
**MONTANA DEPARTMENT OF TRANSPORTATION
WETLAND MITIGATION MONITORING REPORT: YEAR 2006**

*Ringling - Galt
Ringling, Montana*



Prepared for:

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

Prepared by:

POST, BUCKLEY, SCHUH, AND JERNIGAN
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Helena, MT 59624

December 2006

Project No: B43054.00 - 0214



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1.0 INTRODUCTION

The Ringling-Galt wetland mitigation project was constructed in 2000 to provide partial mitigation for projected wetland impacts resulting from Montana Department of Transportation's (MDT) Ringling – North highway reconstruction project. Constructed in Watershed #7 (Missouri-Sun-Smith) and the MDT Butte District, the 20-acre mitigation site is located approximately 7 miles north of Ringling in Meagher County (**Figure 1**). The site occurs on private land (Galt Ranch) located northeast of US Hwy 89, in the Agate Creek drainage.

Design features included minor excavation and placement of a dike across Agate Creek to retain surface water drainage. A primary water control structure was built near the north end of the dike, with an emergency spillway constructed around the north end of the dike. Wetland hydrology is to be primarily provided by surface water from Agate Creek, and supplemented by precipitation. Following construction, the dike and other disturbed areas were seeded with a graminoid seed mix.

No wetland habitat occurred at the site prior to project implementation (Urban pers. comm.). Target wetland communities to be produced at the site included open water/aquatic bed and shallow marsh/wet meadow. Target wetland functions to be provided at the site included habitat diversity, flood control & storage, general wildlife habitat, sediment filtration, and nutrient cycling.

MDT has conducted no formal monitoring; however, MDT personnel have visited the site intermittently. Photographs taken during these visits have not been incorporated into a report format, but are available in the MDT project files. To date, and potentially due to extreme drought conditions, the site has not yet retained enough surface water for a sufficient length of time to begin the establishment of wetland communities. The site was formally monitored in 2001, 2003, 2004, and 2006 but was not monitored in 2002 and 2005 due to extreme drought conditions and lack of surface water. Under yearly guidance by MDT, the site is being monitored twice per year to document wetland and other biological attributes.

