MONTANA DEPARTMENT OF TRANSPORTATION WETLAND MITIGATION MONITORING REPORT: YEAR 2003

Circle Mitigation Site
Circle, Montana

Prepared for:

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

Prepared by:

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

March 2004

Project No: 130091.021

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LAND & WATER

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1.0 INTRODUCTION

This annual report summarizes methods and results from the third year (2003) of monitoring for the Montana Department of Transportation's (MDT) Circle mitigation site. The Circle wetland, located in Watershed #12 of the Glendive District, was constructed to mitigate the impacts for 1.7 acres of wetlands associated with MDT improvements to Highway 200. The site is located in McCone County along the northwest side of Highway 200 between highway markers 276.2 and 276.5, Section 20, Township 19 North, Range 48 East **(Figure 1)**. Elevations are approximately 2,430 feet above sea level.

The Circle wetland was constructed in 1999 in a former oxbow of the Redwater River **(Figure 2, Appendix A)**. The pre-project wetland limits are shown on **Figure 3, Appendix A** and total approximately 2.98 acres. This project was developed in part to compensate for 1.7 acres of wetland impacts resulting from the Southwest-Brockway East project (Harris, 1998).

2.0 METHODS

2.1 Monitoring Dates and Activities

The Circle wetland was monitored on August 29, 2003. All information contained within the Wetland Mitigation Site Monitoring Form **(Appendix B)** was collected at this time. 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 assessment of any inflow/outflow structures.

2.2 Hydrology

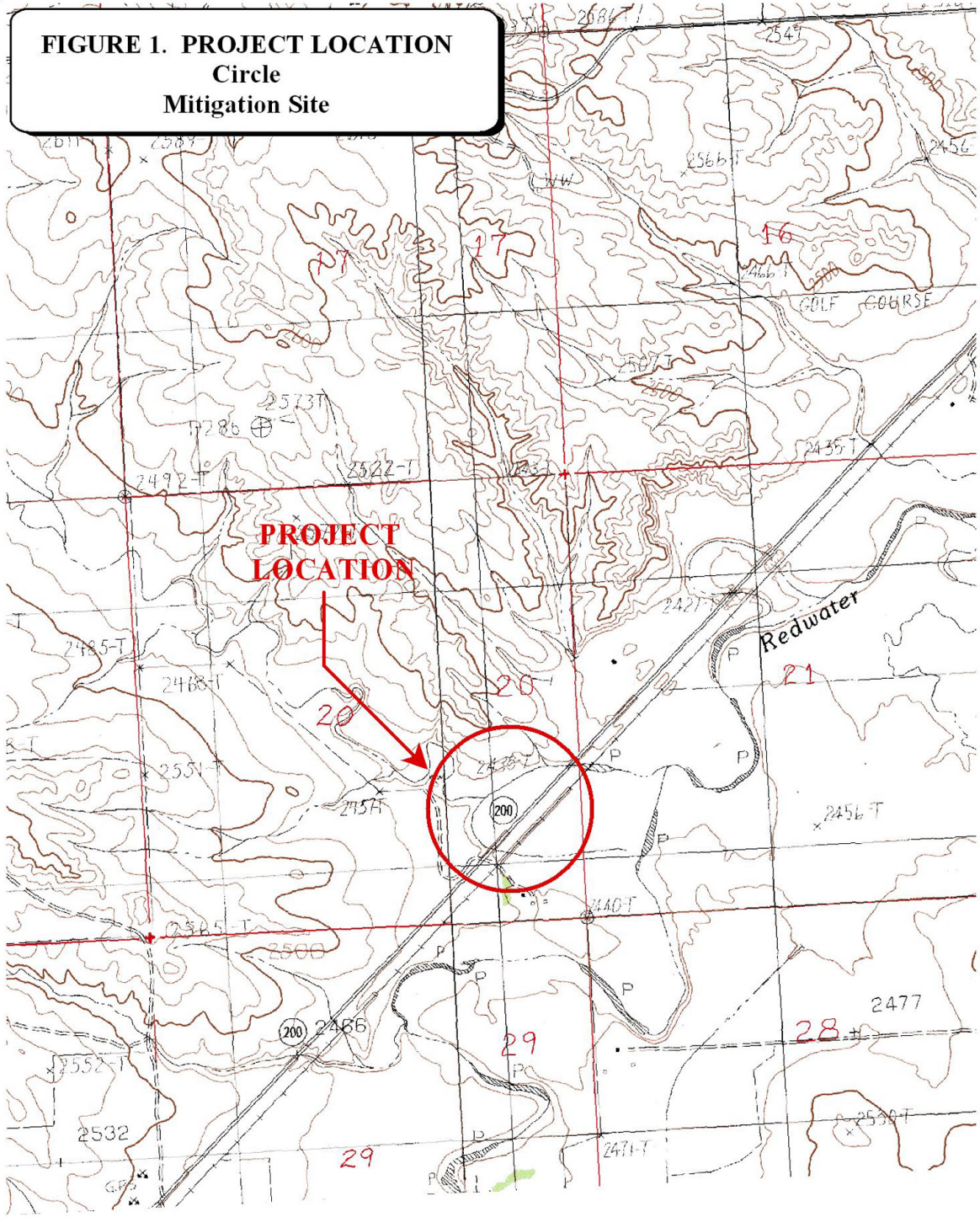
Wetland hydrology indicators were recorded using procedures outlined in the US Army Corps (COE) 1987 Wetland Delineation Manual. Hydrology data were recorded on the Routine Wetland Delineation Data Form **(Appendix B)** at each wetland determination point. Precipitation data for the year 2003 were compared to the 1963-2002 average (WRCC 2003).

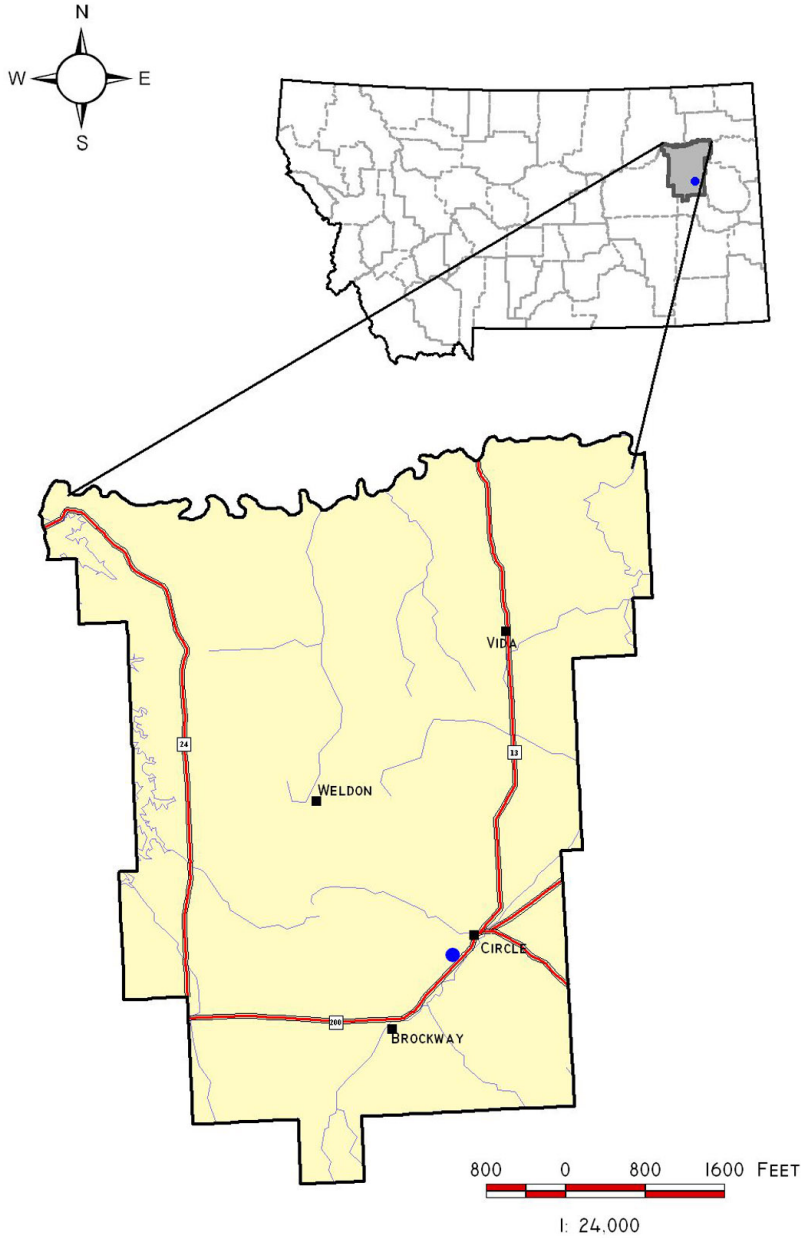
All additional hydrologic data were recorded on the mitigation site monitoring form **(Appendix B)**. The boundary between emergent vegetation and open water was mapped on the aerial photograph **(Figure 3, Appendix A)**. There are no groundwater monitoring wells at the site.

