habitat unit in the north portion of the property, but were not mapped in 2004 due to the lack of hydrology. It remains to be seen whether these mudflats are again inundated and productive during “normal” precipitation and peak flow years, or whether they will transition to wetlands and/or open water areas. Mudflats are considered “special aquatic sites” under COE regulations. As defined in 40 CFR (230.3[q-1]), “special aquatic sites” are areas possessing special characteristics of productivity, habitat, wildlife protection, or other important and easily disrupted ecological values. Special aquatic sites include sanctuaries and refuges, wetlands, mud flats, vegetated shallows, coral reefs, and riffle/pool complexes.

Approximately 3.4 acres of wetland occurred at the site prior to construction. The 27.6-acre mitigation goal is inclusive of these 3.4 acres of pre-existing wetlands. Consequently, the goal for net wetland gain at the site is $27.6 - 3.4 = 24.2$ acres. As of 2004, the site has netted $12.33 - 3.4 = 8.93$ wetland acres and 0.0 open water/mudflat acres, for a total of 8.93 acres of aquatic habitats, or 37% of the goal.

3.5 Wildlife

Wildlife species, or evidence of wildlife, observed on the site during 2002 - 2004 monitoring efforts are listed in **Table 3**. Specific evidence observed, as well as activity codes pertaining to birds, are provided on the completed monitoring form in **Appendix B**. The site provides habitat for several wildlife species, particularly shorebirds, waterfowl, and amphibians.

Five mammal, one amphibian, and 16 bird species were noted using the mitigation site during the course of 2004 monitoring activities. No birdhouses were installed at this site.

Northern leopard frogs (*Rana pipiens*) (approximately 6-8) were observed in the outer oxbow during the mid-season visit in 2002, but none in 2003 or 2004. Leopard frogs are considered “species of special concern” by the Montana Natural Heritage Program (MNHP) due largely to their apparent extirpation from the portion of their historic distribution west of the Continental Divide. This species has been assigned a rank of S1 west of the Continental Divide and S3 east of the Divide by the MNHP. The outer oxbow is considered documented secondary habitat for this species due to the few individuals observed during 2002 and apparent intermittent nature of surface water. Numerous western chorus frogs (*Pseudacris triseriata*) were observed in the native inlet slough of the inner oxbow during the 2004 spring visit.

Table 3: Fish and wildlife species observed on the Perry Ranch Mitigation Site from 2002 to 2004.

FISH	
None	
AMPHIBIANS	
Northern Leopard Frog (<i>Rana pipiens</i>) Western Chorus Frog (<i>Pseudacris triseriata</i>)	
REPTILES	
None	
BIRDS	
American Avocet (<i>Recurvirostra americana</i>) American Robin (<i>Turdus migratorius</i>) American White Pelican (<i>Pelecanus erythrorhynchos</i>) Bank Swallow (<i>Riparia riparia</i>) Blue-winged Teal (<i>Anas discors</i>) Brewer's Blackbird (<i>Euphagus cyanocephalus</i>) Canada Goose (<i>Branta Canadensis</i>) Cinnamon Teal (<i>Anas cyanoptera</i>) Cliff Swallow (<i>Petrochelidon pyrrhonota</i>) Common Snipe (<i>Gallinago gallinago</i>) Eastern Kingbird (<i>Tyrannus tyrannus</i>) Franklin's Gull (<i>Larus pipixcan</i>) Great Blue Heron (<i>Ardea herodias</i>) Gray Partridge (<i>Perdix perdix</i>) Horned Lark (<i>Eremophila alpestris</i>) Killdeer (<i>Charadrius vociferous</i>) Lesser Scaup (<i>Aythya affinis</i>) Long-billed Dowitcher (<i>Limnodromus scolopaceus</i>)	Mallard (<i>Anas platyrhynchos</i>) Northern Harrier (<i>Circus cyaneus</i>) Northern Rough-winged Swallow (<i>Stelgidopteryx serripennis</i>) Northern Shoveler (<i>Anas clypeata</i>) Red-winged Blackbird (<i>Agelaius phoeniceus</i>) Red-tailed Hawk (<i>Buteo jamaicensis</i>) Savannah Sparrow (<i>Passerculus sandwichensis</i>) Semipalmated Plover (<i>Charadrius semipalmatus</i>) Solitary Sandpiper (<i>Tringa solitaria</i>) Spotted Sandpiper (<i>Actitis macularia</i>) Vesper Sparrow (<i>Poocetes gramineus</i>) Western Meadowlark (<i>Sturnella neglecta</i>) Western Sandpiper (<i>Calidris mauri</i>) Willet (<i>Catoptrophorus semipalmatus</i>) Wilson's Phalarope (<i>Phalaropus tricolor</i>) Yellow-headed Blackbird (<i>Xanthocephalus xanthocephalus</i>)
MAMMALS	
American Badger (<i>Taxidea taxus</i>) Coyote (<i>Canis latrans</i>) Deer (<i>Odocoileus sp.</i>) Raccoon (<i>Procyon lotor</i>) Richardson's Ground Squirrel (<i>Spermophilus richardsonii</i>)	

Bolded species were observed during 2004 monitoring. All other species were observed during one or more of the previous monitoring years, but not during 2004.

3.6 Macroinvertebrates

No surface water was present during the mid-season visit in 2003 or 2004. Consequently, no macro-invertebrate sample was collected at the site in 2003 or 2004.

3.7 Functional Assessment

Completed functional assessment forms are presented in **Appendix B**. Functional assessment results are summarized in **Table 4**. Forms were prepared for the inner and outer oxbows. Results in 2004 were identical to 2003 results for the inner oxbow and very similar to 2003 results for the outer oxbow. The inner oxbow of the mitigation site again rated as Category III site, while the outer oxbow again rated as a Category II site using the 1999 MDT functional assessment method. Both are developing, and it is anticipated that both will receive higher wildlife habitat and other functional ratings as wetland communities continue to grow and establish with normal precipitation. The wildlife score was lowered slightly for the outer oxbow in 2004 due to decreased inundation and decreases in observed wildlife use. Baseline functional conditions were determined by MDT using a modified 1997 MDT functional assessment method; thus, results between the two assessments are not directly comparable, but do provide a sense of where functions have improved. Prior to construction, the inner oxbow rated as a Category III site, and the outer oxbow rated as a Category IV site.

Based on functional assessment results (**Table 4**), approximately 67 functional units have been gained thus far at the Perry Ranch mitigation site.

3.8 Photographs

Representative panoramic and single frame photographs taken from photo-points are provided in **Appendix C**. A 2004 aerial photograph is also included in **Appendix C**.

3.9 Maintenance Needs/Recommendations

Several dike problems were noted during the 2002 summer visit, but these were repaired during 2003 and were still stable in 2004. An approximate 150-foot long section of fence was down during the May and July 2003 visits, allowing cattle free access to the site. The fence was repaired by the time the October 2003 visit was conducted and was in good condition in 2004.

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 two consecutive poor precipitation years.

Approximately 12.33 acres of wetlands presently occur on the site (**Figure 3, Appendix A**). Wetland acreage at the site decreased by approximately 0.08 acre in 2004, while mudflat areas decreased by 6.2 (none were delineated in 2004). This was presumably due to the effects of two consecutive poor precipitation years.

Table 4: Summary of 2004 wetland function/value ratings and functional points¹ at the Perry Ranch Mitigation Project.

Function and Value Parameters from the 1999 MDT Montana Wetland Assessment Method ¹	Pre-Construction (1997 method)		Post-construction (1999 method)	
	Inner Oxbow	Outer Oxbow	2004 Inner Oxbow	2004 Outer Oxbow
Listed/Proposed T&E Species Habitat	Low (0.1)	Low (0.1)	Low (0.3)	Low (0.3)
MNHP Species Habitat	None (0.0)	None (0.0)	Mod (0.6)	Mod (0.7)
General Wildlife Habitat	Mod (0.4)	Low (0.1)	Mod (0.7)	Mod (0.7)
General Fish/Aquatic Habitat	NA	NA	NA	NA
Flood Attenuation	Mod (0.5)	Low (0.2)	Mod (0.5)	Mod (0.5)
Short and Long Term Surface Water Storage	--	--	Mod (0.6)	High (0.9)
Sediment, Nutrient, Toxicant Removal	Mod (0.5)	Mod (0.5)	Mod (0.7)	High (1)
Sediment/Shoreline Stabilization	NA	NA	NA	NA
Production Export/Food Chain Support	Mod (0.7)	Mod (0.6)	Mod (0.6)	Mod (0.7)
Groundwater Discharge/Recharge	High (1.0)	Low (0.1)	High (1.0)	High (1.0)
Uniqueness	Low (0.3)	Low (0.2)	Mod (0.4)	Mod (0.4)
Recreation/Education Potential	Low (0.1)	Low (0.1)	Mod (0.7)	Mod (0.7)
Actual Points/Possible Points	4.4 / 10	2.7 / 10	6.1 / 10	6.9 / 10
% of Possible Score Achieved	44%	27%	61%	69%
Overall Category	III	IV	III	II
Total Acreage of Assessed Wetlands and Other Aquatic Habitats within Site Boundaries (ac)	2.30	1.10	6.28	6.05
Functional Units (acreage x actual points)	10.12	2.97	38.31	41.74
Net Acreage Gain (ac)	NA	NA	6.28 – 2.3 = 3.98	6.05 – 1.1 = 4.95
Net Functional Unit Gain (fu)	NA	NA	38.31 - 10.12 = 28.19	41.74 – 2.97 = 38.77
Total Functional Unit Gain	66.96 Total Functional Units			

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

Approximately 3.4 acres of wetland occurred at the site prior to construction. The 27.6-acre mitigation goal is inclusive of these 3.4 acres of pre-existing wetlands. Consequently, the goal for net wetland gain at the site is $27.6 - 3.4 = 24.2$ acres. As of 2004, the site has netted $12.33 - 3.4 = 8.93$ wetland acres and 0.0 open water/mudflat acres, for a total of 8.93 acres of aquatic habitats, or 37% of the goal. This is presently the maximum assignable credit at this site as of 2004. Approximately 67 functional units have been gained at this site to date.

