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# **MONTANA DEPARTMENT OF TRANSPORTATION WETLAND MITIGATION MONITORING REPORT: YEAR 2002**

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## *Roundup Wetland Roundup, Montana*



Prepared for:

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

February 2003

Project No: 130091.031

Compiled and Edited by:

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



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## 1.0 INTRODUCTION

This annual report summarizes methods and results of the second year of monitoring at the Montana Department of Transportation's (MDT) Roundup mitigation site. The Roundup wetland site was created to provide wetland mitigation credits for MDT's reconstruction of U.S. Highway 12 in Watershed #10 located in District 5, Billings District. The site is located in Musselshell County, Montana, Section 18, Township 8 North, Range 26 East, immediately south of U.S. Highway 12 and approximately one mile east of the town of Roundup (**Figure 1**). Elevations range from approximately 3,169 to 3,175 feet above sea level.

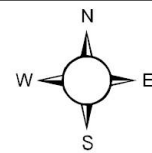
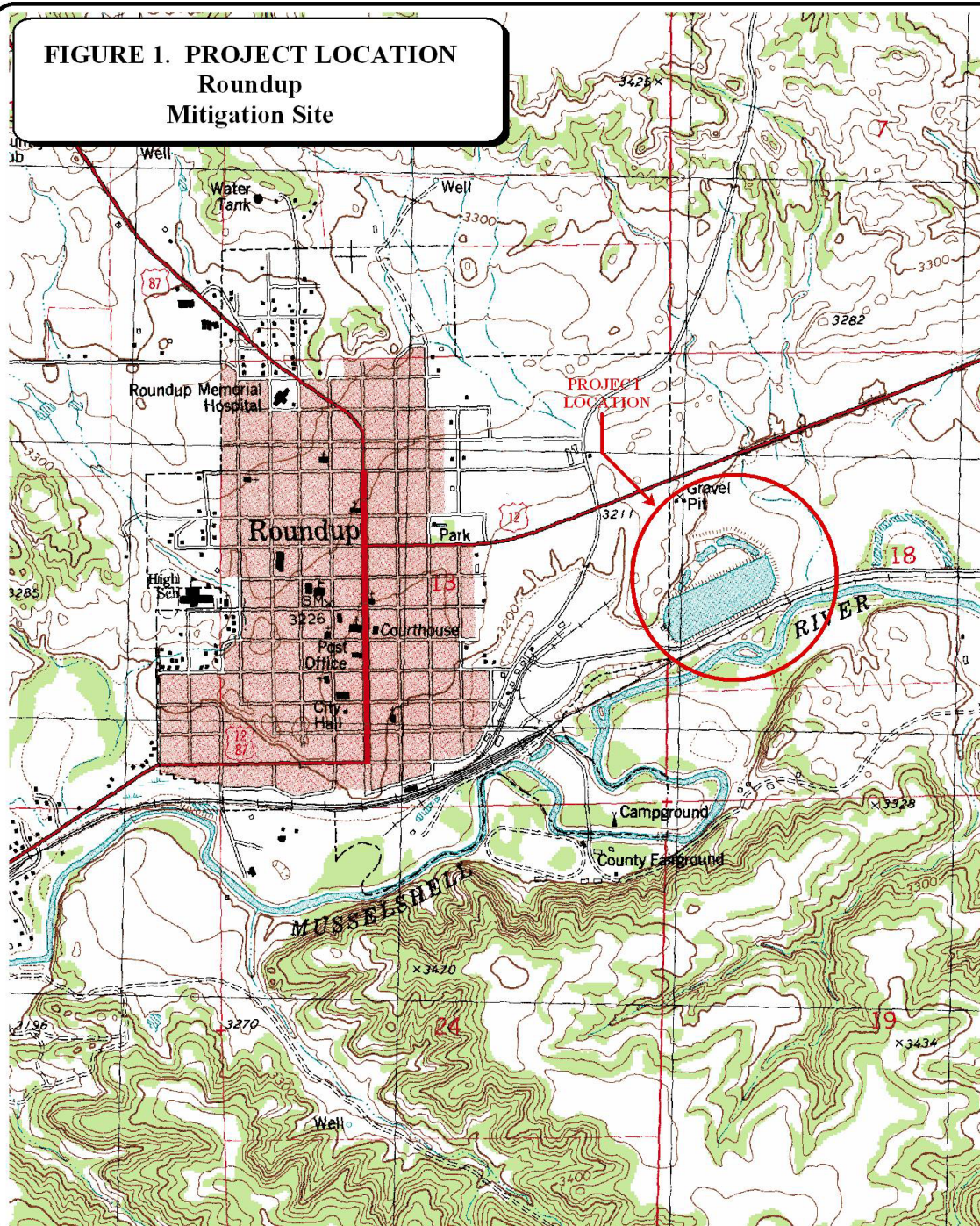
The mitigation site is located at the site of the former wastewater lagoons for the city of Roundup (**Figure 2, Appendix A**). This former two-celled treatment facility, covering approximately 26 acres, contained sludge of varying depths with concentrations of nitrates, and possibly heavy metals of which portions were capped during construction modification. Five monitoring wells were installed around the lagoon to monitor any possible groundwater contamination from the sludge. After a review of groundwater quality sampling data, both the DEQ and EPA agreed that there was not a groundwater contamination problem associated with the lagoons (MDT). The organic "sludge" was left in the west end of the southern end of the wetland bed and capped with one foot of soil during construction to prevent potential biohazards risks. The dike between cells was breached as shown in **Figures 2 and 3 (Appendix A)** to allow water to access both cells.

Construction was completed on this site in April of 2000 with a goal of creating at least 24 acres of wetlands with a diverse vegetative community. The site was designed to develop a hemi-marsh emergent wetland system with standing water depths no greater than three feet. Water depths vary within the wetland due to the natural topography behind the dike. Water was designed to enter the wetland mitigation system through two methods and locations (**MDT Monitoring Plan and Detail: Final Plan, Appendix D**).

One source of hydrology is through a channel, which funnels storm water runoff from the northeastern section of the city of Roundup and U.S. Highway 12 into the southwestern end of the wetland. The estimated runoff volume for this system is 12,700 m<sup>3</sup>, and 17,825 m<sup>3</sup> of water for the 5- and 25-year event, respectively (MDT 2000). Treated wastewater from the new Roundup sewage treatment facility is also discharged into the wetland to maintain the design water level elevation. There is no physical "outlet" designed for the system; water leaves only through evaporation and evapotranspiration. The site has only been filling with the wastewater and stormwater since July of 2001.

The Roundup lagoons are visited three times during the year: a spring and fall bird survey and during mid-summer to collect the monitoring data. The Roundup wetland will be monitored for at least one more year to assess whether or not the COE's and other agencies' Section 404 requirements have been fulfilled.

**FIGURE 1. PROJECT LOCATION**  
**Roundup**  
**Mitigation Site**



800 0 800 1600 FEET  
 1: 24,000

PROJECT #: 130091.031  
 DATE: APRIL 2001  
 LOCATION:  
 PROJECT MANAGER: B. DUTTON  
 DRAWN BY: B. NOECKER

**LAND & WATER** CONSULTING, INC.

1120 CEDAR PO BOX 8254 MISSOULA, MT 59807



## 2.0 METHODS

### 2.1 Monitoring Dates and Activities

The Roundup wetland mitigation site was monitored on three dates in 2002: May 10 (bird observation), July 17 (monitoring event), and October 7 (bird observation). All information contained within the Wetland Mitigation Site Monitoring Form (**Appendix B**) was collected during the monitoring event. Activities and information conducted/collected included: wetland delineation; wetland/open water boundary mapping; vegetation community mapping; vegetation transects; soils data; hydrology data; bird and general wildlife use; photograph points; functional assessment; and maintenance need assessment of any bird nesting structures and inflow and outflow structures.

### 2.2 Hydrology

Wetland hydrology indicators were recorded using procedures outlined in the COE 1987 Wetland Delineation Manual. Hydrology data were recorded on the Routine Wetland Delineation Data Form (**Appendix B**) at each wetland determination point.

All additional hydrologic data were recorded on the mitigation site monitoring form (**Appendix B**). The boundary between emergent vegetation and open water was mapped on the aerial photograph (**Figure 3, Appendix A**). Groundwater is monitored at one well that is located inside of the monitoring limits (**Detail: Final Plan, Appendix D**). Precipitation data for 2002 were compared to the 1914-2001 average (WRCC 2002).

### 2.3 Vegetation

General vegetation types were delineated on an aerial photograph during the site visit (**Figure 3, Appendix A**). Coverage of the dominant species in each community type is listed on the monitoring form (**Appendix B**). A comprehensive plant species list for the entire site was compiled and will be updated as new species are encountered. Observations from past years will be compared with new data to document vegetation changes over time. Minimal woody vegetation was planted at this site by the Conservation District.