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. Woody species were not planted at this site.

FIGURE 1. PROJECT LOCATION
Circle
Mitigation Site





PROJECT #: 130091.021
DATE: APRIL 2001
LOCATION:
PROJECT MANAGER: B. DUTTON
DRAWN BY: B. NOECKER

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

The location of the vegetation transect is shown on **Figure 2, Appendix A**. Percent cover for each species was recorded on the vegetation transect form **(Appendix B)**. Transect ends were marked with metal fence posts and their locations recorded 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)**.

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: North Plains Region 4 (Reed 1988). The information was recorded on the COE 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 D).** A general, qualitative bird list has been compiled using these observations. Observations will be compared between years in future studies.

2.8 Macroinvertebrates

In 2003 macroinvertebrate sampling was intended. However, due to lack of water at the time of investigation, no samples were collected.

2.9 Functional Assessment

A functional assessment form was completed in 2003 for the Circle 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. The remainder of the assessment was completed in the office **(Appendix B)**.

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 are recorded on the wetland monitoring form.

During the 2001 monitoring season, each photo-point was marked on the ground with a wooden stake and the location recorded with a resource grade GPS **(Appendix C)**. The approximate locations are shown on **Figure 2, Appendix A**. Photographs were taken from the same locations during the 2003 site visit. All photographs were taken using a digital camera. A 2003 aerial photo is included in **Appendix C**.

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 D)**. Points collected included: the vegetation transect beginning and ending locations; photograph 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. No new GPS data were collected during the 2003 field season; changes in the wetland boundary, vegetation communities, location of the vegetation transect, and the sample point locations were drawn on an aerial photograph.

2.12 Maintenance Needs

No bird boxes or inflow structures were located within this site. There is a small containment structure in the lowest elevation of the oxbow that was installed to maintain water in the wetland for longer periods (Sickerson, pers. comm.). This structure is less than 0.5 meters in height and overflows are conveyed through a box culvert under the roadway and into the Redwater River. The structure was examined (non-engineering) for any obvious maintenance needs.

3.0 RESULTS

3.1 Hydrology

The Circle mitigation site was constructed in 1999 to be a 4.3-acre wetland adjacent to an historic oxbow of the Redwater River. The hydrologic source is primarily groundwater and secondarily, stormwater. A containment area was excavated at the lowest elevation of the oxbow to retain water for longer periods. Excess water simply flows out through a box culvert under the highway and into the Redwater River.

During the August 29, 2003 visit less than 1% of the assessment area was inundated. These wet areas were comprised of several very small (1 x 1.5') puddles less than 2" deep. The lack of surface water may be explained in part as a result of the late-season investigation and that

Montana is in the fifth year of a state-wide drought. The wetland is also fed by an unnamed intermittent stream that likely ceases to flow at the end of most summers.

Precipitation data for the Circle station indicate that the yearly average (1971-2000) is 13.35 inches (WRCC, 2003); through the month of August the precipitation average is 10.16 inches. During 2003, precipitation through the month of August was 12.25 inches or 121% of the average; precipitation in May and June of 2003 was larger than normal for a near total of 7 inches. The site was dry during the late-August investigation as a result a return to drought conditions during mid- and late-summer. Given the stream source is intermittent, late-summer drying may be a normal condition.

3.2 Vegetation

Vegetation species identified on the site are presented in **Table 1** and in the monitoring form **(Appendix B)**. Five (5) dominant vegetation communities are mapped on the mitigation area map (**Figure 3, Appendix A**). The communities include: Type 1, *Agropyron smithii*; Type 2, *Scirpus;* Type 3, *Scirpus Species/Distichlis stricta; Type 4, Juncus effuses; and Type 5, Distichlis stricta/Hordeum jubatum.* Dominant species within each community are listed on the monitoring form **(Appendix B)**. The 2001 and 2002 transect data is included for comparison, although the transect was moved to a new location in 2002; **Table 2** and **Chart 1** illustrate data trends over time. The decrease in hydrophytic species from 2002 to 2003 resulted from the lack of *Glyceria* or *Chenopodium* (assumed likely FAC-FACW) observations during 2003.

Though the surface water had nearly all evaporated by the end of August, the wetland was 100% saturated in those areas of normal inundation and a salt residue had accumulated on the surface of the soil. This condition gave the investigator an opportunity to traverse areas that are normally too wet. Though no new species were discovered, the particular areas in which *Scirpus* species colonized the wetland were particularly interesting. *Scirpus pungens* is generally more abundant and appears to proliferate in areas with less inundation, even along the upland margins. *Scirpus maritimus* was observed scattered throughout the *S. pungens* community, but was observed in stronger singular colonies along the original stream channel course where inundation is likely more constant.

Table 1: ***2001-2003 Circle Wetland Mitigation Vegetation Species List***

Scientific Name[1]	Region 4 (North Plains) Wetland Indicator Status
Agropyron cristatum	-(UPL)
Agropyron smithii	FACU
Artemisia tridentate	-(UPL)
Brassica spp.	FACW+
Bromus japonicus	FACU
Carex praegracilis	FACW
Chenopodium spp.	(unknown sp.; FAC-FACW)
Cirsium arvense	FACU
Distichlis stricta	-(FACW)
Elaeagnus angustifolia	FAC
Eleocharis palustris	OBL
Glyceria grandis.	OBL
Grindelia spp.	(Unknown-likely FACU)
Hordeum jubatum	FACW
Juncus balticus	OBL
Juncus effuses	OBL
Kochia spp.	FAC
Poa fendleriana	FACU
Rumex crispus	FACW
Scirpus acutus	**OBL**
Scirpus pungens	OBL
Scirpus maritimus	**-(OBL)**
Stipa spp.	(unknown sp.; UPL)
Trifolium spp.	(unknown sp.; FACU)
Typha latifolia	OBL

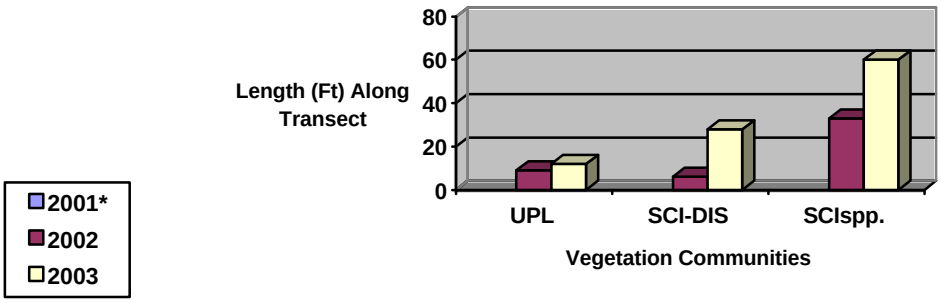
[1] **Bolded** species indicate those documented within the analysis area for the first time in 2003.
-Species not included in the National List of Plant Species that Occur in Wetlands (Reed 1988); status in parentheses are probable.