4.0 REFERENCES

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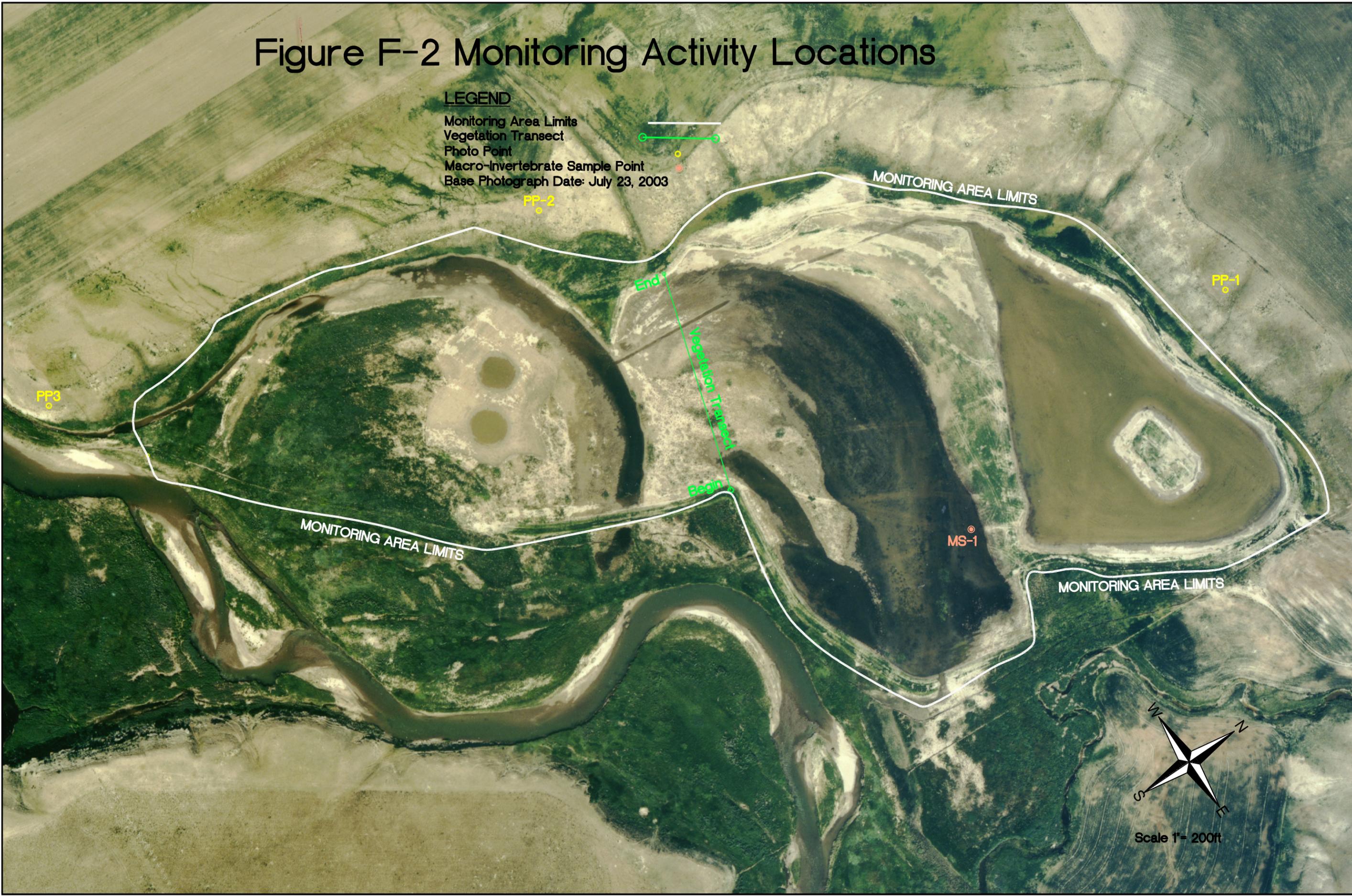
Appendix A

FIGURES 2 & 3

MDT Wetland Mitigation Monitoring
Perry Ranch
Glacier County, Montana

Figure F-2 Monitoring Activity Locations

LEGEND
 Monitoring Area Limits
 Vegetation Transect
 Photo Point
 Macro-Invertebrate Sample Point
 Base Photograph Date: July 23, 2003



PROJECT NAME MDT Perry Ranch Wetland Mitigation	
DRAWING TITLE Monitoring Activity Locations	
PROJ NO: B43054.305	DRAWN: RA
FILE NAME: TASK20BASE.dwg	CHECKED:
SCALE: 1" = 200ft	APPRVD: BD
LOCATION: Perry Ranch	PROJ MGR: BD
	
SHEET NUMBER F-2 OF 1	
REV - DATE: 6-10-05	



Scale 1" = 200ft

Figure 3 Mapped Site Features 2004

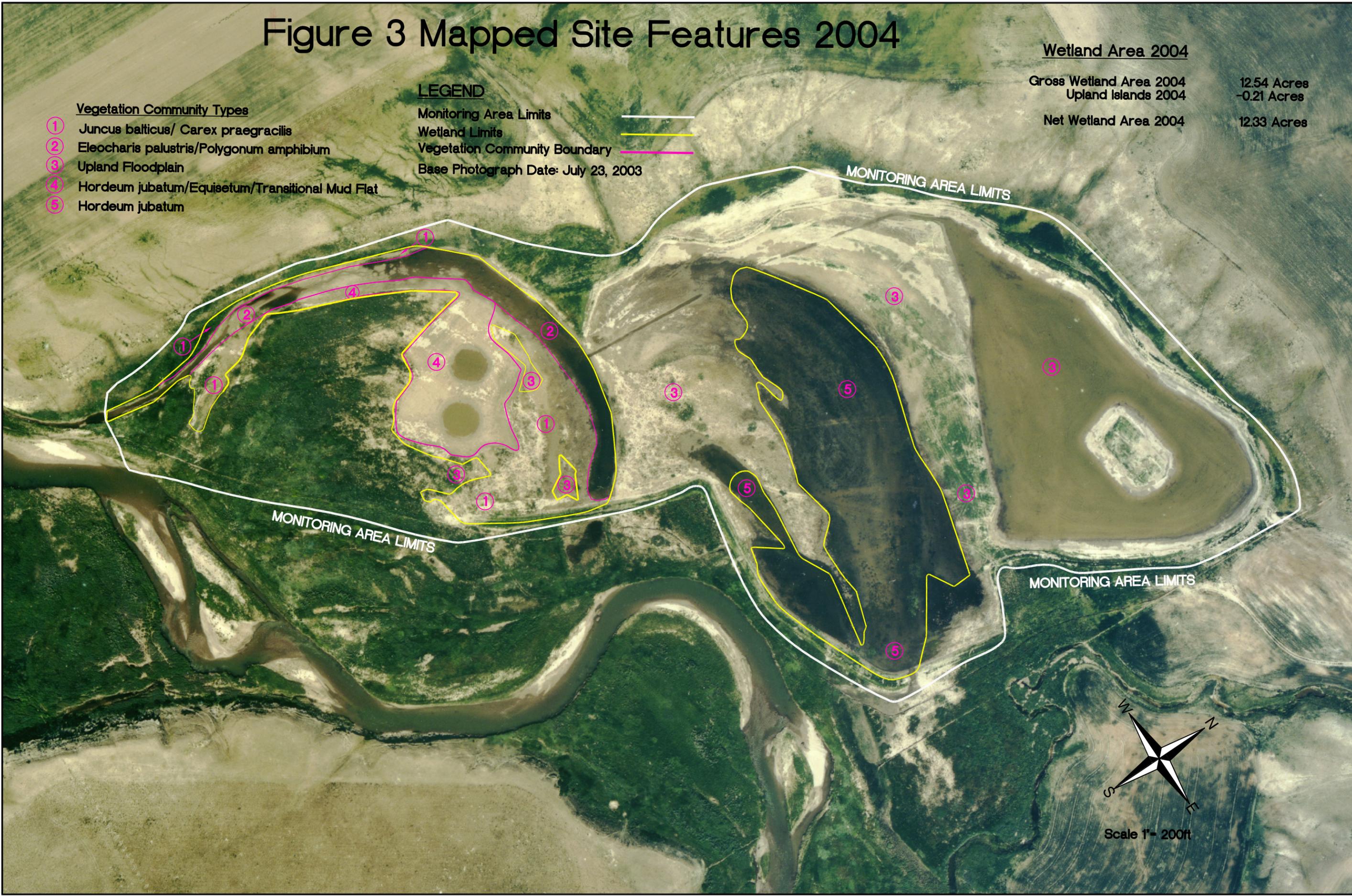
Wetland Area 2004

Gross Wetland Area 2004	12.54 Acres
Upland Islands 2004	-0.21 Acres
Net Wetland Area 2004	12.33 Acres

- Vegetation Community Types**
- ① Juncus balticus/ Carex praegracilis
 - ② Eleocharis palustris/Polygonum amphibium
 - ③ Upland Floodplain
 - ④ Hordeum jubatum/Equisetum/Transitional Mud Flat
 - ⑤ Hordeum jubatum

LEGEND

- Monitoring Area Limits —
 - Wetland Limits —
 - Vegetation Community Boundary —
- Base Photograph Date: July 23, 2003



Scale 1" = 200ft

PROJECT NAME
MDT Perry Ranch Wetland Mitigation

DRAWING TITLE
Mapped Site Features 2004

PROJ NO: B43054.305	DRAWN: RA
FILE NAME: TASK20BASE.dwg	CHECKED: JB
SCALE: 1" = 200ft	APPVD: JB
LOCATION: Perry Ranch	PROJ MGR: BD

LAND & WATER CONSULTING, INC.
P.O. BOX 8254
Missoula, MT 59807

SHEET NUMBER	F-3 OF 1
REV -	
DATE: 1-22-04	

Appendix B

2004 WETLAND MITIGATION SITE MONITORING FORM

2004 BIRD SURVEY FORMS

2004 WETLAND DELINEATION FORMS

2004 FUNCTIONAL ASSESSMENT FORMS

MDT Wetland Mitigation Monitoring

Perry Ranch

Glacier County, Montana

LWC / MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name: Perry Ranch Project Number: -- Assessment Date: 7 / 27 / 04
 Location: Cut Bank Creek MDT District: Great Falls Milepost: --
 Legal description: T_34N R_8W Section_27/34 Time of Day: 1500 - 1800
 Weather Conditions: overcast, dry, windy Person(s) conducting the assessment: JB
 Initial Evaluation Date: 5 / / 02 Visit #: 6 Monitoring Year: 3 (2004)
 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: Present Absent X Average depths: 0" in Range of depths: 0 - 0 in

Assessment area under inundation: 0 %

Depth at emergent vegetation-open water boundary: NA ft

If assessment area is not inundated are the soils saturated w/in 12" of surface: Yes X No

Other evidence of hydrology on site (drift lines, erosion, stained vegetation etc.): Sediment deposits, drift lines in inner and outer oxbows. Signs were marginal in 2004, indicating possible brief inundation.

Groundwater

Monitoring wells: Present Absent X

Record depth of water below ground surface

Well #	Depth	Well #	Depth	Well #	Depth

Additional Activities Checklist:

X Map emergent vegetation-open water boundary on air photo

X Observe extent of surface water during each site visit and look for evidence of past surface water elevations (drift lines, erosion, vegetation staining etc.)

NA GPS survey groundwater monitoring wells locations if present

COMMENTS/PROBLEMS: None of the site is currently inundated, other than patches in the delivery ditch for 100-200 feet downstream of creek. The site is much drier than in 2002 at this time of year, although some flooding appears to have occurred during spring (2003 was dry also). The creek level is currently just below the site inlet channel. No surface water was present in the main body of the site during the July mid-season visit in 2004. Portions of the native channel were inundated during the May bird survey, as was one of the small circular depressions in the inner oxbow, but the rest of the site was dry.