The transect was relocated during the 2002 visit within the center of the constructed wetland. The location of this transect is shown on **Figure 2, Appendix A**. Percent cover for each species was recorded on the vegetation transect form (**Appendix B**). The transect will be used to evaluate changes over time, especially the establishment and increase of hydrophytic vegetation. Transect ends were marked with metal fence posts and their locations hand-drawn on the vegetation map. Photos of the transect were taken from both ends during the site visit.

### 2.4 Soils

Soils were evaluated during the site visit according to the procedure 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 terminology used by NRCS was used to describe hydric soils.

## 2.5 Wetland Delineation

A wetland delineation was conducted within the assessment area according to the 1987 COE Wetland Delineation Manual. Wetland and upland areas within the monitoring area were investigated for the presence of wetland hydrology, hydrophytic vegetation and hydric soils. The indicator status of vegetation was derived from the National List of Plant Species that Occur in Wetlands: Northwest Region 9 (Reed 1988). The information was recorded on the Routine Wetland Delineation Forms (**Appendix B**). The wetland/upland and open water boundaries were used to calculate the wetland area.

## 2.6 Mammals, Reptiles, and Amphibians

Mammal, reptile, and amphibian species observations were recorded on the wetland monitoring form during the site visit (**Appendix B**). Indirect use indicators were also recorded including tracks, scat and burrows. A comprehensive wildlife species list for the entire site was compiled and will be updated as new species are encountered. Observations from past years will be compared with new data to determine if wildlife use is changing over time.

## 2.7 Birds

Bird observations were recorded during the site visit according to the established bird survey protocol (**Appendix E**). Five (5) wood duck boxes have been installed on site. A general, qualitative bird list has been compiled using these observations. Observations will be compared between years in future studies.

## 2.8 Macroinvertebrates

One macroinvertebrate sample was collected during the site visit following the 2001 protocol (**Appendix E**). Samples were preserved as outlined in the sampling procedure and sent to a laboratory for analysis. The approximate sampling location is indicated on **Figure 2, Appendix A**.

## 2.9 Functional Assessment

A functional assessment form was completed for the Roundup wetland mitigation site using the 1999 MDT Montana Wetland Assessment Method. Field data necessary for this assessment were collected on a condensed data sheet included in the mitigation site monitoring form (**Appendix B**). The remainder of the assessment was completed in the office.

## 2.10 Photographs

Photographs were taken showing the current land use surrounding the site, the wetland buffer, the monitored area, and the vegetation transect. A description and compass direction for each photograph were recorded on the wetland monitoring form.

During the 2001 monitoring season, each photograph point was marked on the ground with a wooden stake and the location recorded with a resource grade GPS (**Appendix E**) and retaken at the same locations in 2002. New photo locations were recorded on the map by hand. The approximate locations are shown on **Figure 2, Appendix A**. All photographs were taken using a 50 mm lens.

## 2.11 GPS Data

During the 2001 monitoring season survey points were collected using a resource grade Trimble, Geoexplorer III hand-held GPS unit (**Appendix E**). Points collected included: photograph locations; bird box locations, and the jurisdictional wetland boundary. In addition, during the August 2001 monitoring season survey points were collected at four (4) landmarks recognizable on the air photo for purposes of line fitting to the topography. GPS points were not collected during the 2002 season.

## 2.12 Maintenance Needs

The condition of inflow and outflow structures, and nesting structures or other mitigation related structures were evaluated. This examination did not entail an engineering-level analysis.

## 3.0 RESULTS

### 3.1 Hydrology

During the 2002 monitoring event, depth to groundwater within well number #3 was 9.17 feet. The approximate location of well #3 is shown on **Figure 2, Appendix B**.

As mentioned, water was designed to enter the system through two methods and locations. One method of water entry is through a drainage channel which funnels storm water and roadway runoff from the northeastern section of the city of Roundup and U.S. Highway 12 into the southwestern end of the wetland (**Detail: Site Plan, Appendix D**). Second, treated wastewater from the new Roundup sewage treatment facility is discharged into the wetland to maintain the designed water level elevation.

The wetland was originally designed with a flow-through system; treated water would have flowed into the wetland system and then into the Musselshell River. This design feature was eliminated by the EPA and MTDEQ because the wetland would then be considered part of the treatment facility, which generally are not considered mitigation by the EPA, and may have

required special discharge permits. Water levels in the wetland decrease through evaporation and evapotranspiration.

During the July 2002 visit, approximately 25% of the assessment area was inundated with approximately 0.5 to 4 feet of standing water. The south lagoon had three, large, very shallow (<2") areas of water in the "Exposed Soil" region that were not drawn on the map. When the site was visited again in October, a rain event had occurred the night before and all of the ponds and exposed soil areas indicated on **Figure 3** were inundated (see cover photo).

According to the Western Regional Climate Center (WRCC 2002), the Roundup station annual mean (1914 – 2001) precipitation is 12.48 inches; the average precipitation through the month of July is 8.42 inches. For the year 2002, precipitation through July was 6.34 inches (with 8 days missing out of one month) or at least 75% of the mean. The low accumulation of precipitation by July would explain the lack of water in the southern lagoon during July.

### 3.2 Vegetation

Vegetation species identified on the site are presented in **Table 1** and in the monitoring form (**Appendix B**). Five (5) vegetation communities were mapped on the mitigation area map (**Figure 3, Appendix A**). The communities include: Type 1, *Kochia scoparia*; Type 2, *Chenopodium hybridum*; Type 3, *Alopecurus arundinaceus*; Type 4, *Rumex crispus/Scirpus pungens*; and, Type 5, *Agropyron cristatum/Kochia scoparia*. Dominant species within each community are listed on the monitoring form (**Appendix B**).

The Roundup wetland site appears to be developing greater plant species diversity; however, the obligate/facultative wet vegetation species (Community Type 4) occur within very small areas (<10 square feet) and may not have been observed during 2001.

The wetland boundary includes areas with no vegetation that become open water pools after storm events and/or the release of treated water from the treatment plant. At the time of the monitoring event (July) most of the south lagoon was dry with the exception of a three large shallow (<2" deep) pools; in October the exposed areas of July were completely inundated. The vegetated portion of the wetland in general qualifies as a wetland because the dominant vegetation, *Kochia*, is a FAC species. The other dominant plant, *Chenopodium hybridum*, is not included within the indicator status manual. However, *Chenopodium* grew most profusely along the saturated margins of the open water ponds and was rarely seen elsewhere; thus, these areas were included within the wetland boundary.

The NRCS/District Conservationist for Roundup, John Rouane, was contacted for information regarding plantings in 2001. He stated that only a few species were planted within the fenced area and that overall the survival rate was less than 20% due to the severe drought in 2001. The species planted included buffaloberry, cotoneaster, and chokecherry. None of these species were found during 2002.

**Table 1: 2001 and 2002 Roundup Wetland Vegetation Species List**

Scientific Name	Common Name	Indicator Status
<i>Agropyron cristatum</i>	crested wheatgrass	-
<i>Alopecurus arundinaceus</i> **	creeping foxtail	- (in wet areas)
<i>Chenopodium leptophyllum</i> **	narrow-leaf goosefoot	FACU
<i>Chenopodium hybridum</i> **	sowbane	-
<i>Cirsium arvense</i> *	Canada thistle	FACU+
<i>Grindelia squarrosa</i> **	curly-cup gumweed	FACU
<i>Kochia scoparia</i> *	summer-cypress	FAC
<i>Lemna spp.</i> **	duckweed	OBL
<i>Melilotus officinalis</i> **	yellow sweetclover	FACU
<i>Phalaris arundinacea</i>	reed canary grass	FACW
<i>Polygonum spp.</i> **	knotweed	(unknown, likely FACW-OBL)
<i>Puccinellia nuttalliana</i> **	Nuttall's alkali grass	OBL
<i>Rhus trilobata</i> **	smooth sumac	-
<i>Ribes aureum</i> **	golden currant	FAC+
<i>Rumex crispus</i> **	curly dock	FACW
<i>Rumex maritimus</i> **	golden dock	FACW+
<i>Scirpus pungens</i> **	three-square bulrush	FACU to FACU-

- : Not included in the Wetland Indicator manual or No Indicator.

\*denotes observed in 2002 in addition to previous years

\*\*denotes observed in 2002 for the first time

No star indicates a species was observed in 2001, but not in 2002

The vegetation transect results are detailed in the monitoring form (**Appendix B**) and are summarized below.

#### 2001 Transect Data

Transect 1 Start	Upland Type 2 (60')	Wetland * Type 1 (40')	Total 100'	End Transect 1
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#### 2002 Transect Data

Transect 1 Start	Upland Type 1 (10')	Wetland Type 1 (176')	Upland Type 1 (10')	Total 196'	End Transect 1
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The new transect spans the distance between the old dike separating the south and north lagoons and a constructed island adjacent to one of the northern lagoon ponds. The area between the dike and islands qualified as a wetland with nearly 100% *Kochia* (FAC), very strong hydric soils and evidence of hydrology. The dike and islands were classified as upland, though the dominant species was also *Kochia*, as a result of the absence of hydric soil and evidence of hydrology. This *Kochia scoparia* vegetation type was placed in Community Type 1; however, it is classified as upland or wetland depending on the presence or absence of hydric soils.

