# MONTANA DEPARTMENT OF TRANSPORTATION WETLAND MITIGATION MONITORING REPORT: 2002

*Perry Ranch*
*Glacier County, Montana*

Prepared for:
**MONTANA DEPARTMENT OF TRANSPORTATION**
2701 Prospect Avenue
Helena, MT 59620-1001

Prepared by:
**LAND & WATER CONSULTING, INC.**
P.O. Box 8254
Missoula, MT 59807

May 2003

Project No: 130091.020

# MONTANA DEPARTMENT OF TRANSPORTATION

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## YEAR 2002

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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. 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 mitigation figure is inclusive of these 3.4 acres of existing wetlands.

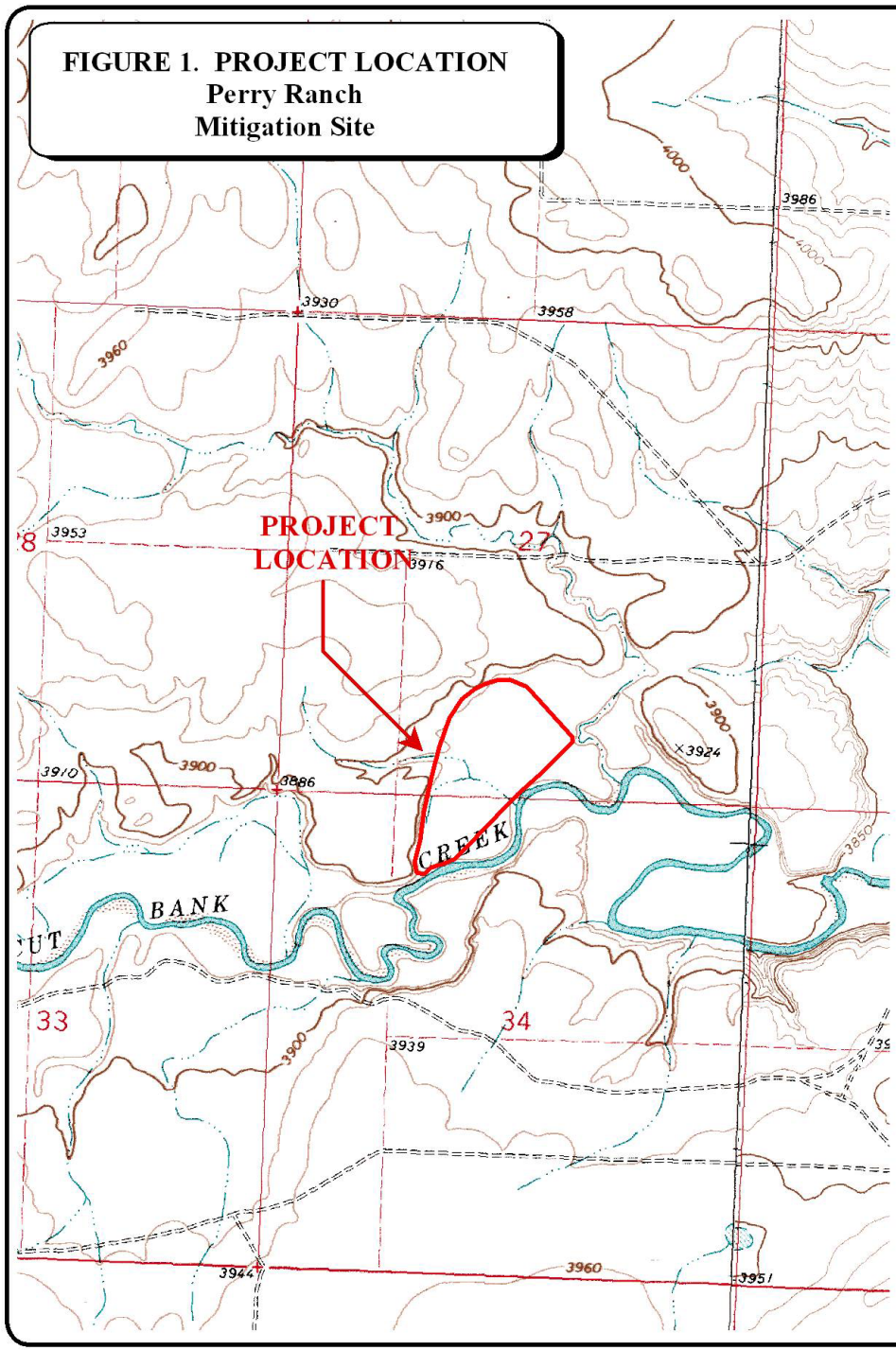
The 2002 monitoring episode was the first conducted at the site since its construction in 2001. This site will be monitored three times per year over the remainder of the contract period to document wetland and other biological attributes. No performance standards or success criteria were required by the U.S. Army Corps of Engineers (COE), MDT, Blackfeet Tribe, or other agencies. The area to be monitored is illustrated in **Figure 2, Appendix B**.

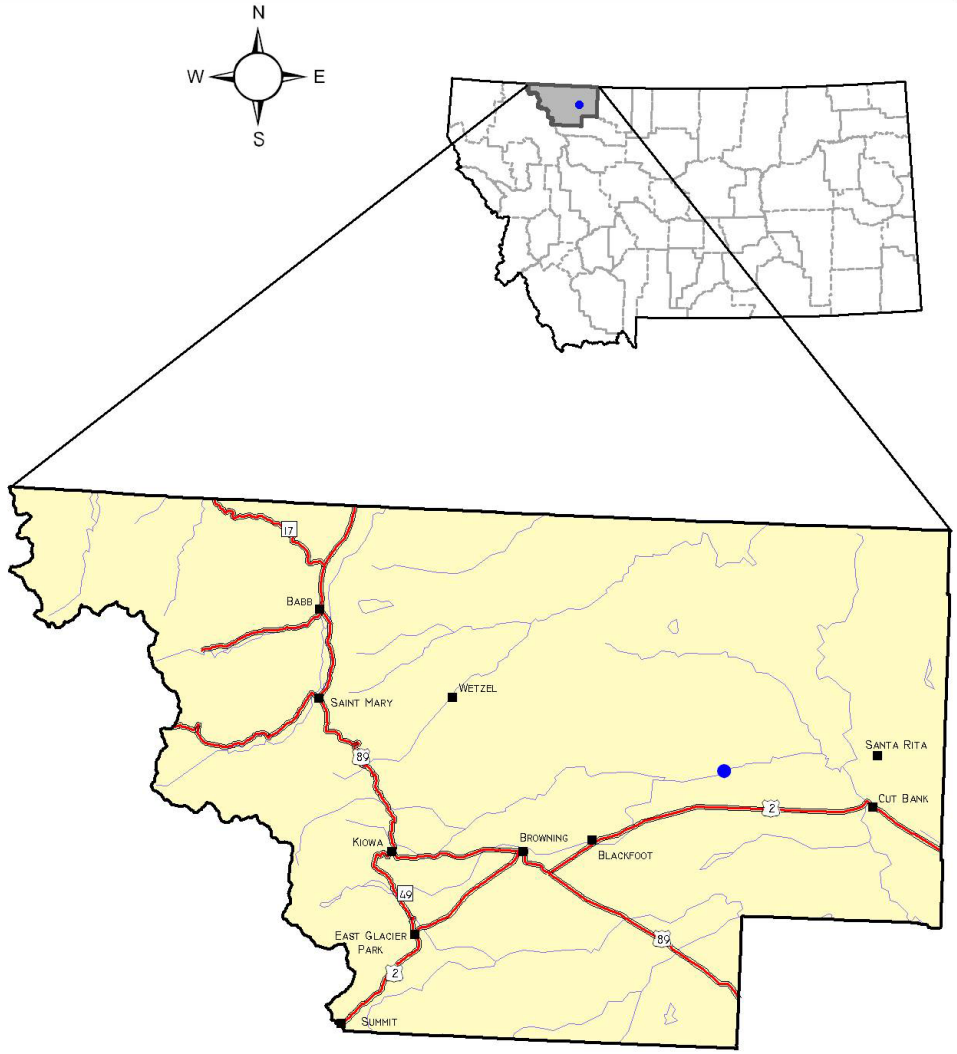
# 2.0 METHODS

## 2.1 Monitoring Dates and Activities

The site was visited on May 15 (spring), July 31 (mid-season), and October 3 (fall) 2002. The primary purpose of the spring and fall visits were to conduct a bird/general wildlife reconnaissance.

# FIGURE 1. PROJECT LOCATION
## Perry Ranch
## Mitigation Site




800 0 800 1600 FEET

1: 24,000

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; macroinvertebrate sampling; 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 source 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 an 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" 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. Photos 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 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**). The wetland/upland boundary was delineated using a GPS unit in conjunction with hand-mapping onto an 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 2002 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 during 2002 monitoring was compiled.

## 2.7 Birds

Bird observations were recorded during all three visits. No formal census plots, spot mapping, point counts, or strip transects were conducted. During the spring and fall visits, 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 2002 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. Data were recorded on the wetland mitigation monitoring form. Macroinvertebrate sampling procedures are provided in **Appendix E**. The sampling location is shown on **Figure 2** (**Appendix A**). The sample was preserved as outlined in the sampling procedure and sent to a laboratory for analysis.

## 2.9 Functional Assessment

Functional assessment was completed using the 1999 MDT Montana Wetland Assessment Method. Field data necessary for this assessment were 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. 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.

## 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

The site was not inundated during the May 15$^{th}$ visit, with the exception of small amounts of surface water standing in portions of the delivery ditch. However, flow in Cut Bank Creek peaked subsequent to the spring visit and inundated most of the site. Flows in excess of 1,300 cfs were recorded in Cut Bank Creek during late May-June 2002; peak flows for 1998 through 2001 ranged between 840 and 990 cfs. Yearly or monthly 2001 and 2002 precipitation data for Cut Bank and Browning were not available. Based on MDT photographs, as well as flood debris

deposited in shrubs approximately three feet above the ground surface, most of the site was inundated during this late May-June period in 2002.

During the mid-season visit, the site as a whole was estimated to be approximately 40 percent inundated, with an average depth of 0.5 feet and a range of depths from zero to an estimated two feet. Inundated areas included the pre-existing "channel" within the inner oxbow, and most excavated portions of the outer oxbow, including the large excavated depression with the designed island in the north portion of the site. A dike breach at the center portion of the outer oxbow prevented surface water from backing further and remaining longer on the site.

During the fall visit, surface water only remained in a small portion of the pre-existing "channel" within the inner oxbow, and within a center portion of the outer oxbow. The large excavated depression with the designed island in the north portion of the site was completely dewatered.

A groundwater component appears to contribute to this site in association with pre-existing wetland areas in the inner and possibly the outer oxbow.

## 3.2 Vegetation

Vegetation species identified on the site are presented in **Table 1** and on the attached data form. Two wetland community types were identified and mapped on the mitigation area (**Figure 3**, **Appendix A**) during 2002. These included Type 1: *Juncus balticus/Carex praegracilis*, and Type 2: *Eleocharis palustris/Polygonum amphibium*. Type 3: "upland floodplain", occurs on the valley floor between all wetland and open water areas on the site. 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 and the "center" portion of the outer oxbow within and adjacent to pre-existing wetland areas. These areas may flood more frequently and for longer duration than the areas supporting Type 1 communities. Groundwater may also influence vegetation development in these areas.

Open water/mudflat areas are those that were inundated during 2002 visits and/or support very scattered, sparse wetland vegetation. These areas are considered transitional and will likely develop into wetlands if adequate hydrology continues to be provided. Some of the areas mapped as "upland floodplain" are also considered transitional, but were neither inundated for sufficient duration or supporting enough wetland vegetation to be mapped as aquatic habitats. Such areas were generally disturbed by construction, and pioneering upland weedy vegetation in these areas appears to have been largely drowned out by 2002 flood events, leaving them largely unvegetated.

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 Perry Ranch Vegetation Species List***

| Species | Region 9 (Northwest) Wetland Indicator |
|---|---|
| ***Achillea millefolium*** | FACU |
| *Agropyron intermedium* | -- |
| *Agropyron repens* | FACU |
| *Agropyron smithii* | -- |
| ***Amaranthus retroflexus*** | FACU+ |
| *Artemisia frigida* | -- |
| ***Aster spp.*** | -- |
| *Bouteloua gracilis* | -- |
| ***Brassica kaber*** | -- |
| *Bromus inermis* | -- |
| ***Cardaria draba*** | -- |
| *Carex lanuginose* | OBL |
| *Carex praegracilis* | FACW |
| *Chenopodium album* | FAC |
| *Cirsium arvense* | FAC- |
| ***Descurainia pinnata*** | -- |
| *Distichlis spicata* | FAC+ |
| *Eleocharis palustris* | OBL |
| ***Epilobium ciliatum*** | FACW- |
| ***Equisetum arvense*** | FAC |
| ***Equisetum hyemale*** | FACW |
| *Glycyrrhiza lepidota* | FAC+ |
| *Grindelia squarrosa* | -- |
| *Hordeum jubatum* | FAC- |
| ***Juncus balticus*** | OBL |
| *Kochia scoparia* | FAC |
| *Koeleria pyramidata* | -- |
| *Medicago sativa* | -- |
| *Melilotus alba* | FACU |
| *Melilotus officinalis* | FACU |
| *Opuntia sp.* | -- |
| *Phalaris arundinacea* | FACW |
| *Phleum pretense* | FAC- |
| ***Poa annua*** | FAC- |
| *Poa pratensis* | FAC |
| *Polygonum amphibium* | OBL |
| *Potentilla anserina* | OBL |
| ***Rosa arkansana*** | NI |
| *Rumex crispus* | FACW |
| *Salix exigua* | OBL |
| *Salix lutea* | OBL |
| *Solidago canadensis* | FACU |
| ***Spartina pectinata*** | OBL |
| ***Stipa viridula*** | -- |
| *Symphoricarpos occidentalis* | -- |
| *Taraxacum officinale* | FACU |
| *Thlaspi arvense* | -- |
| ***Triglochin maritimum*** | OBL |
| ***Typha latifolia*** | OBL |

Vegetation transect results are detailed in the attached data form, and are summarized graphically below. As of 2002, the transect traverses no wetlands. However, it does traverse two transitional upland areas (see discussion above) likely to transition to wetlands, given adequate hydrology.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Start (east)** | ***Up. (17')*** | ***Transitional Upland (115')*** | ***Upland (185')*** | ***Transitional Upland (205')*** | ***Up.. (10')*** | **Total: 532'** | **End (west)** |

## 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 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, but were generally lighter in color with a matrix of 2.5Y4/2 and no mottles. These soils are considered to be developing hydric characteristics.

Most soils on the site occurring within wetlands were either inundated or saturated 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:

| | |
|---|---|
| Delineated Wetlands: | 10.09 acres (emergent) |
| Open Water/Mudflat areas: | 7.83 acres |
| Total Aquatic Habitats: | 17.92 acres |

Approximately 10.09 acres of wetlands presently occur on the site (**Figure 3**, **Appendix A**). Shallow open water/mudflat areas were mapped in association with wetlands at the inner oxbow and as a discrete habitat unit in the north portion of the property. It remains to be seen whether the mudflats are 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. To date, the site has netted 10.09 – 3.4 = 6.69 wetland acres and 7.83 open water/mudflat acres, for a total of 14.52 acres of aquatic habitats.

## 3.5 Wildlife

Wildlife species, or evidence of wildlife, observed on the site during 2002 monitoring efforts are listed in **Table 2**. 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 and waterfowl.

Four mammal, one amphibian, and 22 bird species were noted using the mitigation site during the course of 2002 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. 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.

**Table 2:** ***Fish and Wildlife Species Observed on the Perry Ranch Mitigation Site - 2002***

| | |
|---|---|
| **FISH**<br><br>None | |
| **AMPHIBIANS**<br><br>Northern Leopard Frog (*Rana pipiens*) | |
| **REPTILES**<br><br>None | |
| **BIRDS**<br><br>American Avocet (*Recurvirostra americana*)<br>Blue-winged Teal (*Anas discors*)<br>Canada Goose (*Branta Canadensis*)<br>Cliff Swallow (*Petrochelidon pyrrhonota*)<br>Common Snipe (*Gallinago gallinago*)<br>Franklin's Gull (*Larus pipixcan*)<br>Great Blue Heron (*Ardea herodias*)<br>Killdeer (*Charadrius vociferous*)<br>Mallard (*Anas platyrhynchos*)<br>Northern Harrier (*Circus cyaneus*) | Northern Shoveler (*Anas clypeata*)<br>Red-winged Blackbird (*Agelaius phoeniceus)*<br>Semipalmated Plover (*Charadrius semipalmatus*)<br>Solitary Sandpiper (*Tringa solitaria*)<br>Spotted Sandpiper (*Actitis macularia*)<br>Vesper Sparrow (*Pooecetes gramineus*)<br>Western Kingbird (*Tyrannus verticalis*)<br>Western Meadowlark (*Sturnella neglecta*)<br>Western Sandpiper (*Calidris mauri*)<br>Willet (*Catoptrophorus semipalmatus*)<br>Wilson's Phalarope (*Phalaropus tricolor*)<br>Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*) |
| **MAMMALS**<br><br>American Badger (*Taxidea taxus*)<br>Coyote (*Canis latrans*)<br>Deer (*Odocoileus sp.*)<br>Raccoon *(Procyon lotor)* | |

## 3.6 Macroinvertebrates

Macroinvertebrate sampling results are provided in **Appendix B** and summarized by Rhithron Associates in the italicized section below.

*Low taxa richness and a highly tolerant assemblage suggested that sub-optimal biologic conditions characterized this site. Warm water temperatures and/or nutrient enrichment were suggested by the high biotic index value (8.77) and by the implication of hypoxic substrates. The hemoglobin-bearing midge Chironomus sp. was very abundant in the sample. Taxonomic composition of the assemblage suggested monotonous habitats, with few macrophytes.*

The macroinvertebrate assemblage suggested a newly developing wetland; nutrient enrichment may decrease over time as the effects of grazing diminish at the site.

## 3.7 Functional Assessment

Completed functional assessment forms are presented in **Appendix B**. Functional assessment results are summarized in **Table 3**. Forms were prepared for the inner and outer oxbows. No functional assessment was conducted at the stand-alone open water/mudflat area at the north end of the site due to the absence of wetlands in this area.

The inner oxbow of the mitigation site rated as Category III site, while the outer oxbow 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. 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 3)**, approximately 65 functional units have been gained thus far at the Perry Ranch mitigation site.

## 3.8 Photographs

Representative photographs taken from photo-points are provided in **Appendix C**.

## 3.9 Maintenance Needs/Recommendations

Several dike problems were noted during the summer visit. During early summer flooding, a full dike breach had occurred at the east end of the outer oxbow, and two other locations exhibiting substantial dike scour from the Cut Bank Creek side of the dike were noted and immediately reported to MDT. MDT conducted a subsequent examination of the dike and initiated repairs during fall of 2002 (Urban pers. comm.). Other than scour damage, no other substantive dike problems were noted. Fences also appeared to be in good condition.

**Table 3:** ***Summary of 2002 Wetland Function/Value Ratings and Functional Points [1] at the Perry Ranch Mitigation Project***

| Function and Value Parameters from the 1999 MDT Montana Wetland Assessment Method[1] | Wetland Sites | | | |
|---|---|---|---|---|
| | Inner Oxbow Pre-construction (1997 method) | Outer Oxbow Pre-construction (1997 method) | Inner Oxbow Post-construction (1999 method) | Outer Oxbow Post-construction (1999 method) |
| 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) | High (0.9) |
| 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 | 7.1 / 10 |
| % of Possible Score Achieved | 44% | 27% | 61% | 71% |
| Overall Category | III | IV | III | II |
| Total Acreage of Assessed Wetlands and Other Aquatic Habitats within Site Boundaries | 2.3 ac | 1.1 ac | 6.46 ac* | 5.49 ac |
| Functional Units (acreage x actual points) | 10.12 fu | 2.97 fu | 39.41 fu | 38.98 fu |
| Net Acreage Gain | NA | NA | 6.46 – 2.3 = 4.16 ac* | 5.49 – 1.1 = 4.39 ac |
| Net Functional Unit Gain | NA | NA | 39.41 - 10.12 = 29.29 fu | 38.98 – 2.97 = 36.01 fu |
| Total Functional Unit "Gain" | 65.3 Total Functional Units | | | |

[1] See completed MDT functional assessment forms in Appendix B for further detail.
* Includes 1.86 acres of adjacent open water / mudflat

## 3.10 Current Credit Summary

No specific performance criteria were required to be met at this site in order to document its success. However, the site appears to be developing as designed.

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. To date, the site has netted 10.09 – 3.4 = 6.69 wetland acres and 7.83 open water/mudflat acres, for a total of 14.52 acres of aquatic habitats. This is presently the maximum assignable credit at this site as of 2002.

Approximately 65 functional units have been gained at this site.