Table 2: ***2001-2003 Transect Data Summary***

Monitoring Year	2001[1]	2002	2003
Transect Length	40 feet	132 feet	132 feet
# Vegetation Community Transitions along Transect	1	5	3
# Vegetation Communities along Transect	2	3	2
# Hydrophytic Vegetation Communities along Transect	1	2	2
Total Vegetative Species	8	9	7
Total Hydrophytic Species	3	8	6
Total Upland Species	5	1	1
Estimated % Total Vegetative Cover	75%	36%	77%
% Transect Length Comprised of Hydrophytic Vegetation Communities	50%	29.5%	67%
% Transect Length Comprised of Upland Vegetation Communities	50%	6%	9%
% Transect Length Comprised of Unvegetated Open Water	0%	29.5%	0%
% Transect Length Comprised of Bare Substrate	0%	34%	24%

[1] Transect moved in 2002.

Chart 1: Length of Vegetation Communities along Transect 1



*** 2001 transect moved; data not included in bar graph.**

2001 Transect Map

Transect 1 Start	Upland Type 1 (20')	Wetland Type 2 (20')	Total 40'	End Transect 1

2002 Transect Map

Transect 1 Start	Upland Type 1 (9')	Wetland Type 3 (6')	Wetland Type 2 (15')	Open Water (39')	Mud (45')	Wetland Type 2 (18')	Total 132'	End Transect 1

2003 Transect Map

Transect 1 Start	Upland Type 1 (12')	Wetland Type 3 (28')	Salty Mud Flat (32')	Wetland Type 2 (60')	Total 132'	End Transect 1

3.3 Soils

The site was mapped as part of the McCone County Soil Survey. The dominant soil on the site is the Havrelon loam (Map Unit 86). This deep, well-drained soil is formed in alluvium on low terraces and floodplains of the Missouri and Redwater Rivers and their tributaries. Havrelon soils and the inclusions of Trembles, Cherry, and Ridgelaw soils are not listed on the Montana NRCS Hydric Soil list.

Soils were sampled at one wetland location (SP-1) and one upland (SP-2). Soils at SP-1 were a dark olive brown (2.5Y 3/3) organic streaked sandy clay loam from 0-14 inches; an organic layer was observed at a depth of 2-3". Dark yellowish brown mottles were noted throughout the soil profile (10YR 4/6). The soil was saturated to the surface. Soils at SP-2 were a dark yellowish brown (10YR 4/3, 3/3) sandy loam from 0-12 inches; no saturation or hydric indicators were notes.

3.4 Wetland Delineation

The delineated wetland boundary is depicted on **Figure 3, Appendix A**. According to the MDT, approximately 2.98 wetland acres occurred at the site prior to mitigation construction. The gross wetland area has remained stable since 2002 at 7.6 acres, which includes 2.98 acres of pre-existing wetlands and 1.18 acres of mudflats. The net wetland area in 2002 (excluding shallow open water) was 2.92 acres and in 2003 the net area (excluding mud flats) was 3.44 acres.

Wetland vegetation is apparently expanding into open-water/mud flat areas. The lack of water in the wetland may be the result of the late-season visit and possibly the effect of drought. The COE data forms are included in **Appendix B**.

3.5 Wildlife

Wildlife species are listed in **Table 3.** Activities and densities associated with these observations area included on the monitoring form in **Appendix B**. Mammal observations were limited to deer tracks. No bird boxes have been installed at this site. A spring bird visit would likely result in increased avian observations.

Table 3. ***Wildlife Species Observed at the Circle Mitigation Site[1] 2001-2003***

Birds	
American coot (*Fulica Americana)*	Killdeer (*Charadrius vociferous)*
Barn Swallow (Hirundo	Mallard (*Anas platyrhynchos)*
Black Tern (*Chlidonias niger*)	Red-winged Black bird (*Agelaius phoeniceus)*
Eastern Kingbird *(Tyrannus tyrannus)*	Spotted sandpiper (*Actitis macularia)*
Greater Yellow Legs *(Tringa melanoleuca)*	**Barn Swallow (*Hirundo rustica*)**
Blue winged teal (*Anas discors)*	Tree Swallow *(Tachycineta bicolor)*
Cinnamon teal (*Anas cyanoptera*)	**Western Meadowlark (*Sturnella neglecta*)**
Common Nighthawk *(Chordeiles minor)*	Willet (*Catoptrophorus semipalmatus)*
Common snipe (*Gallinago gallinago)*	
MAMMALS	
Deer tracks (2003)	
Coyote tracks *(Canis latrans)*	
White-tailed deer *(Odocoileus virginianus)*	

[1]**Bolded** species were observed during 2003 monitoring. All other species were observed during one or more of the previous monitoring years, but not during 2003.

3.6 Macroinvertebrates

No macroinvertebrate samples were collected as a result of lack of water in the wetland at the time of investigation (late-August).

3.7 Functional Assessment

Completed functional assessment forms are included in **Appendix B** and summarized below in **Table 4**. The 1998 baseline functional assessment resulted in a Category III (43%) rating. In 2001, the site was rated as a Category II (66%) wetland. The wetland also rated as a Category II wetland (77%) in 2002 and 2003. It is unlikely that the rating of this wetland will improve further unless structural diversity is increased by planting with shrubs and trees, and maintaining the cattle-exclosure conditions for most of the wetland. Providing water-access points for cattle would not damage the wetland as a whole and only disturb in a few controlled areas.

3.8 Photographs

Representative photos taken from photo points and transect ends are included in **Appendix C.** The 2003 aerial photograph is also included in **Appendix C.**

Table 4: ***Summary of 2001-2003 Wetland Function/Value Ratings and Functional Points at the Circle Wetland Mitigation Project***

Function and Value Parameters From the 1999 MDT Montana Wetland Assessment Method	2001	2002	2003
Listed/Proposed T&E Species Habitat	Low (.3)	Low (.3)	Low (.3)
MNHP Species Habitat	Moderate (.6)	High (.8)	High (.8)
General Wildlife Habitat	Exceptional (1)	Exceptional (1)	Exceptional (1)
General Fish/Aquatic Habitat	NA	NA	NA
Flood Attenuation	Moderate (.5)	Moderate (.5)	Moderate (.5)
Short and Long Term Surface Water Storage	Moderate (.7)	High (.8)	High (.8)
Sediment, Nutrient, Toxicant Removal	High (1)	High (1)	High (1)
Sediment/Shoreline Stabilization	High (1)	High (1)	High (1)
Production Export/Food Chain Support	Moderate (.7)	Moderate (.7)	Moderate (.7)
Groundwater Discharge/Recharge	High (1)	High (1)	High (1)
Uniqueness	Moderate (.4)	Moderate (.4)	Moderate (.4)
Recreation/Education Potential	Low (.1)	High (1)	High (1)
Actual Points/ Possible Points	7.3/11	8.5/11	8.5/11
% of Possible Score Achieved	66%	77%	77%
Overall Category	II	II	II
Total Acreage of Assessed Wetlands within Monitoring Area	7.33 ac (2.98 pre-existing)	7.6 ac (2.98 pre-existing)	7.6 ac (2.98 pre-existing)
Total Functional Units (acreage x actual points)	53.73 fu	64.6 fu	64.6 fu
Net Acreage Gain (“new” wetlands)	4.35 ac	4.62 ac	4.62 ac
Net Functional Unit Gain (new acreage x actual points)	31.76 fu	39.27 fu	39.27 fu

3.9 Maintenance Needs/Recommendations

No maintenance is required at this site. The cattle exclusion fence was intact and it is recommended that the fence be maintained in perpetuity while providing watering access points.