### 3.3 Soils

The site was mapped as part of the Musselshell County Soil Survey. The Havre-Glendive Complex (11A) is the dominant mapped soil at the site. The soil series is well drained and typical of floodplains, alluvial fans and stream terraces; it is classified as an Aridic Ustifluvents. The old lagoons were constructed entirely within this complex. The Havre component is a loamy texture and the Glendive component tends to be a fine, sandy loam.

Soils were sampled at one wetland site (SP-1) and one upland site (SP-2); SP-1 is located between the old dike that historically separated the north and south lagoons and SP-2 is on the constructed island adjacent to the northern lagoon pond. At SP-1 (wetland) soils were a dusky red (2.5YR 3/2) sandy loam at a depth of 0-3 inches; mottles were a yellowish brown 10YR 5/8 (30%) and organic streaking was noted. From 3-12 inches the soil was a matrix of dusky red (2.5YR 3/2) and reddish brown (2.5YR 4/3) sandy clay, streaked with greenish gray (Gley 1 5/10GY); no mottles were evident in this layer. From 12-18 inches the soil was reddish brown (2.5YR 5/4) with yellowish brown mottles (3%). Oxidized root channels were also observed within 12 inches and the clay layer was damp but not saturated. At SP-2 (upland) on the island, the soil was a weak red (2.5YR 4/2) sandy loam from 0-4 inches and from 4-10 inches a sandy gravelly loam. An impenetrable rock layer was found at 10 inches, likely a feature of the constructed island.

### 3.4 Wetland Delineation

The delineated wetland boundary includes the mud flats in the southern lagoon, which likely fill with water after a storm event or treatment plant release (as was observed in October 2002 after a storm event). The wetland boundary excludes the historic dike and the constructed islands (**Figure 3, Appendix A**). The gross “wetland” area is comprised of 22 acres, 5.32 acres of open water and 7.48 acres of mud flats; the resulting net wetland area is 9.2 acres. The COE data forms are included in **Appendix B**.

The mudflats no longer support weedy species where the line of inundation occurs after storm events; it is anticipated that wetland vegetation will begin to colonize the mud flats, especially if as little as 2 inches of water is maintained in the flats throughout the year. The overall gross wetland acreage of 22 acres is greater than in 2001 (18.5 acres) primarily because of delineation methods. The north and east lagoon depressions were inundated with open water during 2002 site visit, and though less than 6 feet deep, this open water acreage decreased the net wetland acreage. The mud flat acreage was also subtracted from the 2002 gross wetland acreage because these areas technically do not qualify as wetlands due to the lack of hydrophytic vegetation. The mud flats may be considered a special aquatic site.

### 3.5 Wildlife

Wildlife species are listed in **Table 2**. Activities and densities associated with these observations area included on the monitoring form in **Appendix B**. Deer are routinely seen in the wetland area and a family of red fox had excavated a den in the bank to the north of the site. On two occasions during the investigation an adult fox was seen traversing the site carrying prey. Two kits were observed in the vicinity of the den chasing a third kit with the same prey that had been delivered by the parent.

Only four (4) of the five (5) wood duck boxes were located in 2002; the locations are shown on **Figure 2, Appendix B**; the locations of all 5 boxes are indicated on the detail plan map in **Appendix D**. The box on the west end of the wetland was missing. None of the boxes that were checked showed signs of occupation during any of the monitoring visits. However, the box in



**Table 2. Wildlife Species Observed on the Roundup Wetland Mitigation Site**

<b>BIRDS</b>	
American Avocet ( <i>Recurvirostra americana</i> ) <sup>12*</sup>	Northern Shoveler ( <i>Anas clypeata</i> ) <sup>1*</sup>
American Coot ( <i>Fulica americana</i> ) <sup>1*</sup>	Red-wing Blackbird ( <i>Agelaius phoeniceus</i> ) <sup>12*</sup>
American Robin ( <i>Turdus migratorius</i> )	Ring-necked Duck ( <i>Aythya collaris</i> ) <sup>1**</sup>
Barn Swallow ( <i>Riparia riparia</i> ) <sup>1**</sup>	Ring-necked Pheasant ( <i>Phasianus colchicus</i> ) <sup>13*</sup>
Black-necked Stilt ( <i>Himantopus mexicanus</i> ) <sup>2**</sup>	Rock Dove ( <i>Columba livia</i> )
Blue-winged Teal ( <i>Anas discors</i> ) <sup>1**</sup>	Ross Goose ( <i>Chen rossii</i> ) <sup>1**</sup>
Canada Goose ( <i>Branta canadensis</i> ) <sup>12*</sup>	Ruddy Duck ( <i>Oxyura dominica</i> ) <sup>1**</sup>
Cliff Swallow ( <i>Hirundo pyrrhonota</i> ) <sup>2**</sup>	Sandhill Crane ( <i>Grus canadensis</i> ) <sup>12*</sup>
Common Snipe ( <i>Gallinago gallinago</i> ) <sup>3**</sup>	Song Sparrow ( <i>Melospiza melodia</i> ) <sup>2**</sup>
Eared Grebe ( <i>Podiceps nigricollis</i> ) <sup>1**</sup>	Spotted Sandpiper ( <i>Actitis macularia</i> ) <sup>12*</sup>
Eastern Kingbird ( <i>Tyrannus tyrannus</i> ) <sup>2**</sup>	Tree swallow ( <i>Tachycineta bicolor</i> ) <sup>12*</sup>
Great Blue Heron ( <i>Ardea herodias</i> ) <sup>2**</sup>	Sandpiper (species unidentified) <sup>2*</sup>
Greater Yellow legs ( <i>Tringa melanoleuca</i> ) <sup>**</sup>	Violet Green Swallow ( <i>Tachycineta thalassina</i> ) <sup>1**</sup>
Green-winged Teal ( <i>Anas crecca</i> ) <sup>13*</sup>	Whimbrel ( <i>Numenius phaeopus</i> ) <sup>1**</sup>
Killdeer ( <i>Charadrius vociferus</i> ) <sup>123*</sup>	Willet ( <i>Catoptrophorus semipalmatus</i> ) <sup>1**</sup>
Lesser Scaup ( <i>Aythya affinis</i> ) <sup>1**</sup>	Wilson's Phalarope ( <i>Phalaropus tricolor</i> ) <sup>1**</sup>
Lesser Yellow Legs ( <i>Tringa flavipes</i> ) <sup>1**</sup>	Wood Duck ( <i>Aix sponsa</i> ) <sup>13**</sup>
Mallard ( <i>Anas platyrhynchos</i> ) <sup>123*</sup>	Yellow-headed Blackbird ( <i>Xanthocephalus xanthocephalus</i> )
Northern Harrier ( <i>Circus cyaneus</i> ) <sup>1**</sup>	Yellow-rumped Warbler ( <i>Dendroica coronata</i> ) <sup>1**</sup>
<b>MAMMALS</b>	
Fox ( <i>Vulpes fulva</i> ) <sup>1**</sup>	
Deer ( <i>Odocoileus spp.</i> )	

<sup>1</sup> Spring Visit 2002    <sup>2</sup> Mid-season 2002    <sup>3</sup> Fall Visit 2002

\*denotes observed in 2002 in addition to previous years

\*\*denotes observed in 2002 for the first time

No star indicates a species was observed in 2001, but not in 2002

the north lagoon was within the open water during all site visits. Several wood ducks, males and females or immatures, were observed in the north lagoon during the fall visit.

### 3.6 Macroinvertebrates

The macroinvertebrate sampling results are included in **Appendix B**. Rhithron, Inc. summarized the results as stated below.

Scores indicated poor conditions at this site in both 2001 and 2002. Warm water temperatures and nutrient enrichment were both suggested by the taxonomic composition and tolerance characteristics of the assemblage sampled at this site. Hypoxic substrates appeared to have resulted, since the midge fauna was dominated by hemoglobin-bearing taxa in both years.

### 3.7 Functional Assessment

Completed functional assessment forms are included in **Appendix B** and summarized below in **Table 3**. The site rated as an overall Category III wetland and scores 149.6 Functional Units. This represents an increase of approximately 107% since 2001. The increase in points resulted from more wetland acreage being identified within the assessment area (AA) and higher scores within several categories. Higher scores in the wildlife variables occurred as a result of a frog observation, likely the S3 Northern leopard frog observed in the northern lagoon, and the high diversity of bird species.