VEGETATION COMMUNITIES

Community No.:_1__ Community Title (main species):_Juncus balticus / Carex praegracilis

Dominant Species	% Cover	Dominant Species	% Cover
JUN BAL	>50	GLY LEP	1-5
CAR PRA	>50	SPA PEC	1-5
POT ANS	21-50	AGR REP	1-5
TRI MAR	<1	CAR LAN	1-5
EQU ARV	11-20	ELE PAL	1-5

COMMENTS/PROBLEMS: ___Same as 2002/2003_____

Community No.:_2__ Community Title (main species):_Eleocharis palustris / Polygonum amphibium

Dominant Species	% Cover	Dominant Species	% Cover
ELE PAL	21-50	EQU ARV	6-10
POL AMP	21-50	EQU HYA	6-10
ALO PRA	6-10	CAR LAN	<1
SPA PEC	1-5	RUM CRI	1-5
PHA ARU	<1	GLY ELA	<1

COMMENTS/PROBLEMS: ___Same as 2002 /2003_____

Community No.:_3__ Community Title (main species):_Upland Floodplain_____

Dominant Species	% Cover	Dominant Species	% Cover
KOC SCO	21-50	SYM OCC	1-5
AGR INT	21-50	ROS ARK	1-5
AGR REP	21-50	HOR JUB	>50
AMA RET	6-10	ALO PRA	1-5
CAR PRA	6-10	RUM CRI	1-5

COMMENTS/PROBLEMS: ___Consists of upland areas within “flooded perimeter” – species composition varies across the site. HOR JUB is starting to vastly dominate some areas, which may transition to wetlands.

Additional Activities Checklist:

_X__ Record and map vegetative communities on air photo

VEGETATION COMMUNITIES (continued)

Community No.: 4 Community Title (main species): Hordeum jubatum / Equisetum / Transitional Mudflat

Dominant Species	% Cover	Dominant Species	% Cover
EQU ARV	>50	SAL EXI (seedlings)	1-5
HOR JUB	>50	SAL AMY (seedlings)	1-5
ALO PRA	1-5	AGR INT	6-10
RUM CRI	1-5	CAR PRA	1-5
POT ANS	11-20	ELE PAL	<1

COMMENTS/PROBLEMS: This community primarily occurs in transitional areas of the inner oxbow. Vegetation, although still relatively sparse, increased in these areas over 2002 and 2003. Hordeum increased in dominance.

Community No.: 5 Community Title (main species): Hordeum jubatum _____

Dominant Species	% Cover	Dominant Species	% Cover
HOR JUB	>50	AGR INT	1-5
POT ANS	21-50	KOC SCO	6-10
POL AMP	11-20	ELE PAL	1-5
ALO PRA	1-5	JUN BAL	1-5
RUM MAR	11-20		

COMMENTS/PROBLEMS: Type 2 (2003) in the outer oxbow transitioned to this community in 2004 due to decreased hydrology. Still a wetland community, however.

Community No.: 6 Community Title (main species): Hillside Upland _____

Dominant Species	% Cover	Dominant Species	% Cover
STI VIR	>50	OPU sp.	6-10
AGR SMI	21-50	KOL CRI	6-10
AGR INT	21-50	SYM OCC	11-20
ART FRI	11-20	ROS ARK	11-20
GRI SQU	11-20	BRO INE	1-5

COMMENTS/PROBLEMS: **Consists** of upland areas on hillsides outside of the floodplain.

COMPREHENSIVE VEGETATION LIST

Species	Vegetation Community Number(s)	Species	Vegetation Community Number(s)
<i>Achillea millefolium</i>	3, 6	<i>Phalaris arundinacea</i>	1
<i>Agropyron intermedium</i>	3, 6, 5	<i>Phleum pratense</i>	3, 6
<i>Agropyron repens</i>	3, 6	<i>Poa annua</i>	3
<i>Agropyron smithii</i>	6	<i>Poa pratensis</i>	6
<i>Agrostis alba</i>	3	<i>Polygonum amphibium</i>	2, 5
<i>Alopecurus pratensis</i>	2, 4, 5	<i>Potentilla anserina</i>	1, 5
<i>Amaranthus retroflexus</i>	3, 6	<i>Rosa arkansana</i>	6
<i>Artemisia frigida</i>	6	<i>Rumex crispus</i>	2, 3, 4
<i>Aster spp.</i>	6	<i>Rumex maritima</i>	5
<i>Bouteloua gracilis</i>	6	<i>Salix exigua</i>	3
<i>Brassica kaber</i>	6	<i>Salix lutea</i>	3
<i>Bromus inermis</i>	6	<i>Solidago canadensis</i>	3
<i>Cardaria draba</i>	6	<i>Spartina pectinata</i>	2
<i>Carex lanuginosa</i>	1, 2	<i>Stipa viridula</i>	6
<i>Carex praeegracilis</i>	1, 3	<i>Symphoricarpos occidentalis</i>	6
<i>Chenopodium album</i>	3	<i>Taraxacum officinale</i>	3, 6
<i>Cirsium arvense</i>	3, 6	<i>Thlaspi arvense</i>	3, 6
<i>Dactylis glomerata</i>	3	<i>Triglochin maritimum</i>	1
<i>Descurainia pinnata</i>	6	<i>Typha latifolia</i>	2
<i>Distichlis spicata</i>	1	<i>Sisymbrium altissimum</i>	3
<i>Eleocharis palustris</i>	1, 2, 5	<i>Salix amygdaloides</i>	4
<i>Epilobium ciliatum</i>	1		
<i>Equisetum arvense</i>	1, 2, 4		
<i>Equisetum hyemale</i>	2		
<i>Glyceria elata</i>	2		
<i>Glycyrrhiza lepidota</i>	1		
<i>Grindelia squarrosa</i>	6		
<i>Hordeum jubatum</i>	3, 4, 5		
<i>Juncus balticus</i>	1, 5		
<i>Kochia scoparia</i>	3, 6, 5		
<i>Koeleria pyramidata</i>	6		
<i>Medicago sativa</i>	3, 6		
<i>Melilotus alba</i>	3, 6		
<i>Melilotus officinalis</i>	3, 6		
<i>Opuntia sp.</i>	6		

COMMENTS/PROBLEMS: __ Outer oxbow is drying out due to lack of water in 2004.

PHOTOGRAPHS

Using a camera with a 50 mm lenses and color film take photographs of the following permanent reference points listed in the checklist below. Record the direction of the photograph using a compass. (The first time at each site establish a permanent reference point by setting a 1/2 inch rebar or fencepost extending 2-3' above ground, survey the location with a resource grade GPS and mark the location on the air photo.)

Checklist:

- X___ One photo for each of the 4 cardinal directions surrounding wetland
- X___ At least one photo showing upland use surrounding wetland – if more than one upland use exists, take additional photos
- X___ At least one photo showing buffer surrounding wetland
- X___ One photo from each end of vegetation transect showing transect

Location	Photo Frame #	Photograph Description	Compass Reading
A		See Photo Sheets	
B			
C			
D			
E			
F			
G			
H			

COMMENTS/PROBLEMS: _____

GPS SURVEYING

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

Checklist:

- ___ Jurisdictional wetland boundary
- ___ 4-6 landmarks recognizable on the air photo
- ___ Start and end points of vegetation transect(s)
- ___ Photo reference points
- ___ Groundwater monitoring well locations

COMMENTS/PROBLEMS: GPS unit not used in 2004 – wetland mapping modified by hand using aerial photographs in 2004.



WETLAND DELINEATION

(Attach Corps of Engineers delineation forms)

At each site conduct the items on the checklist below:

- Delineate wetlands according to the 1987 Army Corps manual.
- Delineate wetland-upland boundary on the air photo
- Survey wetland-upland boundary with a resource grade GPS survey

COMMENTS/PROBLEMS: GPS unit not used in 2004 – wetland mapping modified by hand using aerial photographs in 2004.

FUNCTIONAL ASSESSMENT

(Complete and attach full MDT Montana Wetland Assessment Method field forms; also attach abbreviated field forms, if used)

COMMENTS/PROBLEMS: _____

MAINTENANCE

Were man-made nesting structures installed at this site? YES___ NO__X_

If yes, do they need to be repaired? YES___ NO___

If yes, describe problems below and indicate if any actions were taken to remedy the problems.

NA

Were man-made structures build or installed to impound water or control water flow into or out of the wetland?

YES__X_ NO___

If yes, are the structures working properly and in good working order? YES_X_ NO___

If no, describe the problems below.

COMMENTS/PROBLEMS: None.



MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: Perry Ranch Date: 7/27/04 Examiner: JB Transect # 1 of 1

Approx. transect length: 532 feet Compass Direction from Start (Upland): 288 degrees

Vegetation type A:		Type 3 – Upland Floodplain
Length of transect in this type:	17	Feet
Species:		Cover:
HOR JUB		>50
POA PRA		11-20
ALO PRA		1-5
MED SAT		<1
AMA RET		<1
CHE ALB		<1
AGR INT		11-20
AGR ALB		1-5
Total Vegetative Cover:		100%

Vegetation type B:		Type 3– Upland Floodplain (vegetated transitional)
Length of transect in this type:	115	feet
Species:		Cover:
AGR INT		11-20
HOR JUB		>50
ALO PRA		<1
POT ANS		<1
MED SAT		1-5
KOC SCO		<1
GYL LEP		<1
CHE ALB		<1
RUM MAR		<1
Still considered transitional, although drier in '04 than '03.		
Total Vegetative Cover:		90%

Vegetation type C:		Type 3 – Upland Floodplain
Length of transect in this type:	125	feet
Species:		Cover:
AMA RET		11-20
AGR REP		>50
AGR INT		>50
KOC SCO		21-50
DES PIN		1-5
CAR PRA		6-10
THL ARV		1-5
CHE ALB		11-20
CAR DRA		1-5
HOR JUB		11-20
POA PRA (also CIR ARV at 1-5%)		11-20
Total Vegetative Cover:		100%

Vegetation type D:		Type 3– Upland Floodplain (vegetated transitional)
Length of transect in this type:	115	feet
Species:		Cover:
HOR JUB		>50
AGR INT		>50
RUM CRI		<1
ALO PRA		1-5
KOC SCO		<1
This community still is mapped as Type 3, but may be transitional. It was starting to pick up some wetter species in 2003, but shifted to direr species again in 2004 due to lack of water.		
Total Vegetative Cover:		90%

MDT WETLAND MONITORING – VEGETATION TRANSECT (continued)

Site: Perry Ranch Date: 7/27/04 Examiner: JB Transect # 1 of 1 continued

Approx. transect length: 532 feet Compass Direction from Start (Upland): 288 degrees

Vegetation type E:		Type 3 – Upland Floodplain	
Length of transect in this type:	150	feet	
Species:		Cover:	
KOC SCO		>50	
HOR JUB		1-5	
RUM CRI		<1	
SIS ALT		1-5	
This community still is mapped as Type 3, but may be transitional. Vastly dominated by KOC SCO and apparently did not flood in 2004.			
This area was virtually bare in 2003.			
Total Vegetative Cover:		100%	

Vegetation type F:		Type 5, Hillside Upland	
Length of transect in this type:	10	feet	
Species:		Cover:	
KOC SCO		21-50	
GRI SQU		1-5	
RUM MAR		6-10	
SIS ALT		21-50	
THL ARV		1-5	
HOR JUB		<1	
Total Vegetative Cover: 100%			

Vegetation type G:			
Length of transect in this type:		feet	
Species:		Cover:	
Total Vegetative Cover:			

Vegetation type H:			
Length of transect in this type:		feet	
Species:		Cover:	
Total Vegetative Cover:			



MDT WETLAND MONITORING – VEGETATION TRANSECT (back of form)

Cover Estimate

+ = <1% 3 = 11-20%
 1 = 1-5% 4 = 21-50%
 2 = 6-10% 5 = >50%

Indicator Class:

+ = Obligate
 - = Facultative/Wet
 0 = Facultative

Source:

P = Planted
 V = Volunteer

Percent of perimeter 30 % developing wetland vegetation – excluding dam/berm structures.