## 4.0 REFERENCES

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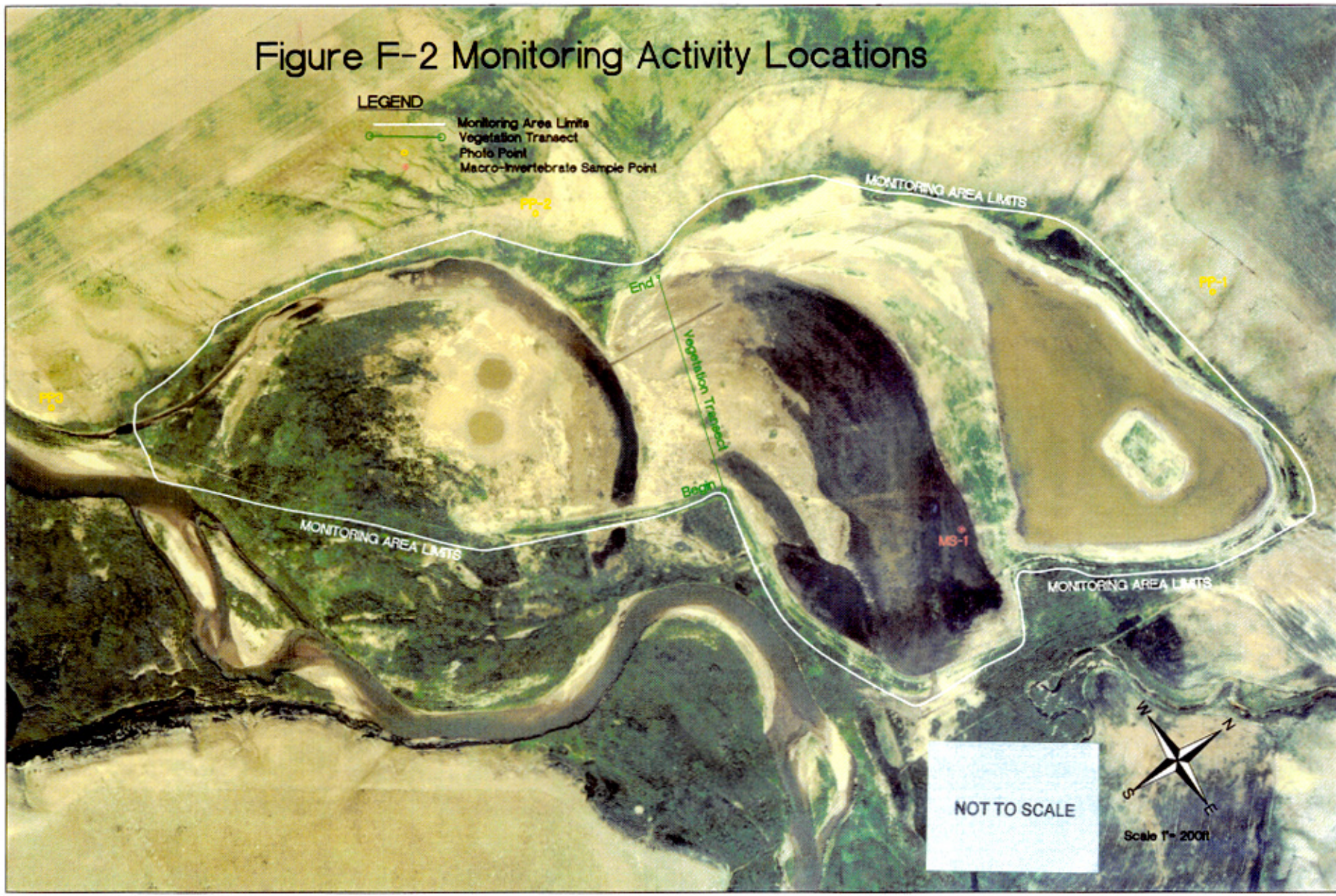
# Appendix A

## FIGURES 2 - 3

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

# Figure F-2 Monitoring Activity Locations




PROJECT NAME: MDT Perry Ranch Wetland Mitigation

DRAWING TITLE: Monitoring Activity Locations

DRAWN: RA

CHECKED:

APPVD: BD

PROJ.MGR: BD

PROJ.NO: 1300991.020

FILE NAME: TAUROSBASE.dwg

SCALE: 1"= 200ft

LOCATION: Perry Ranch

LAND & WATER CONSULTING, INC.
P.O. BOX 6304
Missoula, MT 59807

SHEET NUMBER: F-2 of

REV: -

DATE:

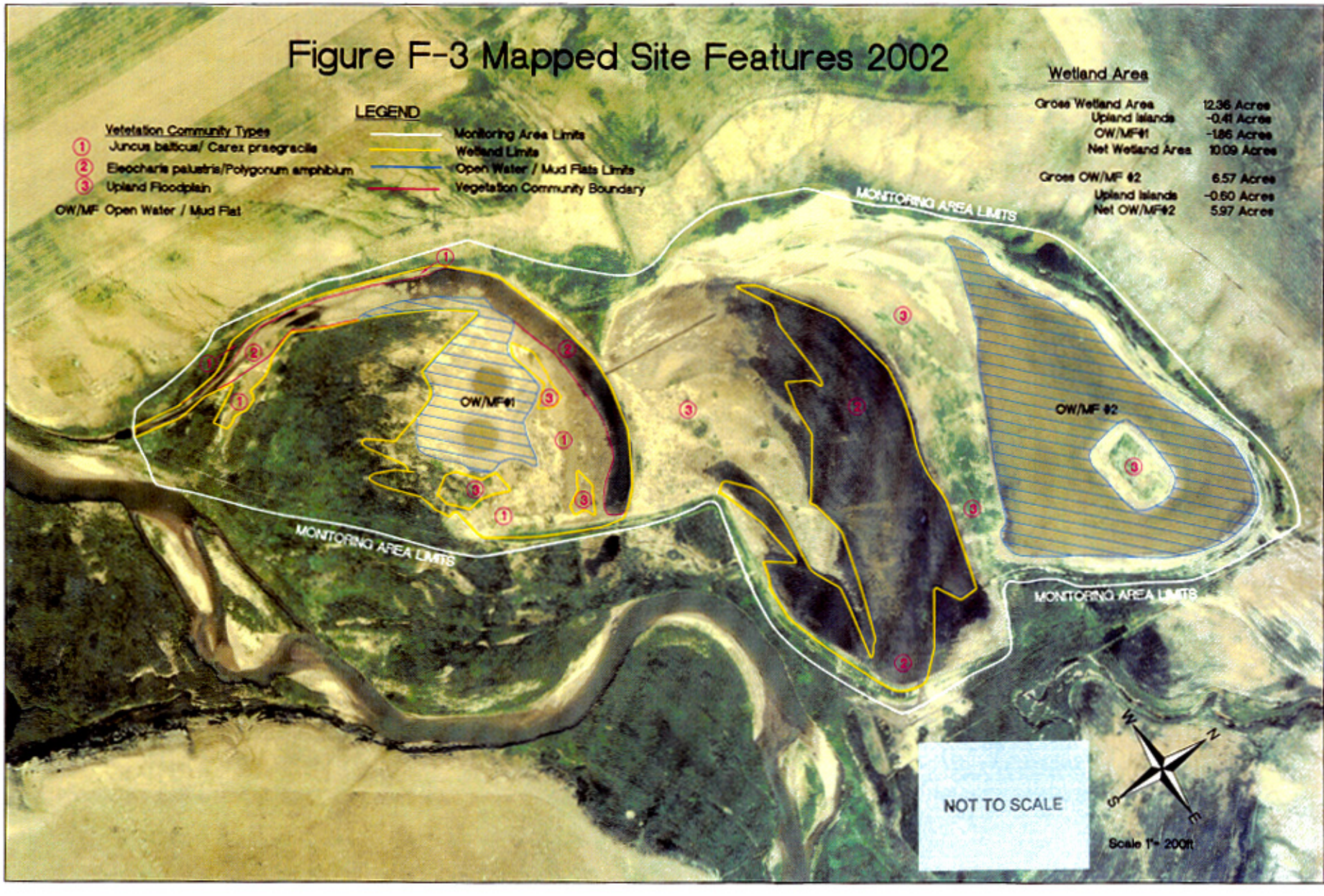


Figure F-3 Mapped Site Features 2002
LEGEND
Monitoring Area Limits
Wetland Limits
Open Water / Mud Flats Limits
Vegetation Community Boundary
Vetetation Community Types
1 Juncus balticus/ Carex praegracilis
2 Eleocharis palustris/Polygonum amphibium
3 Upland Floodplain
OW/MF Open Water / Mud Flat
Wetland Area
Gross Wetland Area 12.36 Acres
Upland Islands -0.41 Acres
OW/MF#1 -1.86 Acres
Net Wetland Area 10.09 Acres
Gross OW/MF #2 6.57 Acres
Upland Islands -0.60 Acres
Net OW/MF#2 5.97 Acres
MONITORING AREA LIMITS
OW/MF#1
OW/MF #2
NOT TO SCALE
Scale 1"= 200ft
MDT Perry Ranch Wetland Mitigation
Mapped Site Features 2002
F-3

# Appendix B

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## COMPLETED 2002 WETLAND MITIGATION SITE MONITORING FORM
## COMPLETED 2002 BIRD SURVEY FORMS
## COMPLETED 2002 WETLAND DELINEATION FORMS
## COMPLETED 2002 FUNCTIONAL ASSESSMENT FORMS
## MACROINVERTEBRATE DATA

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

LAND & WATER

# DRAFT - MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name: Perry Ranch Project Number: _____ Assessment Date: 07/31/02
Location: Cut Bank Creek MDT District: Great Falls Milepost: ←
Legal description: T 34 N R 08 W Section 27/34 Time of Day: 07:00 – 14:30
Weather Conditions: Overcast, Dry, Windy Person(s) conducting the assessment: JB
Initial Evaluation Date: / /02 Visit #: 2 Monitoring Year: 1 (2002)
Size of evalusaiton area: ~30 acres Land use surrounding wetland: Range land + Creek

## HYDROLOGY

**Surface Water**
Inundation: Present ✓ Absent ___ Average depths: ~8" Range of depths: 0 - 2 ft
Assessment area under inundation: 40 %
Depth at emergent vegetation-open water boundary: 0-6"
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.): Much of the site flooded in 2002, as evidenced by drift lines, watermarks, bent vegetation, sediment deposits, dead upland vegetation, and cracked soils. Site was, at max, inundated to depth of ~ 3' feet.

**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:** Much of mitigation site appears to have flooded. There is a breach in the dike, or more water would have remained. Two other near-breach areas are mapped.

## COMPREHENSIVE VEGETATION LIST

LAND & WATER B-2

| Species | Vegetation Community Number(s) | Species | Vegetation Community Number(s) |
|---|---|---|---|
| KOC SCO | up, 1 | SPA PEC | 1,2 |
| HOR JUB | up, 1 | EQU HYA | 1,2 |
| THL ARV | up | SAL EXI 3-4 seedlings | 2 |
| AGR REP | up, 1 | SAL LUT " " " | 2 |
| AGR INT | up | MEL ALB | up |
| AGR SMI | up | MEL OFF | up |
| SOL CAN | up | MED SAT | up |
| CIR ARV - Noxious - | up, 1 | POA ANN | up, 1 |
| SYM OCC | up, 1 | BRA KAB wild mustard | up |
| Opuntia sp. | up | DES PIN tansy mustard | up |
| ART FRI | up | TYP LAT (1-2 seedlings) | 2 |
| KOL CRI | up | GLY LEP | up, 1 |
| STI VIR | up | RUM CRI | 1,2 |
| GRI SQU | up | | |
| ROS ARK | up, 1 | | |
| coneflower | up | | |
| BOT GRA | up | | |
| PHA ARU | up, 1, 2 | | |
| JUN BAL | 1,2 | | |
| POT ANS | 1 | | |
| ELE PAL | 1,2 | | |
| DIS STR | up, 1 | | |
| BRO INE | up | | |
| CAR PRA | up, 1 | | |
| CAR LAN | 1,2 | | |
| EQU ARV | 1,2 | | |
| TRI MAR | 1 | | |
| pigweed | up | | |
| CHE ALB | up | | |
| CAR DRA - Noxious - | up | | |
| POL AMP | 2 | | |
| DHL PRA | up | | |
| POA PRA | up | | |
| ACH MIL | up | | |
| Aster sp. | up | | |

**COMMENTS/PROBLEMS:** Excavated "open water" areas in west end of site showed sparse EQU ARV, but not enough to be considered "vegetated". These sites considered as open water/mudflat until they are vegetated.

## VEGETATION COMMUNITIES

LAND & WATER B-3

Community No.: 1 Community Title (main species): JUN BAL/CAR PRA

| 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:**

Community No.: 2 Community Title (main species): ELE PAL/POL AMP

| 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 | | |

**COMMENTS/PROBLEMS:** Deeper, more permanent water areas

Community No.: 3 Community Title (main species): Upland Floodplain

| Dominant Species | % Cover | Dominant Species | % Cover |
|---|---|---|---|
| KOC SCO | 21-50 | SYM OCC | 6-10 |
| AGR INT | 21-50 | ROS ARK | 6-10 |
| AGR REP | 21-50 | HOR JUB | 21-50 |
| pigweed | 6-10 | | |
| CAR PRA | 6-10 | | |

**COMMENTS/PROBLEMS:** Upland areas w/in flooded perimeter - species comp. varies across site.

**Additional Activities Checklist:**

X Record and map vegetative communities on air photo

## VEGETATION COMMUNITIES

LAND & WATER B-4

Community No.: 4 Community Title (main species): Hillside Upland

| Dominant Species | % Cover | Dominant Species | % Cover |
|---|---|---|---|
| STI VIR | >50 | Cactus | 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:** Uplands outside of floodplain

Community No.:____ Community Title (main species):_____

| Dominant Species | % Cover | Dominant Species | % Cover |
|---|---|---|---|
| | | | |
| | | | |
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**COMMENTS/PROBLEMS:** _____

Community No.:____ Community Title (main species):_____

| Dominant Species | % Cover | Dominant Species | % Cover |
|---|---|---|---|
| | | | |
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| | | | |

**COMMENTS/PROBLEMS:** _____

**Additional Activities Checklist:**

X Record and map vegetative communities on air photo

# MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: Perry Ranch Date: 7/31/02 Examiner: JB Transect # 1

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

**Vegetation type 1:** Upland (floodplain)

Length of transect in this type: 17 feet

| | |
|---|---|
| KOC SCO | 11-20% |
| CAR PRA | 1-5% |
| pigweed | 1-5% |
| AGR INT | 21-50% |
| CHE ALB | 1-5% |
| EQU ARV | <1% |
| BRA KAB | <1% |

Total Vegetative Cover: 100%

**Vegetation type 2:** Transitional Upland floodplain

Length of transect in this type: 115 feet

| | |
|---|---|
| EQU ARV | <1 |
| AGR INT | <1 |
| CAR PRA | 1-5 |
| TRI MAR | <1 (1 plant) |
| ALO PRA | 1-5 |

* Not really vegetated

Total Vegetative Cover: ~10%

**Vegetation type 3:** Upland (floodplain)

Length of transect in this type: 185 feet

| | | | |
|---|---|---|---|
| Pigweed | 11-20% | HOR JUB | 1-5% |
| AGR REP | 750% | EQU ARV | 1-5% |
| AGR INT | 750% | CIR ARV | 1-5% |
| KOC SCO | 21-50% | POA PRA | 11-20% |
| DES PIN | 1-5% | | |
| CAR PRA | 6-10% | | |
| THL ARV | 1-5% | | |
| MEL OFF | 11-20% | | |
| CHE ALB | 11-20% | | |
| CAR DRA | 1-5% | | |
| TAR OFF | 1-5% | | |

Total Vegetative Cover: ~70%

**Vegetation type 4:** Transitional Upland Floodplain

Length of transect in this type: 205 feet

RUM CRI (1 plant)
EQU ARV (1 plant)

cover = <1% Prev. veg flooded out * killed

Type 5: Upland 10 feet

KOC SCO <1%, the rest unvegetated

Total Vegetative Cover: <1%

MDT WETLAND MONITORING – VEGETATION TRANSECT (back of form)

**Cover Estimate**
+ = <1%
1 = 1-5%
2 = 6-10%
3 = 11-20%
4 = 21-50%
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 food 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:

Many unvegetated areas crossed by transect. These areas are likely to become established with wetland vegetation if hydrology continues.

## PLANTED WOODY VEGETATION SURVIVAL LAND & WATER B-7

| Species | Number Originally Planted | Number Observed | Mortality Causes |
|---|---|---|---|
| None Planted | | | |
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**COMMENTS/PROBLEMS:** _____

## WETLAND DELINEATION

LAND & WATER B-8

At each site conduct the items on the checklist below:

X Delineate wetlands according to the 1987 Army Corps manual.

X Delineate wetland-upland boundary on the air photo

X Survey wetland-upland boundary with a resource grade GPS survey

**COMMENTS/PROBLEMS:** See Data Forms

## FUNCTIONAL ASSESSMENT

Collect information to complete MDT Function and Values Assessment in the office.

**Jeff is completing this section**

**COMMENTS/PROBLEMS:** See Data Forms

## MAINTENANCE

Were man-made nesting structures installed at this site? YES___ NO X

If yes, do they need to be repaired? YES___ NO X

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

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___ NO X

If no, describe the problems below.

**COMMENTS/PROBLEMS:** The dike is breached (washed out ~ 12' section) in one location (SE corner), and has been eroded from the south (the creek side) between the breach area + the transect location in two places.

# WILDLIFE

LAND & WATER B-9

## BIRDS

| Species | Number Observed | Nesting or Breeding Activity | Likely Breeding Resident | Likely Migrating | | Species | Number Observed | Nesting or Breeding Activity | Likely Breeding Resident | Likely Migrating |
|---|---|---|---|---|---|---|---|---|---|---|
| See bird form | | | | | | | | | | |

Were man made nesting structures installed? Yes____ No X Type: – How many? – Are the nesting structures being utilized? Yes NA No NA Do the nesting structures need repairs? Yes NA No NA

## MAMMALS AND HERPTILES

| Species | Number Observed | Indirect indication of use | | | |
|---|---|---|---|---|---|
| | | Tracks | Scat | Burrows | Other |
| Northern leopard frog – under oxbow | ~6-10 | | | | |
| Raccoon – tracks all wetlands – | | X | | | |
| Badger – burrows in upland – | 1 | | | X | |
| Deer – tracks all wetlands – | | X | | | |
| Coyote – tracks all wetlands – | | X | | | |

**Additional Activities Checklist:**

X Macroinvertebrate sampling (if required) under oxbow

**COMMENTS/PROBLEMS:** _____

## 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 ½ 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 | 46-51 | PP1 125°, 150°, 165°, 205°, 230°, 255° | |
| B | 52-60 | PP2 35°, 65°, 80°, 105°, 115°, 135°, 160°, 175°, 200° | |
| C | 61-63 | PP3 50°, 40°, 25° | |
| D | 64 | Dike washout, SE corner | |
| E | 65 | Transect start → end 286° | |
| F | 66 | Transect end → start 100° | |
| G | 67 | Wetland #2 | |
| 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:

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

**COMMENTS/PROBLEMS:** PP1 = 1801 PP1, PP2 = 1802 PP2, PP3 = 1803 PP3, 1801 Tstart, 1801 Tend
1801 Wetland 1 = gross area W/ OW + upland
1802 = Upland 1, 1803 = Upland 2, 1804 = Upland 3 (all w/in 1801 Wetland gross area)
1805 Wetland 2 = Wetland 2
OW area in NW corner drawn on photo very accurately – not GPS'd.
6 reference points on photo 1801 – 1806

**BIRD SURVEY – FIELD DATA SHEET**

Page_1__of_1__
Date:5/15/02
Survey Time:0630-0830

**SITE:** Perry Ranch

| Bird Species | # | Behavior | Habitat | Bird Species | # | Behavior | Habitat |
|---|---|---|---|---|---|---|---|
| Canada Goose | 8 | FO | MA | | | | |
| killdeer | 10 | F | MF | | | | |
| vesper sparrow | 3 | F | UP | | | | |
| western meadowlark | 3 | F | UP | | | | |
| northern shoveler | 4 | L | MA | | | | |
| willet | 2 | L, F | MA | | | | |
| semipalmated plover | 10 | F | UP | | | | |
| mallard | 3 | FO | MA | | | | |
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**Notes:** badger holes, deer tracks, ground squirrels, raccoon tracks, coyote tracks

Site mostly dry, delivery ditch channel partially flooded, creek not to inlet level yet.

**Behavior**: BP – one of a breeding pair; BD – breeding display; F – foraging; FO – flyover; L – loafing; N – nesting

**Habitat**: AB – aquatic bed; FO – forested; I – island; MA – marsh; MF – mud flat; OW – open water; SS – scrub/shrub; UP – upland buffer; WM – wet meadow, US – unconsolidated shoreline

**BIRD SURVEY – FIELD DATA SHEET**

Page_1__of_1__
Date:7/31/02
Survey Time:0630-0830

**SITE:** Perry Ranch

| Bird Species | # | Behavior | Habitat | Bird Species | # | Behavior | Habitat |
|---|---|---|---|---|---|---|---|
| killdeer | 20 | F | MF | | | | |
| American avocet | 12 | F | MA | | | | |
| blue-wing teal | 12 | F, N | MA | | | | |
| Franklin's gull | 1 | FO | MA | | | | |
| willet | 2 | F | MA | | | | |
| red-winged blackbird | 6 | F, N | MA | | | | |
| yellow-headed blackbird | 6 | F | MA | | | | |
| western sandpiper | 20 | F | MA | | | | |
| phalarope | 6 | F | MA | | | | |
| great blue heron | 1 | FO | MA | | | | |
| mallard | 12 | FO | MA | | | | |
| Canada goose | 15 | FO | MA | | | | |
| solitary sandpiper | 2 | F | MA | | | | |
| cliff swallow | 20 | F | MA | | | | |

**Notes:** badger holes, badger, deer tracks, raccoon tracks, 6 n. leopard frogs at outer oxbow

Site inundated to large extent.