3.10 Current Credit Summary

The gross wetland area has remained stable since 2002 at 7.6acres, which includes 2.98 acres of pre-existing wetlands and 1.18 acres of mud flats at the time of the investigation. The net wetland area in 2002 (excluding shallow open water) was 2.92 acres and in 2003 the net area (excluding mud flats) was 3.44 acres. In both 2002 and 2003, open water / temporarily bare substrate areas were included in “net gain” totals of 4.62 acres. Wetland vegetation is apparently expanding into open-water/mud flat areas. The lack of water in the wetland is the result of the late-season visit and drought; the dry condition of the wetland is not a negative factor given the causes. The 2003 mitigation ratio of wetland creation at the Circle Mitigation Site to Southwest-Brockway East project impacts is 2:1. The wetland continues as a Category II wetland; improvement of this rating is unlikely unless vegetation diversity is increased.

A continuation of the livestock fence around the Circle wetland is highly recommended to protect the sensitive wetland environment. Several watering access points for livestock could be incorporated, which would limit vegetation trampling to a small number of areas.

4.0 REFERENCES

Berglund, J. 1999. *MDT Montana Wetland Assessment Method*. Prepared for Montana Department of Transportation. May 1999.

Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual*. US Army Corps of Engineers. Washington, DC.

Harris, R. 1998. *Biological Memorandum and Wetland Finding, MDT's Circle Southwest-Brockway East Projects,* Turnstone Biological.

Reed, P.B. 1988. National list of plant species that occur in wetlands: North Plains (Region 4). Biological Report 88(26.4), May 1988. U.S. Fish and Wildlife Service. Washington, D.C.

Sickerson, L. District 4 Biologist, Montana Department of Transportation. Helena, Montana. March 2002 telephone conversations.

US Army Corps of Engineers. 1987. *Corps of Engineers Wetlands Delineation Manual*. US Army Corps. Washington, DC.

USDA Natural Resource Conservation Service. Soil Survey of McCone County, Montana.

Western Regional Climate Center, 2003. Circle, MT Station: http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?mtcirc

Appendix A

FIGURES 2 - 3

MDT Wetland Mitigation Monitoring
Circle Mitigation Site
Circle, Montana

LAND & WATER

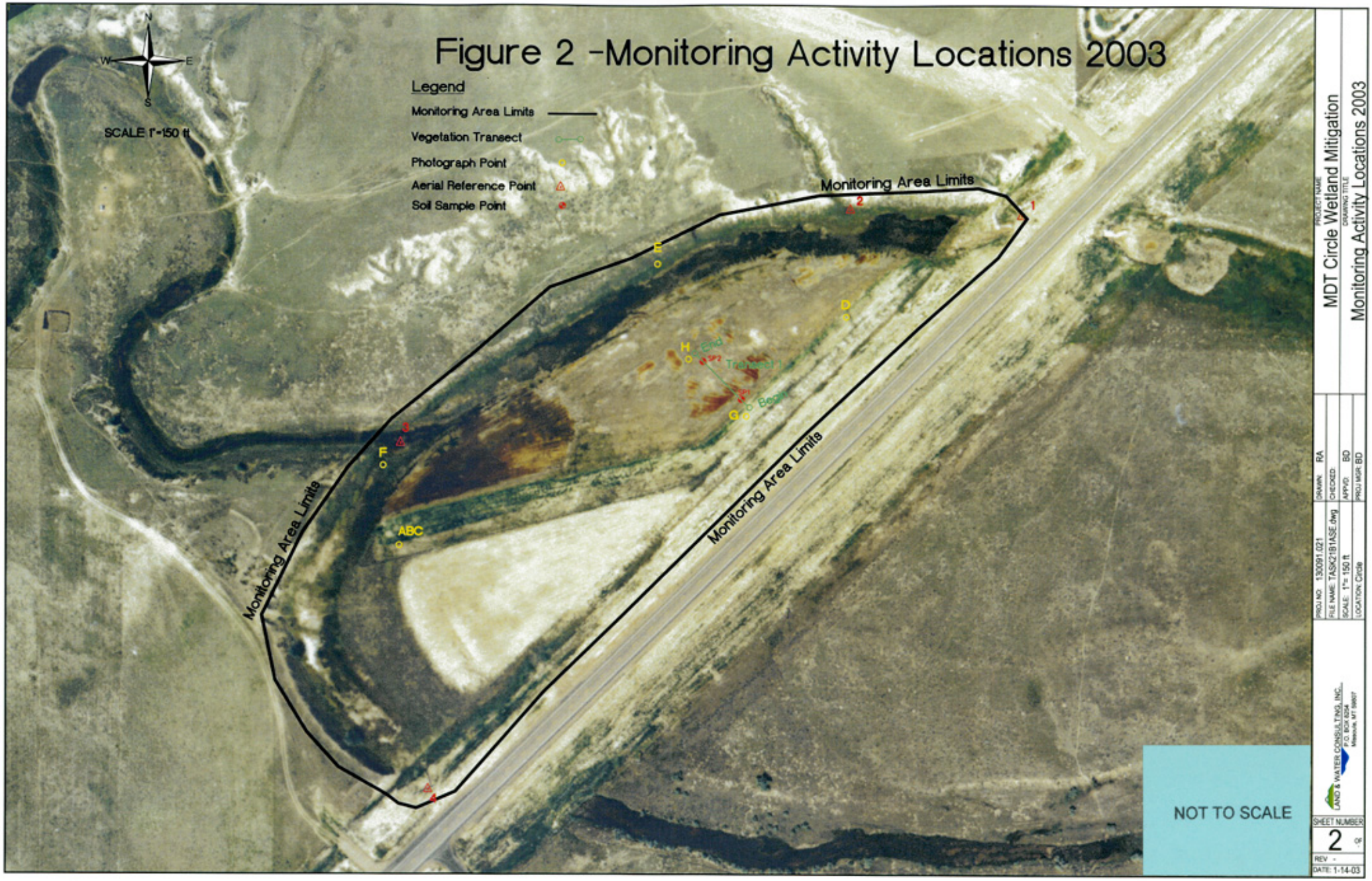
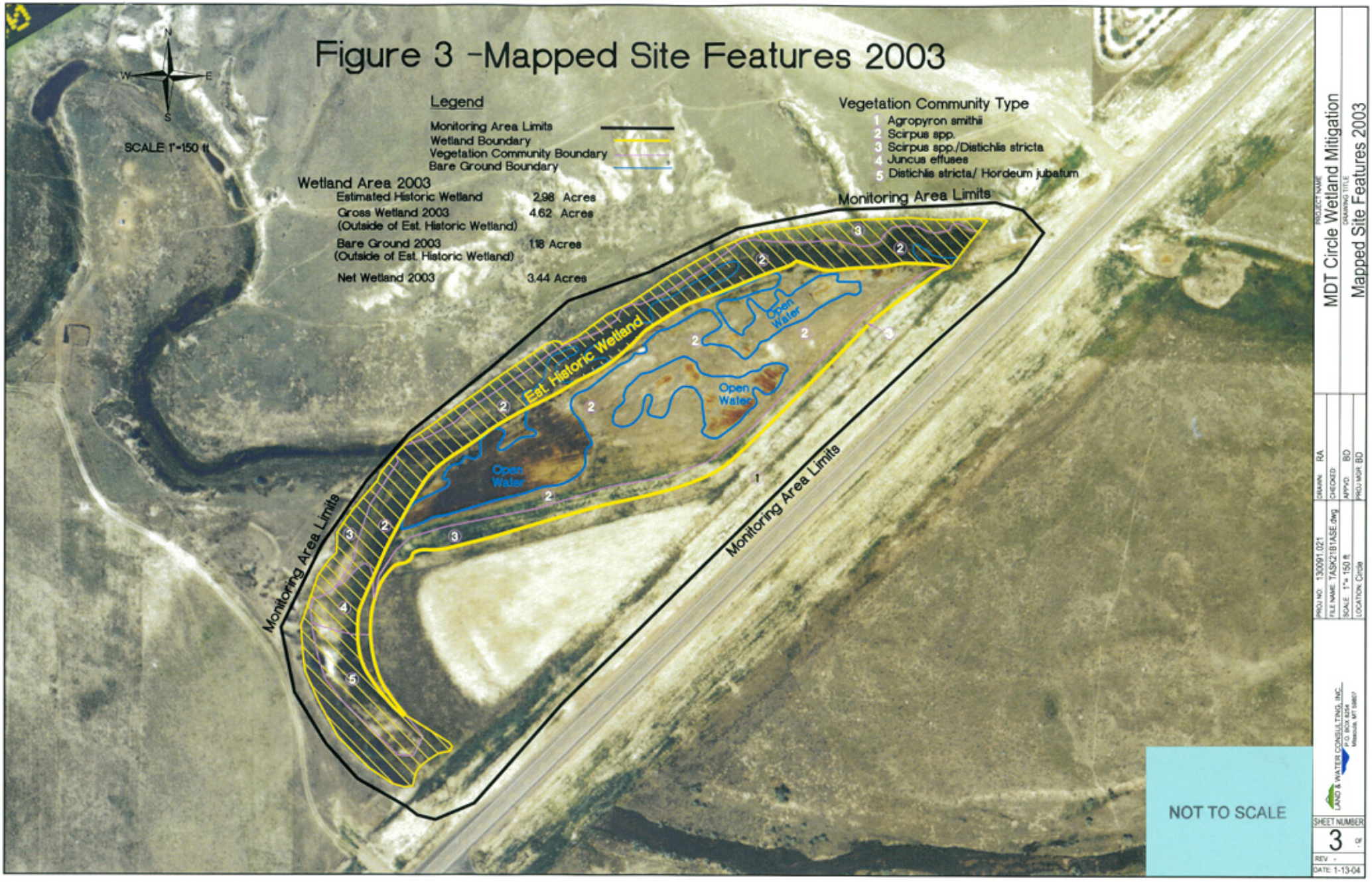