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 a point where water depths or saturation are maximized. Mark this location with another metal fencepost.

Estimate cover within a 10 ft 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.

Notes:

<p>Most of this transect occurred within the same general vegetation type – Type 3 – upland floodplain. Some areas along the transect were, however, still considered transitional (B and D) in 2004, despite the lack of water on the site. Segment E was devoid of vegetation in 2003, presumably due to flooding, but was dominated by weedy species (KOC SCO) in 2004 and therefore not mapped as transitional. These communities will likely change with addition of water.</p>



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

Project/Site: Perry Ranch Mitigation Site	Project No: Task 20	Date: 27-Jul-2004
Applicant/Owner: Montana Department of Transportation	County: Glacier	State: Montana
Investigators: Berglund	Plot ID: 3	

Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation:)? Is the area a potential Problem Area? (If needed, explain on the reverse side)	<input checked="" type="radio"/> Yes <input type="radio"/> No	Community ID: Emergent Transect ID: W-1 Field Location: WL#1 @ lobe of inlet channel @ s. end
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------

VEGETATION (USFWS Region No. 9)					
Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
<i>Potentilla anserina</i> Silverweed	Herb	OBL	<i>Hordeum jubatum</i> Barley, Fox-Tail	Herb	FAC+
<i>Carex praegracilis</i>	Herb	FACW	<i>Agropyron repens</i> Quackgrass	Herb	FACU
Sedge, Clustered Field			<i>Plantago lanceolata</i> Plantain, English	Herb	FACU+
<i>Juncus balticus</i> Rush, Baltic	Herb	OBL	<i>Alopecurus pratensis</i> Foxtail, Meadow	Herb	FACW
<i>Phalaris arundinacea</i> Grass, Reed Canary	Herb	FACW	<i>Glycyrrhiza lepidota</i> Licorice, American	Herb	FAC+
<i>Distichlis spicata</i> Saltgrass, Inland	Herb	FAC+			
<i>Agrostis alba</i> Redtop	Herb	FACW			

Percent of Dominant Species that are OBL, FACW or FAC: 6/8 = 75.00%
 (excluding FAC-) 9/11 = 81.82%
 FAC Neutral: 6/8 = 75.00%
 Numeric Index: 27/11 = 2.45

Remarks:

HYDROLOGY	
<u>NO</u> 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: N/A (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:
 Obviously flooded in 2003, and may have flooded in 2004.

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

Project/Site: Perry Ranch Mitigation Site	Project No: Task 20	Date: 27-Jul-2004
Applicant/Owner: Montana Department of Transportation	County: Glacier	State: Montana
Investigators: Berglund	Plot ID: 3	

SOILS					
Map Unit Name (Series and Phase): Kwanis fine sandy loam					
Map Symbol: KS			Drainage Class: wd		Mapped Hydric Inclusion?
Taxonomy (Subgroup): Mixed Frigid Typic Ustifluvents				Field Observations Confirm Mapped Type? Yes <input type="radio"/> No <input checked="" type="radio"/>	
Profile Description					

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc
8	B	2.5Y4/1	2.5Y5/6	Few Faint	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 Reducing Conditions
 NO Listed on National Hydric Soils List
 NO Other (Explain in Remarks)

Remarks:
 Dark streaking present as well.

WETLAND DETERMINATION			
Hydrophytic Vegetation Present?	<input checked="" type="radio"/> Yes	No	Is the Sampling Point within the Wetland?
Wetland Hydrology Present?	<input checked="" type="radio"/> Yes	No	<input checked="" type="radio"/> Yes
Hydric Soils Present?	<input checked="" type="radio"/> Yes	No	No

Remarks:
 Plot taken in excavated lobe of inlet channel near the south end of the monitoring area. Area is developing strong wetland characteristics, but fairly dry in 2004.



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

Project/Site: Perry Ranch Mitigation Site	Project No: Task 20	Date: 27-Jul-2004
Applicant/Owner: Montana Department of Transportation		County: Glacier
Investigators: Berglund		State: Montana
		Plot ID: 4

Do Normal Circumstances exist on the site? Is the site significantly disturbed (Atypical Situation)? Is the area a potential Problem Area? (If needed, explain on the reverse side)	<input checked="" type="radio"/> Yes <input type="radio"/> No	Community ID: Emergent/Mud Flat Transect ID: W-4 Field Location: inner oxbow near excavated ponds
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------

VEGETATION (USFWS Region No. 9)

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
<i>Hordeum jubatum</i>	Herb	FAC+	<i>Triglochin maritimum</i>	Herb	OBL
Barley,Fox-Tail			Arrow-Grass,Seaside		
<i>Equisetum arvense</i>	Herb	FAC	<i>Bromus inermis</i>	Herb	NI
Horsetail,Field			Brome, smooth		
<i>Potentilla anserina</i>	Herb	OBL	<i>Salix exigua</i>	Herb	OBL
Silverweed			Willow,Sandbar		
<i>Chenopodium album</i>	Herb	FAC	<i>Alopecurus pratensis</i>	Herb	FACW
Goosefoot,White			Foxtail,Meadow		
<i>Glyceria elata</i>	Herb	FACW+	<i>Kochia scoparia</i>	Herb	FAC
Grass,Tall Manna			Summer-Cypress,Mexican		
<i>Salix amygdaloides</i>	Herb	FACW	<i>Eleocharis palustris</i>	Herb	OBL
Willow,Peach-Leaf			Spikerush,Creeping		
<i>Carex praegracilis</i>	Herb	FACW	<i>Agropyron intermedium</i>	Herb	NI
Sedge,Clustered Field			Wheatgrass, intermediate		

Percent of Dominant Species that are OBL, FACW or FAC: (excluding FAC-) 12/12 = 100.00%	FAC Neutral: 8/8 = 100.00%
	Numeric Index: 24/12 = 2.00
Remarks: Several SAL AMY and SAL EXI seedlings present in 2004. Site is now supporting wetland vegetation, with coverage at about 60-70%.	

HYDROLOGY

<u>NO</u> 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: N/A (in.)	Wetland Hydrology Indicators Primary Indicators <u>NO</u> Inundated <u>NO</u> Saturated in Upper 12 Inches <u>NO</u> Water Marks <u>NO</u> Drift Lines YES Sediment Deposits YES Drainage Patterns in Wetlands Secondary Indicators <u>NO</u> Oxidized Root Channels in Upper 12 Inches <u>NO</u> Water-Stained Leaves <u>NO</u> Local Soil Survey Data YES FAC-Neutral Test <u>NO</u> Other(Explain in Remarks)
Remarks: Soil is moist at 10", but not currently saturated. Floods from Cut Bank Creek.	

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

Project/Site: Perry Ranch Mitigation Site	Project No: Task 20	Date: 27-Jul-2004
Applicant/Owner: Montana Department of Transportation		County: Glacier
Investigators: Berglund		State: Montana
		Plot ID: 4

SOILS

Map Unit Name (Series and Phase): Kwanis fine sandy loam	Mapped Hydric Inclusion?
Map Symbol: KS Drainage Class: wd	Field Observations Confirm Mapped Type? Yes <input type="radio"/> No <input checked="" type="radio"/>
Taxonomy (Subgroup): Mixed Frigid Typic Ustifluvents	

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc
10	A/B	10YR4/2	N/A	N/A N/A	Sandy loam

Hydric Soil Indicators: <u>NO</u> Histosol <u>NO</u> Histic Epipedon <u>NO</u> Sulfidic Odor <u>NO</u> Aquic Moisture Regime <u>NO</u> Reducing Conditions <u>NO</u> Gleyed or Low Chroma Colors	<u>NO</u> Concretions <u>NO</u> High Organic Content in Surface Layer in Sandy Soils <u>NO</u> Organic Streaking in Sandy Soils <u>NO</u> Listed on Local Hydric Soils List <u>NO</u> Listed on National Hydric Soils List YES Other (Explain in Remarks)
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Remarks: Soils are developing in this area; likely inundated for sufficient duration to satisfy NRCS hydric soils criterion #4.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input checked="" type="radio"/> Yes No	Is the Sampling Point within the Wetland? <input checked="" type="radio"/> Yes No
Wetland Hydrology Present? <input checked="" type="radio"/> Yes No	
Hydric Soils Present? <input checked="" type="radio"/> Yes No	

Remarks: This area was again mapped as transitional wetland, and is in the process of converting from mud flat. Hydrophytic vegetation is colonizing, especially willow seedlings, and hydrology appears to be present. Soils are developing.



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

i. AA is Documented (D) or Suspected (S) to contain (check box):

- Primary or Critical habitat (list species) D S _____
- Secondary habitat (list species) D S _____
- Incidental habitat (list species) D S Bald Eagle, Piping Plover
- No usable habitat D S _____

ii. Rating (Based on the strongest habitat chosen in 14A(i) above, find the corresponding rating of High (H), Moderate (M), or Low (L) for this function.

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	none
Functional Point and Rating	---	---	---	---	---	.3 (L)	---

If documented, list the source (e.g., observations, records, etc.): _____

14B. HABITAT FOR PLANTS AND ANIMALS RATED AS S1, S2, OR S3 BY THE MONTANA NATURAL HERITAGE PROGRAM.

Do not include species listed in 14A(i).

i. AA is Documented (D) or Suspected (S) to contain (check box):

- Primary or Critical habitat (list species) D S _____
- Secondary habitat (list species) D S Northern Leopard Frog
- Incidental habitat (list species) D S _____
- No usable habitat D S _____

iii. Rating (Based on the strongest habitat chosen in 14B(i) above, find the corresponding rating of High (H), Moderate (M), or Low (L) for this function.

Highest Habitat Level:	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	none
Functional Point and Rating	---	---	---	.6 (M)	---	---	---

If documented, list the source (e.g., observations, records, etc.): Leopard frogs observed at adjacent Outer oxbow in 02, but not 03 or 04.

14C. General Wildlife Habitat Rating

i. Evidence of overall wildlife use in the AA: (Check either substantial, moderate, or low)

- Substantial** (based on any of the following)
 - 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
 - interviews with local biologists with knowledge of the AA
- Moderate** (based on any of the following)
 - 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
 - interviews with local biologists with knowledge of the AA
- Low** (based on any of the following)
 - few or no wildlife observations during peak use periods
 - little to no wildlife sign
 - sparse adjacent upland food sources
 - interviews with local biologists with knowledge of AA

ii. Wildlife Habitat Features (Working from top to bottom, select appropriate AA attributes to determine the exceptional (E), high (H), moderate (M), or low (L)

rating. Structural diversity is from #13. For class cover to be considered evenly distributed, vegetated classes must be within 20% of each other in terms of

their percent composition in the AA (see #10). Duration of Surface Water: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; A = absent.