The wetland remains a Category III wetland because of the low vegetation structural diversity; functional assessment variables that concern vegetation structural diversity continue to score low because of the lack of trees and shrubs. Shrubs, particularly willows, would survive very well in this wetland because of the consistent saturation zone around the northern ponds and lack of grazing. A willow sprigging program may be beneficial during the spring of 2003.

**Table 3: Summary of 2001 and 2002 Wetland Function/Value Ratings and Functional Points at the Roundup Wetland Mitigation Project**

Function and Value Parameters From the 1999 MDT Montana Wetland Assessment Method	2001 Roundup Wetland	2002 Roundup Wetland
Listed/Proposed T&E Species Habitat	Low (0)	Low (0)
MNHP Species Habitat	Low (0)	High (.8)
General Wildlife Habitat	Low (.3)	Moderate (.7)
General Fish/Aquatic Habitat	NA	NA
Flood Attenuation	High (1)	Moderate (.6)
Short and Long Term Surface Water Storage	High (.8)	High (1)
Sediment, Nutrient, Toxicant Removal	Moderate (.7)	Moderate (.7)
Sediment/Shoreline Stabilization	NA	High (1)
Production Export/Food Chain Support	Moderate (.6)	Moderate (.6)
Groundwater Discharge/Recharge	Low (.1)	Low (.1)
Uniqueness	Low (.2)	Low (.3)
Recreation/Education Potential	Low (.2)	High (1)
Actual Points/ Possible Points	3.9/10	6.8/11
% of Possible Score Achieved	39%	61%
Overall Category	III	III
Total Acreage of Assessed Wetlands within Easement	18.517 ac	22 ac
Functional Units (acreage x actual points)	72.21 fu	149.60 fu
Net Acreage Gain	18.517 ac	22 ac
Net Functional Unit Gain	72.21 fu	149.60 fu
Total Functional Unit "Gain"	72.21 fu	149.60 fu

### 3.8 Photographs

Representative photos taken from photo points and transect ends are included in **Appendix C**. A 2002 aerial photograph is also included in **Appendix C**.

### 3.9 Maintenance Needs/Recommendations

All dikes and inlet structures were functioning satisfactorily. All located bird boxes are in good condition, although one box was apparently missing. No maintenance needs were apparent at the site; however, if the flows into the site could be supplemented it would aid in the establishment of hydrophytic vegetation. This may not be feasible, but with average precipitation, the water levels may stabilize with the addition of stormwater flows.

### 3.10 Current Credit Summary

The 2002 delineation of wetlands and special aquatic sites showed a total of 22 acres of developing aquatic habitats. Of that, 5.32 acres are shallow, open water and 7.48 acres are mud flats for a net of 9.2 acres of wetland. The site is two years old and is anticipated to develop more emergent vegetation over time. Given the shallowness of the open water and special

aquatic status of the mud flats, the entire site should be considered creditable for a total of 22 acres.

The Roundup wetland continues to rate as a Category III wetland because of the lack of vegetation structural diversity. However, the site scored 149.6 total actual functional units or a 90% increase since 2001. The wetland could easily attain a Category II status if the vegetation classes increased by the planting of shrubs and trees. Survivorship would likely be high given the perennial availability of water in the northern lagoons and the lack of grazing.

#### 4.0 REFERENCES

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## Appendix A

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### FIGURES 2 - 3

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*MDT Wetland Mitigation Monitoring*  
*Roundup Wetland*  
*Roundup, Montana*



## Figure 2 Monitoring Activity Locations 2002







## **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 FIELD AND FUNCTIONAL ASSESSMENT  
FORMS**

**COMPLETED 2002 MACROINVERTEBRATE SAMPLING  
RESULTS**

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*MDT Wetland Mitigation Monitoring  
Roundup Wetland  
Roundup, Montana*

# LWC / MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name: Roundup Project Number: 130091-031 Assessment Date: 7 /17 /02

Location Roundup, MT MDT District: 5 Milepost: 49

Legal description: T 8N R 26E Section 18 Time of Day: 7AM

Weather Conditions: clear Person(s) conducting the assessment:

LB/LWC

Initial Evaluation Date: 8 / 14 / 01 Visit #: 2 Monitoring Year: 2002

Size of evaluation area: 22 acres Land use surrounding wetland: sewer treatment plant; industrial

## HYDROLOGY

**Surface Water** Source: stormwater and treated water from treatment plant

Inundation: Present X Absent      Average depths: 4 ft Range of depths: 0 - 6 ft

Assessment area under inundation: 24 %

Depth at emergent vegetation-open water boundary: 0.5 ft

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

Other evidence of hydrology on site (drift lines, erosion, stained vegetation etc.):     

     **ON south side of WL during the July visit there was no water but die-back of weeds had occurred where water had inundated that area. During the October visit (birds) a storm had passed through and all of the bare areas within the entire wetland were inundated.**

## Groundwater

Monitoring wells: Present X Absent     

Record depth of water below ground surface

Well #	Depth	Well #	Depth	Well #	Depth
3	9.17 feet				

## 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.)

     -      GPS survey groundwater monitoring wells locations if present

**COMMENTS/PROBLEMS:**



## VEGETATION COMMUNITIES

Community No.: 1 Community Title (main species): Kochia scoparia

Dominant Species	% Cover	Dominant Species	% Cover
<i>Kochia scoparia</i>	99		
<i>Chenopodium leptophyllum</i>	<1		
<i>Chenopodium hybridum</i>	<1		

**COMMENTS/PROBLEMS:** This CT occurs in upland and wetland areas, identified by “UPL:CT-1” and “Wetland: CT-1” on map.

Community No.: 2 Community Title (main species): Chenopodium rubrum

Dominant Species	% Cover	Dominant Species	% Cover
<i>Chenopodium leptophyllum</i>	<5		
<i>Chenopodium hybridum</i>	90		
<i>Kochia scoparia</i>	5		
<i>Rumex maritimus</i>	<1		

**COMMENTS/PROBLEMS:** \_\_\_\_\_

Community No.: 3 Community Title (main species): Alopecurus arundinaceus

Dominant Species	% Cover	Dominant Species	% Cover
<i>Alopecurus arundinaceus</i>	100		

**COMMENTS/PROBLEMS:** \_\_\_\_\_

### Additional Activities Checklist:

Record and map vegetative communities on air photo

## VEGETATION COMMUNITIES (continued)

Community No.: 4 Community Title (main species): Rumex crispus/Scirpus pungens

Dominant Species	% Cover	Dominant Species	% Cover
<i>Alopecurus arundinaceus</i>	<5		
<i>Lemna spp.</i>	<5		
<i>Polygonum spp.</i>	<5		
<i>Puccinellia nuttalliana</i>	<5		
<i>Rumex crispus</i>	40		
<i>Scirpus pungens</i>	40		

**COMMENTS/PROBLEMS:** \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Community No.: 5 Community Title (main species): Agropyron cristatum/ Kochia scoparia

Dominant Species	% Cover	Dominant Species	% Cover
<i>Agropyron cristatum</i>	40	<i>Rhus trilobata</i>	<1
<i>Chenopodium leptophyllum</i>	10	<i>Ribes aureum</i>	<1
<i>Cirsium arvense</i>	<5		
<i>Grindelia spp.</i>	<5		
<i>Kochia scoparia</i>	40		
<i>Melilotus officinalis</i>	<5		

**COMMENTS/PROBLEMS:** \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Community No.: \_\_\_\_\_ Community Title (main species): \_\_\_\_\_

Dominant Species	% Cover	Dominant Species	% Cover

**COMMENTS/PROBLEMS:** \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

## COMPREHENSIVE VEGETATION LIST

[illegible]

**COMMENTS/PROBLEMS:** \_\_\_\_\_

## PLANTED WOODY VEGETATION SURVIVAL

[illegible]

**COMMENTS/PROBLEMS:** \_\_\_\_Remains unknown where shrubs were planted, species planted not found (see report). No shrubs found in wetland. \_\_\_\_\_

[illegible]

## WILDLIFE

### BIRDS

(Attach Bird Survey Field Forms)

Were man made nesting structures installed? Yes ☒ No ☐ Type: wood duck How many? 4 Are the nesting structures being utilized? Yes ☐ No ☐ ☒ unknown  
Do the nesting structures need repairs? Yes ☐ No ☒\*

### MAMMALS AND HERPTILES

Species	Number Observed	Indirect indication of use			
		Tracks	Scat	Burrows	Other
<i>Rana</i> spp.	1				
<i>Vulpes fulva</i>	4			1	3 kits, 1 adult

#### Additional Activities Checklist:

☒ Macroinvertebrate sampling (if required)

**COMMENTS/PROBLEMS:** Knocked on the wood duck boxes that could be reached and the boxes sounded empty, however, at least one brood of woodies seen in October.

\*The wood duck box on the west end of the wetland near inlet is missing and could not be found.