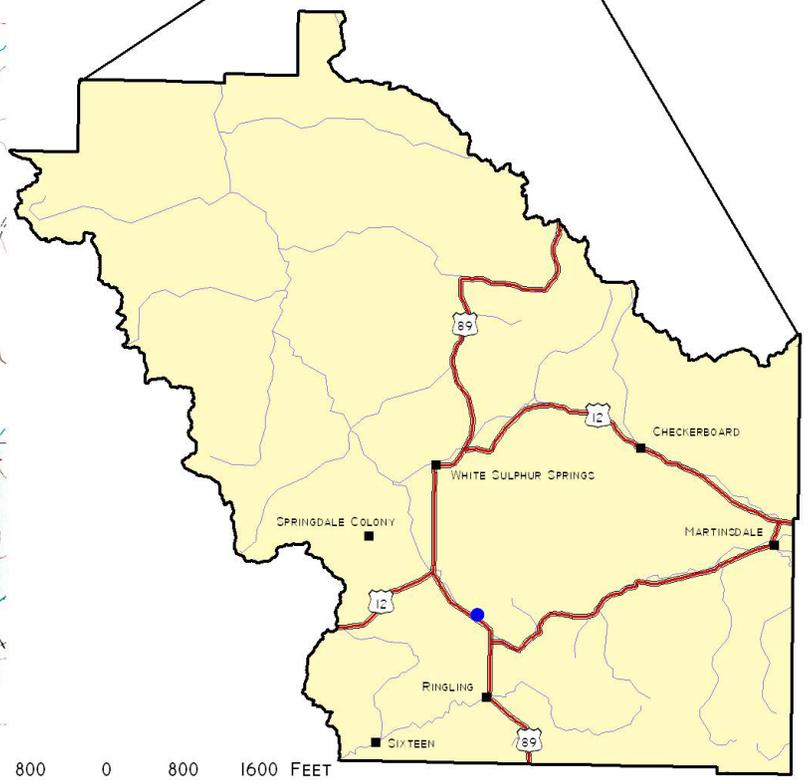
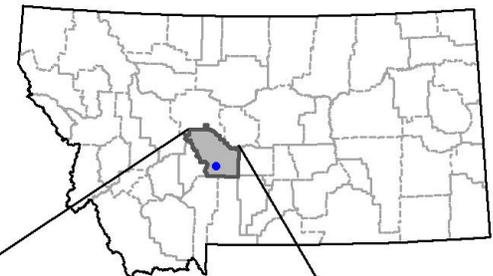
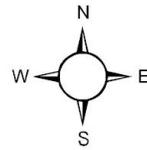
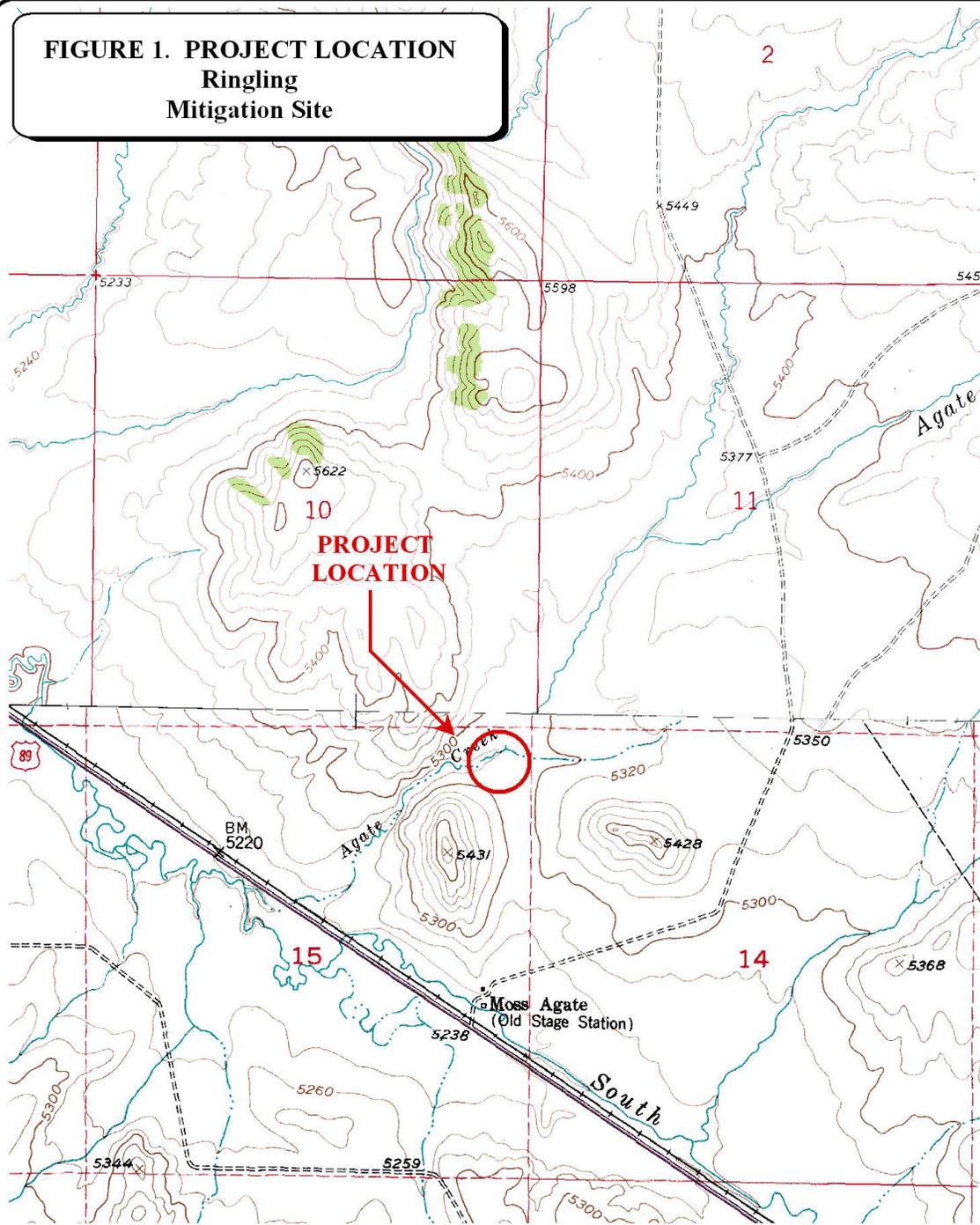
In May 2000, the U.S. Army Corps of Engineers (COE) determined that this site could not be used as permanent mitigation for the Ringling – North project due to the lack of a perpetual conservation easement (COE 2000). Monitoring of the site will proceed in order to document the establishment of wetland habitat to be used as mitigation should the landowner agree to a perpetual conservation easement in the future. The monitoring area is illustrated in **Figure 2 (Appendix A)**.

2.0 METHODS

2.1 Monitoring Dates and Activities

The site was visited on June 14 and August 15, 2006. All information contained on the Wetland Mitigation Site Monitoring Form (**Appendix B**) was collected during these two site visits.

FIGURE 1. PROJECT LOCATION
Ringling
Mitigation Site



1: 24,000

PROJECT #: 130091.015
 DATE: MAY 2001
 LOCATION:
 PROJECT MANAGER: B. DUTTON
 DRAWN BY: B. NOECKER



1120 CEDAR PO BOX 8254 MISSOULA, MT 59807

Activities and information conducted/collected included: vegetation community mapping; vegetation transect; soils data; hydrology data; bird and general wildlife use; photograph points; and (non-engineering) examination of the dike structure. As no wetland habitat has yet established within the monitoring area, wetland delineation was not performed. Consequently, a wetland functional assessment was not performed.

2.2 Hydrology

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

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

2.3 Vegetation

General dominant species-based vegetation community types were delineated on an aerial photograph during the mid-season visit. Standardized community mapping was not employed as many of these systems are geared towards climax vegetation. Estimated percent cover of the dominant species in each community type was recorded on the Wetland Mitigation Site Monitoring Form (**Appendix B**).

The 10-foot wide belt transect that was established in 2001 was evaluated for the fourth time **Figure 2 (Appendix A)**. Percent cover was estimated for each successive vegetative species encountered within the “belt” using the following values: + (<1%); 1 (1-5%); 2 (6-10%); 3 (11-20%); 4 (21-50%); and 5 (>50%). The purpose of the transect is to evaluate changes over time, especially the establishment and increase of hydrophytic vegetation. The transect location was marked on the air photo and all data recorded on the mitigation site monitoring form. Transect endpoint locations were initially recorded in 2001 with the GPS unit. Photos along the transect were taken from both ends during the mid-season visit.