**Behavior**: BP – one of a breeding pair; BD – breeding display; F – foraging; FO – flyover; L – loafing; N – nesting

**Habitat**: AB – aquatic bed; FO – forested; I – island; MA – marsh; MF – mud flat; OW – open water; SS – scrub/shrub; UP – upland buffer; WM – wet meadow, US – unconsolidated shoreline

**BIRD SURVEY – FIELD DATA SHEET**

Page_1__of_1__
Date:10/03/02
Survey Time:0930-1030

**SITE:** Perry Ranch

| Bird Species | # | Behavior | Habitat | Bird Species | # | Behavior | Habitat |
|---|---|---|---|---|---|---|---|
| killdeer | 6 | F | MF | | | | |
| vesper sparrow | 15 | F, FO | UP | | | | |
| common snipe | 2 | F | MA | | | | |
| northern harrier | 1 | F | UP | | | | |
| western kingbird | 2 | F | UP | | | | |

***Notes:*** badger holes, deer tracks, raccoon tracks, coyote tracks

Site largely dewatered; surf water in delivery ditch and center of outer oxbow only.

**Behavior**: BP – one of a breeding pair; BD – breeding display; F – foraging; FO – flyover; L – loafing; N – nesting

**Habitat**: AB – aquatic bed; FO – forested; I – island; MA – marsh; MF – mud flat; OW – open water; SS – scrub/shrub; UP – upland buffer; WM – wet meadow, US – unconsolidated shoreline

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

| | | |
|---|---|---|
| Project/Site: Perry Ranch Mitigation Site | Project No: Task 20 | Date: 31-Jul-2002 |
| Applicant/Owner: Montana Department of Transportation | | County: Glacier |
| Investigators: Berglund | | State: Montana |
| | | Plot ID: 1 |

| | |
|---|---|
| Do Normal Circumstances exist on the site? (Yes) No | Community ID: Transitional |
| Is the site significantly disturbed (Atypical Situation:)? Yes (No) | Transect ID: T-1 |
| Is the area a potential Problem Area? Yes (No) | Field Location: |
| (If needed, explain on the reverse side) | 25' from transect start |

**VEGETATION** (USFWS Region No. 9)

| Dominant Plant Species(Latin/Common) | Stratum | Indicator | Plant Species(Latin/Common) | Stratum | Indicator |
|---|---|---|---|---|---|
| *Carex praegracilis* | Herb | FACW | *Triglochin maritimum* | Herb | OBL |
| Sedge,Clustered Field | | | Arrow-Grass,Seaside | | |
| *Agropyron intermedium* | Herb | NI | *Alopecurus pratensis* | Herb | FACW |
| Wheatgrass, intermediate | | | Foxtail,Meadow | | |

| | |
|---|---|
| Percent of Dominant Species that are OBL, FACW or FAC: (excluding FAC-) 3/3 = 100.00% | FAC Neutral: 3/3 = 100.00%<br>Numeric Index: 5/3 = 1.67 |

**Remarks:**
These were "dominant" species, but coverage only ranged between 1 and 5%. Site was not 30% vegetated. Area is transitional.

**HYDROLOGY**

YES Recorded Data(Describe in Remarks):
- NO Stream, Lake or Tide Gauge
- YES Aerial Photographs
- NO Other

NO 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
- YES Drift Lines
- YES Sediment Deposits
- NO Drainage Patterns in Wetlands

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

**Remarks:**
Was inundated earlier in the year based on 2002 aerial photo and deposits.





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

| | | |
|---|---|---|
| Project/Site: Perry Ranch Mitigation Site | Project No: Task 20 | Date: 31-Jul-2002 |
| Applicant/Owner: Montana Department of Transportation | | County: Glacier |
| Investigators: Berglund | | State: Montana |
| | | Plot ID: 1 |

**SOILS**

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

Profile Description

| Depth (inches) | Horizon | Matrix Color (Munsell Moist) | Mottle Color (Munsell Moist) | Mottle Abundance/Contrast | | Texture, Concretions, Structure, etc |
|---|---|---|---|---|---|---|
| 10 | A/B | 2.5Y4/2 | N/A | N/A | N/A | Clay loam |

Hydric Soil Indicators:

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

**Remarks:**
Soils are developing and may end up satisfying NRCS hydric soils criterian #4.

**WETLAND DETERMINATION**

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

**Remarks:**
Plot was taken near transect start. Area is largely unvegetated and transitional. This area will likely develop stronger wetland characteristics if hydrology continues.

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

| | | |
|---|---|---|
| **Project/Site:** Perry Ranch Mitigation Site<br>**Applicant/Owner:** Montana Department of Transportation<br>**Investigators:** Berglund | **Project No:** Task 20 | **Date:** 31-Jul-2002<br>**County:** Glacier<br>**State:** Montana<br>**Plot ID:** 2 |

| | |
|---|---|
| **Do Normal Circumstances exist on the site?** (Yes) No<br>**Is the site significantly disturbed (Atypical Situation:)?** Yes (No)<br>**Is the area a potential Problem Area?** Yes (No)<br>(If needed, explain on the reverse side) | **Community ID:** Emergent<br>**Transect ID:** WET #2<br>**Field Location:**<br>WL #2, outer oxbow, near macro sample pt |

**VEGETATION** (USFWS Region No. 9)

| Dominant Plant Species(Latin/Common) | Stratum | Indicator | Plant Species(Latin/Common) | Stratum | Indicator |
|---|---|---|---|---|---|
| *Alopecurus pratensis* | Herb | FACW | *Spartina pectinata* | Herb | OBL |
| Foxtail, Meadow | | | Cordgrass, Prairie | | |
| *Eleocharis palustris* | Herb | OBL | *Carex lanuginosa* | Herb | OBL |
| Spikerush, Creeping | | | Sedge, Woolly | | |
| *Polygonum amphibium* | Herb | OBL | *Rumex crispus* | Herb | FACW |
| Smartweed, Water | | | Dock, Curly | | |
| *Equisetum arvense* | Herb | FAC | *Phalaris arundinacea* | Herb | FACW |
| Horsetail, Field | | | Grass, Reed Canary | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

| | |
|---|---|
| **Percent of Dominant Species that are OBL, FACW or FAC:** (excluding FAC-) 8/8 = 100.00% | **FAC Neutral:** 7/7 = 100.00%<br>**Numeric Index:** 13/8 = 1.63 |

**Remarks:**
Few SAL EXI are sterling, but are scattered.

**HYDROLOGY**

| | |
|---|---|
| YES **Recorded Data(Describe in Remarks):**<br>NO **Stream, Lake or Tide Gauge**<br>YES **Aerial Photographs**<br>NO **Other**<br><br>NO **No Recorded Data**<br><br>**Field Observations**<br><br>**Depth of Surface Water:** = 12 *(in.)*<br>**Depth to Free Water in Pit:** N/A *(in.)*<br>**Depth to Saturated Soil:** N/A *(in.)* | **Wetland Hydrology Indicators**<br>**Primary Indicators**<br>YES **Inundated**<br>YES **Saturated in Upper 12 Inches**<br>YES **Water Marks**<br>YES **Drift Lines**<br>YES **Sediment Deposits**<br>NO **Drainage Patterns in Wetlands**<br>**Secondary Indicators**<br>NO **Oxidized Root Channels in Upper 12 Inches**<br>NO **Water-Stained Leaves**<br>NO **Local Soil Survey Data**<br>YES **FAC-Neutral Test**<br>NO **Other(Explain in Remarks)** |

**Remarks:**
Inundated by flooding.



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

| | | |
|---|---|---|
| **Project/Site:** Perry Ranch Mitigation Site<br>**Applicant/Owner:** Montana Department of Transportation<br>**Investigators:** Berglund | **Project No:** Task 20 | **Date:** 31-Jul-2002<br>**County:** Glacier<br>**State:** Montana<br>**Plot ID:** 2 |


**SOILS**

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

**Profile Description**

| Depth (inches) | Horizon | Matrix Color (Munsell Moist) | Mottle Color (Munsell Moist) | Mottle Abundance | Mottle Contrast | Texture, Concretions, Structure, etc |
|---|---|---|---|---|---|---|
| 1 | A | 10YR2/1 | N/A | N/A | N/A | Silt |
| 10 | B | 2.5Y4/1 | N/A | N/A | N/A | Silty clay loam |

**Hydric Soil Indicators:**

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

**Remarks:**

**WETLAND DETERMINATION**

| | |
|---|---|
| Hydrophytic Vegetation Present? (Yes) No<br>Wetland Hydrology Present? (Yes) No<br>Hydric Soils Present? (Yes) No | Is the Sampling Point within the Wetland? (Yes) No |

**Remarks:**
Plot taken in Wetland 2 (outer oxbow) within inundated area. Strong wetland characteristics are developing here.



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

| | | |
|---|---|---|
| Project/Site: Perry Ranch Mitigation Site<br>Applicant/Owner: Montana Department of Transportation<br>Investigators: Berglund | Project No: Task 20 | Date: 31-Jul-2002<br>County: Glacier<br>State: Montana<br>Plot ID: 3 |

| | | |
|---|---|---|
| Do Normal Circumstances exist on the site? | (Yes) No | Community ID: Emergent |
| Is the site significantly disturbed (Atypical Situation:)? | Yes (No) | Transect ID: W-1 |
| Is the area a potential Problem Area? (if needed, explain on the reverse side) | Yes (No) | 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 |
|---|---|---|---|---|---|
| *Potentilla anserina* | Herb | OBL | *Triglochin maritimum* | Herb | OBL |
| Silverweed | | | Arrow-Grass,Seaside | | |
| *Agropyron intermedium* | Herb | NI | *Juncus balticus* | Herb | OBL |
| Wheatgrass, Intermediate | | | Rush,Baltic | | |
| *Carex praegracilis* | Herb | FACW | *Phalaris arundinacea* | Herb | FACW |
| Sedge,Clustered Field | | | Grass,Reed Canary | | |
| *Equisetum arvense* | Herb | FAC | *Distichlis spicata* | Herb | FAC+ |
| Horsetail,Field | | | Saltgrass,Inland | | |

Percent of Dominant Species that are OBL, FACW or FAC: (excluding FAC-) 7/7 = 100.00%

FAC Neutral: 5/5 = 100.00%
Numeric Index: 13/7 = 1.86

Remarks:

**HYDROLOGY**

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

YES No Recorded Data

Field Observations

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

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

Depth to Saturated Soil: N/A *(in.)*

Wetland Hydrology Indicators
- Primary Indicators
  - NO Inundated
  - NO Saturated in Upper 12 Inches
  - YES Water Marks
  - YES Drift Lines
  - YES 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 2002.



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

| | | |
|---|---|---|
| Project/Site: Perry Ranch Mitigation Site<br>Applicant/Owner: Montana Department of Transportation<br>Investigators: Berglund | Project No: Task 20 | Date: 31-Jul-2002<br>County: Glacier<br>State: Montana<br>Plot ID: 3 |

**SOILS**

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

Profile Description

| Depth (Inches) | Horizon | Matrix Color (Munsell Moist) | Mottle Color (Munsell Moist) | Mottle Abundance/Contrast | | Texture, Concretions, Structure, etc |
|---|---|---|---|---|---|---|
| 10 | A/B | 2.5Y3/1 | N/A | N/A | N/A | Sandy clay loam |

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

Remarks:
Dark streaking present as well.

**WETLAND DETERMINATION**

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

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

# MDT Montana Wetland Assessment Form (revised 5/25/1999)

1. Project Name: Perry Ranch 2. Project #: 130091-020 Control #: –

3. Evaluation Date: Mo. 07 Day 31 Yr. 02 4. Evaluator(s): JB 5. Wetlands/Site #(s) 1 - inner oxbow

6. Wetland Location(s): I. Legal: T 34 (N) or S; R 8 E or (W); S 27, 34 ; T ___ N or S; R ___ E or W; S ___ ;
II. Approx. Stationing or Mileposts: NA
III. Watershed: 10030202 GPS Reference No. (if applies): –
Other Location Information: Along Cutbank Creek btwn Browning + Cutbank

7. a. Evaluating Agency: MDT ;
b. Purpose of Evaluation:
1. ___ Wetlands potentially affected by MDT project
2. ___ Mitigation wetlands; pre-construction
3. XX Mitigation wetlands; post-construction
4. ___ Other

8. Wetland size: (total acres) – (visually estimated) ~5 AC (measured, e.g. by GPS [if applies])

9. Assessment area: (AA, tot., ac., see instructions on determining AA) – (visually estimated) ~5 AC (measured, e.g. by GPS [if applies])

10. Classification of Wetland and Aquatic Habitats in AA (HGM according to Brinson, first col.; USFWS according to Cowardin [1979], remaining cols.)

| HGM Class | System | Subsystem | Class | Water Regime | Modifier | % of AA |
|---|---|---|---|---|---|---|
| Riverine | Palustrine | – | EM | C | EX, D | 40 |
| " | " | – | UB | C | EX, D | 60 |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

(Abbreviations: System: Palustrine(P)/ Subsyst.: none/ Classes: Rock Bottom (RB), Unconsolidated bottom (UB), Aquatic Bed (AB), Unconsolidated Shore (US), Moss-lichen Wetland (ML), Emergent Wetland (EM), Scrub-Shrub Wetland (SS), Forested Wetland (FO)/ System: Lacustrine (L)/, Subsyst.: Limnetic (2)/ Classes: RB, UB, AB/ Subsystem: Littoral (4)/ Classes: RB, UB, AB, US, EM/ System: Riverine (R)/ Subsyst.: Lower Perennial (2)/ Classes: RB, UB, AB, US, EM/ Subsystem: Upper Perennial (3)/ Classes: RB, UB, AB, US/ Water Regimes: Permanently Flooded (H), Intermittently Exposed (G), Semipermanently Flooded (F), Seasonally Flooded (C), Saturated (B), Temporarily Flooded (A), Intermittently Flooded (J) Modifiers: Excavated (E), Impounded (I), Diked (D), Partly Drained (PD), Farmed (F), Artificial (A) HGM Classes: Riverine, Depressional, Slope, Mineral Soil Flats, Organic Soil Flats, Lacustrine Fringe

11. Estimated relative abundance: (of similarly classified sites within the same Major Montana Watershed Basin, see definitions)
(Circle one) Unknown Rare (Common) Abundant
Comments:

12. General condition of AA:
I. Regarding disturbance: (use matrix below to determine [circle] appropriate response)

| Conditions within AA | Predominant conditions adjacent to (within 500 feet of) AA | | |
|---|---|---|---|
| | Land managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or buildings. | Land not cultivated, but moderately grazed or hayed or selectively logged; or has been subject to minor clearing; contains few roads or buildings. | Land cultivated or heavily grazed or logged; subject to substantial fill placement, grading, clearing, or hydrological alteration; high road or building density. |
| AA occurs and is managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or occupied buildings. | low disturbance | (low disturbance) | moderate disturbance |
| AA not cultivated, but moderately grazed or hayed or selectively logged; or has been subject to relatively minor clearing, fill placement, or hydrological alteration; contains few roads or buildings. | moderate disturbance | moderate disturbance | high disturbance |
| AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density. | high disturbance | high disturbance | high disturbance |

Comments: (types of disturbance, intensity, season, etc.): Adjacent cultivation + grazing, but not substantive
II. Prominent weedy, alien, & introduced species (including those not domesticated, feral): (list) KOL SCO
III. Provide brief descriptive summary of AA and surrounding land use/habitat: Wetland/mudflat area within Cutbank Creek floodplain - adjacent to pasture + cropland

13. Structural Diversity: (based on number of "Cowardin" *vegetated* classes present [do not include unvegetated classes], see #10 above)

| # of "Cowardin" vegetated classes present in AA (see #10) | ≥ 3 vegetated classes (or ≥ 2 if one is forested) | 2 vegetated classes (or 1 if forested) | ≤ 1 vegetated class |
|---|---|---|---|
| Rating (circle) | High | Moderate | (Low) |

Comments:

## SECTION PERTAINING to FUNCTIONS & VALUES ASSESSMENT

**14A. Habitat for Federally Listed or Proposed Threatened or Endangered Plants or Animals:**

I. AA is Documented (D) or Suspected (S) to contain (circle one based on definitions contained in instructions):

| | | |
|---|---|---|
| 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** (use the conclusions from i above and the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function)

| *Highest Habitat Level* | doc./primary | sus/primary | doc./secondary | sus./secondary | doc./incidental | sus./incidental | None |
|---|---|---|---|---|---|---|---|
| *Functional Points and Rating* | 1 (H) | .9 (H) | .8 (M) | .7 (M) | .5 (L) | .3 (L) | 0 (L) |

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

**14B. Habitat for plant or animals rated S1, S2, or S3 by the Montana Natural Heritage Program:** (not including species listed in14A above)

I. AA is Documented (D) or Suspected (S) to contain (circle one based on definitions contained in instructions):

| | | |
|---|---|---|
| Primary or critical habitat (list species) | D S | |
| Secondary habitat (list species) | D (S) | No. leopard frog – observed in wetland 2 |
| Incidental habitat (list species) | D S | |
| No usable habitat | D S | |

II. **Rating** (use the conclusions from i above and the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function)

| *Highest Habitat Level* | doc./primary | sus/primary | doc./secondary | sus./secondary | doc./incidental | sus./incidental | None |
|---|---|---|---|---|---|---|---|
| *Functional Points and Rating* | 1 (H) | .8 (H) | .7 (M) | .6 (M) | .2 (L) | .1 (L) | 0 (L) |

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

**14C. General Wildlife Habitat Rating:**

I. **Evidence of overall wildlife use in the AA** (circle substantial, moderate, or low based on supporting evidence):

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

***Moderate*** (based on any of the following [check]):
- XX observations of scattered wildlife groups or individuals or relatively few species during peak periods
- XX common occurrence of wildlife sign such as scat, tracks, nest structures, game trails, etc.
- XX adequate adjacent upland food sources
- __ interviews with local biologists with knowledge of the AA

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

**ii. Wildlife habitat features** (working from top to bottom, circle appropriate AA attributes in matrix to arrive at 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 of the AA (see #10). Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; and A = absent [see instructions for further definitions of these terms].)

| *Structural diversity (see #13)* | High | | | | | | | | Moderate | | | | | | | | Low | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Class cover distribution (all vegetated classes)* | Even | | | | Uneven | | | | Even | | | | Uneven | | | | Even | | | |
| *Duration of surface water in ≥ 10% of AA* | P/P | S/I | T/E | A | P/P | S/I | T/E | A | P/P | S/I | T/E | A | P/P | S/I | T/E | A | P/P | S/I | T/E | A |
| Low disturbance at AA (see #12i) | E | E | E | H | E | E | H | H | E | H | H | M | E | H | M | M | E | H | M | M |
| Moderate disturbance at AA (see #12i) | H | H | H | H | H | H | H | M | H | H | M | M | H | M | M | L | H | M | L | L |
| High disturbance at AA (see #12i) | M | M | M | L | M | M | L | L | M | M | L | L | M | L | L | L | L | L | L | L |

iii. **Rating** (use the conclusions from i and ii above and the matrix below to arrive at [circle] the functional points and rating [E = exceptional, H = high, M = moderate, or L = low] for this function)

| *Evidence of wildlife use (i)* | *Wildlife habitat features rating (ii)* | | | |
|---|---|---|---|---|
| | Exceptional | High | Moderate | Low |
| **Substantial** | 1 (E) | .9 (H) | .8 (H) | .7 (M) |
| **Moderate** | .9 (H) | .7 (M) | .5 (M) | .3 (L) |
| **Minimal** | .6 (M) | .4 (M) | .2 (L) | .1 (L) |

**Comments:** Scattered waterfowl + shorebirds obs.

**14D. General Fish/Aquatic Habitat Rating:** (Assess this function if the AA is used by fish or the existing situation is "correctable" such that the AA could be used by fish [i.e., fish use is precluded by perched culvert or other barrier, etc.]. If the AA is not or was not historically used by fish due to lack of habitat, excessive gradient, etc., circle NA here and proceed to the next function. If fish use occurs in the AA but is not desired from a resource management perspective [such as fish use within an irrigation canal], then Habitat Quality [i below] should be marked as "Low", applied accordingly in ii below, and noted ih the comments.)

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

| *Duration of surface water in AA* | Permanent / Perennial | | | Seasonal / Intermittent | | | Temporary / Ephemeral | | |
|---|---|---|---|---|---|---|---|---|---|
| *Cover - % of waterbody in AA containing cover objects such as submerged logs, large rocks & boulders, overhanging banks, floating-leaved vegetation, etc.* | >25% | 10–25% | <10% | >25% | 10–25% | <10% | >25% | 10–25% | <10% |
| Shading - >75% of streambank or shoreline within AA contains riparian or wetland scrub-shrub or forested communities | E | E | H | H | H | M | M | M | M |
| Shading – 50 to 75% of streambank or shoreline within AA contains rip. or wetland scrub-shrub or forested communities | H | H | M | M | M | M | M | L | L |
| Shading - < 50% of streambank or shoreline within AA contains rip. or wetland scrub-shrub or forested communities | H | M | M | M | L | L | L | L | L |

**ii. Modified Habitat Quality** (Circle the appropriate response to the following question. If answer is Y, then reduce rating in i above by one level [E = H, H = M, M = L, L = L]). *Is fish use of the AA precluded or significantly reduced by a culvert, dike, or other man-made structure or activity or is the waterbody included on the MDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support?* Y N Modified habitat quality rating = (circle) E H M L

**iii. Rating** (use the conclusions from i and ii above and the matrix below to arrive at [circle] the functional points and rating [E = exceptional, H = high, M = moderate, or L = low] for this function)

| *Types of fish known or suspected within AA* | *Modified Habitat Quality (ii)* | | | |
|---|---|---|---|---|
| | Exceptional | High | Moderate | Low |
| **Native game fish** | 1 (E) | .9 (H) | .7 (M) | .5 (M) |
| **Introduced game fish** | .9 (H) | .8 (H) | .6 (M) | .4 (M) |
| **Non-game fish** | .7 (M) | .6 (M) | .5 (M) | .3 (L) |
| **No fish** | .5 (M) | .3 (L) | .2 (L) | .1 (L) |

**Comments:** NA

**14E. Flood Attenuation:** (applies only to wetlands subject to flooding via in-channel or overbank flow. If wetlands in AA are not flooded from in-channel or overbank flow, circle NA here and proceed to next function.)