Figure 2 -Monitoring Activity Locations 2003
N
W
E
S
SCALE 1"=150 ft
Legend
Monitoring Area Limits
Vegetation Transect
Photograph Point
Aerial Reference Point
Soil Sample Point
Monitoring Area Limits
Monitoring Area Limits
Monitoring Area Limits
1
2
3
4
A
B
C
D
E
F
G
H
ABC
Transect 1
NOT TO SCALE
PROJECT NAME
MDT Circle Wetland Mitigation
DRAWING TITLE
Monitoring Activity Locations 2003
PROJ NO: 1300911.021
FILE NAME: TASK21B1ASE.dwg
SCALE: 1"= 150 ft
LOCATION: Circle
DRAWN: RA
CHECKED
APP'D: BD
PROJ MGR: BD
LAND & WATER CONSULTING, INC.
P.O. BOX 8254
Missoula, MT 59807
SHEET NUMBER
2
REV -
DATE: 1-14-03

Figure 3 -Mapped Site Features 2003



PROJECT NAME
MDT Circle Wetland Mitigation
DRAWING TITLE
Mapped Site Features 2003

PROJ NO: 1300991.021
FILE NAME: TASK2\81ASE.dwg
SCALE: 1"= 150 ft
LOCATION: Circle

DRAWN: RA
CHECKED:
APPVD: BD
PROJ MGR: BD

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

SHEET NUMBER
3
REV -
DATE: 1-13-04

Appendix B

2003 WETLAND MITIGATION SITE MONITORING FORM
2003 BIRD SURVEY FORMS
2003 WETLAND DELINEATION FORMS
2003 FIELD AND FULL FUNCTIONAL ASSESSMENT FORMS

MDT Wetland Mitigation Monitoring
Circle Mitigation Site
Circle, Montana

LAND & WATER

LWC / MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name:__Circle_____ Project Number:_130091-021____ Assessment Date:_8_/_29_/03_
Location:____Circle, MT_____ MDT District:___5____ Milepost:__276_____
Legal description: T 19N__ R__48E__ Section __20__ Time of Day:__1-3 PM_
Weather Conditions:_clear_(clouds of mosquitos!)_ Person(s) conducting the assessment:__L Bacon____
Initial Evaluation Date:__7_/_17_/_02_ Visit #:___3___ Monitoring Year:___2003_____
Size of evaluation area:___4-5____acres Land use surrounding wetland:_range_____

HYDROLOGY

Surface Water Source:____ Redwater River_____
Inundation**:** Present__X__ Absent____ Average depths:__<2”__ft Range of depths:_0-2__ft
Assessment area under inundation:__0%
Depth at emergent vegetation-open water boundary:__*__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.): _____
__*there are many small (1x1.5’) puddles scattered throughout wetland; large areas that are usually inundated have dried into saturated salt flats.

Groundwater
Monitoring wells: Present_____ Absent__X___
Record depth of water below ground surface

Well #	Depth	Well #	Depth	Well #	Depth

Additional Activities Checklist:
__X__Map emergent vegetation-recent open water boundary on air photo
___X_Observe extent of (recent) surface water during each site visit and look for evidence of past surface water elevations (drift lines, erosion, vegetation staining etc.)
_hand-drawn-2003____GPS survey groundwater monitoring wells locations if present

COMMENTS/PROBLEMS: ___Lack of water within wetland at time of investigation may be result of drought and late-season visit._____

VEGETATION COMMUNITIES

Community No.:_1_ Community Title (main species):____*Agropyon smithii*_____

Dominant Species	% Cover	Dominant Species	% Cover
Agropyon smithii	50		
Cirsium arvense	<10		
Stipa spp.	<10		
Kochia spp.	30		

COMMENTS/PROBLEMS: _____

Community No.:_2___ Community Title (main species):_____ *Scirpus species*_____

Dominant Species	% Cover	Dominant Species	% Cover
Scirpus pungens/Scirpus maritimus	90	Scirpus acutus	<1
Glyceria spp.	10		
Hordeum jubatum	<5		
Distichlis stricta	<5		
Juncus balticus	<5		

COMMENTS/PROBLEMS: _____

Community No.:__3__ Community Title (main species):__ *Scirpus species./ Distichlis stricta*

Dominant Species	% Cover	Dominant Species	% Cover
Scirpus pungens/Scirpus maritimus	40	*Glyceria grandis (maxima)*	10
Distichlis stricta	30	*Eleocharis palustris*	10
Poa fendlerana	<5		
Chenopodium spp.	10		
Hordeum jubatum	<5		

COMMENTS/PROBLEMS: _____Glyceria not observed in 2003._____

Additional Activities Checklist:
__X__Record and map vegetative communities on air photo

VEGETATION COMMUNITIES (continued)

Community No.:__4__ Community Title (main species):_____ *Juncus effuses* _____

Dominant Species	% Cover	Dominant Species	% Cover
Juncus effuses	85		
Carex praegracilis	<5		
Chenopodium spp.	<5		
Hordeum jubatum	<10		

COMMENTS/PROBLEMS: _____recollect succulent in 2003 _____
_____
_____
_____

Community No.:_5___ Community Title (main species):__*Disticlis stricta/Hordeum jubatum*_____

Dominant Species	% Cover	Dominant Species	% Cover
Disticlis stricta	50		
Hordeum jubatum	40		
Scirpus pungens/Scirpus spp.	<5		
Juncus effuses	<5		
Glyceria grandis (maxima)	<5		

COMMENTS/PROBLEMS: _____
_____
_____
_____

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

Dominant Species	% Cover	Dominant Species	% Cover

COMMENTS/PROBLEMS: _____
_____
_____
_____

COMPREHENSIVE VEGETATION LIST

Species	Vegetation Community Number(s)	Species	Vegetation Community Number(s)
Agropyron cristatum	1		
Agropyron smithii	1		
Artemisia tridentate	1		
Brassica spp.	1		
Bromus japonicus	1		
Carex praegracilis	4		
Chenopodium spp.	3		
Cirsium arvense	1		
Distichlis stricta	1, 2, 3		
Elaeagnus angustifolia	1		
Eleocharis palustris	3		
Glyceria spp.	2, 3		
Grindelia spp.	1		
Hordeum jubatum	1, 2, 3		
Juncus balticus	2		
Juncus effuses	2		
Kochia spp.	1		
Poa fendlerana	3		
Rumex crispus	1		
Scirpus acutus	**2**		
Scirpus maritimus	**2**		
Scirpus pungens	2,3		
Stipa spp.	1		
Trifolium spp.	1		
Typha latifolia	2		
Bold denotes seen for first time in 2003.			