Structural Diversity (from #13)	<input type="checkbox"/> High								<input type="checkbox"/> Moderate								<input checked="" type="checkbox"/> Low							
	<input type="checkbox"/> Even				<input type="checkbox"/> Uneven				<input type="checkbox"/> Even				<input type="checkbox"/> Uneven				<input checked="" type="checkbox"/> Even							
Class Cover Distribution (all vegetated classes)																								
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 #12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	H	--	--	--
Moderate disturbance at AA (see #12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
High disturbance at AA (see #12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

iii. Rating (Using 14C(i) and 14C(ii) above and the matrix below to arrive at the functional point and rating of exceptional (E), high (H), moderate (M), or low (L) for this function.)

Evidence of Wildlife Use from 14C(i)	Wildlife Habitat Features Rating from 14C(ii)			
	<input type="checkbox"/> Exceptional	<input type="checkbox"/> High	<input type="checkbox"/> Moderate	<input type="checkbox"/> Low
Substantial	--	--	--	--
Moderate	--	.7 (M)	--	--
Low	--	--	--	--

Comments: Scattered waterfowl and shorebird use observed in 2004.

14D. GENERAL FISH/AQUATIC HABITAT RATING NA (proceed to 14E)

If the AA is not or was not historically used by fish due to lack of habitat, excessive gradient, then check the NA box above.

Assess if the AA is used by fish or the existing situation is "correctable" such that the AA could be used by fish [e.g. fish use is precluded by perched culvert or other barrier, etc.]. If fish use occurs in the AA but is not desired from a resource management perspective (e.g. fish use within an irrigation canal), then Habitat Quality [14D(i)] below should be marked as "Low", applied accordingly in 14D(ii) below, and noted in the comments.

i. **Habitat Quality** (Pick the appropriate AA attributes in matrix to pick the exceptional (E), high (H), moderate (M), or low (L) quality rating.)

Duration of Surface Water in AA	<input type="checkbox"/> Permanent/Perennial			<input type="checkbox"/> Seasonal / Intermittent			<input type="checkbox"/> Temporary / Ephemeral		
Cover - % of waterbody in AA containing cover objects (e.g. submerged logs, large rocks & boulders, overhanging banks, floating-leaved vegetation)	>25%	10-25%	<10%	>25%	10-25%	<10%	>25%	10-25%	<10%
Shading - >75% of streambank or shoreline of AA contains riparian or wetland scrub-shrub or forested communities	--	--	--	--	--	--	--	--	--
Shading - 50 to 75% of streambank or shoreline of AA contains riparian or wetland scrub-shrub or forested communities.	--	--	--	--	--	--	--	--	--
Shading - < 50% of streambank or shoreline of AA contains riparian or wetland scrub-shrub or forested communities.	--	--	--	--	--	--	--	--	--

ii. **Modified Habitat Quality:** Is fish use of the AA precluded or significantly reduced by a culvert, dike, other man-made structure or activity or is the waterbody included on the 'MDEQ list of waterbodies in need of TMDL development' with 'Probable Impaired Uses' listed as cold or warm water fishery or aquatic life support?

Y N If yes, reduce the rating from 14D(i) by one level and check the modified habitat quality rating: E H M L

iii. **Rating** (Use the conclusions from 14D(i) and 14D(ii) above and the matrix below to pick the functional point and rating of exceptional (E), high (H), moderate (M), or low (L).)

Types of Fish Known or Suspected Within AA	Modified Habitat Quality from 14D(ii)			
	<input type="checkbox"/> Exceptional	<input type="checkbox"/> High	<input type="checkbox"/> Moderate	<input type="checkbox"/> Low
Native game fish	--	--	--	--
Introduced game fish	--	--	--	--
Non-game fish	--	--	--	--
No fish	--	--	--	--

Comments: NA

14E. FLOOD ATTENUATION NA (proceed to 14G)

Applies only to wetlands subject to flooding via in-channel or overbank flow.

If wetlands in AA do not flooded from in-channel or overbank flow, check NA above.

i. **Rating** (Working from top to bottom, mark the appropriate attributes to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function.)

Estimated wetland area in AA subject to periodic flooding	<input type="checkbox"/> ≥ 10 acres			<input checked="" type="checkbox"/> <10, >2 acres			<input type="checkbox"/> ≤2 acres		
% of flooded wetland classified as forested, scrub/shrub, or both	75%	25-75%	<25%	75%	25-75%	<25%	75%	25-75%	<25%
AA contains no outlet or restricted outlet	--	--	--	--	--	.5 (M)	--	--	--
AA contains unrestricted outlet	--	--	--	--	--	--	--	--	--

ii. **Are residences, businesses, or other features which may be significantly damaged by floods located within 0.5 miles downstream of the AA?** (check)

Y N Comments: Floods from Cut Bank Creek.

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, check NA above.

i. **Rating** (Working from top to bottom, use the matrix below to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function.)

Abbreviations: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral.

Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding.	<input type="checkbox"/> >5 acre feet			<input checked="" type="checkbox"/> <5, >1 acre feet			<input type="checkbox"/> ≤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	--	--	--	--	.6 (M)	--	--	--	--
Wetlands in AA flood or pond < 5 out of 10 years	--	--	--	--	--	--	--	--	--

Comments: Assumed that floods most years.

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

Applies to wetlands with potential to receive excess 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 NA above.

i. **Rating** (Working from top to bottom, use the matrix below to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function.)

Sediment, Nutrient, and Toxicant Input Levels Within AA	AA receives or surrounding land use has potential to deliver low to moderate levels of sediments, nutrients, or compounds such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.				Waterbody 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	<input type="checkbox"/> ≥ 70%		<input checked="" type="checkbox"/> < 70%		<input type="checkbox"/> ≥ 70%		<input type="checkbox"/> < 70%	
Evidence of flooding or ponding in AA	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No
AA contains no or restricted outlet	--	--	.7 (M)	--	--	--	--	--
AA contains unrestricted outlet	--	--	--	--	--	--	--	--

Comments: Sediments and nutrients inflow 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 that is subject to wave action. If this does not apply, check NA above.

i. **Rating** (Working from top to bottom, use the matrix below to arrive at the functional point and rating exceptional (E), high (H), moderate (M), or low (L) for this function.

% Cover of wetland streambank or shoreline by species with deep, binding rootmasses.	Duration of Surface Water Adjacent to Rooted Vegetation		
	<input type="checkbox"/> Permanent / Perennial	<input type="checkbox"/> Seasonal / Intermittent	<input type="checkbox"/> Temporary / Ephemeral
≥ 65 %	--	--	--
35-64 %	--	--	--
< 35 %	--	--	--

Comments: Not applicable at this stage.

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT

i. **Rating** (Working from top to bottom, use the matrix below to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function.

A = acreage of vegetated component in the AA. B = structural diversity rating from #13. C = Yes (Y) or No (N) as to whether or not the AA contains a surface or subsurface outlet; P/P = permanent/perennial; S/I = seasonal/intermittent; T/E/A = temporary/ephemeral/absent.

A	<input type="checkbox"/> Vegetated component >5 acres						<input checked="" type="checkbox"/> Vegetated component 1-5 acres						<input type="checkbox"/> Vegetated component <1 acre					
B	<input type="checkbox"/> High		<input type="checkbox"/> Moderate		<input type="checkbox"/> Low		<input type="checkbox"/> High		<input type="checkbox"/> Moderate		<input checked="" type="checkbox"/> Low		<input type="checkbox"/> High		<input type="checkbox"/> Moderate		<input type="checkbox"/> Low	
C	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N
P/P	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S/I	--	--	--	--	--	--	--	--	--	--	.6M	--	--	--	--	--	--	--
T/E/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Comments: _____

14J. GROUNDWATER DISCHARGE/RECHARGE (D/R) (Check the indicators in i & ii below that apply to the AA)

i. Discharge Indicators

- Springs 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.
- Other Some alluvial flow likely.

ii. Recharge Indicators

- Permeable substrate presents without underlying impeding layer.
- Wetland contains inlet but not outlet.
- Other _____

iii. **Rating:** Use the information from 14J(i) and 14J(ii) above and the table below to arrive at the functional point and rating of high (H) or low (L) for this function.

Criteria	Functional Point and Rating
AA has known Discharge/Recharge area or one or more indicators of D/R present	1 (H)
No Discharge/Recharge indicators present	--
Available Discharge/Recharge information inadequate to rate AA D/R potential	--

Comments: _____

14K. UNIQUENESS

i. **Rating** (Working from top to bottom, use the matrix below to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function.

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 from #11	<input type="checkbox"/> rare	<input type="checkbox"/> common	<input type="checkbox"/> abundant	<input type="checkbox"/> rare	<input type="checkbox"/> common	<input type="checkbox"/> abundant	<input type="checkbox"/> rare	<input checked="" type="checkbox"/> common	<input type="checkbox"/> abundant
Low disturbance at AA (#12i)	--	--	--	--	--	--	--	.4M	--
Moderate disturbance at AA (#12i)	--	--	--	--	--	--	--	--	--
High disturbance at AA (#12i)	--	--	--	--	--	--	--	--	--

Comments: _____

14L. RECREATION / EDUCATION POTENTIAL

i. Is the AA a known recreational or educational site? Yes (Rate High (1.0), then proceed to 14L(ii) only] No [Proceed to 14L(iii)]

ii. Check categories that apply to the AA: Educational / scientific study Consumptive rec. Non-consumptive rec. Other

iii. Based on the location, diversity, size, and other site attributes, is there a strong potential for recreational or educational use?

- Yes [Proceed to 14L (ii) and then 14L(iv).]
- No [Rate as low in 14L(iv)]

iv. **Rating** (Use the matrix below to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function.

Ownership	Disturbance at AA from #12(i)		
	<input checked="" type="checkbox"/> Low	<input type="checkbox"/> Moderate	<input type="checkbox"/> High
Public ownership	--	--	--
Private ownership	.7(M)	--	--

Comments: Tribal ownership restricts access.