**i. Rating** (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function)

| *Estimated wetland area in AA subject to periodic flooding* | ≥ 10 acres | | | <10, >2 acres | | | ≤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** | 1(H) | .9(H) | .6(M) | .8(H) | .7(H) | .5(M) | .4(M) | .3(L) | .2(L) |
| AA contains **unrestricted outlet** | .9(H) | .8(H) | .5(M) | .7(H) | .6(M) | .4(M) | .3(L) | .2(L) | .1(L) |

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

**Comments:**

**14F. Short and Long Term Surface Water Storage:** (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, circle NA here and proceed with the evaluation.)

**i. Rating** (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function. Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; and T/E = temporary/ephemeral [see instructions for further definitions of these terms].)

| *Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding* | >5 acre feet | | | <5, >1 acre feet | | | ≤1 acre foot | | |
|---|---|---|---|---|---|---|---|---|---|
| *Duration of surface water at wetlands within the AA* | P/P | S/I | T/E | P/P | S/I | T/E | P/P | S/I | T/E |
| Wetlands in AA flood or pond ≥ **5 out of 10 years** | 1(H) | .9(H) | .8(H) | .8(H) | .6(M) | .5(M) | .4(M) | .3(L) | .2(L) |
| Wetlands in AA flood or pond < **5 out of 10 years** | .9(H) | .8(H) | .7(M) | .7(M) | .5(M) | .4(M) | .3(L) | .2(L) | .1(L) |

**Comments:**

**14G. Sediment/Nutrient/Toxicant Retention and Removal:** (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, circle NA here and proceed with the evaluation.)

**i. Rating** (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function.

| *Sediment, nutrient, and toxicant input levels within AA* | AA receives or surrounding land use with 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 with potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present. | | | |
|---|---|---|---|---|---|---|---|---|
| *% cover of wetland vegetation in AA* | ≥ 70% | | < 70% | | ≥ 70% | | < 70% | |
| *Evidence of flooding or ponding in AA* | Yes | No | Yes | No | Yes | No | Yes | No |
| AA contains **no or restricted outlet** | 1 (H) | .8 (H) | .7 (M) | .5 (M) | .5 (M) | .4 (M) | .3 (L) | .2 (L) |
| AA contains **unrestricted outlet** | .9 (H) | .7 (M) | .6 (M) | .4 (M) | .4 (M) | .3 (L) | .2 (L) | .1 (L) |

**Comments:** Sediments, nutrients from Cutbank Creek

**14H Sediment/Shoreline Stabilization:** (applies only if AA occurs on or within the banks of a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body which is subject to wave action. If does not apply, circle **NA** here and proceed to next function)

**i. Rating** (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [E = exceptional, H = high, M = moderate, or L = low] for this function.

| *% Cover of wetland streambank or shoreline by species with deep, binding rootmasses* | *Duration of surface water adjacent to rooted vegetation* | | |
|---|---|---|---|
| | permanent / perennial | seasonal / intermittent | Temporary / ephemeral |
| ≥ 65% | 1 (H) | .9 (H) | .7 (M) |
| 35-64% | .7 (M) | .6 (M) | .5 (M) |
| < 35% | .3 (L) | .2 (L) | .1 (L) |

**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 [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function. Factor A = acreage of vegetated component in the AA; Factor B = structural diversity rating from #13; Factor C = whether or not the AA contains a surface or subsurface outlet; the final three rows pertain to duration of surface water in the AA, where P/P = permanent/perennial; S/I = seasonal/intermittent; T/E /A= temporary/ephemeral or absent [see instructions for further definitions of these terms].)

| *A* | Vegetated component >5 acres | | | | | | Vegetated component 1-5 acres | | | | | | Vegetated component <1 acre | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *B* | High | | Moderate | | Low | | High | | Moderate | | Low | | High | | Moderate | | Low | |
| *C* | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No |
| P/P | 1H | .9H | .9H | .8H | .8H | .7M | .9H | .8H | .8H | .7M | .7M | .6M | .7M | .6M | .6M | .4M | .4M | .3L |
| S/I | .9H | .8H | .8H | .7M | .7M | .6M | .8H | .7M | .7M | .6M | .6M | .5M | .6M | .5M | .5M | .3L | .3L | .2L |
| T/E/A | .8H | .7M | .7M | .6M | .6M | .5M | .7M | .6M | .6M | .5M | .5M | .4M | .5M | .4M | .4M | .2L | .2L | .1L |

**Comments:**

**14J. Groundwater Discharge/Recharge:** (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
XX Other Some alluvial flow

**ii. Recharge Indicators**

___Permeable substrate present without underlying impeding layer
___Wetland contains inlet but no outlet
___Other

**iii. Rating:** Use the information from i and ii above and the table below to arrive at [circle] the functional points and rating [H = high, L = low] for this function.

| *Criteria* | *Functional Points and Rating* |
|---|---|
| AA is known Discharge/Recharge area or one or more indicators of D/R present | 1 (H) |
| No Discharge/Recharge indicators present | .1 (L) |
| Available Discharge/Recharge information inadequate to rate AA D/R potential | N/A (Unknown) |

**Comments:**

**14K. Uniqueness:**

**i. Rating** (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] 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 MNHP | | | AA does not contain previously cited rare types and structural diversity (#13) is high or contains plant association listed as "S2" by the MNHP | | | AA does not contain previously cited rare types or associations and structural diversity (#13) is low-moderate | | |
|---|---|---|---|---|---|---|---|---|---|
| *Estimated relative abundance (#11)* | rare | common | abundant | rare | common | abundant | rare | common | abundant |
| Low disturbance at AA (#12i) | 1 (H) | .9 (H) | .8 (H) | .8 (H) | .6 (M) | .5 (M) | .5 (M) | .4 (M) | .3 (L) |
| Moderate disturbance at AA (#12i) | .9 (H) | .8 (H) | .7 (M) | .7 (M) | .5 (M) | .4 (M) | .4 (M) | .3 (L) | .2 (L) |
| High disturbance at AA (#12i) | .8 (H) | .7 (M) | .6 (M) | .6 (M) | .4 (M) | .3 (L) | .3 (L) | .2 (L) | .1 (L) |

**Comments:**

**14L. Recreation/Education Potential: i. Is the AA a known rec./ed. site:** (circle) Y N (If yes, rate as [circle] High [1] and go to ii; if no go to iii)

**ii. Check categories that apply to the AA:** XX Educational/scientific study; XX Consumptive rec.; XX Non-consumptive rec.; ___Other

**iii. Based on the location, diversity, size, and other site attributes, is there strong potential for rec./ed. use?** Y N
(If yes, go to ii, then proceed to iv; if no, then rate as [circle] Low [0.1])

**iv. Rating** (use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function.

| *Ownership* | *Disturbance at AA (#12i)* | | |
|---|---|---|---|
| | low | moderate | high |
| public ownership | 1 (H) | .5 (M) | .2 (L) |
| private ownership | .7 (M) | .3 (L) | .1 (L) |

**Comments:** Tribal ownership.

## FUNCTION & VALUE SUMMARY & OVERALL RATING

| Function & 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 | 0.3 | 1 | |
| B. MT Natural Heritage Program Species Habitat | MOD | 0.6 | 1 | |
| C. General Wildlife Habitat | MOD | 0.7 | 1 | |
| D. General Fish/Aquatic Habitat | NA | — | — | |
| E. Flood Attenuation | MOD | 0.5 | 1 | |
| F. Short and Long Term Surface Water Storage | MOD | 0.6 | 1 | |
| G. Sediment/Nutrient/Toxicant Removal | MOD | 0.7 | 1 | |
| H. Sediment/Shoreline Stabilization | NA | — | — | |
| I. Production Export/Food Chain Support | MOD | 0.6 | 1 | |
| J. Groundwater Discharge/Recharge | HIGH | 1 | 1 | |
| K. Uniqueness | MOD | 0.4 | 1 | |
| L. Recreation/Education Potential | MOD | 0.7 | 1 | |
| Totals: | | 6.1 | 10 | |

61%

**OVERALL ANALYSIS AREA (AA) RATING:** (Circle appropriate category based on the criteria outlined below) I II (III) IV

**Category I Wetland:** (Must satisfy **one** of the following criteria; if does not meet criteria, go to Category II)
___ Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; **or**
___ Score of 1 functional point for Uniqueness; **or**
___ Score of 1 functional point for Flood Attenuation **and** answer to Question 14E.ii is "yes"; **or**
___ Total actual functional points > 80% (round to nearest whole #) of total possible functional points.

**Category II Wetland:** (Criteria for Category I not satisfied **and** meets any **one** of the following criteria; if not satisfied, go to Category IV)
___ Score of 1 functional point for Species Rated S1, S2, or S3 by the MT Natural Heritage Program; **or**
___ Score of .9 or 1 functional point for General Wildlife Habitat; **or**
___ Score of .9 or 1 functional point for General Fish/Aquatic Habitat; **or**
___ "High" to "Exceptional" ratings for **both** General Wildlife Habitat **and** General Fish/Aquatic Habitat; **or**
___ Score of .9 functional point for Uniqueness; **or**
___ Total Actual Functional Points > 65% (round to nearest whole #) of total possible functional points.

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

**Category IV Wetland:** (Criteria for Categories I or II are not satisfied and all of the following criteria are met; if does not satisfy criteria go to Category III)
___ "Low" rating for Uniqueness; **and**
___ "Low" rating for Production Export/Food Chain Support; **and**
___ Total actual functional points < 30% (round to nearest whole #) of total possible functional points

# MDT Montana Wetland Assessment Form (revised 5/25/1999)

1. Project Name: Perry Ranch 2. Project #: 13009I-020 Control #: –

3. Evaluation Date: Mo. 07 Day 31 Yr. 02 4. Evaluator(s): JB 5. Wetlands/Site #(s): 2 - outer oxbow

6. Wetland Location(s): i. Legal: T 34 (N) or S; R 8 E or (W) S 27 ; T ___ N or S; R ___ E or W; S ___ ;
ii. Approx. Stationing or Mileposts: NA

iii. Watershed: 10030202 GPS Reference No. (if applies): –
Other Location Information: Along Cutbank Creek between Browning and Cutbank

7. a. Evaluating Agency: MDT ;
b. Purpose of Evaluation:
1. ___ Wetlands potentially affected by MDT project
2. ___ Mitigation wetlands; pre-construction
3. XX Mitigation wetlands; post-construction
4. ___ Other

8. Wetland size: (total acres) ___ (visually estimated)
~7 AC (measured, e.g. by GPS [if applies])

9. Assessment area: (AA, tot., ac., see instructions on determining AA) – (visually estimated)
~7 AC (measured, e.g. by GPS [if applies])

10. Classification of Wetland and Aquatic Habitats in AA (HGM according to Brinson, first col.; USFWS according to Cowardin [1979], remaining cols.)

| HGM Class | System | Subsystem | Class | Water Regime | Modifier | % of AA |
|---|---|---|---|---|---|---|
| Riverine | Palustrine | – | EM | C | EX, D | 100 |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

(Abbreviations: **System**: Palustrine(P)/ **Subsyst**: none/ **Classes**: Rock Bottom (RB), Unconsolidated bottom (UB), Aquatic Bed (AB), Unconsolidated Shore (US), Moss-lichen Wetland (ML), Emergent Wetland (EM), Scrub-Shrub Wetland (SS), Forested Wetland (FO)/ **System**: Lacustrine (L)/, **Subsyst.**: Limnetic (2)/ **Classes:** RB, UB, AB/ **Subsystem:** Littoral (4)/ **Classes:** RB, UB, AB, US, EM/ **System:** Riverine (R)/ **Subsyst.:** Lower Perennial (2)/ Classes: RB, UB, AB, US, EM/ **Subsystem:** Upper Perennial (3)/ Classes: RB, UB, AB, US/ **Water Regimes:** Permanently Flooded (H), Intermittently Exposed (G), Semipermanently Flooded (F), Seasonally Flooded (C), Saturated (B), Temporarily Flooded (A), Intermittently Flooded (J) **Modifiers:** Excavated (E), Impounded (I), Diked (D), Partly Drained (PD), Farmed (F), Artificial (A) **HGM Classes:** Riverine, Depressional, Slope, Mineral Soil Flats, Organic Soil Flats, Lacustrine Fringe

11. Estimated relative abundance: (of similarly classified sites within the same Major Montana Watershed Basin, see definitions)
(Circle one) Unknown Rare (Common) Abundant
Comments:

12. General condition of AA:
i. Regarding disturbance: (use matrix below to determine [circle] appropriate response)

| *Conditions within AA* | *Predominant conditions adjacent to (within 500 feet of) AA* | | |
|---|---|---|---|
| | Land managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or buildings. | Land not cultivated, but moderately grazed or hayed or selectively logged; or has been subject to minor clearing; contains few roads or buildings. | Land cultivated or heavily grazed or logged; subject to substantial fill placement, grading, clearing, or hydrological alteration; high road or building density. |
| AA occurs and is managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or occupied buildings. | low disturbance | (low disturbance) | moderate disturbance |
| AA not cultivated, but moderately grazed or hayed or selectively logged; or has been subject to relatively minor clearing, fill placement, or hydrological alteration; contains few roads or buildings. | moderate disturbance | moderate disturbance | high disturbance |
| AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density. | high disturbance | high disturbance | high disturbance |

Comments: (types of disturbance, intensity, season, etc.) Adjacent to cultivation + grazing, but not substantive
ii. Prominent weedy, alien, & introduced species (including those not domesticated, feral): (list) No weedy sp. in wetland
iii. Provide brief descriptive summary of AA and surrounding land use/habitat: Wetland area within Cutbank Creek floodplain - adjacent to range + cropland.

13. Structural Diversity: (based on number of "Cowardin" *vegetated* classes present [do not include unvegetated classes], see #10 above)

| *# of "Cowardin" vegetated classes present in AA (see #10)* | ≥ 3 vegetated classes (or ≥ 2 if one is forested) | 2 vegetated classes (or 1 if forested) | ≤ 1 vegetated class |
|---|---|---|---|
| *Rating (circle)* | High | Moderate | (Low) |

Comments:

## SECTION PERTAINING to FUNCTIONS & VALUES ASSESSMENT

2

**14A. Habitat for Federally Listed or Proposed Threatened or Endangered Plants or Animals:**

**I.** AA is Documented (D) or Suspected (S) to contain (circle one based on definitions contained in instructions):

| | | |
|---|---|---|
| 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** (use the conclusions from i above and the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function)

| *Highest Habitat Level* | doc./primary | sus/primary | doc./secondary | sus./secondary | doc./incidental | sus./incidental | None |
|---|---|---|---|---|---|---|---|
| *Functional Points and Rating* | 1 (H) | .9 (H) | .8 (M) | .7 (M) | .5 (L) | .3 (L) | 0 (L) |

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

**14B. Habitat for plant or animals rated S1, S2, or S3 by the Montana Natural Heritage Program:** (not including species listed in14A above)

**I.** AA is Documented (D) or Suspected (S) to contain (circle one based on definitions contained in instructions):

| | | |
|---|---|---|
| Primary or critical habitat (**list species**) | D S | |
| Secondary habitat (**list species**) | (D) S | Northern leopard frogs observed (6-10) |
| Incidental habitat (**list species**) | D S | |
| No usable habitat | D S | |

**II. Rating** (use the conclusions from i above and the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function)

| *Highest Habitat Level* | doc./primary | sus/primary | doc./secondary | sus./secondary | doc./incidental | sus./incidental | None |
|---|---|---|---|---|---|---|---|
| *Functional Points and Rating* | 1 (H) | .8 (H) | .7 (M) | .6 (M) | .2 (L) | .1 (L) | 0 (L) |

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

**14C. General Wildlife Habitat Rating:**

**I. Evidence of overall wildlife use in the AA** (circle substantial, moderate, or low based on supporting evidence):

***Substantial*** (based on any of the following [check]):
- XX observations of abundant wildlife #'s or high species diversity (during any period)
- XX 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 [check]):
- __ 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 the AA

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

**ii. Wildlife habitat features** (working from top to bottom, circle appropriate AA attributes in matrix to arrive at 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 of the AA (see #10). Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; and A = absent [see instructions for further definitions of these terms].)

| *Structural diversity (see #13)* | High | | | | | | | | Moderate | | | | | | | | Low | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Class cover distribution (all vegetated classes)* | Even | | | | Uneven | | | | Even | | | | Uneven | | | | Even | | | |
| *Duration of surface water in ≥ 10% of AA* | P/P | S/I | T/E | A | P/P | S/I | T/E | A | P/P | S/I | T/E | A | P/P | S/I | T/E | A | P/P | S/I | T/E | A |
| **Low** disturbance at AA (see #12i) | E | E | E | H | E | E | H | H | E | H | H | M | E | H | M | M | E | H | M | M |
| **Moderate** disturbance at AA (see #12i) | H | H | H | H | H | H | H | M | H | H | M | M | H | M | M | L | H | M | L | L |
| **High** disturbance at AA (see #12i) | M | M | M | L | M | M | L | L | M | M | L | L | M | L | L | L | L | L | L | L |

**iii. Rating** (use the conclusions from i and ii above and the matrix below to arrive at [circle] the functional points and rating [E = exceptional, H = high, M = moderate, or L = low] for this function)

| *Evidence of wildlife use (i)* | *Wildlife habitat features rating (ii)* | | | |
|---|---|---|---|---|
| | Exceptional | High | Moderate | Low |
| **Substantial** | 1 (E) | .9 (H) | .8 (H) | .7 (M) |
| **Moderate** | .9 (H) | .7 (M) | .5 (M) | .3 (L) |
| **Minimal** | .6 (M) | .4 (M) | .2 (L) | .1 (L) |

**Comments:** Many shorebirds, waterfowl observed + frogs. Numerous avocet pairs.

**14D. General Fish/Aquatic Habitat Rating:** (Assess this function if the AA is used by fish or the existing situation is "correctable" such that the AA could be used by fish [i.e., fish use is precluded by perched culvert or other barrier, etc.]. If the AA is not or was not historically used by fish due to lack of habitat, excessive gradient, etc., circle **NA** here and proceed to the next function. If fish use occurs in the AA but is not desired from a resource management perspective [such as fish use within an irrigation canal], then Habitat Quality [i below] should be marked as "Low", applied accordingly in ii below, and noted ih the comments.)

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

| *Duration of surface water in AA* | Permanent / Perennial | | | Seasonal / Intermittent | | | Temporary / Ephemeral | | |
|---|---|---|---|---|---|---|---|---|---|
| *Cover - % of waterbody in AA containing cover objects such as submerged logs, large rocks & boulders, overhanging banks, floating-leaved vegetation, etc.* | >25% | 10–25% | <10% | >25% | 10–25% | <10% | >25% | 10–25% | <10% |
| Shading - >**75%** of streambank or shoreline within AA contains riparian or wetland scrub-shrub or forested communities | E | E | H | H | H | M | M | M | M |
| Shading – **50 to 75%** of streambank or shoreline within AA contains rip. or wetland scrub-shrub or forested communities | H | H | M | M | M | M | M | L | L |
| Shading - < **50%** of streambank or shoreline within AA contains rip. or wetland scrub-shrub or forested communities | H | M | M | M | L | L | L | L | L |

**ii. Modified Habitat Quality** (Circle the appropriate response to the following question. If answer is Y, then reduce rating in i above by one level [E = H, H = M, M = L, L = L]). *Is fish use of the AA precluded or significantly reduced by a culvert, dike, or other man-made structure or activity or is the waterbody included on the MDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support?* **Y** **N** Modified habitat quality rating = (circle) **E** **H** **M** **L**

**iii. Rating** (use the conclusions from i and ii above and the matrix below to arrive at [circle] the functional points and rating [E = exceptional, H = high, M = moderate, or L = low] for this function)

| *Types of fish known or suspected within AA* | *Modified Habitat Quality (ii)* | | | |
|---|---|---|---|---|
| | Exceptional | High | Moderate | Low |
| **Native game fish** | 1 (E) | .9 (H) | .7 (M) | .5 (M) |
| **Introduced game fish** | .9 (H) | .8 (H) | .6 (M) | .4 (M) |
| **Non-game fish** | .7 (M) | .6 (M) | .5 (M) | .3 (L) |
| **No fish** | .5 (M) | .3 (L) | .2 (L) | .1 (L) |

**Comments:** NA

**14E. Flood Attenuation:** (applies only to wetlands subject to flooding via in-channel or overbank flow. If wetlands in AA are not flooded from in-channel or overbank flow, circle **NA** here and proceed to next function.)