COMMENTS/PROBLEMS: _____

_____

_____

_____

LAND & WATER

PLANTED WOODY VEGETATION SURVIVAL

Species	Number Originally Planted	Number Observed	Mortality Causes
NONE			

COMMENTS/PROBLEMS: _____

WILDLIFE

BIRDS

(Attach Bird Survey Field Forms)

Were man made nesting structures installed? Yes____ No_X___Type:_____ How many?_____ Are the nesting structures being utilized? Yes____ No____ Do the nesting structures need repairs? Yes____ No____

MAMMALS AND HERPTILES

Species	Number Observed	Indirect indication of use			
		Tracks	Scat	Burrows	Other
Deer		X			

Additional Activities Checklist:
__not able___Macroinvertebrate sampling (if required)

COMMENTS/PROBLEMS: __Sampling was planned this year but was not accomplished because of lack of water. _____

PHOTOGRAPHS

Using a camera with a 50 mm lenses and color film take photographs of the following permanent reference points listed in the checklist below. Record the direction of the photograph using a compass. (The first time at each site establish a permanent reference point by setting a ½ inch rebar or fencepost extending 2-3' above ground, survey the location with a resource grade GPS and mark the location on the air photo.)
Checklist:

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

Location	Photograph Description	(2001) Compass Readings
A	wetland view	N
B	upland use (across WL)	320
C	WL buffer (across WL)	W
D	wetland view	W
E	wetland view	S
F	wetland view	E
G	Beginning transect (new 2002)	NW
H	End transect (new 2002)	SE

COMMENTS/PROBLEMS: _____

*GPS SURVEYING

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

Checklist:

__X___ Jurisdictional wetland boundary
__no-2003___4-6 landmarks recognizable on the air photo
__X__ Start and end points of vegetation transect(s)
__X__ Photo reference points
_none__ Groundwater monitoring well locations

COMMENTS/PROBLEMS: *Data in checklist was hand-drawn for the 2003 investigation.

WETLAND DELINEATION

(Attach Corps of Engineers delineation forms)

At each site conduct the items on the checklist below:
__X____Delineate wetlands according to the 1987 Army Corps manual.
__X___ Delineate wetland-upland boundary on the air photo
__X*___ Survey wetland-upland boundary with a resource grade GPS survey

COMMENTS/PROBLEMS: _ *boundary hand-drawn 2002_____

FUNCTIONAL ASSESSMENT

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

COMMENTS/PROBLEMS: _____

MAINTENANCE

Were man-made nesting structures installed at this site? YES___ NO__X__
If yes, do they need to be repaired? YES____ NO____
If yes, describe problems below and indicate if any actions were taken to remedy the problems.

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

COMMENTS/PROBLEMS: Outflow area constructed to slow passage of water out of the wetland and to allow ponding; outlet stream not impeded and culvert clear.

MDT WETLAND MONITORING – VEGETATION TRANSECT

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

Approx. transect length: 132’ Compass Direction from Start (Upland): 315 deg.

Vegetation type A:	CT 1	
Length of transect in this type:	12’	feet
Species:		Cover:
HORJUB		3%
KOCHIA spp.		70%
AGRSMI		<25%
Total Vegetative Cover:		100%

Vegetation type B:	CT 3	
Length of transect in this type:	28'	feet
Species:		Cover:
SCIPUN		95
ELEPAL		<5
Total Vegetative Cover:		100%

Vegetation type C:	Salt flat	
Length of transect in this type:	32’	feet
Species:		Cover:
Saturated mud flat w/ salt deposits		100
Total Vegetative Cover:		100%

Vegetation type D:	CT 2	
Length of transect in this type:	60’	feet
Species:		Cover:
SCIPUN/SCIMAR		75
DISSPI		<1
Saturated mud flat w/ salt deposits		25
Total Vegetative Cover:		75%

MDT WETLAND MONITORING – VEGETATION TRANSECT (back of form)

Cover Estimate

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

Indicator Class:

+ = Obligate
- = Facultative/Wet
0 = Facultative

Source:

P = Planted
V = Volunteer

Percent of perimeter 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 food depth (in open water), or at a point where water depths or saturation are maximized. Mark this location with another metal fencepost.

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

Notes:

Despite the fact that there is very little surface water in the wetland, vegetation is 100% in areas not ordinarily inundated.
Mud flat areas were saturated on day of investigation.

3/01 rev

LAND & WATER

BIRD SURVEY – FIELD DATA SHEET

Page__1_of__1_
Date: 7/17/02
Survey Time: 6-8 PM

SITE: Circle, MT

Bird Species	#	Behavior	Habitat	Bird Species	#	Behavior	Habitat
Barn swallow	1	F	MA				
Western meadowlark	15	FO	MA edge				

Notes:

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: Circle Wetland				Date: 8-29-03	
Applicant/Owner: MDT				County: McCone	
Investigator: Lynn Bacon, Land & Water Consulting				State: MT	
Do Normal Circumstances exist on the site:	x	Yes	No	Community ID: Emergent	
Is the site significantly disturbed (Atypical Situation)?		Yes	x No	Transect ID:	
Is the area a potential Problem Area?:		Yes	x No	Plot ID: SP-1	
(If needed, explain on reverse.)					

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Scirpus pungens*	H	OBL	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/ = 100%

Remarks: SP on the wetland end of the transect. Vegetation thriving except where normally inundated.

HYDROLOGY

x Recorded Data (Describe in Remarks):
- Stream, Lake, or Tide Gauge
- x Aerial Photographs
- Other

No Recorded Data Available

Field Observations:

Depth of Surface Water: _____ (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil: surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- Inundated
- x Saturated in Upper 12 Inches
- x Water Marks
- Drift Lines
- x Sediment Deposits
- x Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- Oxidized Root Channels in Upper 12 Inches
- Water-Stained Leaves
- Local Soil Survey Data
- FAC-Neutral Test
- Other (Explain in Remarks)

Remarks:

Soil saturated in all "mud flat" areas.

LAND & WATER

SOILS

Map Unit Name (Series and Phase):	86 Havrelon loam	Drainage Class:	well
Taxonomy (Subgroup):	NA	Field Observations Confirm Mapped Type?	- Yes - No

Profile Description:

Depth inches	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0 - 14	A	2.5Y 3/3	10YR 4/6		organic streaked, sandy clay loam
2-3”					Organic layer

Hydric Soil Indicators:

____	Histosol	____	Concretions
____	Histic Epipedon	x	High Organic Content in surface Layer in Sandy Soils
____	Sulfidic Odor	____	Organic Streaking in Sandy Soils
____	Aquic Moisture Regime	____	Listed on Local Hydric Soils List
____	Reducing Conditions	____	Listed on National Hydric Soils List
x	Gleyed or Low-Chroma Colors	____	Other (Explain in Remarks)

Chroma is slightly high even w/ mottled soils to technically qualify as hydric soil, however there is organic streaking, and likely reducing and aquic moisture regime.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	X	Yes		No	
Wetland Hydrology Present?	X	Yes		No	
Hydric Soils Present?	X	Yes		No	
					Is this Sampling Point Within a Wetland? X Yes ____ No

Remarks:

Wetland continues to thrive within the boundaries GPSed in 2001; however wetland not expanding outside of boundary as a result of topographic constraints.

Approved by HQUSACE 2/92

LAND & WATER

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

Project/Site: Circle Wetland	Date: 8-29-03
Applicant/Owner: MDT	County: McCone
Investigator: Lynn Bacon, Land & Water Consulting	State: MT

Do Normal Circumstances exist on the site:	x	Yes		No	Community ID: UPL
Is the site significantly disturbed (Atypical Situation)?		Yes	x	No	Transect ID:
Is the area a potential Problem Area?:		Yes	x	No	Plot ID: SP-2
(If needed, explain on reverse.)					