FUNCTION, VALUE SUMMARY, AND OVERALL RATING – Inner Oxbow

Function and Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units (Actual Points x Estimated AA Acreage)
A. Listed/Proposed T&E Species Habitat	Low	0.30	1	
B. MT Natural Heritage Program Species Habitat	Moderate	0.60	1	
C. General Wildlife Habitat	Moderate	0.70	1	
D. General Fish/Aquatic Habitat	NA	0.00	--	
E. Flood Attenuation	Moderate	0.50	1	
F. Short and Long Term Surface Water Storage	Moderate	0.60	1	
G. Sediment/Nutrient/Toxicant Removal	Moderate	0.7	1	
H. Sediment/Shoreline Stabilization	NA	0.00	--	
I. Production Export/Food Chain Support	Moderate	0.60	1	
J. Groundwater Discharge/Recharge	High	1.00	1	
K. Uniqueness	Moderate	0.40	1	
L. Recreation/Education Potential	Moderate	0.70	1	
Totals:		6.10	10.00	
Percent of Total Possible Points:			61% (Actual / Possible) x 100 [rd to nearest whole #]	

<p>Category I Wetland: (Must satisfy one of the following criteria. If not proceed to Category II.)</p> <p><input type="checkbox"/> Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; or</p> <p><input type="checkbox"/> Score of 1 functional point for Uniqueness; or</p> <p><input type="checkbox"/> Score of 1 functional point for Flood Attenuation and answer to Question 14E(ii) is "yes"; or</p> <p><input type="checkbox"/> Percent of total Possible Points is > 80%.</p>
<p>Category II Wetland: (Criteria for Category I not satisfied and meets any one of the following Category II criteria. If not satisfied, proceed to Category IV.)</p> <p><input type="checkbox"/> Score of 1 functional point for Species Rated S1, S2, or S3 by the MT Natural Heritage Program; or</p> <p><input type="checkbox"/> Score of .9 or 1 functional point for General Wildlife Habitat; or</p> <p><input type="checkbox"/> Score of .9 or 1 functional point for General Fish/Aquatic Habitat; or</p> <p><input type="checkbox"/> "High" to "Exceptional" ratings for both General Wildlife Habitat and General Fish / Aquatic Habitat; or</p> <p><input type="checkbox"/> Score of .9 functional point for Uniqueness; or</p> <p><input type="checkbox"/> Percent of total possible points is > 65%.</p>
<p><input checked="" type="checkbox"/> Category III Wetland: (Criteria for Categories I, II, or IV not satisfied.)</p>
<p>Category IV Wetland: (Criteria for Categories I or II are not satisfied and <u>all</u> of the following criteria are met; If not satisfied, proceed to Category III.)</p> <p><input type="checkbox"/> "Low" rating for Uniqueness; and</p> <p><input type="checkbox"/> "Low" rating for Production Export / Food Chain Support; and</p> <p><input type="checkbox"/> Percent of total possible points is < 30%.</p>

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

I

 II

 III

 IV

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

iv. AA is Documented (D) or Suspected (S) to contain (check box):

- Primary or Critical habitat (list species) D S _____
- Secondary habitat (list species) D S _____
- Incidental habitat (list species) D S Bald Eagle, Piping Plover
- No usable habitat D S _____

v. Rating (Based on the strongest habitat chosen in 14A(i) above, find the corresponding rating of High (H), Moderate (M), or Low (L) for this function.

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	none
Functional Point and Rating	---	---	---	---	---	.3 (L)	---

If documented, list the source (e.g., observations, records, etc.): _____

14B. HABITAT FOR PLANTS AND ANIMALS RATED AS S1, S2, OR S3 BY THE MONTANA NATURAL HERITAGE PROGRAM.

Do not include species listed in 14A(i).

ii. AA is Documented (D) or Suspected (S) to contain (check box):

- Primary or Critical habitat (list species) D S _____
- Secondary habitat (list species) D S Northern Leopard Frog
- Incidental habitat (list species) D S _____
- No usable habitat D S _____

vi. Rating (Based on the strongest habitat chosen in 14B(i) above, find the corresponding rating of High (H), Moderate (M), or Low (L) for this function.

Highest Habitat Level:	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	none
Functional Point and Rating	---	---	.7 (M)	---	---	---	---

If documented, list the source (e.g., observations, records, etc.): Leopard frogs observed at Outer oxbow in 2002, but not 2003 or 2004. Few individuals observed.

14C. General Wildlife Habitat Rating

ii. Evidence of overall wildlife use in the AA: (Check either substantial, moderate, or low)

- Substantial** (based on any of the following)
 - 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
 - interviews with local biologists with knowledge of the AA
- Low** (based on any of the following)
 - few or no wildlife observations during peak use periods
 - little to no wildlife sign
 - sparse adjacent upland food sources
 - interviews with local biologists with knowledge of AA
- Moderate** (based on any of the following)
 - 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
 - interviews with local biologists with knowledge of the AA

ii. Wildlife Habitat Features (Working from top to bottom, select appropriate AA attributes to determine the exceptional (E), high (H), moderate (M), or low (L)

rating. Structural diversity is from #13. For class cover to be considered evenly distributed, vegetated classes must be within 20% of each other in terms of their percent composition in the AA (see #10). Duration of Surface Water: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; A= absent.

Structural Diversity (from #13)	<input type="checkbox"/> High								<input type="checkbox"/> Moderate								<input checked="" type="checkbox"/> Low			
	<input type="checkbox"/> Even				<input type="checkbox"/> Uneven				<input type="checkbox"/> Even				<input type="checkbox"/> Uneven				<input checked="" type="checkbox"/> Even			
Class Cover Distribution (all vegetated classes)																				
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 #12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	H	--	--
Moderate disturbance at AA (see #12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
High disturbance at AA (see #12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

iii. Rating (Using 14C(i) and 14C(ii) above and the matrix below to arrive at the functional point and rating of exceptional (E), high (H), moderate (M), or low (L) for this function.)

Evidence of Wildlife Use from 14C(i)	Wildlife Habitat Features Rating from 14C(ii)			
	<input type="checkbox"/> Exceptional	<input checked="" type="checkbox"/> High	<input type="checkbox"/> Moderate	<input type="checkbox"/> Low
Substantial	--	--	--	--
Moderate	--	.7 (M)	--	--
Low	--	--	--	--

Comments: Scattered wildlife species observed in 2004 - site dry, so "downgraded" to moderate use.

14D. GENERAL FISH/AQUATIC HABITAT RATING NA (proceed to 14E)

If the AA is not or was not historically used by fish due to lack of habitat, excessive gradient, then check the NA box above.

Assess if the AA is used by fish or the existing situation is "correctable" such that the AA could be used by fish [e.g. fish use is precluded by perched culvert or other barrier, etc.]. If fish use occurs in the AA but is not desired from a resource management perspective (e.g. fish use within an irrigation canal), then Habitat Quality [14D(i)] below should be marked as "Low", applied accordingly in 14D(ii) below, and noted in the comments.

i. **Habitat Quality** (Pick the appropriate AA attributes in matrix to pick the exceptional (E), high (H), moderate (M), or low (L) quality rating.)

Duration of Surface Water in AA	<input type="checkbox"/> Permanent/Perennial			<input type="checkbox"/> Seasonal / Intermittent			<input type="checkbox"/> Temporary / Ephemeral		
Cover - % of waterbody in AA containing cover objects (e.g. submerged logs, large rocks & boulders, overhanging banks, floating-leaved vegetation)	>25%	10-25%	<10%	>25%	10-25%	<10%	>25%	10-25%	<10%
Shading - >75% of streambank or shoreline of AA contains riparian or wetland scrub-shrub or forested communities	--	--	--	--	--	--	--	--	--
Shading - 50 to 75% of streambank or shoreline of AA contains riparian or wetland scrub-shrub or forested communities.	--	--	--	--	--	--	--	--	--
Shading - < 50% of streambank or shoreline of AA contains riparian or wetland scrub-shrub or forested communities.	--	--	--	--	--	--	--	--	--

ii. **Modified Habitat Quality:** Is fish use of the AA precluded or significantly reduced by a culvert, dike, other man-made structure or activity or is the waterbody included on the 'MDEQ list of waterbodies in need of TMDL development' with 'Probable Impaired Uses' listed as cold or warm water fishery or aquatic life support?

Y N If yes, reduce the rating from 14D(i) by one level and check the modified habitat quality rating: E H M L

iii. **Rating** (Use the conclusions from 14D(i) and 14D(ii) above and the matrix below to pick the functional point and rating of exceptional (E), high (H), moderate (M), or low (L).)

Types of Fish Known or Suspected Within AA	Modified Habitat Quality from 14D(ii)			
	<input type="checkbox"/> Exceptional	<input type="checkbox"/> High	<input type="checkbox"/> Moderate	<input type="checkbox"/> Low
Native game fish	--	--	--	--
Introduced game fish	--	--	--	--
Non-game fish	--	--	--	--
No fish	--	--	--	--

Comments: NA

14E. FLOOD ATTENUATION NA (proceed to 14G)

Applies only to wetlands subject to flooding via in-channel or overbank flow.

If wetlands in AA do not flooded from in-channel or overbank flow, check NA above.

i. **Rating** (Working from top to bottom, mark the appropriate attributes to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function.)

Estimated wetland area in AA subject to periodic flooding	<input type="checkbox"/> ≥ 10 acres			<input checked="" type="checkbox"/> <10, >2 acres			<input type="checkbox"/> ≤2 acres		
% of flooded wetland classified as forested, scrub/shrub, or both	75%	25-75%	<25%	75%	25-75%	<25%	75%	25-75%	<25%
AA contains no outlet or restricted outlet	--	--	--	--	--	.5 (M)	--	--	--
AA contains unrestricted outlet	--	--	--	--	--	--	--	--	--

ii. **Are residences, businesses, or other features which may be significantly damaged by floods located within 0.5 miles downstream of the AA?** (check)

Y N Comments: Floods from Cut Bank Creek.

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, check NA above.

i. **Rating** (Working from top to bottom, use the matrix below to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function.)

Abbreviations: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral.

Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding.	<input checked="" type="checkbox"/> >5 acre feet			<input type="checkbox"/> <5, >1 acre feet			<input type="checkbox"/> ≤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	--	.9 (H)	--	--	--	--	--	--	--
Wetlands in AA flood or pond < 5 out of 10 years	--	--	--	--	--	--	--	--	--

Comments: Assumed that floods most years.

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

Applies to wetlands with potential to receive excess 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 NA above.

i. **Rating** (Working from top to bottom, use the matrix below to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function.)

Sediment, Nutrient, and Toxicant Input Levels Within AA	AA receives or surrounding land use has potential to deliver low to moderate levels of sediments, nutrients, or compounds such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.				Waterbody 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.			
	<input checked="" type="checkbox"/> ≥ 70%		<input type="checkbox"/> < 70%		<input type="checkbox"/> ≥ 70%		<input type="checkbox"/> < 70%	
Evidence of flooding or ponding in AA	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No
AA contains no or restricted outlet	1 (H)	--	--	--	--	--	--	--
AA contains unrestricted outlet	--	--	--	--	--	--	--	--

Comments: Sediments and nutrients inflow 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 that is subject to wave action. If this does not apply, check NA above.

i. **Rating** (Working from top to bottom, use the matrix below to arrive at the functional point and rating exceptional (E), high (H), moderate (M), or low (L) for this function.

% Cover of wetland streambank or shoreline by species with deep, binding rootmasses.	Duration of Surface Water Adjacent to Rooted Vegetation		
	<input type="checkbox"/> Permanent / Perennial	<input type="checkbox"/> Seasonal / Intermittent	<input type="checkbox"/> Temporary / Ephemeral
≥ 65 %	--	--	--
35-64 %	--	--	--
< 35 %	--	--	--

Comments: Not applicable at this stage.