**i. Rating** (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function)

| *Estimated wetland area in AA subject to periodic flooding* | ≥ 10 acres | | | <10, >2 acres | | | ≤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** | 1(H) | .9(H) | .6(M) | .8(H) | .7(H) | .5(M) | .4(M) | .3(L) | .2(L) |
| AA contains **unrestricted outlet** | .9(H) | .8(H) | .5(M) | .7(H) | .6(M) | .4(M) | .3(L) | .2(L) | .1(L) |

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

**14F. Short and Long Term Surface Water Storage:** (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, circle **NA** here and proceed with the evaluation.)

**i. Rating** (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function. Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; and T/E = temporary/ephemeral [see instructions for further definitions of these terms].)

| *Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding* | >5 acre feet | | | <5, >1 acre feet | | | ≤1 acre foot | | |
|---|---|---|---|---|---|---|---|---|---|
| *Duration of surface water at wetlands within the AA* | P/P | S/I | T/E | P/P | S/I | T/E | P/P | S/I | T/E |
| Wetlands in AA flood or pond ≥ **5 out of 10 years** | 1(H) | .9(H) | .8(H) | .8(H) | .6(M) | .5(M) | .4(M) | .3(L) | .2(L) |
| Wetlands in AA flood or pond < **5 out of 10 years** | .9(H) | .8(H) | .7(M) | .7(M) | .5(M) | .4(M) | .3(L) | .2(L) | .1(L) |

**Comments:**

**14G. Sediment/Nutrient/Toxicant Retention and Removal:** (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, circle **NA** here and proceed with the evaluation.)

**i. Rating** (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function.

| *Sediment, nutrient, and toxicant input levels within AA* | AA receives or surrounding land use with 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 with potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present. | | | |
|---|---|---|---|---|---|---|---|---|
| *% cover of wetland vegetation in AA* | ≥ 70% | | < 70% | | ≥ 70% | | < 70% | |
| *Evidence of flooding or ponding in AA* | Yes | No | Yes | No | Yes | No | Yes | No |
| AA contains **no or restricted outlet** | 1 (H) | .8 (H) | .7 (M) | .5 (M) | .5 (M) | .4 (M) | .3 (L) | .2 (L) |
| AA contains **unrestricted outlet** | .9 (H) | .7 (M) | .6 (M) | .4 (M) | .4 (M) | .3 (L) | .2 (L) | .1 (L) |

**Comments:**

**14H Sediment/Shoreline Stabilization:** (applies only if AA occurs on or within the banks or a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body which is subject to wave action. If does not apply, circle **NA** here and proceed to next function)

**i. Rating** (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [E = exceptional, H = high, M = moderate, or L = low] for this function.

| *% Cover of wetland streambank or shoreline by species with deep, binding rootmasses* | *Duration of surface water adjacent to rooted vegetation* | | |
|---|---|---|---|
| | permanent / perennial | seasonal / intermittent | Temporary / ephemeral |
| ≥ 65% | 1 (H) | .9 (H) | .7 (M) |
| 35-64% | .7 (M) | .6 (M) | .5 (M) |
| < 35% | .3 (L) | .2 (L) | .1 (L) |

**Comments:** NA at this time

**14I. Production Export/Food Chain Support:**

**i. Rating** (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function. Factor A = acreage of vegetated component in the AA; Factor B = structural diversity rating from #13; Factor C = whether or not the AA contains a surface or subsurface outlet; the final three rows pertain to duration of surface water in the AA, where P/P = permanent/perennial; S/I = seasonal/intermittent; T/E /A= temporary/ephemeral or absent [see instructions for further definitions of these terms].)

| *A* | Vegetated component >5 acres | | | | | | Vegetated component 1-5 acres | | | | | | Vegetated component <1 acre | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *B* | High | | Moderate | | Low | | High | | Moderate | | Low | | High | | Moderate | | Low | |
| *C* | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No |
| **P/P** | 1H | .9H | .9H | .8H | .8H | .7M | .9H | .8H | .8H | .7M | .7M | .6M | .7M | .6M | .6M | .4M | .4M | .3L |
| **S/I** | .9H | .8H | .8H | .7M | .7M | .6M | .8H | .7M | .7M | .6M | .6M | .5M | .6M | .5M | .5M | .3L | .3L | .2L |
| **T/E/A** | .8H | .7M | .7M | .6M | .6M | .5M | .7M | .6M | .6M | .5M | .5M | .4M | .5M | .4M | .4M | .2L | .2L | .1L |

**Comments:**

**14J. Groundwater Discharge/Recharge:** (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
X Other Alluvial flow/connections likely

**ii. Recharge Indicators**

___Permeable substrate present without underlying impeding layer
___Wetland contains inlet but no outlet
___Other

**iii. Rating:** Use the information from i and ii above and the table below to arrive at [circle] the functional points and rating [H = high, L = low] for this function.

| *Criteria* | *Functional Points and Rating* |
|---|---|
| AA is known Discharge/Recharge area or one or more indicators of D/R present | 1 (H) |
| No Discharge/Recharge indicators present | .1 (L) |
| Available Discharge/Recharge information inadequate to rate AA D/R potential | N/A (Unknown) |

**Comments:**

**14K. Uniqueness:**

**i. Rating** (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] 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 MNHP | | | AA does not contain previously cited rare types **and** structural diversity (#13) is high **or** contains plant association listed as "S2" by the MNHP | | | AA does not contain previously cited rare types or associations **and** structural diversity (#13) is low-moderate | | |
|---|---|---|---|---|---|---|---|---|---|
| *Estimated relative abundance (#11)* | rare | common | abundant | rare | common | abundant | rare | common | abundant |
| **Low** disturbance at AA (#12i) | 1 (H) | .9 (H) | .8 (H) | .8 (H) | .6 (M) | .5 (M) | .5 (M) | .4 (M) | .3 (L) |
| **Moderate** disturbance at AA (#12i) | .9 (H) | .8 (H) | .7 (M) | .7 (M) | .5 (M) | .4 (M) | .4 (M) | .3 (L) | .2 (L) |
| **High** disturbance at AA (#12i) | .8 (H) | .7 (M) | .6 (M) | .6 (M) | .4 (M) | .3 (L) | .3 (L) | .2 (L) | .1 (L) |

**Comments:**

**14L. Recreation/Education Potential: i. Is the AA a known rec./ed. site:** (circle) Y N (If yes, rate as [circle] High [1] and go to ii; if no go to iii)

**ii. Check categories that apply to the AA:** X Educational/scientific study; X Consumptive rec.; X Non-consumptive rec.; ___Other

**iii. Based on the location, diversity, size, and other site attributes, is there strong potential for rec./ed. use?** Y N
(If yes, go to ii, then proceed to iv; if no, then rate as [circle] Low [0.1])

**iv. Rating** (use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function.

| *Ownership* | *Disturbance at AA (#12i)* | | |
|---|---|---|---|
| | low | moderate | high |
| **public** ownership | 1 (H) | .5 (M) | .2 (L) |
| **private** ownership | .7 (M) | .3 (L) | .1 (L) |

**Comments:** Tribal ownership

## FUNCTION & VALUE SUMMARY & OVERALL RATING

| Function & 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 | 0.3 | 1 | |
| B. MT Natural Heritage Program Species Habitat | MOD | 0.7 | 1 | |
| C. General Wildlife Habitat | HIGH | 0.9 | 1 | |
| D. General Fish/Aquatic Habitat | NA | — | — | |
| E. Flood Attenuation | MOD | 0.5 | 1 | |
| F. Short and Long Term Surface Water Storage | HIGH | 0.9 | 1 | |
| G. Sediment/Nutrient/Toxicant Removal | HIGH | 1 | 1 | |
| H. Sediment/Shoreline Stabilization | NA | — | — | |
| I. Production Export/Food Chain Support | MOD | 0.7 | 1 | |
| J. Groundwater Discharge/Recharge | HIGH | 1 | 1 | |
| K. Uniqueness | MOD | 0.4 | 1 | |
| L. Recreation/Education Potential | MOD | 0.7 | 1 | |
| Totals: | | 7.1 | 10 | |

71%

**OVERALL ANALYSIS AREA (AA) RATING:** (Circle appropriate category based on the criteria outlined below) I (II) III IV

**Category I Wetland:** (Must satisfy **one** of the following criteria; if does not meet criteria, go to Category II)
___ Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; **or**
___ Score of 1 functional point for Uniqueness; **or**
___ Score of 1 functional point for Flood Attenuation **and** answer to Question 14E.ii is "yes"; **or**
___ Total actual functional points > 80% (round to nearest whole #) of total possible functional points.

√ **Category II Wetland:** (Criteria for Category I not satisfied **and** meets any **one** of the following criteria; if not satisfied, go to Category IV)
___ Score of 1 functional point for Species Rated S1, S2, or S3 by the MT Natural Heritage Program; **or**
XX Score of .9 or 1 functional point for General Wildlife Habitat; **or**
___ Score of .9 or 1 functional point for General Fish/Aquatic Habitat; **or**
___ "High" to "Exceptional" ratings for **both** General Wildlife Habitat **and** General Fish/Aquatic Habitat; **or**
___ Score of .9 functional point for Uniqueness; **or**
XX Total Actual Functional Points > 65% (round to nearest whole #) of total possible functional points.

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

**Category IV Wetland:** (Criteria for Categories I or II are not satisfied and all of the following criteria are met; if does not satisfy criteria go to Category III)
___ "Low" rating for Uniqueness; **and**
___ "Low" rating for Production Export/Food Chain Support; **and**
___ Total actual functional points < 30% (round to nearest whole #) of total possible functional points

| Montana Department of Transportation | | | |
|---|---|---|---|
| Wetland Mitigation Monitoring Project | | | |
| Rhithron Associates, Inc. | | | |
| for Land and Water Consulting | | Project Name | Perry Ranch |
| 2001 and 2002 | | | |
| | | Date | Jul-02 |
| Coelenterata | | *Hydra* | |
| Turbellaria | | *Dugesia* | |
| Oligochaeta | Enchytraeidae | Enchytraeidae | |
| | Lumbriculidae | Lumbriculidae | |
| | Naididae | *Chaetogaster* | |
| | | *Nais elinguis* | |
| | | *Nais variabilis* | 1 |
| | | *Ophidonais serpentina* | |
| | Tubificidae | Tubificidae - immature | |
| | | *Limnodrilus hoffmeisteri* | |
| Hirudinea | | *Mooreobdella microstoma* | |
| | | *Nephelopsis* | |
| | | *Helobdella stagnalis* | |
| | | *Helobdella* | |
| | | *Glossiphonia* | |
| | | *Theromyzon* | |
| Bivalvia | Sphaeriidae | *Sphaerium* | |
| Gastropoda | Lymnaeidae | *Fossaria* | |
| | Physidae | *Physa* | |
| | Planorbidae | *Gyraulus* | |
| | | *Helisoma* | |
| | | *Planorbella* | |
| Crustacea | Cladocera | Cladocera | 2 |
| | Copepoda | Calanoida | |
| | | Cyclopoida | |
| | Ostracoda | Ostracoda | |
| | Amphipoda | *Gammarus* | |
| | | *Hyalella azteca* | |
| | Isopoda | *Caecidotea* | |
| | Decapoda | *Orconectes* | |
| Acarina | | Acari | 1 |
| Odonata | Aeshnidae | *Anax junius* | |
| | Libellulidae | Libellulidae-early instar | |
| | | *Sympetrum* | |
| | Coenagrionidae | Coenagrionidae-early instar | |
| | | *Enallagma* | |
| | Lestidae | *Lestes* | |
| Ephemeroptera | Baetidae | *Baetis tricaudatus* | |
| | | *Callibaetis* | 1 |
| | | *Centroptilum* | |
| | Caenidae | *Caenis* | |
| | Ephemerellidae | *Ephemerella* | |
| | Heptageniidae | *Cinygma* | |
| | | *Nixe* | |
| | Leptophlebiidae | *Paraleptophlebia* | |
| | Ameletidae | *Ameletus* | |
| Homoptera | Corixidae | Corixidae - immature | |
| | | *Corisella tarsalis* | |
| | | *Hesperocorixa* | |
| | | *Palmacorixa buenoi* | |
| | | *Sigara* | |
| | | *Trichocorixa* | |
| | Nepidae | *Ranatra* | |
| | Notonectidae | *Notonecta* | |
| Plecoptera | Chloroperlidae | *Sweltsa* | |
| | Perlodidae | *Skwala* | |
| Trichoptera | Brachycentridae | *Brachycentrus* - early instar | |
| | Hydroptilidae | Hydroptilidae - pupa | |

| | | | |
|---|---|---|---|
| | | *Hydroptila* | |
| | Lepidostomatidae | *Lepidostoma* | |
| | Leptoceridae | Leptoceridae - early instar | |
| | | *Ceraclea* | |
| | | *Mystacides* | |
| | | *Nectopsyche* | |
| | | *Ylodes* | |
| | Limnephilidae | *Psychoglypha suborealis* | |
| Coleoptera | Chysomelidae | Chrysomelidae | |
| | Curculionidae | *Bagous* | |
| | Dytiscidae | *Acilius* | |
| | | Dytiscidae - early instar larvae | |
| | | Hydroporinae - early instar larvae | |
| | | *Hygrotus* | |
| | | *Liodessus* | |
| | | *Laccophilus* | |
| | | *Neoporus* | |
| | | *Oreodytes* | |
| | | *Rhantus* | |
| | | *Stichtotarsus* | |
| | Elmidae | *Dubiraphia* | |
| | | *Heterlimnius* | |
| | | *Lara avara* | |
| | | *Optioservus* | |
| | | *Zaitzevia* | |
| | Haliplidae | *Haliplus* | |
| | | *Peltodytes* | |
| | Hydrophilidae | Hydrophilidae - early instar larvae | |
| | | *Berosus* | |
| | | *Helophorus* | |
| | | *Hydrobius* | |
| | | *Hydrochara* | |
| | | *Laccobius* | |
| | | *Tropisternus* | 1 |
| Diptera | Athericidae | *Atherix* | |
| | Ceratopogonidae | *Bezzia/Palpomyia* | |
| | | *Dasyhelea* | |
| | Chaoboridae | *Chaoborus* | |
| | Culicidae | *Anopheles* | |
| | | *Culex* | |
| | Dixidae | *Dixella* | |
| | Dolichopodidae | Dolichopodidae | |
| | Empididae | *Clinocera* | |
| | Ephydridae | Ephydridae | |
| | Muscidae | Muscidae | |
| | Pelecorhynchidae | *Glutops* | |
| | Psychodidae | *Pericoma* | |
| | Simuliidae | *Simulium* | |
| | Sciomyzidae | Sciomyzidae | |
| | Stratiomyidae | *Odontomyia* | |
| | Tabanidae | Tabanidae | |
| | Tipulidae | *Hexatoma* | |
| | | *Tipula* | |
| | Chironomidae | *Ablabesmyia* | 1 |
| | | *Acricotopus* | |
| | | *Camptocladius* | |
| | | *Chironomus* | 135 |
| | | *Cladotanytarsus* | |
| | | *Corynoneura* | |
| | | Cricotopus Bicinctus Gr. | |
| | | Cricotopus (Cricotopus) Gr. | 63 |
| | | *Cricotopus nostococladius* | |
| | | *Cryptotendipes* | |
| | | *Diamesa* | |

| | | | |
|---|---|---|---|
| | | *Dicrotendipes* | |
| | | *Einfeldia* | |
| | | *Endochironomus* | |
| | | *Labrundinia* | |
| | | *Micropsectra* | |
| | | *Microtendipes* | |
| | | *Odontomesa* | |
| | | *Orthocladius annectens* | 10 |
| | | *Pagastia* | |
| | | *Parachironomus* | |
| | | *Paracladopelma* | 1 |
| | | *Paramerina* | |
| | | *Parametriocnemus* | |
| | | *Paratanytarsus* | |
| | | *Paratendipes* | |
| | | *Phaenopsectra* | |
| | | *Polypedilum* | |
| | | *Procladius* | 4 |
| | | *Psectrocladius elatus* | |
| | | *Psectrocladius vernalis* | 1 |
| | | *Psectrotanypus* | |
| | | *Pseudochironomus* | |
| | | *Stichtochironomus* | |
| | | *Tanypus* | |
| | | *Tanytarsus* | 1 |
| | | *Theinemanniella* | |
| | | *Tvetenia* | |
| | | | |
| | | Total | 222 |
| | | | |
| | | | |
| | | | |
| | | | |
| | | Total taxa | 13 |
| | | POET | 1 |
| | | Chironomidae taxa | 8 |
| | | Crustacea taxa + Mollusca taxa | 1 |
| | | % Chironomidae | 97.30% |
| | | Orthocladiinae/Chironomidae | 0.34 |
| | | %Amphipoda | 0.00% |
| | | %Crustacea + %Mollusca | 0.90% |
| | | HBI | 8.78 |
| | | %Dominant taxon | 60.81% |
| | | %Collector-Gatherers | 95.95% |
| | | %Filterers | 0.90% |
| | | | |
| | | Scores (2002 criteria) | |
| | | Total taxa | 3 |
| | | POET | 1 |
| | | Chironomidae taxa | 5 |
| | | Crustacea taxa + Mollusca taxa | 1 |
| | | % Chironomidae | 1 |
| | | Orthocladiinae/Chironomidae | 3 |
| | | %Amphipoda | 5 |
| | | %Crustacea + %Mollusca | 5 |
| | | HBI | 1 |
| | | %Dominant taxon | 1 |
| | | %Collector-Gatherers | 5 |
| | | %Filterers | 1 |
| | | | |
| | | Total score | 32 |

# Appendix C

## REPRESENTATIVE PHOTOGRAPHS
## AERIAL PHOTO

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

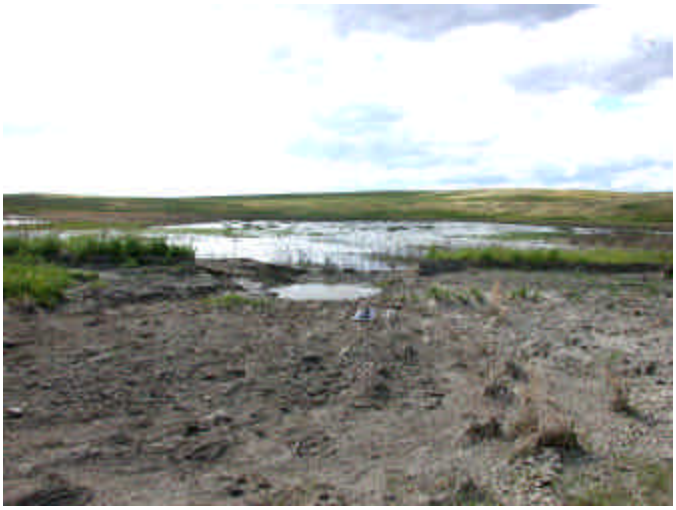
LAND & WATER

**2002 Perry Ranch Photosheet**

Photo Point 1: Panoramic view of northernmost excavated area on July 31, 2002. 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 31, 2002. General photo aspect is east / southeast from adjacent hillside to west.