No woody species were planted at the site. Consequently, no monitoring relative to the survival of such species was conducted.

2.4 Soils

Soils were evaluated during the mid-season visit according to procedures outlined in the COE 1987 Wetland Delineation Manual. Soil data were recorded on the COE Routine Wetland Delineation Data Form (**Appendix B**). The most current Natural Resources Conservation Service (NRCS) terminology was used to describe hydric soils (USDA 1998). The Meagher County soil survey has not yet been published by the NRCS; however, a draft copy of

preliminary mapping completed in 2001 was obtained from the NRCS (NRCS 2001). Map units and associated properties listed in this draft survey were used in describing project area soils.

2.5 Wetland Delineation

Wetland delineation was conducted during the mid-season visit according to the 1987 COE Wetland Delineation Manual. The monitoring area was 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 a COE Routine Wetland Delineation Data Form (**Appendix B**).

2.6 Mammals, Reptiles, and Amphibians

Mammal, reptile, and amphibian species observations and other positive indicators of use, such as vocalizations, were recorded on the wetland monitoring form during the site visits. Indirect use indicators, including tracks; scat; burrows; eggshells; skins; bones; etc., were also recorded. These observations were recorded as the observer traversed the site while conducting other required activities. Direct sampling methods, such as snap traps, live traps, and pitfall traps, were not implemented. A comprehensive wildlife species list for the entire site was compiled (**Appendix B**).

2.7 Birds

Bird observations were also recorded during the site visits. No formal census plots, spot mapping, point counts, or strip transects were conducted. Bird observations were recorded incidental to other monitoring activity observations, using the bird survey protocol (**Appendix D**) as a general guideline. Observations were categorized by species, activity code, and general habitat association (**Bird Survey Form** in **Appendix B**). A comprehensive bird list was compiled using these observations.

2.8 Macroinvertebrates

Macroinvertebrate sampling was not conducted at this site per the request of MDT.

2.9 Functional Assessment

A functional assessment, using the 1999 MDT Montana Wetland Assessment Method, was proposed for this site prior to monitoring (Berglund 1999). Upon conducting the mid-season field survey, it was determined that no wetland habitat had yet established within the monitoring area, and therefore a functional assessment was deemed unnecessary for the 2006 monitoring season.

2.10 Photographs

The July 6, 2006 aerial photograph was used as the base for **Figures 2 and 3 (Appendix A)**. Photographs were taken in 2006 showing the current land use surrounding the site, upland buffer, monitored area, and vegetation transect (**Appendix C**). Four photograph points were established and recorded with a resource grade GPS unit in 2001. The approximate locations of these photo points are shown on **Figure 2 (Appendix A)**. All photographs were taken using a digital camera. A description and compass direction for each photograph was recorded on the Wetland Mitigation Site Monitoring Form (**Appendix B**).

2.11 GPS Data

During the 2001 monitoring season, survey points were collected with a resource grade GPS unit at the vegetation transect beginning and ending locations, and at all photograph locations. The procedures used for GPS mapping and aerial photography referencing are included in **Appendix D**. No new GPS data were collected during the 2006 monitoring year.

2.12 Maintenance Needs

The dike near the north end of the site was examined during the 2006 site visit for obvious signs of breaching, damage, or other problems. This did not constitute an engineering-level structural inspection, but rather a cursory examination. Current or future potential problems were documented.

3.0 RESULTS

3.1 Hydrology

During the June site visit, standing water was documented on the site for the second time since monitoring began in 2001 (water was also documented during the spring of 2003). The solid blue line on **Figure 3 in Appendix A** shows the extent of inundation during the June visit and the dashed line represents the area upstream of the dike that was still wet in August. Inundation levels during the mid-season visit were encouraging, as this level of inundation had not been previously documented on the site since monitoring began in 2001.

Agate Creek is an ephemeral tributary of the South Fork of the Smith River and is dammed by the dike constructed for this project. No other dike structures are known in this drainage upstream of the project area. Agate Creek has a defined low water channel, and narrow floodplain, indicating that during most years, water drains through the project area during spring runoff. However, the absence of wetland vegetation within the drainage prior to dike construction indicates that the length of inundation is insufficient to support wetland vegetation.

Drought conditions are likely responsible for the overall lack of water being retained behind the dike since monitoring started. Standing water documented on the site in 2006 is likely due to average to above average precipitation in May and June. According to the Western Regional

Climate Center, White Sulphur Springs yearly precipitation totals for 2001 (9.62 inches), 2002 (10.9 inches), 2003 (10.22), 2004 (11.15), and 2005 (13.42) were 76, 86, 81, 88, and 106 percent, respectively, of the total annual mean precipitation (12.63 inches) in this area.

Surface water retention in 2006 was encouraging, as it was the first time since 2003 that water had been documented on the site. Continued inundation in future years could result in the establishment of wetland habitat where none has yet developed.

3.2 Vegetation

Vegetation species identified on the site are presented in **Table 1** and on the attached data form. Although containing a few hydrophytic species, the site was dominated by upland vegetation. Common species included big sagebrush (*Artemisia tridentata*), bluebunch wheatgrass (*Agropyron spicatum*), western wheatgrass (*Agropyron smithii*), blue grama (*Bouteloua gracilis*), needle-and-thread grass (*Stipa comata*), lupine (*Lupinus sp.*), common yarrow (*Achillea millefolium*), licorice (*Glycyrrhiza lepidota*), iris (*Iris missouriensis*) and hound’s tongue (*Cynoglossum officinale*).