## 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:

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

Location	Photo Frame #	Photograph Description	Compass Reading
A	017	wetland view (7/17/02)	N
B	4A	upland use (10/7/02)	S
C	016	wetland view (7/17/02)	E
D	5A	wetland view (10/17/02)	W
E	00A	wetland view (10/17/02)	S
F	013	wetland view (7/17/02)	E
G		(transect end on island; film ripped inside camera at this photo)	retake 2003
H	15	transect end on old dike (7/17/02)	N

**COMMENTS/PROBLEMS:** Photos were taken on 2 different dates because of film malfunction on 7/17; when the site was revisited in October most of the interior was inundated and thus point G (transect end on island).

## 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 for site in designated GPS field notebook

Checklist:

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

**COMMENTS/PROBLEMS:** \*Data hand-drawn during 2002 monitoring event.

## WETLAND DELINEATION

(Attach Corps of Engineers delineation forms)

At each site conduct the items on the checklist below:

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

**COMMENTS/PROBLEMS:** ☐ \*Hand-drawn 2002. \_\_\_\_\_

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## FUNCTIONAL ASSESSMENT

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

**COMMENTS/PROBLEMS:** \_\_\_\_\_

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## MAINTENANCE

Were man-made nesting structures installed at this site? YES ☒ NO \_\_\_\_\_

If yes, do they need to be repaired? YES \_\_\_\_\_ NO ☒ \*

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

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

YES \_\_\_\_\_ NO ☒ \*

If yes, are the structures working properly and in good working order? YES \_\_\_\_\_ NO \_\_\_\_\_

If no, describe the problems below.

**COMMENTS/PROBLEMS:** ☐ \* One box missing and could not be found; was located on west end.

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# MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: Roundup Date: 7/17/02 Examiner: LB/LWC Transect # 1

Approx. transect length: 196' Compass Direction from Start (Upland): 14 degrees

<b>Vegetation type A:</b> CT 1 (Upland Soils)		
Length of transect in this type:	10'	feet
Species:	Cover:	
KOCSCO	100	
Total Vegetative Cover:	100%	

<b>Vegetation type B:</b> CT 1 (Hydric Soils)		
Length of transect in this type:	176'	feet
Species:	Cover:	
KOCSCO	100	
CHEHYB	<1	
Total Vegetative Cover:	100%	

<b>Vegetation type C:</b> CT 1 (Upland Soils)		
Length of transect in this type:	10'	feet
Species:	Cover:	
KOCSCO	100	
Total Vegetative Cover:	100%	

<b>Vegetation type D:</b>		
Length of transect in this type:		feet
Species:	Cover:	
Total Vegetative Cover:		





## MDT WETLAND MONITORING – VEGETATION TRANSECT (back of form)

## Cover Estimate

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

**Indicator Class:**

+ = Obligate  
- = Facultative/Wet  
0 = Facultative

**Source:**

P = Planted  
V = Volunteer

Percent of perimeter 100%\* % developing wetland vegetation – excluding dam/berm structures.

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

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

Notes:

\* Most of open water edges are vegetated w/ *Chenopodium hybridum* but this species has no indicator status (not in manual). Because this perimeter was saturated it is assumed it is a FAC-OBL spp.

[illegible]

**BIRD SURVEY – FIELD DATA SHEET**

Page\_\_1\_of\_1\_\_

 Date: **see below**
**SITE: Roundup: May, July and October Surveys**

Bird Species	#	Behavior	Habitat	Bird Species	#	Behavior	Habitat
<b><u>SPRING: (5/10)</u></b>				<b><u>MID-SEASON (7/17):</u></b>			
American Avocet	15	F	MA/OW	American Avocet	X	F/DD <sup>1</sup>	
American Coot	4	F	OW	Black-necked Stilt	X	F	MA
Barn Swallow	X	FO/F	(OW)	Canada Goose	X	F	OW
Blue-winger teal	X	F	OW	Eastern Kingbird	1		
Canada Goose	4	L	OW	Great Blue Heron	1	F	MA
Earred Grebe	6	L	OW	Killdeer	X	F	MA
Great Blue Heron	1	F	MA	Mallard	X	F	OW
Greater Yellow legs	1	F	MA	Red-winged blackbird			
Killdeer	X	F	MA	Sandhill Crane	1	F	MA (UPL interior)
Lesser Scaup	4	F	OW	Song Sparrow			
Lesser Yellow Legs	1	F	MA	Spotted Sandpiper	X	F	OW
Mallard	4+	BP	OW	Tree swallow	X	FO/F	(OW)
Northern Harrier	1 (f)	F	MA				
Northern Shoveler	15	F	OW				
Red-wing Blackbird	X	BD/F	MA				
Ring-necked Duck	2	BP	MA	<b><u>FALL(10/7):</u></b>			
Ross Goose	1	L	MA	Common Snipe	1	FO	(OW)
Ruddy Duck	1 (m)	L	OW	Green-winged Teal		FO	(OW)
Tree swallow	X	FO/F	(OW)	Killdeer	X	F	MA
Unident. Sand Piper		F	MA	Mallard	X	FO	(OW)
Violet Green Swallow	X	F	(OW)	Ring-necked Pheasant	2	F	MA
Whimbrel	3	F	MA	Unid. black birds	X	FO	(OW)
Willet	3	FO		Wood Duck	(note)	FO	OW
Wilson's Phalarope	X prs.	F	MA				
Wood Duck	1 (m)	F	OW	note: 2-males; 3- females or immatures			
Yellow-rumped warbler	1	F	MA				

**Notes:** X = several/uncountable

1 Defensive display, avocet have young that are foraging in shallow OW

**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: <u>Roundup</u> Applicant/Owner: <u>MDT</u> Investigator: <u>LB/LWC</u>	Date: <u>7/17/02</u> County: <u>Musselshell</u> State: <u>MT</u>
Do Normal Circumstances exist on the site: <u>X</u> Yes                      No  Is the site significantly disturbed (Atypical Situation)? <u>X</u> Yes                      No Is the area a potential Problem Area?:                      Yes <u>X</u> No (If needed, explain on reverse.)	Community ID: <u>Kochia (btw stake G and H)</u>  Transect ID: <u>1</u> Plot ID: <u>SP-1</u>

**VEGETATION**

Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator	
1 <u>Kochia scoparia</u>	<u>H</u>	<u>FAC</u>		9			
2				10			
3				11			
4				12			
5				13			
6				14			
7				15			
8				16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-). 1/1

Qualifies as wetland given the FAC inclusion in wetland indicators.

**HYDROLOGY**

<p><u>X</u> Recorded Data (Describe in Remarks):  <u>                    </u> Stream, Lake, or Tide Gauge  <u>                    </u> <u>X</u> Aerial Photographs  <u>                    </u> Other  <u>                    </u> No Recorded Data Available</p> <hr/> <p>Field Observations:</p> <p>Depth of Surface Water:                      <u>                    </u> -                      (in.)</p> <p>Depth to Free Water in Pit:                      <u>                    </u> -                      (in.)</p> <p>Depth to Saturated Soil:                      <u>                    </u> -                      (in.)</p>	<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators:</p> <p><u>                    </u> Inundated</p> <p><u>                    </u> Saturated in Upper 12 Inches</p> <p><u>                    </u> Water Marks</p> <p><u>                    </u> Drift Lines</p> <p><u>                    </u> Sediment Deposits</p> <p><u>                    </u> <u>X</u> Drainage Patterns in Wetlands</p> <p>Secondary Indicators (2 or more required):</p> <p><u>                    </u> <u>X</u> Oxidized Root Channels in Upper 12 Inches</p> <p><u>                    </u> Water-Stained Leaves</p> <p><u>                    </u> Local Soil Survey Data</p> <p><u>                    </u> FAC-Neutral Test</p> <p><u>                    </u> Other (Explain in Remarks)</p>
<p>Remarks:</p> <p>Unknown how often area becomes inundated but the pond is designed to overflow into this region.</p>	

## SOILS

Map Unit Name		Havre-Glendive Complex (11A)		Drainage Class: <u>well</u>	
(Series and Phase):				Field Observations	
Taxonomy (Subgroup):		<u>NA</u>		Confirm Mapped Type? <u>    </u> Yes <u>  X  </u> No	
<b>Profile Description:</b>					
Depth inches	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-3	A	2.5YR 3/2	10YR 5/8	30%	sandy w/ organic streaking
3-12	A	2.5YR 3/2; 2.5YR 4/3			sandy clay
		Gley 1 5/10GY			streak within matrix
12-18	B	2.5YR 5/4	10YR 5/8	3%	sand
<b>Hydric Soil Indicators:</b>					
<u>    </u> Histosol		<u>    </u> Concretions			
<u>    </u> Histic Epipedon		<u>  X  </u> High Organic Content in surface Layer in Sandy Soils			
<u>    </u> Sulfidic Odor		<u>    </u> Organic Streaking in Sandy Soils			
<u>  X  </u> Aquic Moisture Regime		<u>    </u> Listed on Local Hydric Soils List			
<u>  X  </u> Reducing Conditions		<u>    </u> Listed on National Hydric Soils List			
<u>  X  </u> Gleyed or Low-Chroma Colors		<u>    </u> Other (Explain in Remarks)			
Hydric soil; clay layer damp but not saturated.					