Photo Point 3: Panoramic view of SW end of site on July 31, 2002. General photo aspect is northeast from adjacent hillside to southwest. Delivery ditch is in foreground.

| | |
|---|---|
| | |
| Photo from transect start facing 288 degrees W/NW. | Photo from transect end facing 100 degrees E/SE. |
| |  |
| Photo from within outer oxbow, near north end, facing east. | Photo of dike washout at east end of outer oxbow, photo from downstream of dike facing west, top of dike is vegetated. |
| | |
| | |

**2002 Perry Ranch**

JOB:PERRY RANCH WETLAND ROLL:000 SCALE:1:6000 FLT:32 07/23/2002 12:11:24
FS100 1/ 600 f/5.6 FF1.0 EC 0 SIN dt055.7 26.8V -57mb ER00 CAM

# Appendix D

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## MDT Proposed Project Layout
## MDT Baseline Wetland Maps and Functional Assessment Forms

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

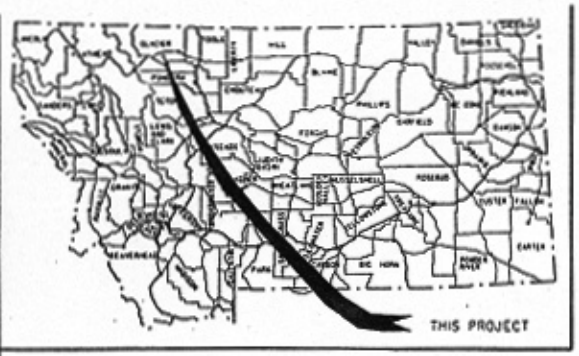
LAND & WATER

LAND & WATER D-1

~. H. MORSH.K

# MONTANA DEPARTMENT OF TRANSPORTATION

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

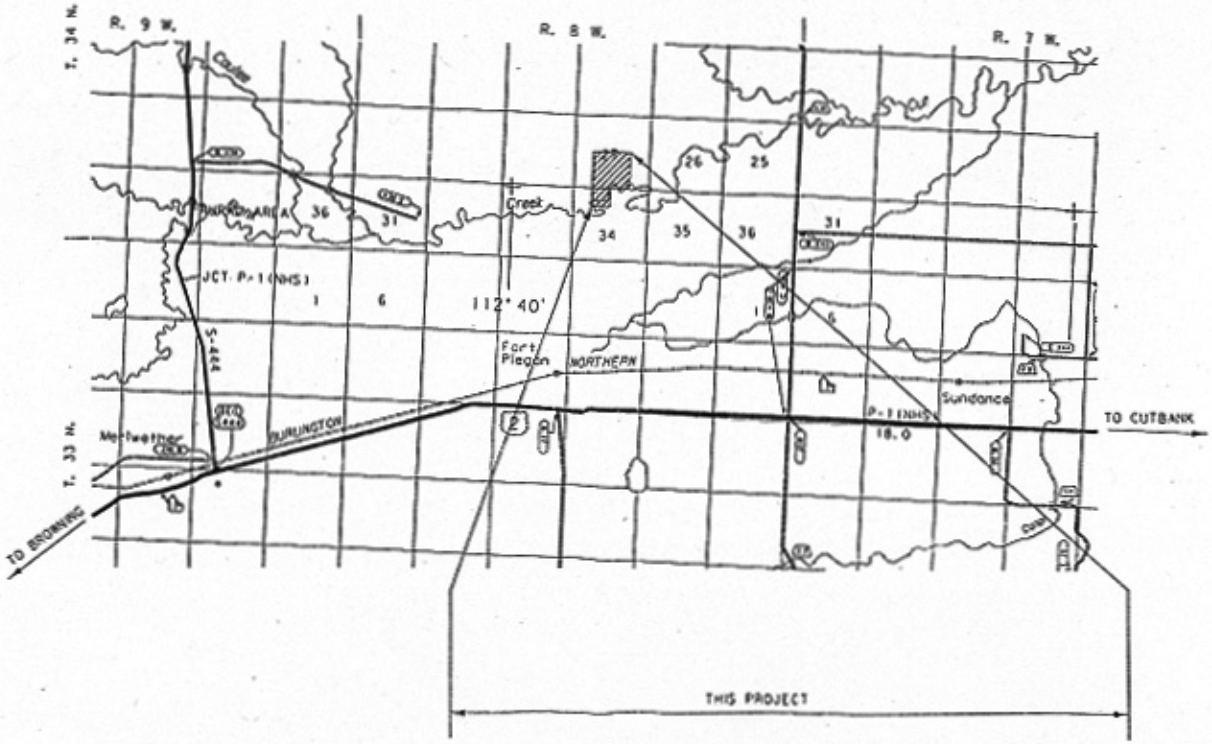



DESIGN DATA
A.D.T. =
A.D.T. =
D.H.V. =
D. =
T. =
V. =
ALL TRUCKS =
EWS by ESAL'S =
GROWTH RATE =

LETTING DATE = _____

LENGTH kilometers

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




PRELIMINARY
FOR PLAN IN HAND ONLY

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

RELATED PROJECTS

ASSOCIATED PROJECT AGREEMENT NUMBERS

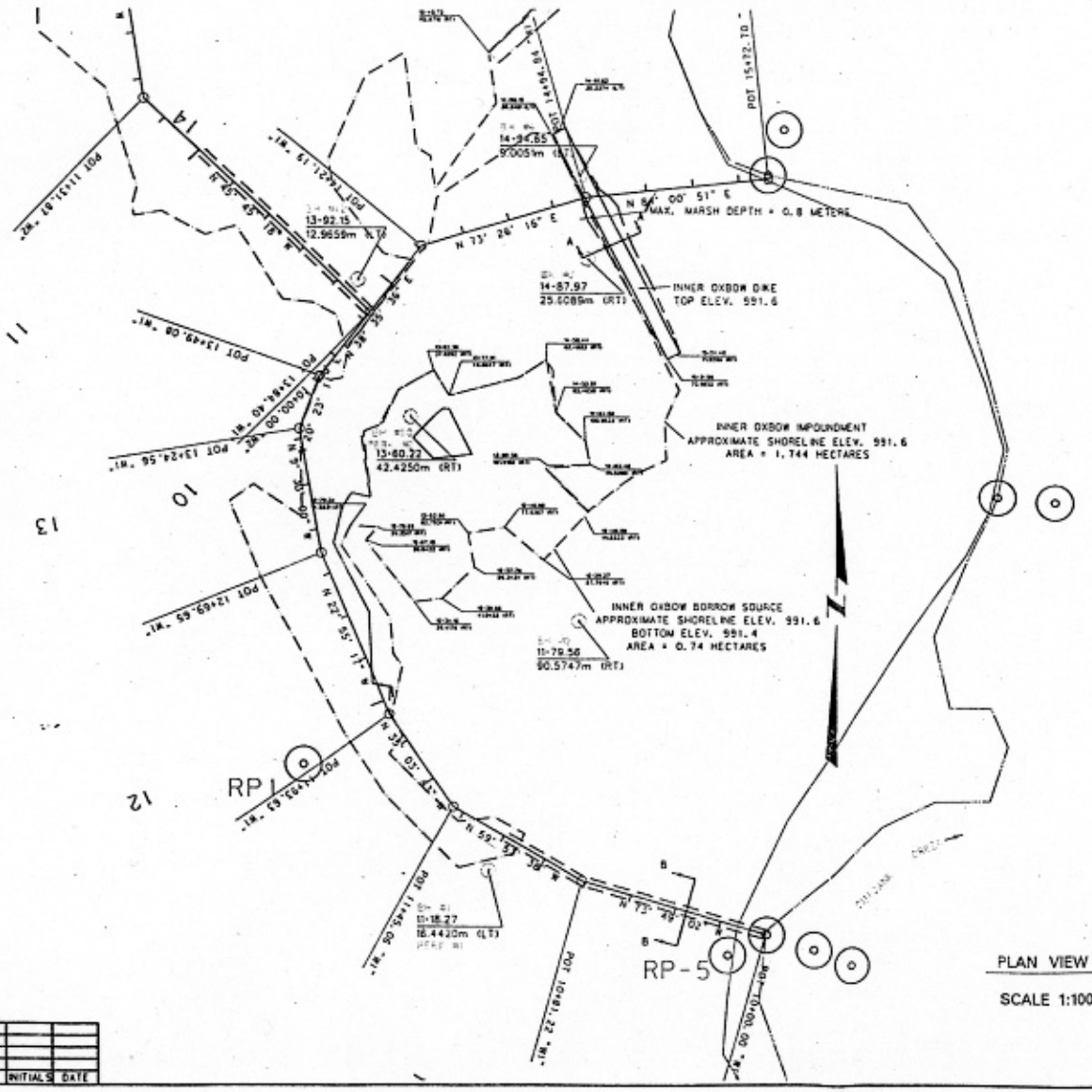
| | |
|---|---|
| R/W & U.C. | |
| P.E. | |

CONTROL NO.

LAND & WATER D-2

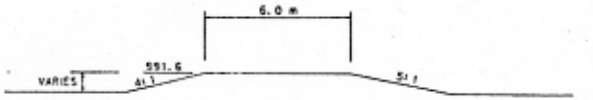
| STATE | PROJECT NUMBER | SHEET NO. |
|---|---|---|
| MONTANA | NH 0002(232) | 6 |

# INNER OXBOW LAYOUT




PLAN VIEW

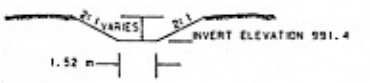
SCALE 1:100




SECTION A-A-SPREDER DIKE TYPICAL SECTION

SCALE 1:10

STA. 10+00 TO STA. 11+20




SECTION B-B-INTAKE WEIR TYPICAL SECTION

SCALE 1:10

| | | |
|---|---|---|
| DESIGNER | | |
| DRAWN | | |
| CHECKED | | |
| REVISED | | |
| | INITIALS | DATE |

INNER OXBOW

LAYOUT DETAIL

ALIGNMENT "W1"

PRELIMINARY

MONTANA DEPARTMENT OF TRANSPORTATION

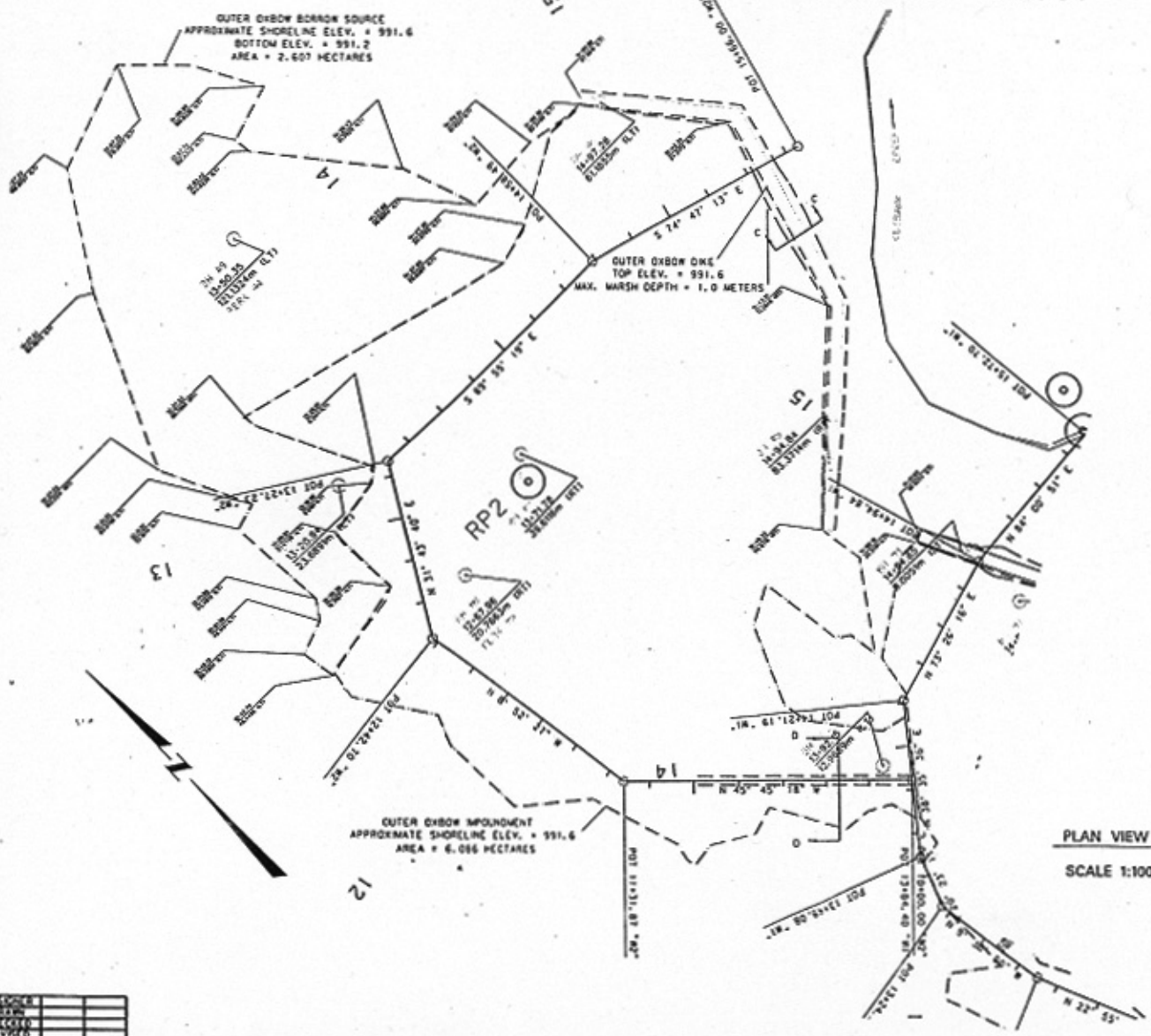
MONTANA CADD

13:37:41 28 JUL 1998 02313

LAND & WATER D-3

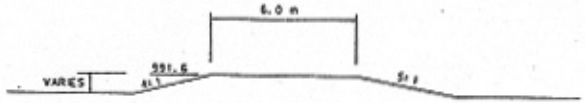
| STATE | PROJECT NUMBER | SHEET |
|---|---|---|
| MONTANA | NH 0002(232) | 2 |

# OUTER OXBOW LAYOUT




PLAN VIEW

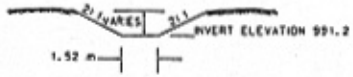
SCALE 1:100




SECTION C-C-SPREDER DIKE TYPICAL SECTION

SCALE 1:10

STA. 10+00 TO STA. 11+00



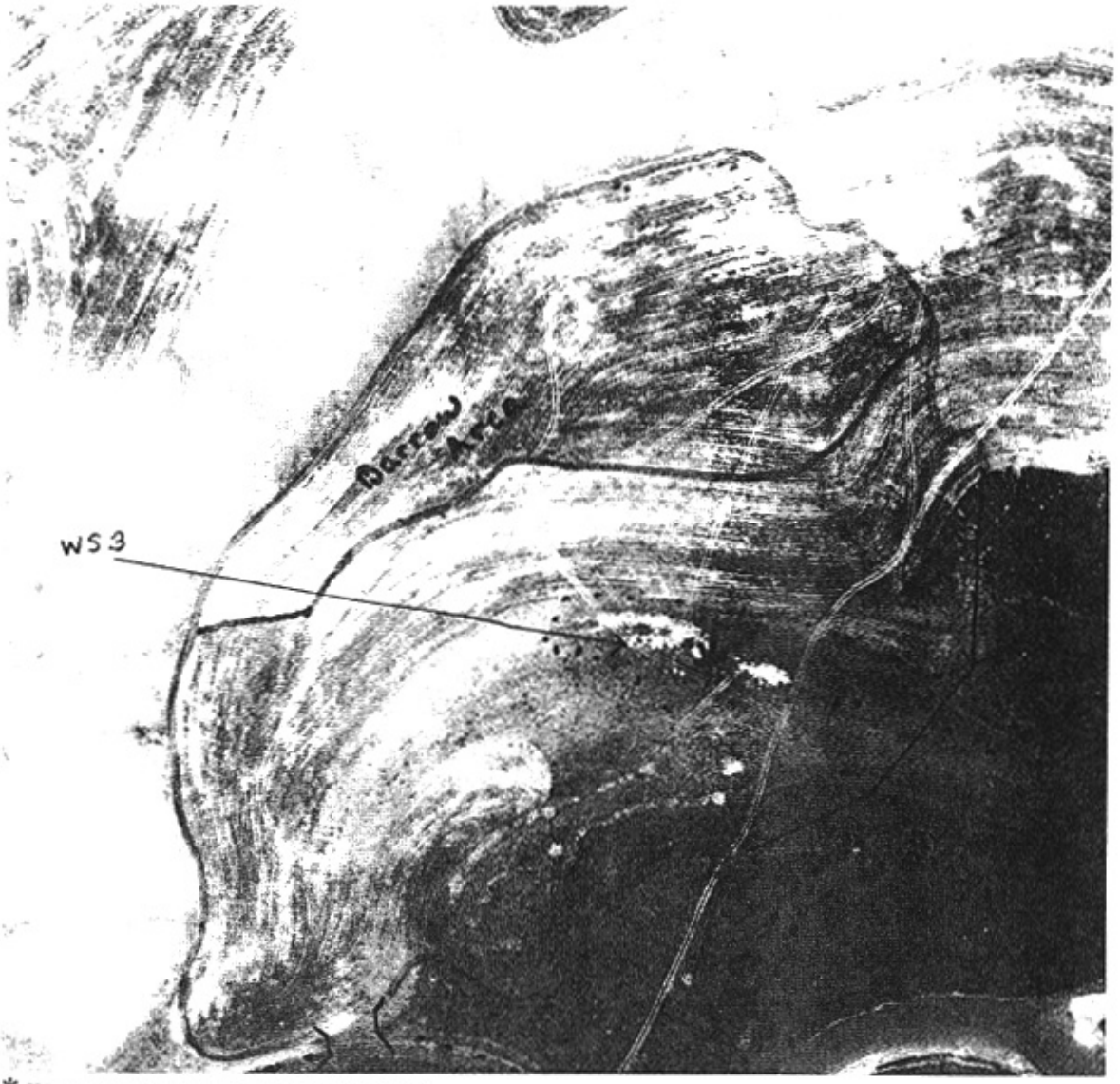

SECTION D-D-INTAKE WEIR TYPICAL SECTION

SCALE 1:10

OUTER OXBOW
LAYOUT DETAIL
ALIGNMENT "W2"

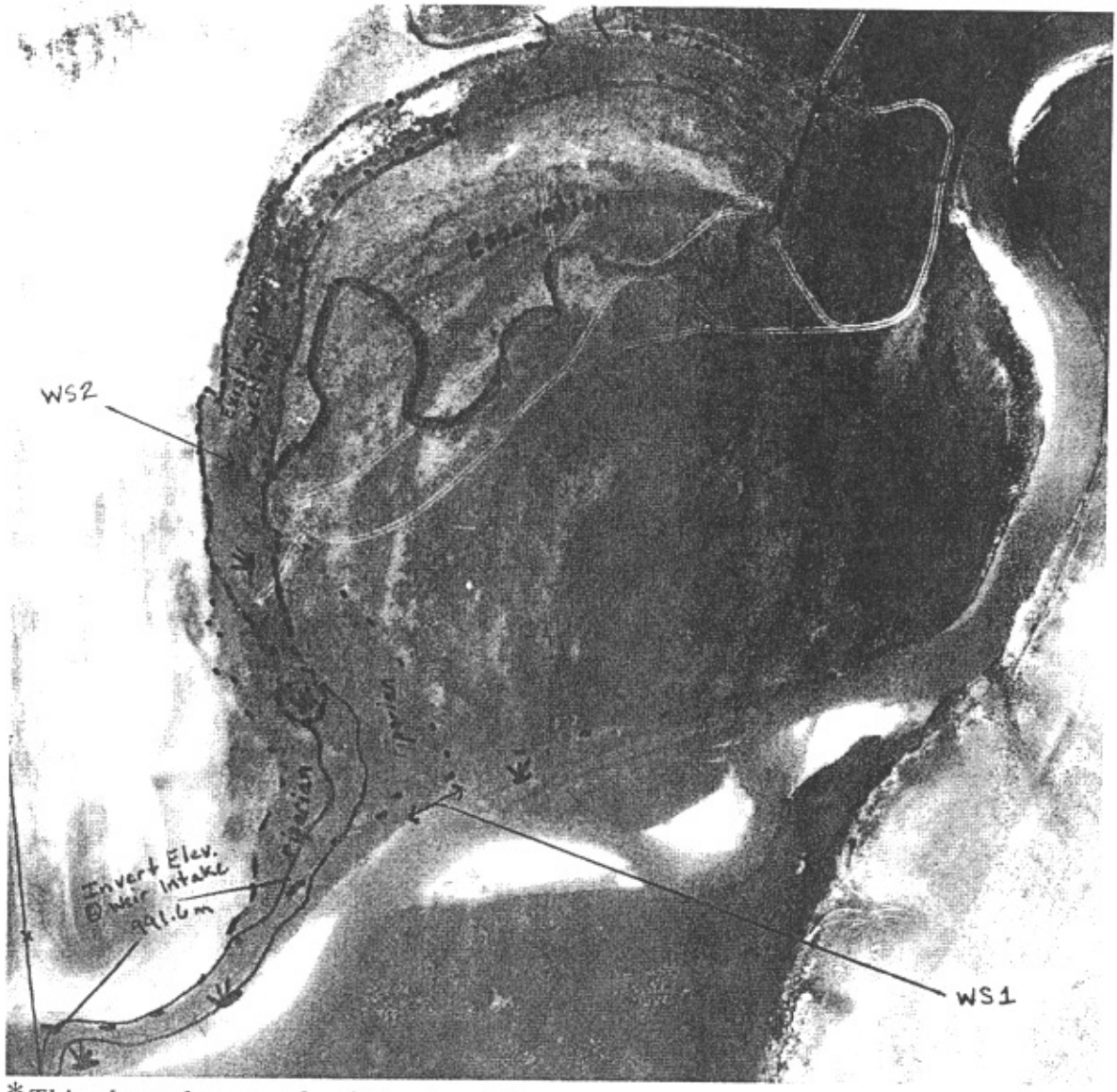
PRELIMINARY

| | | |
|---|---|---|
| DESIGNED | | |
| DRAWN | | |
| CHECKED | | |
| REVISED | | |
| | INITIALS | DATE |




*This photo shows wetland site 3*

It is anticipated that with the construction of the low head dikes, and the placing and grading of the invert and its associated channel along CutBank Creek, the project will directly impact a maximum of approximately 0.2 acres of existing wetlands (category II, III, and IV). Monitoring will be required for a substantial amount of time (minimum 5 years) to determine any changes in functional capacity of existing (pre-construction) wetlands and what the functional capacity of the whole system is post-construction. It is anticipated that the proposed project total wetland size should be approximately 26 – 28 acres, note that these acreages include the existing 3.4 acres of the inner and outer oxbow wetlands prior to project construction.