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Poa fendlerana*	H	FACU-	9			
2	*Grindelia sp.*	H	UPL	10			
3	*Agoipyron smithii*	H	FACU	11			
4	*Hordeum jubatum*	H	FACW	12			
5				13			
6				14			
7				15			
8				16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-). 1/4 = 25%

SP not within the wetland boundary. SCIPUN is beginning to grow into what was the upland edge; saturation zone may be expanding.

HYDROLOGY

x Recorded Data (Describe in Remarks):
- Stream, Lake, or Tide Gauge
- x Aerial Photographs
- Other

No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)

Depth to Free Water in Pit: NA (in.)

Depth to Saturated Soil: NA (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- Inundated
- Saturated in Upper 12 Inches
- Water Marks
- Drift Lines
- Sediment Deposits
- Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- Oxidized Root Channels in Upper 12 Inches
- Water-Stained Leaves
- Local Soil Survey Data
- FAC-Neutral Test
- Other (Explain in Remarks)

Remarks:

Soil profile wet (not saturated) at 4" and there is some evidence that wetland veg may be expanding into what was upland and may be beginning to develop as a minor saturation zone.

LAND & WATER

SOILS

Map Unit Name (Series and Phase): 86 Havrelon loam
Drainage Class: well
Taxonomy (Subgroup): NA
Field Observations
Confirm Mapped Type? _____ Yes X No

Profile Description:

Depth inches	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0 - 12	A	10YR 4/3,3/3			sandy loam

Hydric Soil Indicators:

_____ Histosol
_____ Histic Epipedon
_____ Sulfidic Odor
_____ Aquic Moisture Regime
_____ Reducing Conditions
_____ Gleyed or Low-Chroma Colors
_____ Concretions
_____ High Organic Content in surface Layer in Sandy Soils
_____ Organic Streaking in Sandy Soils
_____ Listed on Local Hydric Soils List
_____ Listed on National Hydric Soils List
_____ Other (Explain in Remarks)

No hydric indicators.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? _____ Yes X No
Wetland Hydrology Present? _____ Yes X No
Hydric Soils Present? _____ Yes X No

Is this Sampling Point Within a Wetland? _____ Yes x No

Remarks:

Wetland not expanding into the edge of upland where transect end is located, however saturation zone may be expanding slightly (not enough to be classified as WL yet). If expansion occurs it is likely to do so only up to approx. 1 foot from present boundary as a result of topographic constraints.

Approved by HQUSACE 2/92

LAND & WATER

MDT MONTANA WETLAND ASSESSMENT FORM (revised May 25, 1999)

1. Project Name: Circle **2. Project #:** -130091021 **Control #:** _____

3. Evaluation Date: 8/29/2003 **4. Evaluator(s):** LB/LWC **5. Wetland / Site #(s):** _____

6. Wetland Location(s) **i. T:** 19 N **R:** 48 E **S:** 20 **T:** __ N **R:** __ E **S:** _____

ii. Approx. Stationing / Mileposts: _____

iii. Watershed: 10060002 **GPS Reference No. (if applies):** _____

Other Location Information: _____

7. A. Evaluating Agency LWC

B. Purpose of Evaluation:

- ☐ Wetlands potentially affected by MDT project
- ☐ Mitigation wetlands; pre-construction
- ☒ Mitigation wetlands; post-construction
- ☐ Other

8. Wetland Size (total acres): _____ (visually estimated)
7.6 (measured, e.g. GPS)

9. Assessment Area (total acres): _____ (visually estimated)
7.6 (measured, e.g. GPS)

10. CLASSIFICATION OF WETLAND AND AQUATIC HABITATS IN AA

HGM CLASS [1]	SYSTEM [2]	SUBSYSTEM [2]	CLASS [2]	WATER REGIME [2]	MODIFIER [2]	% OF AA
Depression	Palustrine	None	Emergent Wetland	Intermittently Exposed	Excavated	90
Riverine	Riverine	Lower Perennial	Unconsolidated Bottom	Intermittently Flooded	---	10
---	---	---	---	---	---	
---	---	---	---	---	---	

[1] = Smith et al. 1995. [2] = Cowardin et al. 1979.

11. ESTIMATED RELATIVE ABUNDANCE (of similarly classified sites within the same Major Montana Watershed Basin)
Common **Comments:** _____

12. GENERAL CONDITION OF AA

i. Regarding Disturbance: (Use matrix below to select appropriate response.)

Conditions Within AA	Predominant Conditions Adjacent (within 500 Feet) To 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 a natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or occupied buildings.	---	low disturbance	---
AA not cultivated, but moderately grazed or hayed or selectively logged or has been subject to relatively minor clearing, or fill placement, or hydrological alteration; contains few roads or buildings.	---	---	---
AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density.	---	---	---

Comments: (types of disturbance, intensity, season, etc.) none

ii. Prominent weedy, alien, & introduced species: kochia

iii. Briefly describe AA and surrounding land use / habitat: cattle grazing outside of fenced WL, hwy to south

13. STRUCTURAL DIVERSITY (Based on 'Class' column of #10 above.)

Number of 'Cowardin' Vegetated Classes Present in AA	≥3 Vegetated Classes or ≥ 2 if one class is forested	2 Vegetated Classes or 1 if forested	= 1 Vegetated Class
Select Rating	---	---	Low

Comments: _____

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

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

Primary or Critical habitat **(list species)**	☐ D	☐ S	
Secondary habitat **(list species)**	☐ D	☐ S	
Incidental habitat **(list species)**	☐ D	☒ S	Bald Eagle
No usable habitat	☐ D	☐ S	

ii. RATING **(BASED ON THE STRONGEST HABITAT CHOSEN IN 14A(I) ABOVE, FIND THE CORRESPONDING RATING OF HIGH (H), MODERATE (M), OR LOW (L) FOR THIS FUNCTION.**

HIGHEST HABITAT LEVEL	DOC/PRIMARY	SUS/PRIMARY	DOC/SECONDARY	SUS/SECONDARY	DOC/INCIDENTAL	SUS/INCIDENTAL	NONE
FUNCTIONAL POINT AND RATING	---	---	---	---	---	.3 (L)	---

IF DOCUMENTED, LIST THE SOURCE **(E.G., OBSERVATIONS, RECORDS, ETC.)**: _____

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

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

Primary or Critical habitat **(list species)**	☐ D	☒ S	N.Leopard frog
Secondary habitat **(list species)**	☐ D	☒ S	Peregrin Falcon
Incidental habitat **(list species)**	☐ D	☒ S	Black Tern
No usable habitat	☐ D	☐ S	_____

iii. RATING **(BASED ON THE STRONGEST HABITAT CHOSEN IN 14B(I) ABOVE, FIND THE CORRESPONDING RATING OF HIGH (H), MODERATE (M), OR LOW (L) FOR THIS FUNCTION.**

HIGHEST HABITAT LEVEL:	DOC/PRIMARY	SUS/PRIMARY	DOC/SECONDARY	SUS/SECONDARY	DOC/INCIDENTAL	SUS/INCIDENTAL	NONE
FUNCTIONAL POINT AND RATING	---	.8 (H)	---	---	---	---	---

IF DOCUMENTED, LIST THE SOURCE **(E.G., OBSERVATIONS, RECORDS, ETC.)**: _____

14C. General Wildlife Habitat Rating

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

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

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

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

II. WILDLIFE HABITAT FEATURES (Working from top to bottom, select appropriate AA attributes to determine the exceptional (E), high (H), moderate (M), or low (L) rating. Structural diversity is from #13. For class cover to be considered evenly distributed, vegetated classes must be within 20% of each other in terms of their percent composition in the AA (see #10). Duration of Surface Water: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; A= absent.