## WETLAND DETERMINATION

Hydrophytic Vegetation Present? <u>  X  </u> Yes <u>    </u> No Wetland Hydrology Present? <u>  X  </u> Yes <u>    </u> No Hydric Soils Present? <u>  X  </u> Yes <u>    </u> No	Is this Sampling Point Within a Wetland? <u>  X  </u> Yes <u>    </u> No
<b>Remarks:</b>  This SP is located between the old dike and a constructed island. The whole interior area, which this SP is located within, was excluded last year from the WL boundary but no soil pits were excavated; appears to be 100% Kochia and hydric soils were found in most of the site.	

Approved by HQUSACE 2/92



## SOILS

Map Unit Name		Havre-Glendive Complex (11A)		Drainage Class: <u>wll</u>	
(Series and Phase):				Field Observations	
Taxonomy (Subgroup):		<u>NA</u>		Confirm Mapped Type? <u>    </u> Yes <u>    </u> No	
<b>Profile Description:</b>					
Depth inches	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-4	B	2.5YR 4/2			sandy loam
4-10	B	2.5YR 4/2			sandy gravelly loam
10+					rocks/heavy fill
<b>Hydric Soil Indicators:</b>					
<u>    </u> Histosol		<u>    </u> Concretions			
<u>    </u> Histic Epipedon		<u>    </u> High Organic Content in surface Layer in Sandy Soils			
<u>    </u> Sulfidic Odor		<u>    </u> Organic Streaking in Sandy Soils			
<u>    </u> Aquic Moisture Regime		<u>    </u> Listed on Local Hydric Soils List			
<u>    </u> Reducing Conditions		<u>    </u> Listed on National Hydric Soils List			
<u>    </u> Gleyed or Low-Chroma Colors		<u>    </u> Other (Explain in Remarks)			
Non-hydric soil.					

## WETLAND DETERMINATION

Hydrophytic Vegetation Present? <u>  X  </u> Yes <u>    </u> No Wetland Hydrology Present? <u>    </u> Yes <u>  X  </u> No Hydric Soils Present? <u>    </u> Yes <u>  X  </u> No	Is this Sampling Point Within a Wetland? <u>    </u> Yes <u>  X  </u> No
Remarks:  Island is not within WL boundary.	

Approved by HQUSACE 2/92

## Field Data Sheet for 1999 MDT Wetland Assessment Form

Site: RouchupDate: 7/17/02 By: B/LuxEstimated AA Size (Circle Ac.): <1 1-5 >5Brief Description: hx sewage treatment ponds

HGM Class (CIRCLE)	Cowardin Class	Est. % of AA	Predominant Water Regime (CIRCLE)
Mineral Soil Flats	<u>Emergent</u>	<u>100</u>	<u>Perm Flood</u> <u>Int Exp</u> <u>Sem Perm Flood</u> <u>Seas Flood</u> <u>Sat</u> <u>Tem Flood</u> <u>Int Flood</u>
Organic Soil Flats	Aquatic Bed		Perm Flood Int Exp Sem Perm Flood Seas Flood Sat Tem Flood Int Flood
Riverine (nonperennial)	Moss-Lichen		Perm Flood Int Exp Sem Perm Flood Seas Flood Sat Tem Flood Int Flood
Riverine (upper perennial)	Scrub-Shrub		Perm Flood Int Exp Sem Perm Flood Seas Flood Sat Tem Flood Int Flood
Riverine (lower perennial)	Forested		Perm Flood Int Exp Sem Perm Flood Seas Flood Sat Tem Flood Int Flood
Lacustrine Fringe	Unconsolidated Bottom		Perm Flood Int Exp Sem Perm Flood Seas Flood Sat Tem Flood Int Flood
Depression (closed)	Other:		Perm Flood Int Exp Sem Perm Flood Seas Flood Sat Tem Flood Int Flood
Depression (open, groundwater)			
Depression (open, surface water)			
Slope			
Organic Soil Flats	Total Estimated % Vegetated	<u>65</u>	

RELATIVE ABUNDANCE: rare com. abun.

DISTURBANCE is:

High ModerateLow trafficHYDROLOGY: Max. acre-ft surf. water at wetlands in AA subject to inundation: <1 1-5 >5 (if no flooding/ponding, go to groundwater\* section)

Does AA contain surface or subsurface outlet?

Y

N

If outlet present, is it restricted (subsurface will always be "yes")? Y N

Longest duration of surface water:	Surface Water Duration and other attributes (circle)		
at any wetlands within AA	<u>Perm / Peren</u>	Seas / Intermit	Temp / Ephem
in at least 10% of AA (both wetlands and nonwetlands [deepwater, streambed...])	Perm / Peren	<u>Seas / Intermit</u>	Temp / Ephem
Where fish are or historically were present (circle NA if not applicable)	Perm / Peren	Seas / Intermit	Temp / Ephem
% of waterbody containing cover objects	>25%	10-25%	<u>&lt;10%</u>
% bank or shore with riparian or wetland shrub or forested communities	>75%	50-74%	<u>&lt;50%</u>
adjacent to rooted wetland vegetation along a defined watercourse or shoreline subject to wave action (circle NA if not applicable)	<u>Perm / Peren</u>	Seas / Intermit	Temp / Ephem
% cover of wetland bank or shore by sp. with binding rootmasses	<u>&gt;65%</u> <u>clero-</u> <u>binding</u>	35-64%	<35%

Flood Attenuation: Do any wetlands on site flood as a result of in-channel or overbank flow? Y N (if no, go to groundwater\* section below)

Estimated wetland area subject to periodic flooding (acres):

>10

2-10

Estimated % of flooded wetland classified SS, FO or both:

>75

25-74

25\*Evidence of groundwater discharge or recharge? Y NList: lined ponds - but could get gnd water from bank N of ponds

## HABITAT

Habitat for Listed or Proposed Threatened, Endangered, or Montana Natural Heritage Program S1, S2, or S3 Plants or Animals:

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

Primary or critical habitat (list species)

D S

T/E:

D S MNHP:

Secondary habitat (list species)

D S

T/E:

D S MNHP:

Incidental habitat (list species)

D S

T/E:

D S MNHP:

No usable habitat

D S

T/E:

D S MNHP:

Wildlife observations? fox familyFish observations? 8

## OTHERS

Do wetlands have potential to receive excess sediments, nutrients, or toxicants? Y NFrom: stormwater

Potential to receive: low to moderate levels

high levels

On TMDL List? Y NDoes site contain bog, fen, warm springs, >80 year-old forested wetland, or MNHP "S1" or "S2" plant association? Y N

List:

Is AA a known recreation / education site? Y NType: School groupsDoes AA offer strong potential for use as recreation / education site? Y NType: bird ID - very high diversity



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

1. Project Name: Pandup 2. Project #: B0091-031 Control #: \_\_\_\_\_3. Evaluation Date: Mo. 7 Day 17 Yr. 02 4. Evaluator(s): Bauer - 5. Wetlands/Site #(s): \_\_\_\_\_  
LWC6. Wetland Location(s): I. Legal: T 8 N or S; R 26 E or W; S 18 : T \_\_\_\_\_ N or S; R \_\_\_\_\_ E or W; S \_\_\_\_\_

II. Approx. Stationing or Mileposts: \_\_\_\_\_

III. Watershed: 10040202 GPS Reference No. (if applies): \_\_\_\_\_

Other Location Information: \_\_\_\_\_

7. a. Evaluating Agency: LWC ; 8. Wetland size: (total acres) \_\_\_\_\_ (visually estimated)

b. Purpose of Evaluation: \_\_\_\_\_ (measured, e.g. by GPS (if applies))

1. \_\_\_\_\_ Wetlands potentially affected by MDT project

2. \_\_\_\_\_ Mitigation wetlands; pre-construction

3. ✓ Mitigation wetlands; post-construction

4. \_\_\_\_\_ Other

9. Assessment area: (AA, tot., ac., \_\_\_\_\_ (visually estimated)

see instructions on determining AA) \_\_\_\_\_ (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
Depressional	Palustrine	-	UB, Em, AB #, J	E		700

(Abbreviations: System: Palustrine (P) Subsystem: 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) Subsystem: Littoral (2) Classes: RB, UB, AB/ Subsystem: Littoral (4) Classes: RB, UB, AB, US, EM/ System: Rivine (R) Subsystem: Lower Perennial (2) Classes: RB, UB, AB, US, EM/ Subsystem: Upper Perennial (3) Classes: RB, UB, AB, US/ Water Regimes: Permanently Flooded (H), Intermittently Flooded (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), Filled (F), Artificial (A) HGM Classes: Rivine, 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 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	<u>high disturbance</u>
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.): traffic w/in 500' of AAII. Prominent weedy, alien, & introduced species (including those not domesticated, feral): (list) championium - kochiaIII. Provide brief descriptive summary of AA and surrounding land use/habitat: sewage treatment plant