*This photo shows wetland sites 1 and 2

LAND & WATER D-6

# Montana Wetland Field Evaluation Form (revised 9/23/1997, DRAFT)

**1. Project Name:** Fuccy Ranch **2. Project #:** 0008(232) **& Control #:** 0703

**3. Evaluation Date:** Mo. 7 Day 30 Yr. 98 **4. Evaluator(s):** P. Basting **5. Wetlands/Site #(s)** # 3 (oxbow)

**6. Wetland Location(s): i. Legal:** Twnshp. 34 (N) or S; Range 8 E or (W); Section 27/35 ; ¼ S. ____ ; ¼¼S. ____ ; ¼¼¼S. ____
**ii. Geographic: Latitude:** Degrees ____ ; Min. ____ ; Sec. ____ ; **Longitude:** Degrees ____ Min. ____ ; Sec. ____
**iii. UTM:** ____ **iv. Watershed:** ____ **GPS Reference No.:** ____
**Access Description:** ____

**7. a. Evaluating Agency:** MDT ;
**b. Purpose of Evaluation:**
1. ____ Wetlands potentially affected by MDT project
2. X Mitigation wetlands; pre-construction
3. ____ Mitigation wetlands; post-construction
4. ____ Other

**8. Wetland size:** (total acres) ____ (visually estimated) 1.1 (measured, e.g. by GPS) Field sheet; planimeter

**9. Assessment area:** (AA tot., ac., see instructions on determining AA) 3.0 (visually estimated) ____ (measured, e.g. by GPS)

**10. Classification of AA** (HGM according to Brinson, first column; USFWS according to Cowardin[1979], remaining columns)

| HGM Class | System | Subsyst | Class | Water Regime | Modifier | Dominance Type | % of AA |
|---|---|---|---|---|---|---|---|
| Riverine Lower Perennial | Palustrine | – | EM | Temporarily Flooded | | Emergent - (Heju, Elpa, Rucr) | 100 |
| | | | | | | | |
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| | | | | | | | |
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| | | | | | | | |

(Abbreviations: System: Palustrine(P)/ Subsyst.: none/ Classes: Rock Bottom (RB), Unconsolidated bottom (UB), Aquatic Bed (AB), Unconsolidated Shore (US), Moss-lichen Wetland (ML), Emergent Wetland (EM), Scrub-Shrub Wetland (SS), Forested Wetland (FO)/ System: Lacustrine (L)/, Subsyst.: Limnetic (2)/ Classes: RB, UB, AB/ Subsystem: Littoral (4)/ Classes: RB, UB, AB, US, EM/ System: Riverine (R)/ Subsyst.: Lower Perennial (2)/ Classes: RB, UB, AB, US, EM/ Subsystem: Upper Perennial (3)/ Classes: RB, UB, AB, US/
Water Regimes: Intermittently Exposed (G), Semipermanently Flooded (F), Seasonally Flooded (C), Temporarily Flooded (A), Intermittently Flooded (J)

**11. Estimate relative abundance:** (of similarly classified sites within the same Major Montana Watershed Basin, see definitions)
(Circle one) Unknown Rare Common (Abundant)
**Comments:** (i) [illegible] (ii) [illegible], subject to periodic flood flow (overbank) from Bitterroot Crk and [illegible] [illegible] for surrounding

**12. General condition of AA:** cropland.
**i. Regarding disturbance:** (circle one, see definitions) Undisturbed Encroached Upon (Directly Disturbed)
**Comments:** (types of disturbance, intensity, season, etc.): Cultivation & farming
**ii. Weedy, alien, & introduced species (including those not domesticated, feral):** (list) 0

**13. Habitat Diversity:** (count only the number of different "Cowardin" types occurring at level of water regime [equal NWI classes, #10 above])
**i. Number of NWI classes w/ persistent vegetation:** (circle points) ≥ 3 classes = 5 pts. 2 classes = 3 pts. ≤ 1 class = 1 pt.
**ii. Open water in the AA:** (circle one) present = 2 pts. absent = 1 pt.
*Score is:* (i 1 ) x (ii 1 ) = 1

| Score | 10 | 5-6 | 2-3 | 1 |
|---|---|---|---|---|
| Rating | Exceptional | High | Moderate | Low |
| Functional Points | NA | NA | NA | NA |

**Comments:** ____

**14. Provide brief descriptive summary of AA & surrounding land use and habitat:** Assessment area and surrounding land is primarily agricultural small grain production under crop/fallow rotation, subject to cattle grazing primarily in early spring & fall

## SECTION PERTAINING to FUNCTIONS & VALUES ASSESSMENT

**15A. Habitat for Federally Listed, Proposed, or Candidate Threatened or Endangered Plants or Animals:**

AA is Documented (D) or Suspected (S) to receive (circle one):

Regular use or is designated critical habitat (list species) D S _____

Occasional (infrequent, sporadic) use (list species) D S _____

Incidental (chance, inconsequential) use (list species) D S Grizzly Bear (Spring/Fall)

No use D S _____

| Highest Level Use: | doc./reg. | doc./occ. | sus./reg. | sus./occ. | doc./incid. | sus./incid. | None |
|---|---|---|---|---|---|---|---|
| Rating | High | High | Moderate | Moderate | Low | Low | None |
| Functional Points | 1.0 | 0.8 | 0.7 | 0.6 | 0.2 | 0.1 | 0.0 |

Sources for documented use (e.g. observations, records, etc.) NWP, USFWS, D County

**15B. Habitat for plant or animals rated S1, S2, or S3 by the Montana Natural Heritage Program:** (not including species listed in15A above)

AA is Documented (D) or Suspected (S) to receive (circle one):

Regular use (list species) D S _____

Occasional (infrequent, sporadic) use (list species) D S _____

Incidental (chance, inconsequential) use (list species) D S _____

No use D S _____

| Highest Level Use: | doc./reg. | doc./occ. | sus./reg. | sus./occ. | doc./incid. | sus./incid. | None |
|---|---|---|---|---|---|---|---|
| Rating | High | High | Moderate | Moderate | Low | Low | None |
| Functional Points | 1.0 | 0.8 | 0.7 | 0.6 | 0.2 | 0.1 | 0.0 |

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

**15C. General Wildlife Habitat Rating:** (Circle appropriate response; AA is verified [V] or suspected [S] to receive substantial [S] moderate [M], or negligible to no use [N]; [see definitions for these terms] by the listed wildlife groups (see definitions for aquatic/semi-aquatic & non-aquatic wildlife)

Aquatic/semi-aquatic birds (list examples) V or S S, M, or N [illegible]

Non-aquatic birds (list examples) V or S S, M, or N [illegible]

Aquatic/semi-aquatic mammals (list ex.) V or S S, M, or N [illegible]

Non-aquatic mammals (list ex.) V or S S, M, or N [illegible]

Aquatic/semi aquatic reptiles (list ex.) V or S S, M, or N painted turtle

Non-aquatic reptiles (list ex.) V or S S, M, or N garter snake

Amphibians (list examples) V or S S, M, or N [illegible]

Invertebrates (list examples) V or S S, M, or N [illegible]

**i. Assessed Wildlife Use** (circle points):

≥3 s's or ≥5 m's + s's = 7 pts.

1-2 s's or 2-4 m's = 3 pts.

No s's and < 2 m's = 1 pt.

**ii. Habitat Diversity from # 13** (circle points)

High to exceptional rating = 3 pts.

Moderate rating = 2 pts.

Low rating = 1 pt.

*Score is: (i ___) x (ii ___) = ___*

| Score | 21 | 14 | 9 | 7 | 6 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|---|
| Rating | High | High | High | High | Mod. | Mod. | Low | Low |
| Functional Points | 1.0 | 0.9 | 0.8 | 0.7 | 0.5 | 0.4 | 0.3 | 0.1 |

Comments: _____

**15D. General Fish Habitat Rating:** (If AA does not contain, or is not connected to, a fish-bearing stream or standing water body [e.g. pond or lake], circle NA here and proceed to the next function)

**i. AA is verified (V) or suspected (S) to support listed groups for portions of their life cycle (circle points)**

Native fish V or S = 5 pts.

Introduced game fish V or S = 3 pts.

Introduced non-game fish V or S = 2 pts.

No fish V or S = 1 pt.

**ii. Surface water in AA is (circle points):**

Permanent/perennial = 3 pts.

Seasonal/intermittent = 2 pts.

Temporary/ephemeral = 1 pt.

*Score is: (i ___) x (ii ___) = ___*

| Score | 15 | 10 | 9 | 6 | 5 | 3,4 | 2 | 1 |
|---|---|---|---|---|---|---|---|---|
| Rating | High | High | High | Mod. | Mod. | Mod. | Low | Low |
| Functional Points | 1.0 | 0.9 | 0.8 | 0.7 | 0.6 | 0.5 | 0.2 | 0.1 |

Comments: N/A

**15E. Flood Attenuation and Storage:** (applies only to wetlands subject to flooding via in-channel or overbank flow).; If wetlands in AA are not flooded from in-channel or overbank flow, circle NA here and proceed to next function. (see 15L for Dynamic Surface Water Storage)

i. Estimated acreage of jurisdictional wetland I the AA that is subject to periodic flooding (circle points)
Flooded wetlands ≥ 10 acres = 7 pts.
Flooded wetland <10 ac.,>2ac.= 5 pts.
Flooded wetlands ≤ 2ac. = 1 pt.

ii. Estimated % of flooded wetland classified as forested (fo), scrub-shrub (ss) or both
> 75% fo/ss = 3 pts.
25-75% fo/ss = 2 pts.
<25% fo/ss = 1 pt.

iii. AA contains no outlet or restricted outlet = 1 pt
AA contains unrestricted outlet = 0 pts.

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*Score is: ([i 1] x [ii 1]) +(iii 1) = 2*

| Score | 22 | 16-21 | 14-15 | 11 | 8-10 | 6-7 | 5-4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|---|---|---|
| Rating | High | High | High | High | Mod. | Mod. | Mod. | Low | Low | Low |
| Functional Points | 1.0 | 0.9 | 0.8 | 0.7 | 0.6 | 0.5 | 0.4 | 0.3 | 0.2 | 0.1 |

Comments: Dominated by cattail in landscape. This outlet somewhat restricted by a culvert.

**15F. Sediment/Nutrient/Toxicant Retention and Removal:** (Circle true [T] or false [F] for each of the following statements)

i. T F AA receives direct discharge of managed water (municipal or road stormwater, agricultural drainage, industrial/municipal wastewater) or accumulation of sediment/excess nutrients evident (deposits on vegetation, algal mats or other signs of eutrophication present) or immediate upstream land use potential to deliver significant sediment/nutrient loads to AA.
ii. T F Evidence of flooding or ponding occurs in AA
iii. T F AA contains restricted outlet or no outlet such that flow is slowed or retarded.
iv. T F Percent cover of emergent and/or dense woody vegetation in the AA exceeds 50%

**Rating of Category:** (i) is true and at least two of (ii), (iii), or (iv) are true = High Rating
Rating is neither High nor Low = Moderate Rating
(I) is false and at least two of (ii), (iii), or (iv) are false = Low Rating

| Score | NA | NA | NA |
|---|---|---|---|
| Rating | High | Mod. | Low |
| Functional Points | 1.0 | 0.5 | 0.1 |

Comments:

**15G Sediment/Shoreline Stabilization:** (applies only if AA occurs on or within the banks or a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body which has a maximum depth exceeding 6.6 ft. at low water (e.g. subject to wave action). If does not apply, circle NA here and proceed to next function; in items I-iv below, circle choice)

i. Estimated % cover of rooted vegetated component in AA
>30% rooted vegetation = 3 points
10-30% rooted vegetation = 2 points
<10% rooted vegetation = 1 point

ii. Water body adjacent to rooted vegetation is
Permanent/Perennial = 5 points
Seasonal/ Intermittent = 3 points
Temporary/Ephemeral = 2 points

*Score is: (i____) x (ii____) = _____*

| Score | 15 | 10 | 9 | 6 | 4 | 5 | 3 | 2 |
|---|---|---|---|---|---|---|---|---|
| Rating | High | High | High | Mod. | Mod. | Mod. | Low | Low |
| Functional Points | 1.0 | 0.9 | 0.8 | 0.7 | 0.5 | 0.4 | 0.2 | 0.1 |

Comments: N/A

**15H. Production Export/Food Chain Support:** (Circle appropriate choice in i-iv below)

i. Acreage of vegetated component in AA:
>5 acres = 10 points
1-5 acres = 5 points
<1 acre = 1 point

ii. Habitat Diversity Rating: (from #13)
High-Exceptional = 3 points
Moderate = 2 points
Low = 1 point

iii. Outlet presence:
AA contains an outlet = 3 points
AA contains no outlet = 1 point

iv. Surface water in AA is:
Permanently/Perennial = 3 points
Seasonal/Intermittent = 2 points
Temporary/Ephemeral = 1 point

*Score is: [(i 5) x (ii 1)] + [(iii 3) x (iv 1)] = 8*

| Score | 39 | 21-36 | 16-19 | 10-14 | 8-9 | 7 | 5-6 | 4 | 3 | 2 |
|---|---|---|---|---|---|---|---|---|---|---|
| Rating | High | High | High | Mod. | Mod. | Mod. | Low | Low | Low | Low |
| Functional Points | 1.0 | 0.9 | 0.8 | 0.7 | 0.6 | 0.5 | 0.4 | 0.3 | 0.2 | 0.1 |

Comments:

**15I. Groundwater Discharge/Recharge:** (Check the indicators in i & ii below that apply to the AA)

i. ___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

ii. ___Permeable substrate present without underlying impeding laye.
___Wetland contains inlet but no outlet
___Other

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**Rating for Discharge(D)/Recharge(R) Properties:**
AA is known D/R area or one or more indicators of D/R present = High
No D/R indicators present = Low
Available D/R information inadequate to rate AA D/R potential = Unkn

| Score | NA | NA | NA |
|---|---|---|---|
| Rating | High | Low | Unknown |
| Functional Points | 1.0 | 0.1 | NA |

Comments: _____

**15J. Uniqueness:**

i. Estimated relative abundance of similarly classified sites within the Major Watershed Basin (#11, circle)
Rare = 3 points
Common = 2 points
Abundant = 1 point

ii. Replacement potential/habitat diversity (#12, circle points)
AA is/contains fen, bog, warm springs or mature (>80 yr)forested wetland = 10 points
AA does not contain above cited types but diversity is high-exceptional = 3 points
AA does not contain above types and habitat diversity is low-moderate = 1 point

iii. Condition of AA: (from #12, circle) Undisturbed = 3 pts. Encroached = 2 pts. Directly Disturbed = 1 pt.
*Score is [(i___) x (ii___)] + (iii)* = 2

| Score | 33 | 31-32 | 22-23 | 12-21 | 10-11 | 8-9 | 5,6,7 | 4 | 2-3 | 1 |
|---|---|---|---|---|---|---|---|---|---|---|
| Rating | High | High | High | High | Mod. | Mod. | Mod. | Low | Low | Low |
| Functional Points | 1.0 | .9 | .8 | .7 | .6 | .5 | .4 | .3 | .2 | .1 |

Comments: _____

**15K. Recreation/Education Potential:** i. Is the AA a known rec./ed. site: (circle) Y N (If yes, rate as High and go to ii; if no go to 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 strong potential for rec./ed. use? Y N
(If yes, go to ii, then proceed to iv; if no, then rate as Low [0.1])
iv. Condition of AA: (from #12, circle points) Undisturbed = 3 pts; Encroached upon = 2 pts.; Directly Disturbed = 1 pt.
v. Ownership of AA: (circle points) Public = 2 points; Private = 1 point
*Score is: (iv___) x (v___)* = _____

| Score | 6 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|
| Rating | High | Mod. | Mod. | Low | Low |
| Functional Points | 1.0 | 0.7 | 0.5 | 0.3 | 0.1 |

Comments: _____

**15L. Dynamic Surface Water Storage:** (Applies to wetlands that do not flood from overbank or in-channel flow, but flood via precipitation, upland surface flow, or groundwater flow. If no jurisdictional wetlands in the AA are subject to flooding, circle NA here and proceed with the evaluation.)

i. Estimated acreage of jurisdictional wetland in the AA subject to periodic flooding (circle points)
Flooded wetlands ≥ 5 acres = 3 points
5 acres > flooded wetland > 1 acre = 2 points
Flooded wetlands < 1 acre = 1 point

ii. Estimated flood frequency (circle points)
Wetland floods ≥ 5/10 years = 2 points
Wetland floods < 5/10 years = 1 point

*Score is (i 2) x (ii 2)* = 4

| Score | 6 | 4 | 2,3 | 1 | 0.5 |
|---|---|---|---|---|---|
| Rating | High | High | Mod. | Low | Low |
| Functional Points | 1.0 | 0.8 | 0.5 | 0.3 | 0.1 |

Comments: Some flooding may be a result of upland surface runoff during snowmelt or early spring rains.

## FUNCTION & VALUE SUMMARY & OVERALL RATING

| Function & Value Variables | Rating | Actual Functional Points | Possible Functional Points | Functional Units; (Actual Points x Estimated AA Acreage) |
|---|---|---|---|---|
| A. Listed/Proposed/Candidate T&E Species Habitat | Low | 0.1 | 1 | |
| B. MT Natural Heritage Program Species Habitat | None | 0.0 | 1 | |
| C. General Wildlife Habitat | Low | 0.1 | 1 | |
| D. General Fish/Aquatic Habitat | N/A | — | — | |
| E. Flood Attenuation and Storage | Low | 0.2 | 1 | |
| F. Sediment/Nutrient/Toxicant Removal | Med. | 1.5 | 1 | |
| G. Sediment/Shoreline Stabilization | N/A | — | — | |
| H. Production Export/Food Chain Support | mod. | 0.6 | 1 | |
| I. Groundwater Discharge/Recharge | Low | 0.1 | 1 | |
| J. Uniqueness | Low | 0.2 | 1 | |
| K. Recreation/Education Potential | Low | 0.1 | 1 | |
| L. Dynamic Surface Water Storage | High | 0.8 | 1 | |
| Totals: | | 2.7 | 10 | |

**OVERALL ANALYSIS AREA (AA) RATING:** (Circle appropriate category based on the criteria outlined below) I II III (IV)

**Category I Wetland:** (Must satisfy one of the following criteria; if does not meet criteria, go to Category II)
- ___ Score of 0.9 or 1 functional point for Listed/Proposed/Candidate Threatened or Endangered Species; or
- ___ Score of 0.9 or 1 functional point for Uniqueness or "High" rating for Uniqueness and Condition (#12) is "Undisturbed" ; or
- ___ Score of 1 functional point for Flood Attenuation and Storage and answer to Question 14.E.3 is "yes"; or
- ___ Total actual functional points > 80% (round to nearest whole #) of total possible functional points.

**Category II Wetland:** (Criteria for Category I not satisfied but meets any one of the following criteria; if not satisfied, go to Cat. IV)
- ___ Score of 1 functional point for Species Rated S1, S2, or S3 by the MT Natural Heritage Program; or
- ___ Score of 1 functional point for General Wildlife Habitat; or
- ___ "High" ratings for both General Wildlife Habitat and General Fish/Aquatic Habitat; or
- ___ "High" rating for Uniqueness or
- ___ Total Actual Functional Points > 65% (round to nearest whole #) of total possible functional points.

**Category III Wetland:** (Criteria for Categories I, II or IV not satisfied; if doe not meet criteria go to Category IV)

**Category IV Wetland:** (Criteria for Categories I or II are not satisfied and any one of the following criteria; if does not satisfy criteria go to Category III)
- X "Low" rating for Uniqueness; and (should this be "or"?)
- ___ "Low" rating for Production Export/Food Chain Support; and
- X Total actual functional points < 30% (round to nearest whole #) of total possible functional points

# Montana Wetland Field Evaluation Form (revised 9/23/1997, DRAFT)

1. Project Name: Fury Ranch 2. Project #: 2002(232) & Control #: 0703

3. Evaluation Date: Mo. 7 Day 30 Yr. 98 4. Evaluator(s): Eastbog, Hill, Wambach, Sickelson 5. Wetlands/Site #(s) 2 (Inner Oxbow)

6. Wetland Location(s): i. Legal: Twnshp. 34 (N) or S; Range 8 E or (W); Section 27/35 : ¼ S. ____ ; ¼¼S. ____ ; ¼¼¼S. ____
ii. Geographic: Latitude: Degrees ____ ; Min. ____ ; Sec. ____ ; Longitude: Degrees ____ Min. ____ ; Sec. ____
iii. UTM: ____ iv. Watershed: ____ GPS Reference No.: ____
Access Description: ____

7. a. Evaluating Agency: MDT ;
b. Purpose of Evaluation:
1. ____ Wetlands potentially affected by MDT project
2. X Mitigation wetlands; pre-construction
3. ____ Mitigation wetlands; post-construction
4. ____ Other

8. Wetland size: (total acres) ____ . ____ (visually estimated)
2 . 3 (measured, e.g. by GPS) planimetered & field verified

9. Assessment area: (AA,tot., ac., see instructions on determining AA) ____ . ____ (visually estimated)
2 . 3 (measured, e.g. by GPS) same as above

10. Classification of AA (HGM according to Brinson, first column; USFWS according to Cowardin[1979], remaining columns)

| HGM Class | System | Subsyst | Class | Water Regime | Modifier | Dominance Type | % of AA |
|---|---|---|---|---|---|---|---|
| Riverine Lower Perennial | Palustrine | – | Emergent | Seasonally Flooded | | Emergent (Elpa, Elte, Poly.) | 100% |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

(Abbreviations: System: Palustrine(P)/ Subsyst.: none/ Classes: Rock Bottom (RB), Unconsolidated bottom (UB), Aquatic Bed (AB), Unconsolidated Shore (US), Moss-lichen Wetland (ML), Emergent Wetland (EM), Scrub-Shrub Wetland (SS), Forested Wetland (FO)/ System: Lacustrine (L)/ Subsyst.: Limnetic (2)/ Classes: RB, UB, AB/ Subsystem: Littoral (4)/ Classes: RB, UB, AB, US, EM/ System: Riverine (R)/ Subsyst.: Lower Perennial (2)/ Classes: RB, UB, AB, US, EM/ Subsystem: Upper Perennial (3)/ Classes: RB, UB, AB, US/ Water Regimes: Intermittently Exposed (G), Semipermanently Flooded (F), Seasonally Flooded (C), Temporarily Flooded (A), Intermittently Flooded (J)

11. Estimate relative abundance: (of similarly classified sites within the same Major Montana Watershed Basin, see definitions)
(Circle one) Unknown Rare (Common) Abundant
Comments: Old oxbow wetland, ground water driven system w/ fairly frequent flooding 5/10 yrs. from overbank flows of Butte Crk.