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

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

Evidence of Wildlife Use from 14C(i)	**Wildlife Habitat Features Rating** from 14C(ii)			
	☒ Exceptional	☐ High	☐ Moderate	☐ Low
Substantial	1 (E)	--	--	--
Moderate	--	--	--	--
Low	--	--	--	--

Comments: Lack of surface water likely unusual

LAND & WATER

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

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

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

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

ii. **Modified Habitat Quality:** Is fish use of the AA precluded or significantly reduced by a culvert, dike, other man-made structure or activity **or** is the waterbody included on the 'MDEQ list of waterbodies in need of TMDL development' with 'Probable Impaired Uses' listed as cold or warm water fishery or aquatic life support**?**
☐ **Y** ☐ **N** If yes, reduce the rating from 14D(i) by one level and check the modified habitat quality rating: ☐ E ☐ H ☐ M ☐ L

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

Types of Fish Known or Suspected Within AA	**Modified Habitat Quality** from 14D(ii)			
	☐ Exceptional	☐ High	☐ Moderate	☐ Low
Native game fish	--	--	--	--
Introduced game fish	--	--	--	--
Non-game fish	--	--	--	--
No fish	--	--	--	--

Comments: _____

14E. FLOOD ATTENUATION ☐ **NA** (proceed to 14G)
Applies only to wetlands subject to flooding via in-channel or overbank flow.
If wetlands in AA do not flooded from in-channel or overbank flow, check NA above.

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

Estimated wetland area in AA subject to periodic flooding	☐ ≥ 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**	--	--	--	--	--	.5 (M)	--	--	--
AA contains **unrestricted outlet**	--	--	--	--	--	--	--	--	--

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

14F. SHORT AND LONG TERM SURFACE WATER STORAGE ☐ **NA** (proceed to 14G)
Applies to wetlands that flood or pond from overbank or in-channel flow, precipitation, upland surface flow, or groundwater flow.
If no wetlands in the AA are subject to flooding or ponding, check NA above.

i. Rating (Working from top to bottom, use the matrix below to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function.)
Abbreviations: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral.

Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding.	☐ >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 [3] **5 out of 10 years**	--	--	--	.8 (H)	--	--	--	--	--
Wetlands in AA flood or pond **< 5 out of 10 years**	--	--	--	--	--	--	--	--	--

Comments: _____

14G. SEDIMENT/NUTRIENT/TOXICANT RETENTION AND REMOVAL ☐ **NA** (proceed to 14H)
Applies to wetlands with potential to receive excess sediments, nutrients, or toxicants through influx of surface or ground water or direct input.
If no wetlands in the AA are subject to such input, check NA above.

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

Sediment, Nutrient, and Toxicant Input Levels Within AA	AA receives or surrounding land use has potential to deliver low to moderate levels of sediments, nutrients, or compounds such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.				Waterbody on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants **or** AA receives or surrounding land use has potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.			
% cover of wetland vegetation in AA	☒ ≥ 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)	--	--	--	--	--	--	--
AA contains **unrestricted outlet**	--	--	--	--	--	--	--	--

Comments: _____

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

Applies only if AA occurs on or within the banks or a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body that is subject to wave action. If this does not apply, check NA above.

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

% Cover of wetland streambank or shoreline by species with deep, binding rootmasses.	***Duration of Surface Water Adjacent to Rooted Vegetation***		
	☒Permanent / Perennial	☐Seasonal / Intermittent	☐Temporary / Ephemeral
[3] **65 %**	1 (H)	--	--
35-64 %	--	--	--
< 35 %	--	--	--

Comments:

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT

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

A	☐ Vegetated component >5 acres						☐ Vegetated component 1-5 acres						☐ Vegetated component <1 acre					
B	☐ High		☐ Moderate		☐ Low		☐ High		☐ Moderate		☒ Low		☐ High		☐ Moderate		☐ Low	
C	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☒Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N
P/P	--	--	--	--	--	--	--	--	--	--	.7M	--	--	--	--	--	--	--
S/I	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
T/E/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Comments:

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

i. ☐ **Discharge Indicators**
- ☐ Springs are known or observed.
- ☒ Vegetation growing during dormant season/drought.
- ☒ Wetland occurs at the toe of a natural slopes.
- ☐ 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 presents without underlying impeding layer.
- ☐ Wetland contains inlet but not outlet.
- ☐ Other

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

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

Comments:

14K. UNIQUENESS

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

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

Comments:

14L. RECREATION / EDUCATION POTENTIAL

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

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

iii. Based on the location, diversity, size, and other site attributes, is there a strong potential for recreational or educational use?
☒ **Yes** [Proceed to 14L (ii) and then 14L(iv).] ☐ **No** [Rate as low in 14L(iv)]

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

Ownership	Disturbance at AA from #12(i)		
	☒ Low	☐ Moderate	☐ High
Public ownership	1(H)	--	--
Private ownership	--	--	--

Comments: bird watching;plant ID

FUNCTION, VALUE SUMMARY, AND OVERALL RATING

Function and Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units (Actual Points x Estimated AA Acreage)
A. Listed/Proposed T&E Species Habitat	L	0.30	1	
B. MT Natural Heritage Program Species Habitat	H	0.80	1	
C. General Wildlife Habitat	E	1.00	1	
D. General Fish/Aquatic Habitat	NA		--	
E. Flood Attenuation	H	0.50	1	
F. Short and Long Term Surface Water Storage	H	0.80	1	
G. Sediment/Nutrient/Toxicant Removal	H	1.00	1	
H. Sediment/Shoreline Stabilization	H	1.00	1	
I. Production Export/Food Chain Support	M	0.70	1	
J. Groundwater Discharge/Recharge	H	1.00	1	
K. Uniqueness	M	0.40	1	
L. Recreation/Education Potential	H	1.00	1	
	Totals:	8.50	11.00	64
	Percent of Total Possible Points:		**80%** (Actual / Possible) x 100 [rd to nearest whole #]	

Category I Wetland: (Must satisfy **one** of the following criteria. If not proceed to Category II.)
- ☐ Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; **or**
- ☐ Score of 1 functional point for Uniqueness; **or**
- ☐ Score of 1 functional point for Flood Attenuation **and** answer to Question 14E(ii) is "yes"; **or**
- ☐ Percent of total Possible Points is > 80%.

Category II Wetland: (Criteria for Category I not satisfied **and** meets any **one** of the following Category II criteria. If not satisfied, proceed to Category IV.)
- ☐ 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**
- ☒ Percent of total possible points is > 65%.

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

Category IV Wetland: (Criteria for Categories I or II are not satisfied **and** all of the following criteria are met; If not satisfied, proceed to Category III.)
- ☐ "Low" rating for Uniqueness; **and**
- ☐ "Low" rating for Production Export / Food Chain Support; **and**
- ☐ Percent of total possible points is < 30%.

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

☐ **I** ☒ **II** ☐ **III** ☐ **IV**

Appendix C

REPRESENTATIVE PHOTOGRAPHS
2003 AERIAL PHOTOGRAPH

MDT Wetland Mitigation Monitoring
Circle Mitigation Site
Circle, Montana

LAND & WATER

Location: A **Description:** Wetland view **Compass Reading:** N

Location: B **Description:** Upland us (across WL) **Compass Reading:** 320°

Location: C **Description:** WL buffer (across WL) **Compass Reading:** W

Location: D **Description:** Wetland view **Compass Reading:** W

Location: E **Description:** Wetland view **Compass Reading:** S

Location: F **Description:** Wetland view **Compass Reading:** E

Location: G **Description:** Beginning transect **Compass Reading:** NW

Location: H **Description:** End transect **Compass Reading:** SE


-03 09:52:31 P=-1.6 R=0.1 Y=1.0
5
7-23-[illegible] Circle SW Wetland
1:6000 Horizons, Inc.
C13-61
Circle 2003

Appendix D

BIRD SURVEY PROTOCOL
GPS PROTOCOL

MDT Wetland Mitigation Monitoring
Circle Mitigation Site
Circle, Montana

LAND & WATER

BIRD SURVEY PROTOCOL

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

Species Use within the Mitigation Wetland: Survey Method

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

Sites that can be circumambulated or walked throughout.

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

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

Sites that cannot be circumambulated.

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

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

Species Use within the Mitigation Wetland: Data Recording

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

1. Bird Species List

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

2. Bird Density

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

3. Bird Behavior

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

4. Bird Species Habitat Use

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

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.