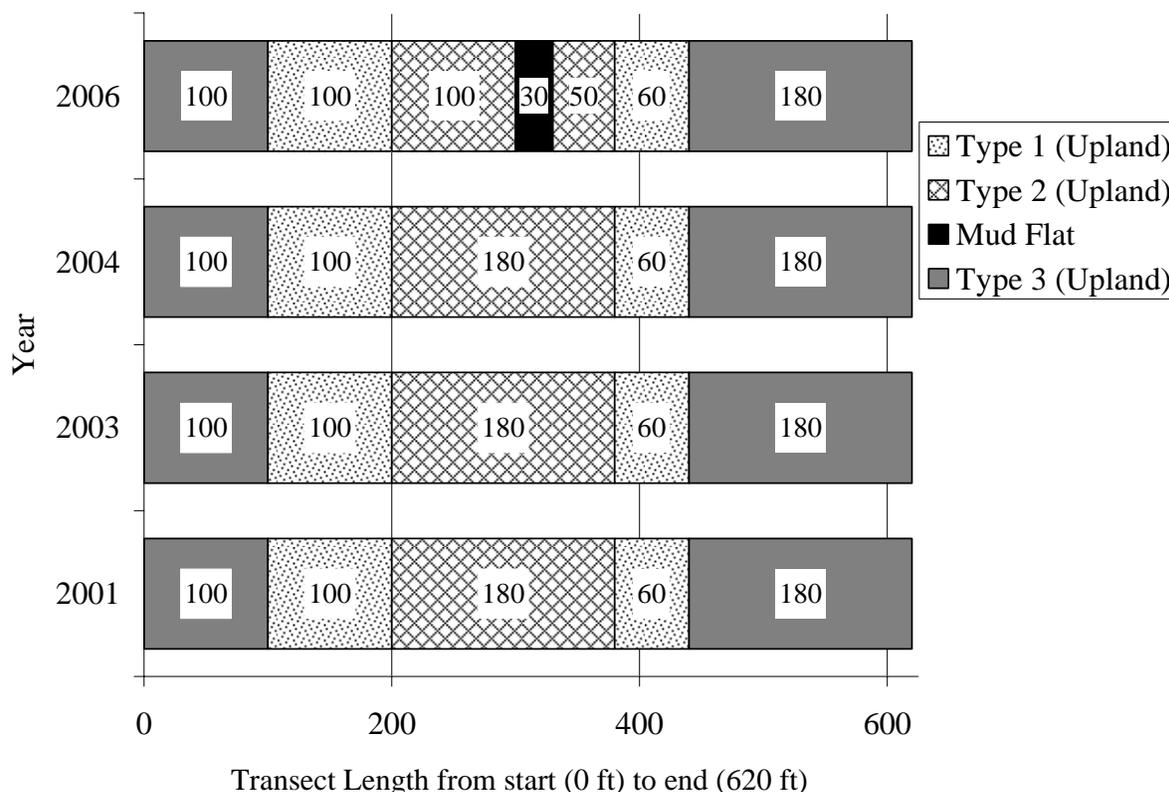
Table 1: 2001 – 2006 vegetation species list for the Ringling - Galt Wetland Mitigation Site.¹

Scientific Name	Region 9 (Northwest) Wetland Indicator
<i>Achillea millefolium</i>	FACU
<i>Agropyron smithii</i>	--
<i>Agropyron spicatum</i>	FACU
<i>Artemisia tridentate</i>	--
<i>Bouteloua gracilis</i>	--
<i>Carex aquatilis</i>	OBL
<i>Cirsium arvense</i>	FAC-
<i>Cynoglossum officinale</i>	--
<i>Glycyrrhiza lepidota</i>	FAC+
<i>Hordeum jubatum</i>	FAC-
<i>Iris missouriensis</i>	FACW+
<i>Juncus balticus</i>	FACW+
<i>Lupinus sp.</i>	FACU
<i>Potentilla anserina</i>	OBL
<i>Rumex crispus</i>	FAC+
<i>Solidago canadensis</i>	FACU
<i>Stipa comata</i>	--
<i>Taraxacum officinale</i>	FACU

¹ **Bolded** species were observed for the first time in 2006.

Vegetation transect results are detailed in the **Monitoring Form (Appendix B)**, and are summarized in the transect map (**Chart 1**). Sagebrush communities dominate the landscape with the exception of a narrow band along the Agate Creek channel, where sagebrush does not persist. This area showed some minor changes in 2006 with trace amounts of hydrophytic vegetation showing up along the channel as a result of inundation. The primary change though was the conversion of upland grass to mud flat. Inundation was sufficiently long to kill the existing upland grasses, but was not replaced in 2006 by emergent wetland species except in trace amounts as previously mentioned. Continued inundation in 2007 would further advance the conversion to wetland habitat in the analysis area.

Chart 1: Transect maps showing vegetation types from the start of transect (0 feet) to the end of transect (620 feet) for each year monitored. Due to lack of water, the site was not monitored in 2002 and 2005.



3.3 Soils

According to the draft Meagher County soil survey , soils at the site are comprised of Martinsdale-Meagher cobbly loams (NRCS 2001). These are moderately well drained to well drained soils that range from loams to clays. This soil type is mapped along the Agate Creek drainage and is not listed as a hydric soil despite having hydric components.