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	<u>Low</u>

Comments: \_\_\_\_\_



## SECTION PERTAINING to FUNCTIONS &amp; 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 \_\_\_\_\_  
 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 in 14A 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 Ram seen - not poss. ID  
 Secondary habitat (list species) D S \_\_\_\_\_  
 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

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

*fox den, parent  
hunting, 2 young seen*

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			
	Even				Uneven				Even				Uneven				Even			
Class cover distribution (all vegetated classes)	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
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:

**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 in 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 = NA]). 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:

**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)	.5 (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 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: ponded areas surrounded by *clenopodium hybridum*

#### 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
- ☐ Other

##### 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) only 1
Available Discharge/Recharge information inadequate to rate AA D/R potential	N/A (Unknown)

Comments: Stormwater + treatment plant inlet and suspect grd water may leak from N-side hill -

#### 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: ☒ 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 [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: waterfowl + shorebird ID; amphibians, too



## FUNCTION &amp; VALUE SUMMARY &amp; 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	L	0	1	
B. MT Natural Heritage Program Species Habitat	H	.8	1	
C. General Wildlife Habitat	m	.7	1	
D. General Fish/Aquatic Habitat	NA	-	-	-
E. Flood Attenuation	m	.6	1	
F. Short and Long Term Surface Water Storage	H	1	1	
G. Sediment/Nutrient/Toxicant Removal	m	.7	1	
H. Sediment/Shoreline Stabilization	H	1	1	
I. Production Export/Food Chain Support	m	.6	1	
J. Groundwater Discharge/Recharge	L	.1	1	
K. Uniqueness	L	.3	1	
L. Recreation/Education Potential	H	1	1	
Totals:		6.8	11	149.6

67%

 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

Montana Department of Transportation Wetland Mitigation Monitoring Project Rhithron Associates, Inc. for Land and Water Consulting 2001 and 2002		Project Name	Roundup	Roundup
		Date	8/14/2001	7/17/2002
Coelenterata		<i>Hydra</i>		
Turbellaria		<i>Dugesia</i>		
Oligochaeta	Enchytraeidae	Enchytraeidae		
	Lumbriculidae	Lumbriculidae		
	Naididae	<i>Chaetogaster</i>		
		<i>Nais elinguis</i>		
		<i>Nais variabilis</i>		
		<i>Ophidonais serpentina</i>		
	Tubificidae	Tubificidae - immature		
		<i>Limnodrilus hoffmeisteri</i>		
Hirudinea		<i>Mooreobdella microstoma</i>		
		<i>Nepheleopsis</i>		
		<i>Helobdella stagnalis</i>		
		<i>Helobdella</i>		
		<i>Glossiphonia</i>		
		<i>Theromyzon</i>		
Bivalvia	Sphaeriidae	<i>Sphaerium</i>		
Gastropoda	Lymnaeidae	<i>Fossaria</i>		
	Physidae	<i>Physa</i>		
	Planorbidae	<i>Gyraulus</i>		
		<i>Helisoma</i>		
		<i>Planorbella</i>		
Crustacea	Cladocera	Cladocera	26	
	Copepoda	Calanoida		
		Cyclopoida	1	
	Ostracoda	Ostracoda		177
	Amphipoda	<i>Gammarus</i>		
		<i>Hyaella azteca</i>		
	Isopoda	<i>Caecidotea</i>		
	Decapoda	<i>Orconectes</i>		
Acarina		Acari		
Odonata	Aeshnidae	<i>Anax junius</i>		
	Libellulidae	Libellulidae-early instar		
		<i>Sympetrum</i>		
	Coenagrionidae	Coenagrionidae-early instar		
		<i>Enallagma</i>		
	Lestidae	<i>Lestes</i>		
Ephemeroptera	Baetidae	<i>Baetis tricaudatus</i>		
		<i>Callibaetis</i>	2	
		<i>Centroptilum</i>		
	Caenidae	<i>Caenis</i>		
	Ephemerellidae	<i>Ephemerella</i>		
	Heptageniidae	<i>Cinygma</i>		
		<i>Nixe</i>		
	Leptophlebiidae	<i>Paraleptophlebia</i>		
	Ameletidae	<i>Ameletus</i>		
Homoptera	Corixidae	Corixidae - immature	6	24
		<i>Corisella tarsalis</i>		1
		<i>Hesperocorixa</i>		
		<i>Palmacorixa buenoi</i>		
		<i>Sigara</i>		
		<i>Trichocorixa</i>		
	Nepidae	<i>Ranatra</i>		
	Notonectidae	<i>Notonecta</i>	1	4
Plecoptera	Chloroperlidae	<i>Sweltsa</i>		
	Perlodidae	<i>Skwala</i>		
Trichoptera	Brachycentridae	<i>Brachycentrus</i> - early instar		
	Hydroptilidae	Hydroptilidae - pupa		

		<i>Hydroptila</i>		
	Lepidostomatidae	<i>Lepidostoma</i>		
	Leptoceridae	Leptoceridae - early instar		
		<i>Ceraclea</i>		
		<i>Mystacides</i>		
		<i>Nectopsyche</i>		
		<i>Ylodes</i>		
	Limnephilidae	<i>Psychoglypha suborealis</i>		
Coleoptera	Chysomelidae	Chrysomelidae		
	Curculionidae	<i>Bagous</i>		
	Dytiscidae	<i>Acilius</i>		
		Dytiscidae - early instar larvae		2
		Hydroporinae - early instar larvae		
		<i>Hygrotus</i>	3	
		<i>Liodessus</i>		
		<i>Laccophilus</i>		
		<i>Neoporus</i>		
		<i>Oreodytes</i>		
		<i>Rhantus</i>		
		<i>Stichtotarsus</i>		
	Elmidae	<i>Dubiraphia</i>		
		<i>Heterlimnius</i>		
		<i>Lara avara</i>		
		<i>Optioservus</i>		
		<i>Zaitzevia</i>		
	Halipidae	<i>Halipus</i>		
		<i>Pelodytes</i>		
	Hydrophilidae	Hydrophilidae - early instar larvae		
		<i>Berosus</i>		1
		<i>Helophorus</i>		
		<i>Hydrobius</i>		
		<i>Hydrochara</i>		
		<i>Laccobius</i>		
		<i>Tropisternus</i>		
Diptera	Athericidae	<i>Atherix</i>		
	Ceratopogonidae	<i>Bezzia/Palpomyia</i>		5
		<i>Dasyhelea</i>		
	Chaoboridae	<i>Chaoborus</i>		
	Culicidae	<i>Anopheles</i>		
		<i>Culex</i>		
	Dixidae	<i>Dixella</i>		
	Dolichopodidae	Dolichopodidae		
	Empididae	<i>Clinocera</i>		
	Ephydriidae	Ephydriidae		
	Muscidae	Muscidae		
	Pelecorhynchidae	<i>Glutops</i>		
	Psychodidae	<i>Pericoma</i>		
	Simuliidae	<i>Simulium</i>		
	Sciomyzidae	Sciomyzidae		
	Stratiomyidae	<i>Odontomyia</i>		
	Tabanidae	Tabanidae		
	Tipulidae	<i>Hexatoma</i>		
		<i>Tipula</i>		
	Chironomidae	<i>Ablabesmyia</i>		
		<i>Acricotopus</i>		
		<i>Camptocladius</i>		
		<i>Chironomus</i>	88	1
		<i>Cladotanytarsus</i>		
		<i>Corynoneura</i>		
		<i>Cricotopus Bicinctus</i> Gr.		
		<i>Cricotopus (Cricotopus)</i> Gr.		1
		<i>Cricotopus nostococladus</i>		
		<i>Cryptotendipes</i>		
		<i>Diamesa</i>		