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT

i. **Rating** (Working from top to bottom, use the matrix below to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function. A = acreage of vegetated component in the AA. B = structural diversity rating from #13. C = Yes (Y) or No (N) as to whether or not the AA contains a surface or subsurface outlet; P/P = permanent/perennial; S/I = seasonal/intermittent; T/E/A = temporary/ephemeral/absent.

A	<input checked="" type="checkbox"/> Vegetated component >5 acres						<input type="checkbox"/> Vegetated component 1-5 acres						<input type="checkbox"/> Vegetated component <1 acre					
B	<input type="checkbox"/> High		<input type="checkbox"/> Moderate		<input checked="" type="checkbox"/> Low		<input type="checkbox"/> High		<input type="checkbox"/> Moderate		<input type="checkbox"/> Low		<input type="checkbox"/> High		<input type="checkbox"/> Moderate		<input type="checkbox"/> Low	
C	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N
P/P	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S/I	--	--	--	--	.7M	--	--	--	--	--	--	--	--	--	--	--	--	--
T/E/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Comments: "Outlet" is exit over dike spillway.

14J. GROUNDWATER DISCHARGE/RECHARGE (D/R) (Check the indicators in i & ii below that apply to the AA)

i. **Discharge Indicators**

- Springs 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.
- Other Some alluvial flow likely.

ii. **Recharge Indicators**

- Permeable substrate presents without underlying impeding layer.
- Wetland contains inlet but not outlet.
- Other _____

iii. **Rating:** Use the information from 14J(i) and 14J(ii) above and the table below to arrive at the functional point and rating of high (H) or low (L) for this function.

Criteria	Functional Point and Rating
AA has known Discharge/Recharge area or one or more indicators of D/R present	1 (H)
No Discharge/Recharge indicators present	--
Available Discharge/Recharge information inadequate to rate AA D/R potential	--

Comments: _____

14K. UNIQUENESS

i. **Rating** (Working from top to bottom, use the matrix below to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function.

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 from #11	<input type="checkbox"/> rare	<input type="checkbox"/> common	<input type="checkbox"/> abundant	<input type="checkbox"/> rare	<input type="checkbox"/> common	<input type="checkbox"/> abundant	<input type="checkbox"/> rare	<input checked="" type="checkbox"/> common	<input type="checkbox"/> abundant
Low disturbance at AA (#12i)	--	--	--	--	--	--	--	.4M	--
Moderate disturbance at AA (#12i)	--	--	--	--	--	--	--	--	--
High disturbance at AA (#12i)	--	--	--	--	--	--	--	--	--

Comments: _____

14L. RECREATION / EDUCATION POTENTIAL

i. Is the AA a known recreational or educational site? Yes (Rate High (1.0), then proceed to 14L(ii) only] No [Proceed to 14L(iii)]

ii. Check categories that apply to the AA: Educational / scientific study Consumptive rec. Non-consumptive rec. Other

iii. Based on the location, diversity, size, and other site attributes, is there a strong potential for recreational or educational use?

- Yes [Proceed to 14L (ii) and then 14L(iv).]
- No [Rate as low in 14L(iv)]

iv. **Rating** (Use the matrix below to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function.

Ownership	Disturbance at AA from #12(i)		
	<input checked="" type="checkbox"/> Low	<input type="checkbox"/> Moderate	<input type="checkbox"/> High
Public ownership	--	--	--
Private ownership	.7(M)	--	--

Comments: Tribal ownership restricts access.

FUNCTION, VALUE SUMMARY, AND OVERALL RATING – Outer Oxbow

Function and Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units (Actual Points x Estimated AA Acreage)
A. Listed/Proposed T&E Species Habitat	Low	0.30	1	
B. MT Natural Heritage Program Species Habitat	Moderate	0.70	1	
C. General Wildlife Habitat	Moderate	0.70	1	
D. General Fish/Aquatic Habitat	NA	0.00	--	
E. Flood Attenuation	Moderate	0.50	1	
F. Short and Long Term Surface Water Storage	High	0.90	1	
G. Sediment/Nutrient/Toxicant Removal	High	1.00	1	
H. Sediment/Shoreline Stabilization	NA	0.00	--	
I. Production Export/Food Chain Support	Moderate	0.70	1	
J. Groundwater Discharge/Recharge	High	1.00	1	
K. Uniqueness	Moderate	0.40	1	
L. Recreation/Education Potential	Moderate	0.70	1	
Totals:		<u>6.9</u>	<u>10.00</u>	
Percent of Total Possible Points:			69% (Actual / Possible) x 100 [rd to nearest whole #]	

<p>Category I Wetland: (Must satisfy one of the following criteria. If not proceed to Category II.)</p> <input type="checkbox"/> Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; or <input type="checkbox"/> Score of 1 functional point for Uniqueness; or <input type="checkbox"/> Score of 1 functional point for Flood Attenuation and answer to Question 14E(ii) is "yes"; or <input type="checkbox"/> Percent of total Possible Points is > 80%.
<p>Category II Wetland: (Criteria for Category I not satisfied and meets any one of the following Category II criteria. If not satisfied, proceed to Category IV.)</p> <input type="checkbox"/> Score of 1 functional point for Species Rated S1, S2, or S3 by the MT Natural Heritage Program; or <input type="checkbox"/> Score of .9 or 1 functional point for General Wildlife Habitat; or <input type="checkbox"/> Score of .9 or 1 functional point for General Fish/Aquatic Habitat; or <input type="checkbox"/> "High" to "Exceptional" ratings for both General Wildlife Habitat and General Fish / Aquatic Habitat; or <input type="checkbox"/> Score of .9 functional point for Uniqueness; or <input checked="" type="checkbox"/> Percent of total possible points is > 65%.
<p><input type="checkbox"/> Category III Wetland: (Criteria for Categories I, II, or IV not satisfied.)</p>
<p>Category IV Wetland: (Criteria for Categories I or II are not satisfied and <u>all</u> of the following criteria are met; If not satisfied, proceed to Category III.)</p> <input type="checkbox"/> "Low" rating for Uniqueness; and <input type="checkbox"/> "Low" rating for Production Export / Food Chain Support; and <input type="checkbox"/> Percent of total possible points is < 30%.

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

I
 II
 III
 IV

Appendix C

REPRESENTATIVE PHOTOGRAPHS 2004 AERIAL PHOTOGRAPH

*MDT Wetland Mitigation Monitoring
Perry Ranch
Glacier County, Montana*

2004 PERRY RANCH



Photo Point 1: Panoramic view of northernmost excavated area on July 27, 2004. General photo aspect is south from adjacent hillside to north.



Photo Point 2: Panoramic view of "outer" (photo left) and "inner" (photo right) oxbows on July 27, 2004. General photo aspect is east / southeast from adjacent hillside to west.



Photo Point 3: Panoramic view of SW end of site on July 27, 2004. General photo aspect is northeast from adjacent hillside to southwest. Delivery ditch is in foreground.

2004 PERRY RANCH



Photo from transect start facing 288 degrees W/NW.



Photo from transect end facing 100 degrees E/SE.



Photo from within inner oxbow, from dike at east end of oxbow, facing west.



Photo from within center of outer oxbow, near west end, facing east.



Photo from dike, facing west through center of outer oxbow.



Photo of OW/MF #2 facing northwest from the southeast edge.

2004 PERRY RANCH AERIAL PHOTOGRAPH



Appendix D

MDT PROPOSED PROJECT LAYOUT

MDT Wetland Mitigation Monitoring
Perry Ranch
Glacier County, Montana

~ . P. L. MORSE, R.

MONTANA DEPARTMENT OF TRANSPORTATION

FEDERAL AID PROJECT NO. NH 0002(232)

WETLAND MITIGATION

PERRY RANCH

GLACIER COUNTY

DESIGN DATA	
ASLT.	
ASLT.	
CHK.	
D.	
T.	
V.	
ALL TRUCKS	
WIS by STATE	
GROWTH RATE	

LETTING DATE -



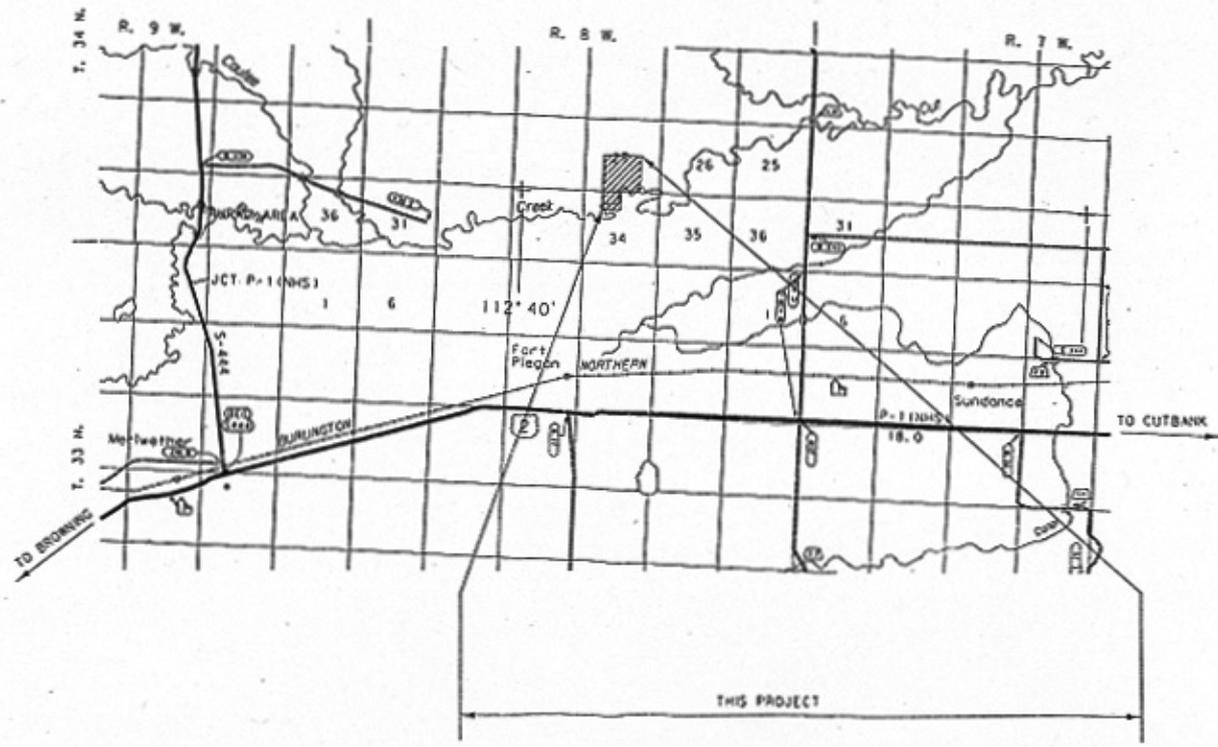
MONTANA DEPARTMENT OF TRANSPORTATION

LENGTH kilometers

SCALES

VERTICAL: 1:1
HORIZONTAL: 1:1

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



**PRELIMINARY
FOR PLAN IN HAND ONLY**

MONTANA DEPARTMENT OF TRANSPORTATION	
APPROVED: _____	
BY: _____ ADMINISTRATOR REGIONAL DIVISION - ENGINEERING	
U.S. DEPARTMENT OF TRANSPORTATION REGIONAL ENGINEERING ADMINISTRATION	
APPROVED: _____	
ENGINEER ADMINISTRATION	DATE

RELATED PROJECTS

ASSOCIATED PROJECT AGREEMENT NUMBERS

CONTROL NO.