Soils examined adjacent to Agate Creek closely resemble the description provided in the soil survey referenced above. Soils near the surface are a dark loam, with clay/loam from 6-18". Soils were moist to the surface, with saturation at approximately 6" near the creek channel along the vegetation transect.

3.4 Wetland Delineation

Prior to project implementation, MDT did not document any wetland habitat in the analysis area. Despite the fact that water was retained on-site in 2003 and again in 2006, the site has not had sufficient hydrology to begin wetland development and thus no wetlands were delineated within the monitoring area. Continued inundation in future years may result in wetland establishment behind the dike and will be documented during future monitoring.

3.5 Wildlife

Wildlife species, or evidence of wildlife, observed on the site during 2006 monitoring effort are listed in **Table 2**. Specific evidence observed, as well as activity codes pertaining to birds, were recorded onto the **Monitoring Form (Appendix B)**. Ground squirrels (*Spermophilus richardsonii*) are prevalent in the monitoring area, while elk (*Cervus elaphus*), pronghorn antelope (*Antilocapra americana*), and mule deer (*Odocoileus hemionus*) use the area on a seasonal basis. The site received substantial use by waterfowl in 2006, with nesting documented during the spring site visit. When inundated, this site has the potential to serve as waterfowl pair bonding and nesting habitat during the spring and summer months as documented in 2006.

Table 2: 2001 – 2006 fish and wildlife species observed at the Ringling – Galt Wetland Mitigation Site.

FISH, AMPHIBIANS, REPTILES
None
BIRDS
American Kestrel (<i>Falco sparverius</i>)
American Wigeon (<i>Anas americana</i>)
Blue-winged Teal (<i>Anas discors</i>)
Cinnamon Teal (<i>Anas cyanoptera</i>)
Cliff Swallow (<i>Petrochelidon pyrrhonota</i>)
Common Goldeneye (<i>Bucephala clangula</i>)
Common Raven (<i>Corvus corax</i>)
Green-winged Teal (<i>Anas crecca</i>)
Killdeer (<i>Charadrius vociferous</i>)
Mallard (<i>Anas platyrhynchos</i>)
Mourning Dove (<i>Zenaida macroura</i>)
Northern Pintail (<i>Anas acuta</i>)
Northern Shoveler (<i>Anas clypeata</i>)
Redhead (<i>Aythya americana</i>)
Red-tailed Hawk (<i>Buteo jamaicensis</i>)
Western Meadowlark (<i>Sturnella neglecta</i>)
Wilson's Phalarope (<i>Phalaropus tricolor</i>)
MAMMALS
Pronghorn Antelope (<i>Antilocapra americana</i>)
Mule Deer (<i>Odocoileus hemionus</i>) (scat only)
Elk (<i>Cervus elaphus</i>) (scat only)
Richardson's Ground Squirrel (<i>Spermophilus richardsonii</i>)

Bolded species were documented during the 2006 monitoring. All other species have been documented during one or more of the previous monitoring seasons.

3.6 Macroinvertebrates

Macroinvertebrate sampling was not conducted at the Batavia site per the direction of MDT.

3.7 Functional Assessment

As no wetland habitat occurs within the monitoring area, a functional assessment form was not completed for this site.

3.8 Photographs

Representative photos taken from photo-points and transect ends are provided in **Appendix C**.

3.9 Maintenance Needs/Recommendations

The dike, water control structure, and emergency spillway were generally in good condition during the mid-season visit. Cattle are using the standpipe near the top of the dike as a scratching post; however, it does not appear as though the pipe has sustained any damage from such use.

In general, it appears that the water available to the site is insufficient during some years to support the proposed wetland creation. This is likely due to persistent drought conditions in the area. However, according to NRCS personnel familiar with the drainage (Brooker pers. comm.), Agate Creek flows enough water during years of normal or above normal precipitation, to flood the basin behind the dike. Monitoring of the site will continue to document any changes that may occur as a result of increased water delivery to the site through runoff and precipitation.

At this time, no corrective actions are recommended, as lack of wetland development to date has apparently resulted from sub-normal precipitation and runoff.

3.10 Current Credit Summary

As previously stated, in May 2000, the COE determined that this site could not be used as permanent mitigation for the Ringling – North project due to the lack of a perpetual conservation easement. No specific performance criteria were required to be met at this site in order to document its success. To date, the site has yet to create any wetland habitat and therefore no credit, COE approved or otherwise, for wetland creation can be attributed to this project. At its maximum in 2006, the site supported 2.54 acres of non-wetland aquatic habitat (open water). Through evaporation and infiltration, the amount of open water decreased to 0.82 acres at the time of the mid-season site visit on August 15th.

Given the lack of wetland development since the project was constructed in 2000, MDT has decided to suspend monitoring at this site until 2009 (Urban pers. comm.).