	<i>Dicrotendipes</i>		
	<i>Einfeldia</i>	49	26
	<i>Endochironomus</i>		
	<i>Labrundinia</i>		
	<i>Micropsectra</i>		
	<i>Microtendipes</i>		
	<i>Odontomesa</i>		
	<i>Orthocladius annectens</i>		
	<i>Pagastia</i>		
	<i>Parachironomus</i>		
	<i>Paracladopelma</i>		
	<i>Paramerina</i>		
	<i>Parametriocnemus</i>		
	<i>Paratanytarsus</i>		
	<i>Paratendipes</i>		
	<i>Phaenopsectra</i>		
	<i>Polypedilum</i>		
	<i>Procladius</i>		
	<i>Psectrocladius elatus</i>		
	<i>Psectrocladius vernalis</i>		
	<i>Psectrotanytus</i>		
	<i>Pseudochironomus</i>		
	<i>Stichtochironomus</i>		
	<i>Tanytus</i>	83	3
	<i>Tanytarsus</i>		
	<i>Theinmanniella</i>		
	<i>Tvetenia</i>		
	Total	259	245
	Total taxa	9	11
	POET	1	0
	Chironomidae taxa	3	4
	Crustacea taxa + Mollusca taxa	2	1
	% Chironomidae	84.94%	12.65%
	Orthoclaadiinae/Chironomidae	0.00	0.03
	%Amphipoda	0.00%	0.00%
	%Crustacea + %Mollusca	10.42%	72.24%
	HBI	9.14	8.09
	%Dominant taxon	33.98%	72.24%
	%Collector-Gatherers	54.05%	83.67%
	%Filterers	10.04%	0.00%
	Scores (2002 criteria)		
	Total taxa	1	3
	POET	1	1
	Chironomidae taxa	3	3
	Crustacea taxa + Mollusca taxa	1	1
	% Chironomidae	1	5
	Orthoclaadiinae/Chironomidae	1	1
	%Amphipoda	5	5
	%Crustacea + %Mollusca	5	1
	HBI	1	1
	%Dominant taxon	3	1
	%Collector-Gatherers	3	3
	%Filterers	5	1
	Total score	30	26

## Appendix C

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### **REPRESENTATIVE PHOTOGRAPHS** **2002 AERIAL PHOTOGRAPH**

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*MDT Wetland Mitigation Monitoring*  
*Roundup Wetland*  
*Roundup, Montana*





**Location: A Photo Frame: 017 Description:**  
Wetland view (7/17/02) **Compass Reading: N**



**Location: B Photo Frame: 4A Description:**  
Wetland view (10/7/02) **Compass Reading: S**



**Location: C Photo Frame: 016 Description:**  
Wetland view (7/17/02) **Compass Reading: E**



**Location: D Photo Frame: 5A Description:**  
Wetland view (10/17/02) **Compass Reading: W**



**Location: E Photo Frame: 00A Description:**  
Wetland view (10/17/02) **Compass Reading: S**



**Location: F Photo Frame: 013 Description:**  
Wetland view (7/17/02) **Compass Reading: E**



**Location:** H    **Photo Frame:** 15    **Description:**  
Transect end on old dike.(7/17/02)    **Compass Reading:** N

## **Appendix D**

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### **ROUNDUP EAST LAGOON WETLAND FINAL PLAN**

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*MDT Wetland Mitigation Monitoring  
Roundup Wetland  
Roundup, Montana*

Figure 2

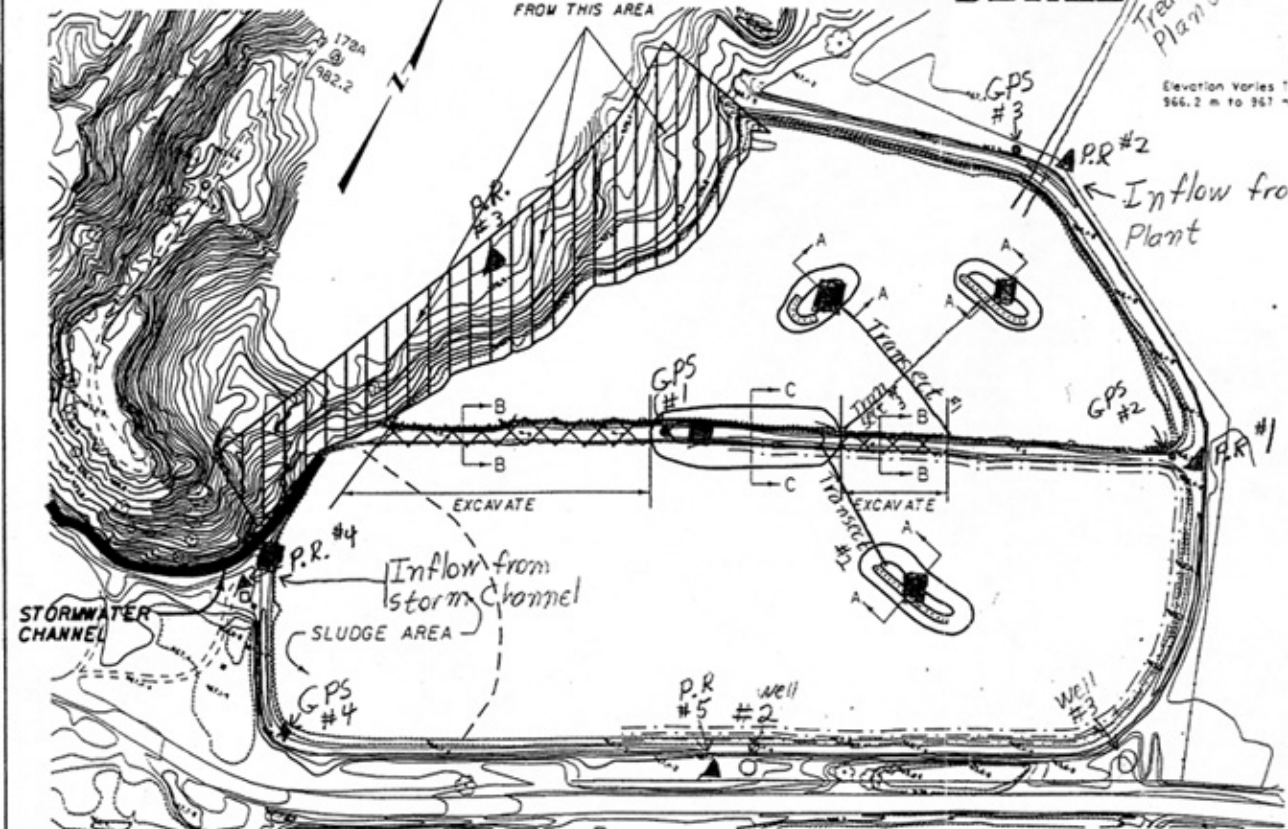
REMOVE HOUSEHOLD AND  
AUTOMOTIVE SCRAP/DEBRIS  
FROM THIS AREA

DETAIL

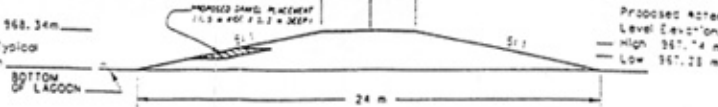
Treatment  
Plant

LAND & WATER D-1

STATE	PROJECT NUMBER	SHEET
MONTANA	STPP 14-5151169	2

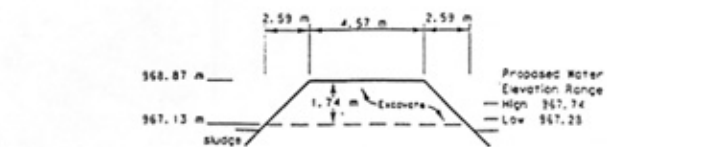


PLAN VIEW - GRAVEL AREAS



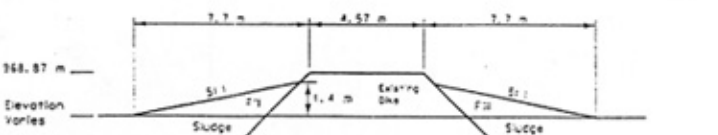
SECTION A-A (Islands)

NOT TO SCALE



SECTION B-B (Existing Dike Excavation)

NOT TO SCALE

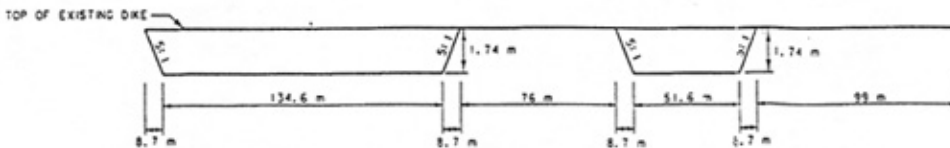


SECTION C-C (Remaining Portion of Existing Dike)

NOT TO SCALE

- ▲ Photo Reference points
- Well
- GPS Point
- Wood Duck Box

SCALE = 1:1250



LONGITUDINAL SECTION OF EXISTING DIKE (between north & south lagoon cells)

NOT TO SCALE

ROUNDUP EAST  
LAGOON WETLAND

FINAL PLAN

## **Appendix E**

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

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*MDT Wetland Mitigation Monitoring  
Roundup Wetland  
Roundup, Montana*

## BIRD SURVEY PROTOCOL

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

### **Species Use within the Mitigation Wetland: Survey Method**

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

#### ***Sites that can be circumambulated or walked throughout.***

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

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

#### ***Sites that cannot be circumambulated.***

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



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

### **Species Use within the Mitigation Wetland: Data Recording**

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

#### ***1. Bird Species List***

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

#### ***2. Bird Density***

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

#### ***3. Bird Behavior***

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

#### ***4. Bird Species Habitat Use***

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

# 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.