12. General condition of AA:
i. Regarding disturbance: (circle one, see definitions) Undisturbed (Encroached Upon) Directly Disturbed
Comments: (types of disturbance, intensity, season, etc.): Spring/Fall Cattle Grazing
ii. Weedy, alien, & introduced species (including those not domesticated, feral): (list) adjacent uplands do have leafy Spurge (Eves) & Canada Thistle (Ciar)

13. Habitat Diversity: (count only the number of different "Cowardin" types occurring at level of water regime [equal NWI classes, #10 above])
i. Number of NWI classes w/ persistent vegetation: (circle points) ≥3 classes = 5 pts. 2 classes = 3 pts. ≤ 1 class = 1 pt.
ii. Open water in the AA: (circle one) present = 2 pts. (absent = 1 pt.)
Score is: (i 1 ) x (ii 1 ) = 1

| Score | 10 | 5-6 | 2-3 | 1 |
|---|---|---|---|---|
| Rating | Exceptional | High | Moderate | Low |
| Functional Points | NA | NA | NA | NA |

Comments: Wetland confined w/in old channel - emergent vegetation only

14. Provide brief descriptive summary of AA & surrounding land use and habitat: Adjacent landuse is spring/fall pasture for grazing and there is a lot/small grain production in the general area. Channelled wetland dominated by Polygonum, Eleocharis, Triglochin etc.

## SECTION PERTAINING to FUNCTIONS & VALUES ASSESSMENT

**15A. Habitat for Federally Listed, Proposed, or Candidate Threatened or Endangered Plants or Animals:**

AA is Documented (D) or Suspected (S) to receive (circle one):

Regular use or is designated critical habitat (list species) D S _____

Occasional (infrequent, sporadic) use (list species) D S _____

Incidental (chance, inconsequential) use (list species) D (S) migratory – bald eagle (Spring/Fall)

No use D S

| Highest Level Use: | doc./reg. | doc./occ. | sus./reg. | sus./occ. | doc./incid. | sus./incid. | None |
|---|---|---|---|---|---|---|---|
| Rating | High | High | Moderate | Moderate | Low | Low | None |
| Functional Points | 1.0 | 0.8 | 0.7 | 0.6 | 0.2 | 0.1 | 0.0 |

Sources for documented use (e.g. observations, records, etc.) MNHP, USFWS, Ravalli County Biological Inventory

**15B. Habitat for plant or animals rated S1, S2, or S3 by the Montana Natural Heritage Program:** (not including species listed in 15A above)

AA is Documented (D) or Suspected (S) to receive (circle one):

Regular use (list species) D S _____

Occasional (infrequent, sporadic) use (list species) D S _____

Incidental (chance, inconsequential) use (list species) D S _____

No use D (S) – MNHP – NO SENSITIVE SPP. OCCURRENCE IN PROJ. AREA

| Highest Level Use: | doc./reg. | doc./occ. | sus./reg. | sus./occ. | doc./incid. | sus./incid. | None |
|---|---|---|---|---|---|---|---|
| Rating | High | High | Moderate | Moderate | Low | Low | None |
| Functional Points | 1.0 | 0.8 | 0.7 | 0.6 | 0.2 | 0.1 | 0.0 |

Sources for documented use (e.g. observations, records, etc.) MNHP, [illegible]

**15C. General Wildlife Habitat Rating:** (Circle appropriate response: AA is verified [V] or suspected [S] to receive substantial [S] moderate [M], or negligible to no use [N]; [see definitions for these terms] by the listed wildlife groups (see definitions for aquatic/semi-aquatic & non-aquatic wildlife)

| | | | |
|---|---|---|---|
| Aquatic/semi-aquatic birds (list examples) | (V) or S | S, (M), or N | Canada Goose, Mallard duck, Mallard, Kingfisher, Teal |
| Non-aquatic birds (list examples) | (V) or S | S, M, or (N) | Red-winged blackbird, robin, swallow |
| Aquatic/semi-aquatic mammals (list ex.) | V or S | S, M, or (N) | Muskrat, mink |
| Non-aquatic mammals (list ex.) | (V) or S | S, (M), or N | [illegible], Fox, Coyote |
| Aquatic/semi aquatic reptiles (list ex.) | V or S | S, M, or (N) | painted turtle |
| Non-aquatic reptiles (list ex.) | V or (S) | S, M, or N | garter snake |
| Amphibians (list examples) | (V) or S | S, (M) or N | N. leopard frog |
| Invertebrates (list examples) | (V) or S | (S), M, or N | dragonflies, damselflies, butterflies, mosquitoes, [illegible] |

**i. Assessed Wildlife Use** (circle points):

≥3 s's or ≥5 m's + s's = 7 pts.

1-2 s's or 2-4 m's = 3 pts.

No s's and < 2 m's = 1 pt.

**ii. Habitat Diversity from # 13** (circle points)

High to exceptional rating = 3 pts.

Moderate rating = 2 pts.

Low rating = (1 pt.)

*Score is:* (i 3) x (ii 1) = 3

| Score | 21 | 14 | 9 | 7 | 6 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|---|
| Rating | High | High | High | High | Mod. | Mod. | Low | Low |
| Functional Points | 1.0 | 0.9 | 0.8 | 0.7 | 0.5 | 0.4 | 0.3 | 0.1 |

Comments: 90% of the wildlife we have observed while in the field at this site (many times) have been directly associated w/ Bark Cr. We have seen relatively little, if any, use of the riparian.

**15D. General Fish Habitat Rating:** (If AA does not contain, or is not connected to, a fish-bearing stream or standing water body [e.g. pond or lake], circle NA here and proceed to the next function)

**i. AA is verified (V) or suspected (S) to support listed groups for portions of their life cycle** (circle points)

Native fish V or S = 5 pts.

Introduced game fish V or S = 3 pts.

Introduced non-game fish V or S = 2 pts.

No fish V or S = 1 pt.

**ii. Surface water in AA is** (circle points):

Permanent/perennial = 3 pts.

Seasonal/intermittent = 2 pts.

Temporary/ephemeral = 1 pt.

*Score is:* (i ___) x (ii ___) = N/A

| Score | 15 | 10 | 9 | 6 | 5 | 3,4 | 2 | 1 |
|---|---|---|---|---|---|---|---|---|
| Rating | High | High | High | Mod. | Mod. | Mod. | Low | Low |
| Functional Points | 1.0 | 0.9 | 0.8 | 0.7 | 0.6 | 0.5 | 0.2 | 0.1 |

Comments: N/A – although site accepts overbank flow in spring flood situations it is not artificially connected to East Bark Cr., this wetland is primarily a spring water driven system.

**15E. Flood Attenuation and Storage:** (applies only to wetlands subject to flooding via in-channel or overbank flow).: If wetlands in A are not flooded from in-channel or overbank flow, circle NA here and proceed to next function. (see 15L for Dynamic Surface Water Stor.

I. Estimated acreage of jurisdictional wetland I the AA that is subject to periodic flooding (circle points)
Flooded wetlands ≥ 10 acres = 7 pts.
Flooded wetland <10 ac.,>2ac. = 5 pts.
Flooded wetlands ≤ 2ac. = 1 pt.

II. Estimated % of flooded wetland classified as forested (fo), scrub-shrub (ss) or both
> 75% fo/ss = 3 pts.
25-75% fo/ss = 2 pts.
<25% fo/ss = 1 pt.

III. AA contains no outlet or restricted outlet = 1
AA contains unrestricted outlet = 0 pt

*Score is: ([i 5] x [ii 1]) +(iii 1) = 6*

| Score | 22 | 16-21 | 14-15 | 11 | 8-10 | 6-7 | 5-4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|---|---|---|
| Rating | High | High | High | High | Mod. | Mod. | Mod. | Low | Low | Low |
| Functional Points | 1.0 | 0.9 | 0.8 | 0.7 | 0.6 | 0.5 | 0.4 | 0.3 | 0.2 | 0.1 |

Comments:

**15F. Sediment/Nutrient/Toxicant Retention and Removal:** (Circle true [T] or false [F] for each of the following statements)

i. T F AA receives direct discharge of managed water (municipal or road stormwater, agricultural drainage, industrial/municipal wastewater) or accumulation of sediment/excess nutrients evident (deposits on vegetation, algal ma or other signs of eutrophication present) or immediate upstream land use potential to deliver significant sediment/nutrien loads to AA.
ii. T F Evidence of flooding or ponding occurs in AA
iii. T F AA contains restricted outlet or no outlet such that flow is slowed or retarded.
iv. T F Percent cover of emergent and/or dense woody vegetation in the AA exceeds 50%

Rating of Category: (i) is true and at least two of (ii), (iii), or (iv) are true = High Rating
Rating is neither High nor Low = Moderate Rating
(i) is false and at least two of (ii), (iii), or (iv) are false = Low Rating

| Score | NA | NA | NA |
|---|---|---|---|
| Rating | High | Mod. | Low |
| Functional Points | 1.0 | 0.5 | 0.1 |

Comments:

**15G Sediment/Shoreline Stabilization:** (applies only if AA occurs on or within the banks or a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body which has a maximum depth exceeding 6.6 ft. at low water (e.g. subject to wave action). If does not apply, circle NA here and proceed to next function; in items I-iv below, circle choice)

i. Estimated % cover of rooted vegetated component in AA
>30% rooted vegetation = 3 points
10-30% rooted vegetation = 2 points
<10% rooted vegetation = 1 point

ii. Water body adjacent to rooted vegetation is
Permanent/Perennial = 5 points
Seasonal/ Intermittent = 3 points
Temporary/Ephemeral = 2 points

*Score is: (i____) x (ii____) = _____*

| Score | 15 | 10 | 9 | 6 | 4 | 5 | 3 | 2 |
|---|---|---|---|---|---|---|---|---|
| Rating | High | High | High | Mod. | Mod. | Mod. | Low | Low |
| Functional Points | 1.0 | 0.9 | 0.8 | 0.7 | 0.5 | 0.4 | 0.2 | 0.1 |

Comments: N/A

**15H. Production Export/Food Chain Support:** (Circle appropriate choice in i-iv below)

i. Acreage of vegetated component in AA:
>5 acres = 10 points
1-5 acres = 5 points
<1 acre = 1 point

ii. Habitat Diversity Rating: (from #13)
High-Exceptional = 3 points
Moderate = 2 points
Low = 1 point

iii. Outlet presence:
AA contains an outlet = 3 points
AA contains no outlet = 1 point

iv. Surface water in AA is:
Permanently/Perennial = 3 points
Seasonal/Intermittent = 2 points
Temporary/Ephemeral = 1 point

*Score is: [(i 5) x (ii 1)] + [(iii 3) x (iv 2)] = 11*

| Score | 39 | 21-36 | 16-19 | 10-14 | 8-9 | 7 | 5-6 | 4 | 3 | 2 |
|---|---|---|---|---|---|---|---|---|---|---|
| Rating | High | High | High | Mod. | Mod. | Mod. | Low | Low | Low | Low |
| Functional Points | 1.0 | 0.9 | 0.8 | 0.7 | 0.6 | 0.5 | 0.4 | 0.3 | 0.2 | 0.1 |

Comments:

**15I. Groundwater Discharge/Recharge:** (Check the indicators in i & ii below that apply to the AA)

i. __Springs are known or observed
___Vegetation growing during dormant season/drought
_x_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

ii. _X_Permeable substrate present without underlying impeding
___Wetland contains inlet but no outlet
___Other

**Rating for Discharge(D)/Recharge(R) Properties:**
AA is known D/R area or one or more indicators of D/R present = High
No D/R indicators present = Low
Available D/R information inadequate to rate AA D/R potential = Unkn

| Score | NA | NA | NA |
|---|---|---|---|
| Rating | High | Low | Unknown |
| Functional Points | 1.0 | 0.1 | NA |

**Comments:** _____

**15J. Uniqueness:**

i. Estimated relative abundance of similarly classified sites within the Major Watershed Basin (#11, circle)
Rare = 3 points
Common = 2 points
Abundant = 1 point

ii. Replacement potential/habitat diversity (#12, circle points)
AA is/contains fen, bog, warm springs or mature (>30 yr)forested wetland = 10 points
AA does not contain above cited types but diversity is high-exceptional = 3 points
AA does not contain above types and habitat diversity is low-moderate = 1 point

iii. Condition of AA: (from #12, circle) Undisturbed = 3 pts. Encroached = 2 pts. Directly Disturbed = 1 pt.
*Score is [(i 2) x (ii 1)] + (iii) =* 4

| Score | 33 | 31-32 | 22-23 | 12-21 | 10-11 | 8-9 | 5.6.7 | 4 | 2-3 | 1 |
|---|---|---|---|---|---|---|---|---|---|---|
| Rating | High | High | High | High | Mod. | Mod. | Mod. | Low | Low | Low |
| Functional Points | 1.0 | .9 | .8 | .7 | .6 | .5 | .4 | .3 | .2 | .1 |

**Comments:** _____

**15K. Recreation/Education Potential:** i. Is the AA a known rec./ed. site: (circle) Y N (If yes, rate as High and go to ii; if no go to 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 strong potential for rec./ed. use? Y N
(If yes, go to ii, then proceed to iv; if no, then rate as Low [0.1])
iv. Condition of AA: (from #12, circle points) Undisturbed = 3 pts; Encroached upon = 2 pts.; Directly Disturbed = 1 pt.
v. Ownership of AA: (circle points) Public = 2 points; Private = 1 point
*Score is: (iv____) x (v____) =* ____

| Score | 6 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|
| Rating | High | Mod. | Mod. | Low | Low |
| Functional Points | 1.0 | 0.7 | 0.5 | 0.3 | 0.1 |

**Comments:** _____

**15L. Dynamic Surface Water Storage:** (Applies to wetlands that do not flood from overbank or in-channel flow, but flood via precipitation, upland surface flow, or groundwater flow. If no jurisdictional wetlands in the AA are subject to flooding, circle NA here and proceed with the evaluation.)

i. Estimated acreage of jurisdictional wetland in the AA subject to periodic flooding (circle points)
Flooded wetlands ≥ 5 acres = 3 points
<5 acres > flooded wetland > 1 acre = 2 points
Flooded wetlands < 1 acre = 1 point

ii. Estimated flood frequency (circle points)
Wetland floods ≥ 5/10 years = 2 points
Wetland floods < 5/10 years = 1 point

*Score is (i 2) x (ii 2) =* 4

| Score | 6 | 4 | 2,3 | 1 | 0.5 |
|---|---|---|---|---|---|
| Rating | High | High | Mod. | Low | Low |
| Functional Points | 1.0 | 0.8 | 0.5 | 0.3 | 0.1 |

**Comments:** I have been to this site several times when overbank flooding has not occurred yet observed standing water from general water flooding.

## FUNCTION & VALUE SUMMARY & OVERALL RATING

| Function & Value Variables | Rating | Actual Functional Points | Possible Functional Points | Functional Units; (Actual Points x Estimated AA Acreage) |
|---|---|---|---|---|
| A. Listed/Proposed/Candidate T&E Species Habitat | LOW | 0.1 | 1 | |
| B. MT Natural Heritage Program Species Habitat | NONE | 0.1 | 1 | |
| C. General Wildlife Habitat | MOD. | 0.4 | 1 | |
| D. General Fish/Aquatic Habitat | N/A | — | — | |
| E. Flood Attenuation and Storage | MOD. | 0.5 | 1 | |
| F. Sediment/Nutrient/Toxicant Removal | MOD | 0.5 | 1 | |
| G. Sediment/Shoreline Stabilization | N/A | — | — | |
| H. Production Export/Food Chain Support | MOD | 0.7 | 1 | |
| I. Groundwater Discharge/Recharge | HIGH | 1.0 | 1 | |
| J. Uniqueness | LOW | 0.3 | 1 | |
| K. Recreation/Education Potential | LOW | 0.1 | 1 | |
| L. Dynamic Surface Water Storage | HIGH | 0.8 | 1 | |
| Totals: | | 4.4 | 10 | |

**OVERALL ANALYSIS AREA (AA) RATING:** (Circle appropriate category based on the criteria outlined below) I II (III) IV

**Category I Wetland:** (Must satisfy one of the following criteria; if does not meet criteria, go to Category II)
- ___ Score of 0.9 or 1 functional point for Listed/Proposed/Candidate Threatened or Endangered Species; or
- ___ Score of 0.9 or 1 functional point for Uniqueness or "High" rating for Uniqueness and Condition (#12) is "Undisturbed" ; or
- ___ Score of 1 functional point for Flood Attenuation and Storage and answer to Question 14.E.3 is "yes"; or
- ___ Total actual functional points > 80% (round to nearest whole #) of total possible functional points.

**Category II Wetland:** (Criteria for Category I not satisfied but meets any one of the following criteria; if not satisfied, go to Cat. IV)
- ___ Score of 1 functional point for Species Rated S1, S2, or S3 by the MT Natural Heritage Program; or
- ___ Score of 1 functional point for General Wildlife Habitat; or
- ___ "High" ratings for both General Wildlife Habitat and General Fish/Aquatic Habitat; or
- ___ "High" rating for Uniqueness or
- ___ Total Actual Functional Points > 65% (round to nearest whole #) of total possible functional points.

**Category III Wetland:** (Criteria for Categories I, II or IV not satisfied; if doe not meet criteria go to Category IV)

**Category IV Wetland:** (Criteria for Categories I or II are not satisfied and any one of the following criteria; if does not satisfy criteria go to Category III)
- ___ "Low" rating for Uniqueness; and (should this be "or" ?)
- ___ "Low" rating for Production Export/Food Chain Support; and
- ___ Total actual functional points < 30% (round to nearest whole #) of total possible functional points

# Appendix E

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## BIRD SURVEY PROTOCOL
## MACROINVERTEBRATE SAMPLING PROTOCOL
## GPS PROTOCOL

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

LAND & WATER

# 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.

# AQUATIC INVERTEBRATE SAMPLING PROTOCOL

## Equipment List

- D-frame sampling net with 1 mm mesh. Wildco is a good source of these.
- Spare net.
- 1-liter plastic sample jars, wide-mouth. VWR has these: catalog #36319-707.
- 95% ethanol: Northwest Scientific in Billings carries this.

All these other things are generally available at hardware or sporting goods stores. Make the labels on an ink jet printer preferably.

- hip waders.
- pre-printed sample labels (printed on Rite-in-the-Rain or other coated paper, two labels per sample).
- pencil.
- plastic pail (3 or 5 gallon).
- large tea strainer or framed screen.
- towel.
- tape for affixing label to jar.
- cooler with ice for sample storage.

## Site Selection

Select the sampling site with these considerations in mind:

- Select a site accessible with hip waders. If substrates are too soft, lay a wide board down to walk on.
- Determine a location that is representative of the overall condition of the wetland.

## Sampling

Wetland invertebrates inhabit the substrate, the water column, the stems and leaves of aquatic vegetation, and the water surface. Your goal is to sweep the collecting net through each of these habitat types, and then to combine the resulting samples into the 1-liter sample jar.

Dip out about a gallon of water into the pail. Pour about a cup of ethanol into the sample jar. Fill out the top half of the sample labels, using pencil, since ink will dissolve in the ethanol.

Ideally, you can sample a swath of water column from near-shore outward to a depth of approximately 3 feet with a long sweep of the net, keeping the net at about half the depth of the water throughout the sweep. Sweep the water surface as well. Pull the net through a vegetated area, beneath the water surface, for at least a meter of distance.

Sample the substrate by pulling the net along the bottom, bumping it against the substrate several times as you pull.

This step is optional, but it gives you a chance to see that you've collected some invertebrates. Rinse the net out into the bucket, and look for insects, crustaceans, etc. If necessary, repeat the sampling process in a nearby location, and add the net contents to the bucket. Remember to sample all four environments.

Sieve the contents of the bucket through the straining device and pour or carefully scrape the contents of the strainer into the sample jar.

If you skip the bucket-and-sieve steps, simply lift handfuls of material out of the sampling net into the jars. In either case, please include some muck or mud and some vegetation in the jar. Often, you will have collected a large amount of vegetable material. If this is the case, lift out handfuls of material from the sieve into the jar, until the jar is about half full. Please limit material you include in the sample, so that there is only a single jar for each sample.

Top off the sample jar with enough ethanol to cover all the material in the jar. Leave as little headroom as possible.

It is not necessary to sample habitats in any specified order. Keep in mind that disturbing the habitats prior to sampling will chase off the animals you are trying to capture.

Complete the sample labels. Place one label inside the sample jar and tape the other label securely to the outside of the jar. Dry the jar before attaching the outer label if necessary. In some situations, it may be necessary to collect more than one sample at a site. If you take multiple samples from the same site, clearly indicate this by using individual sample numbers, along with the total number of samples collected at the site (e.g. Sample #3 of 5 total samples).

Photograph the sampled site.

**Sample Handling/Shipping**

- In the field, keep collected samples cool by storing them in a cooler. Only a small amount of ice is necessary.
- Inventory all samples, preparing a list of all sites and enumerating all samples, before shipping or delivering to the laboratory.
- Deliver samples to Rhithron.

## 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.