4.0 REFERENCES

- Berglund, J. 1999. *MDT Montana Wetland Assessment Method*. May 25th. Prepared for Montana Department of Transportation and Morrison-Maierle, Inc. Prepared by Western EcoTech. Helena, Montana. 18 pp.
- Brooker J. 2002. Project Leader, Natural Resources Conservation Service. White Sulpher Springs, MT. Telephone conversation.
- Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual*. US Army Corps of Engineers. Washington, DC.
- Natural Resources Conservation Service (NRCS). 2001. Draft Meagher County soil mapping. USDA, NRCS, White Sulpher Springs, MT. Unpublished Data.
- Natural Resources Conservation Service. 1998. *Field Indicators of Hydric Soils in the United States*, Version 4. G. Hurt, P. Whited and R. Pringle (eds.). USDA, NRCS Fort Worth, TX.
- Natural Resource Information System. 2001. Montana Watershed Mountain Snow Water Equivalent data. Helena, MT. <http://nris.state.mt.us/Nrcs/Snowwater.html>
- Reed, P.B. 1988. National list of plant species that occur in wetlands: North West (Region 9). Biological Report 88(26.9), May 1988. U.S. Fish and Wildlife Service. Washington, D.C.
- Ralph, C.J., Geupel, G.R., Pyle, P., Martin, T.E., and D.F. DeSante. 1993. *Handbook of field methods for monitoring landbirds*. Gen. Tech. Rep. PSW-GTR-144. Albany, CA: Pacific Southwest Research Station, Forest Service, U.S. Dept. of Agriculture. 41 p.
- Urban, L. Wetland Mitigation Specialist, Montana Department of Transportation. Helena, MT. May 29, 2001 meeting; December 15, 2006 meeting.
- US Army Corps of Engineers (COE). 2000. 404 Permit, Action ID Number 2000-90-311 for MDT's proposed Ringling North highway reconstruction. Helena, MT.

Appendix A

FIGURES 2 & 3

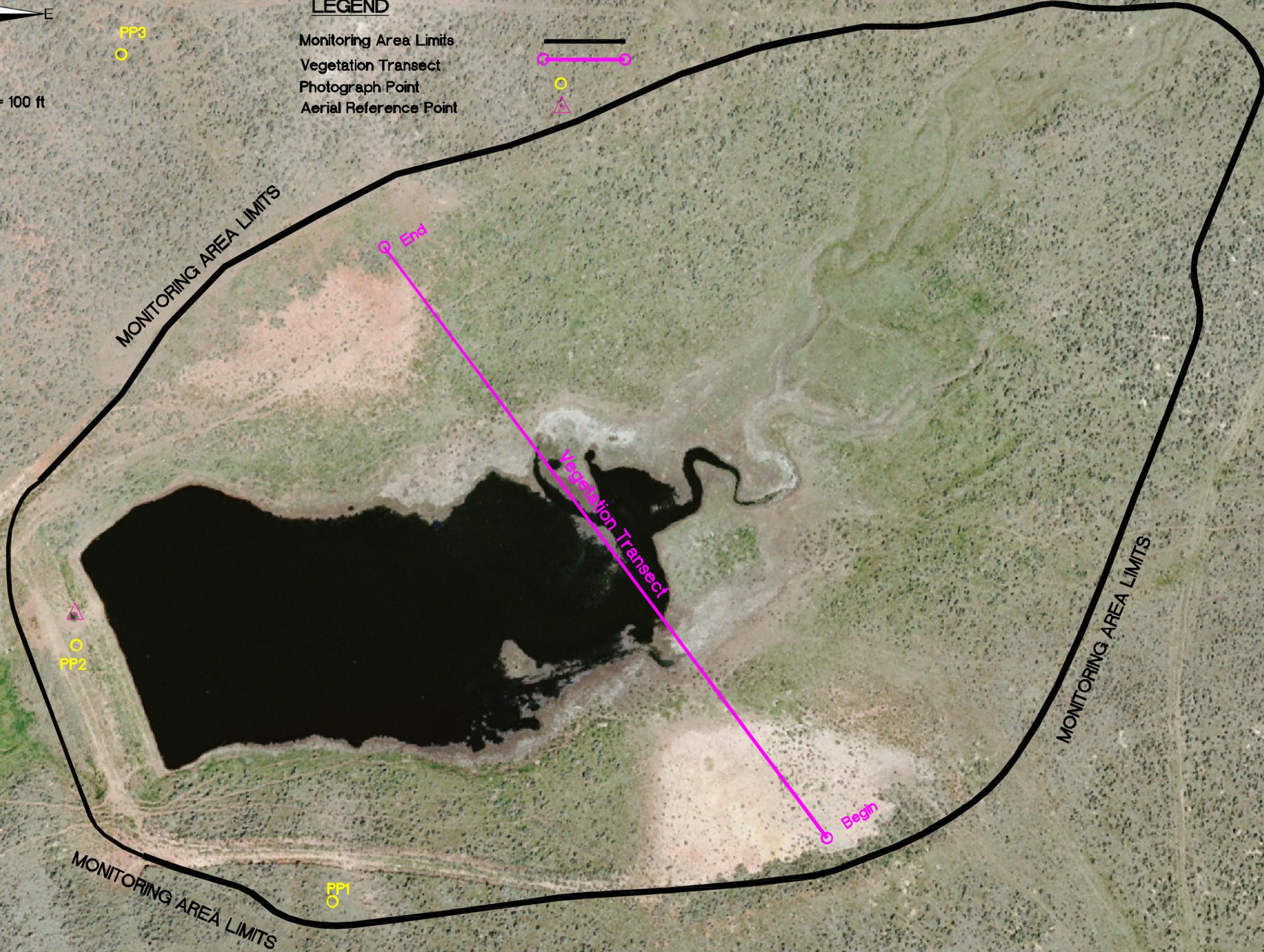
*MDT Wetland Mitigation Monitoring
Ringling-Galt
Ringling, Montana*