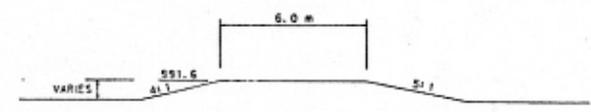
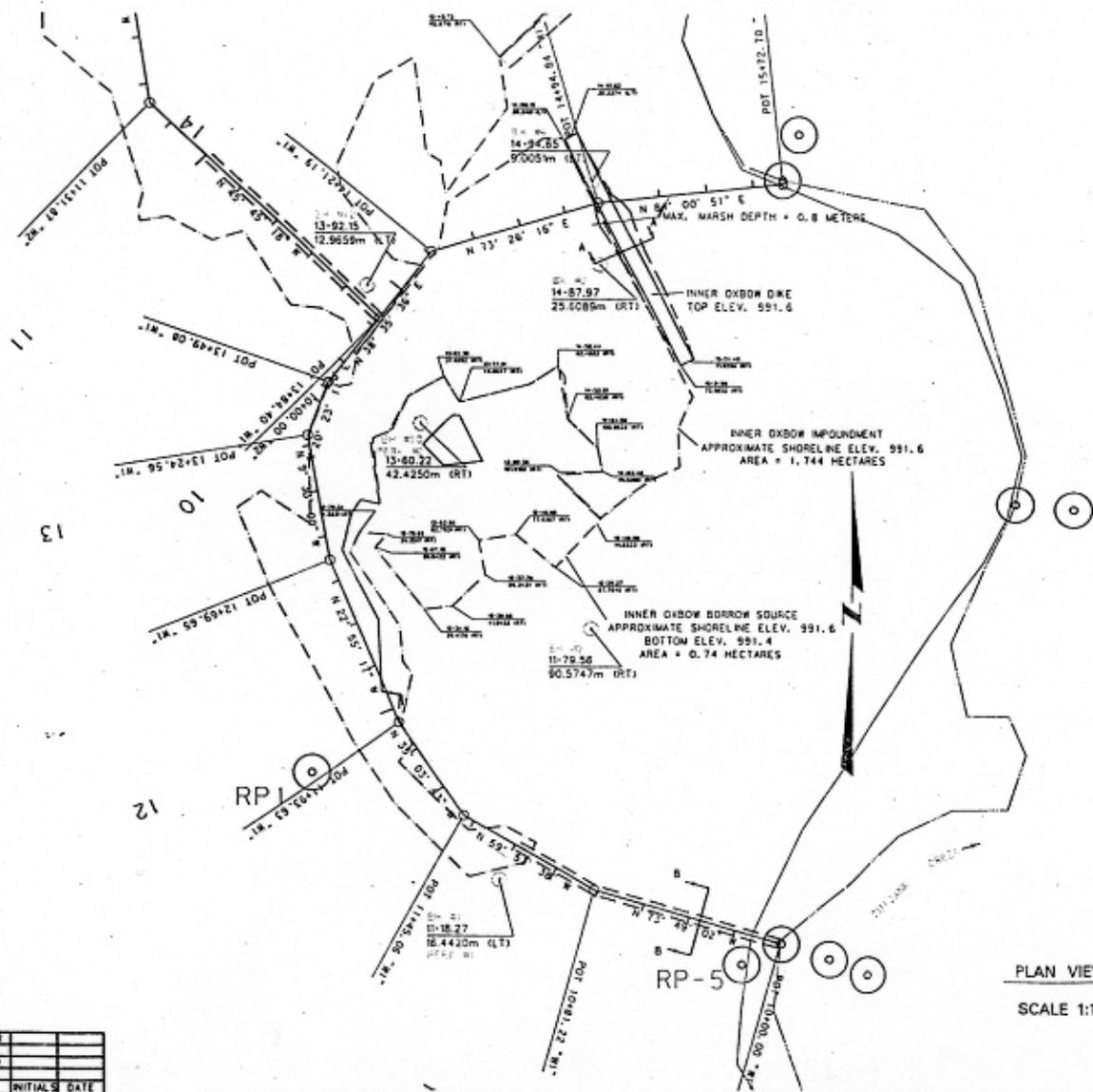
APR 11 2004
OFFICE OF 623.13

MONTANA DEPARTMENT OF TRANSPORTATION

623.13

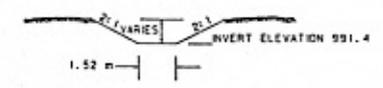
STATE	PROJECT NUMBER	SHEET NO.
MONTANA	NH 0002 (232)	6

INNER OXBOW LAYOUT



SECTION A-A-SPREER DIKE TYPICAL SECTION
SCALE 1:10

STA. 10+00 TO STA. 11+20



SECTION B-B-INTAKE WEIR TYPICAL SECTION
SCALE 1:10

PLAN VIEW
SCALE 1:100

INNER OXBOW
LAYOUT DETAIL
ALIGNMENT "W1"
PRELIMINARY

MONTANA DEPARTMENT OF TRANSPORTATION

DESIGNED BY: JAC
DRAWN BY: JAC
CHECKED BY: JAC
REVISED BY: JAC
DATE: 02/13

DESIGNER	DRAWN	CHECKED	REVISED	INITIALS	DATE

Appendix E

BIRD SURVEY PROTOCOL GPS PROTOCOL

*MDT Wetland Mitigation Monitoring
Perry Ranch
Glacier County, Montana*

BIRD SURVEY PROTOCOL

The following is an outline of the MDT Wetland Mitigation Site Monitoring Bird Survey Protocol. Though each site is vastly different, the bird survey data collection methods must be standardized to a certain degree to increase repeatability. An Area Search within a restricted time frame will be used to collect the following data: a bird species list, density, behavior, and habitat-type use. There will be some decisions that team members must make to fit the protocol to their particular site. Each of the following sections and the desired result describes the protocol established to reflect bird species use over time.

Species Use within the Mitigation Wetland: Survey Method

Result: To conduct a bird survey of the wetland mitigation site within a restricted period of time and the budget allotment.

Sites that can be circumambulated or walked throughout.

These types of sites will include ponds, enhanced historic river channels, wet meadows, and any area that can be surveyed from the entirety of its perimeter or walked throughout. If the wetland is not uncomfortably inundated, conduct several “meandering” transects through the site in an orderly fashion (record the number and approximate location/direction of the transects in the field notebook; they do not have to be formalized or staked). If a very small portion of the site cannot be crossed due to inundation, this method will also apply. Though the sizes of the site vary, each site will require surveying to the fullest extent possible within a set time limit. The optimum times to conduct the survey are in the morning hours. Conduct the survey from sunrise to no later than 11:00 AM. (Note: some sites may have to be surveyed in the late afternoon or evening due to time constraints or weather; if this is the case, record the time of day and include this information in your report discussion.) If the survey is completed before 11:00 AM and no additions are being made to the list, then the task is complete. The overall limiting factor regarding the number of hours that are spent conducting this survey is the number of budgeted hours; this determination must be made by site by each individual.

In many cases, binoculars will be the only instrument that is needed to identify and count the birds using the wetland. If the wetland includes deep water habitat that can not be assessed with binoculars, then a scope and tripod are necessary. If this is the case, establish as many lookout posts as necessary from key vantage points to collect the data. Depending on the size of the open water, more time may be spent viewing the mitigation area from these vantage points than is spent walking the peripheries of more shallow-water wetlands.

Sites that cannot be circumambulated.

These types of sites will include large-bodied waters, such as reservoirs, particularly those with deep water habitat (>6 ft) close to the shore and no wetland development in that area of the shoreline. If one area of the reservoir was graded in such a way to create or enhance the development of a wetland, then that will be the area in which the ambulatory bird survey is conducted. The team member must then determine the length of the shoreline that will be surveyed during each visit.

As stated above in the ambulatory site section, these large sites most likely will have to be surveyed from established vantage points.

Species Use within the Mitigation Wetland: Data Recording

Result: A complete list of bird species using the site, an estimate of bird densities and associated behaviors, and identification of habitat use.

1. Bird Species List

Record the bird species on the Bird Survey - Field Data Sheet using the appropriate 4-letter code of the common name. The coding uses the first two letters of the first two words of the birds' common name or if one name, the first four (4) letters. For example, mourning dove is coded MODO and mallard is MALL. If an unknown individual is observed, use the following protocol and define your abbreviation at the bottom of the field data sheet: unknown shorebird: UNSB; unknown brown bird (UNBR); unknown warbler (UNWA); unknown waterfowl (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 parentheses; do not fill in the habitat column. For example, a flock of black, medium-sized birds could be coded: UNBB / FO (25). You may also note on the data sheet if that particular individual is using a constructed nest box.

2. Bird Density

In the office, sum the Bird Survey – Field Data Sheet data by species and by behavior. Record this data in the Bird Summary Table.

3. Bird Behavior

Bird behavior must be identified by what is known. When a species is simply observed, the behavior that it is immediately exhibiting is what is recorded. Only behaviors that have discreet descriptive terms should be used. The following terms are recommended: breeding pair individual (BP); foraging (F); flyover (FO); loafing (L; e.g. sleeping, roosting, floating with head tucked under wing are loafing behaviors); and, nesting (N). If more behaviors are observed that do have a specific descriptive word, use them and we will add it to the protocol; descriptive words or phrases such as “migrating” or “living on site” are unknown behaviors.

4. Bird Species Habitat Use

We are interested in what bird species are using which particular habitat within the mitigation wetlands. This data is easily collected by simply recording what habitat the species was initially observed. Use the following broad category habitat classifications: aquatic bed (AB - rooted floating, floating-leaved, or submergent vegetation); forested (FO); marsh (MA – cattail, bulrush, emergent vegetation, etc. with surface water); open water (OW – primarily unvegetated); scrub-shrub (SS); and upland buffer (UP); wet meadow (WM – sedges, rushes, grasses with little to no surface water). If other categories are observed onsite that are not suggested here, we will make a new category next year.

GPS MAPPING AND AERIAL PHOTO REFERENCING PROCEDURE

The wetland boundaries, photograph location points and sampling locations were field located with mapping grade Trimble Geo III GPS units. The data was collected with a minimum of three positions per feature using Course/Acquisition code. The collected data was then transferred to a PC and differentially corrected to the nearest operating Community Base Station. The corrected data was then exported to ACAD drawings in Montana State Plain Coordinates NAD 83 international feet.

The GPS positions collected and processed had a 68% accuracy of 7 feet except in isolated areas of Tasks .008 and .011, where it went to 12 feet. This is within the 1 to 5 meter range listed as the expected accuracy of the mapping grade Trimble GPS.

Aerial reference points were used to position the aerial photographs. This positioning did not remove the distortion inherent in all photos; this imagery is to be used as a visual aide only. The located wetland boundaries were given a final review by the wetland biologist and adjustments were made if necessary.

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.