Figure 2- Monitoring Activity Locations



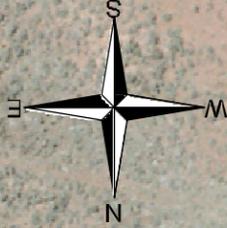
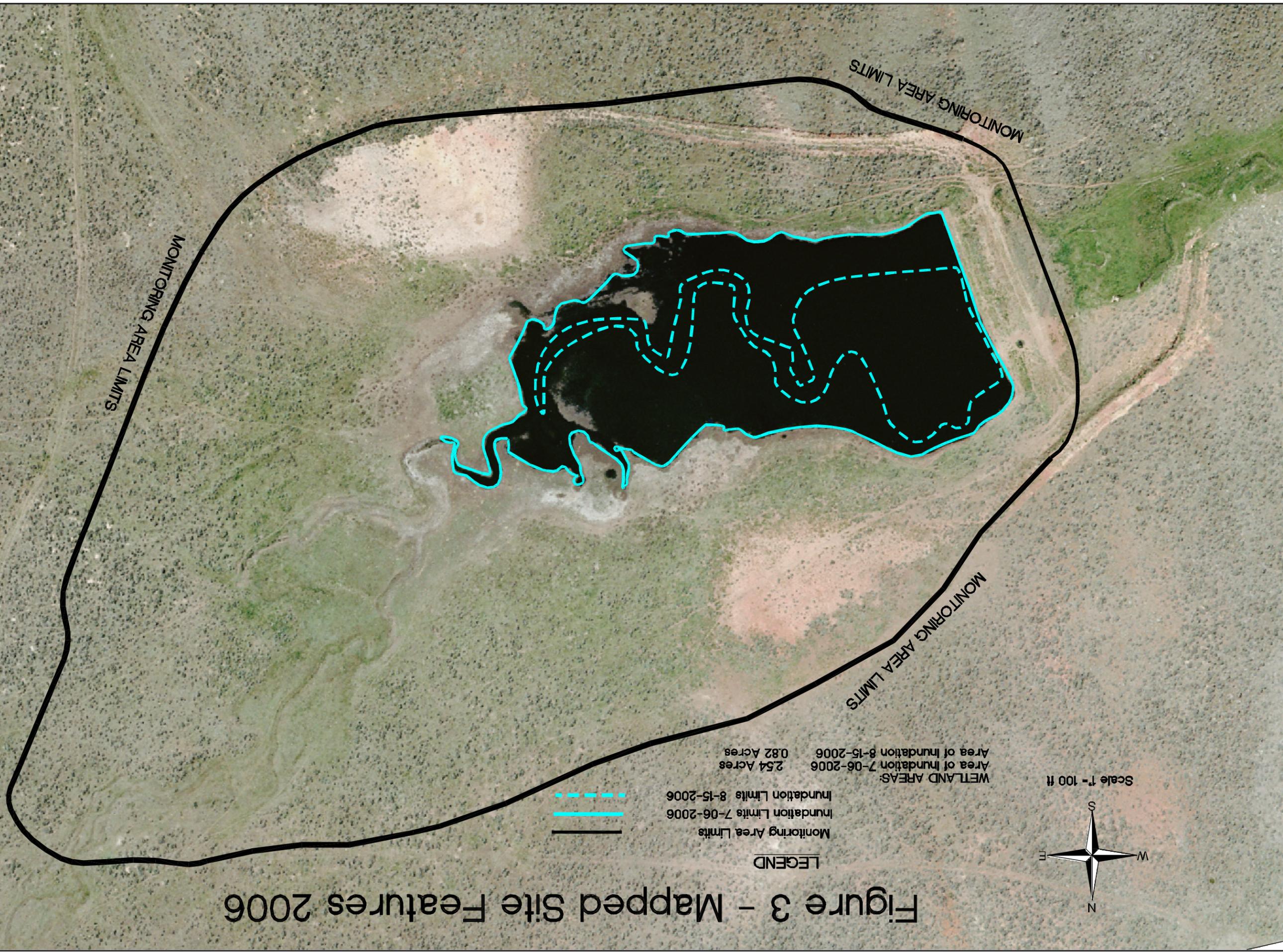
LEGEND

- Monitoring Area Limits
- Vegetation Transect
- Photograph Point
- Aerial Reference Point



PROJECT NAME		MDT Ringling/Gault Wetland Mitigation	
DRAWING TITLE		Monitoring Activities Locations	
PROJ. NO:	B43054.00 0214	DRAWN:	RAA
LOCATION:	Ringling/Gault	PROJ. MGR:	JB
SCALE:	1"=100ft	CHECKED:	MT
FILE NAME:	L:\B43054.0214\Ringling\dwg\Task214Base2006.dwg	APP'D:	JB
1120 Cedar Missoula, MT 59802			
FIGURE		2 OF	
REV -		Nov/20/2006	

Figure 3 - Mapped Site Features 2006



Scale 1" = 100 ft

LEGEND

Monitoring Area Limits



Inundation Limits 7-06-2006



Inundation Limits 8-15-2006



WETLAND AREAS:

Area of Inundation 7-06-2006

2.54 Acres

Area of Inundation 8-15-2006

0.82 Acres

REV - Nov/20/2006	FIGURE 3	PROJECT NAME MDT Ringling/Gault Wetland Mitigation
		DRAWING TITLE Mapped Site Features
		PROJ NO: B43054.00 0214
		DRAWN: RAA
		LOCATION: Ringling/Gault
		PROJ MGR: JB
		CHECKED: MT
		APPVD: JB
		SCALE: 1"=100ft
		FILE NAME: L:\B43054.0214\Ringling\dwg\Task\214Base\2006.dwg
		1120 Cedar Missoula, MT 59802
		PBSJ

Appendix B

2006 WETLAND MITIGATION SITE MONITORING FORM
2006 BIRD SURVEY FORMS
2006 COE WETLAND DELINEATION FORMS

MDT Wetland Mitigation Monitoring
Ringling-Galt
Ringling, Montana

LWC / MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name: Ringling - Galt Project Number: B43054.00 – 0214 Assessment Date: 8/15/06
 Location: 7 miles N of Ringling MDT District: Butte Milepost: _____
 Legal description: T7N R7E Section 15 Time of Day: 1000-1300
 Weather Conditions: Cloudy approx. 75degrees Person(s) conducting the assessment: Traxler
 Initial Evaluation Date: 5 / 29 / 01 Visit #: 8 Monitoring Year: 2006 (year 6)
 Size of evaluation area: 10+ acres Land use surrounding wetland: Agriculture, grazing,

HYDROLOGY

Surface Water Source: Agate Creek
 Inundation: Present Absent _____ Average depths: 12" Range of depths: 0-24"
 Assessment area under inundation: 20%
 Depth at emergent vegetation-open water boundary: NA – no emergent vegetation
 If assessment area is not inundated are the soils saturated w/in 12" of surface: Yes ___ No ___
 Other evidence of hydrology on site (drift lines, erosion, stained vegetation etc.):

Groundwater

Monitoring wells: Present _____ Absent
 Record depth of water below ground surface

Well #	Depth	Well #	Depth	Well #	Depth

Additional Activities Checklist:

- Map emergent vegetation-open water boundary on air photo
- Observe extent of surface water during each site visit and look for evidence of past surface water elevations (drift lines, erosion, vegetation staining etc.)
- NA GPS survey groundwater monitoring wells locations if present

COMMENTS/PROBLEMS:

VEGETATION COMMUNITIES

Community No.: 1 Community Title (main species): ARTTRI - Upland

Dominant Species	% Cover	Dominant Species	% Cover
ARTTRI	21-50		
AGRSPI	21-50		
AGRSMI	21-50		
Lupinus	11-20		

COMMENTS/PROBLEMS:

Community No.: 2 Community Title (main species): IRI MIS / HOR JUB - Upland

Dominant Species	% Cover	Dominant Species	% Cover
IRI MIS	21-50	CAR AQU	<1
ACHMIL	21-50	POT ANS	<1
HOR JUB	21-50		
STICOM	21-50		
RUM CRI	1-5		

COMMENTS/PROBLEMS: Occurs along drainage bottom

Community No.: 3 Community Title (main species): CYNOFF

Dominant Species	% Cover	Dominant Species	% Cover
CYNOFF	11-20		
SOLCAN	11-20		

COMMENTS/PROBLEMS: **Disturbed area where dike material was obtained. Area is less than 50% vegetated. Some Type 2 converted to mud flat due to prolonged inundation that killed upland plants.**

Additional Activities Checklist:

Record and map vegetative communities on air photo

PHOTOGRAPHS

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

Checklist:

- 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		See photo sheets	
B			
C			
D			
E			
F			
G			
H			

COMMENTS/PROBLEMS: _____

GPS SURVEYING

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

Checklist:

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

COMMENTS/PROBLEMS: GPS unit was not utilized during the 2006 monitoring.

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

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

COMMENTS/PROBLEMS: See attached completed delineation form. No wetland habitat on-site.

FUNCTIONAL ASSESSMENT

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

COMMENTS/PROBLEMS: NA

MAINTENANCE

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

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

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

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

YES X NO

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

If no, describe the problems below.

COMMENTS/PROBLEMS: .

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

Project / Site: <u>Ringling - Galt</u> Applicant / Owner: <u>MDT</u> Investigator: <u>PBSJ - Traxler</u>	Date: <u>August 15, 2006</u> County: <u>Meagher</u> State: <u>Montana</u>
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Do Normal Circumstances exist on the site? <u>No</u> Is the site significantly disturbed (Atypical Situation)? <u>No</u> Is the area a potential Problem Area? <u>No</u> (If needed, explain on reverse side)	Community ID: <u>Upland</u> Transect ID: _____ Plot ID: <u>1</u>
---	--

VEGETATION (USFWS Region 9: Northwest)

Dominant Species	Stratum	Indicator	Dominant Species	Stratum	Indicator
1. <i>Agropyron spicatum</i>	Herb	FACU-	11.		
2. <i>Glycyrrhiza lepidota</i>	Herb	FAC+	12.		
3. <i>Achellia millefolium</i>	Herb	FACU	13.		
4. <i>Iris missouriensis</i>	Herb	FACW+	14.		
5. <i>Agropyron smithii</i>	Herb	FACU	15.		
6.			16.		
7.			17.		
8.			18.		
9.			19.		
10.			20.		
Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): 2 / 5 = 40%			FAC Neutral: 1 / 4 = 25%		
Remarks: <u>Upland plot near Agate Creek channel</u>					

HYDROLOGY

<u>No</u> Recorded Data (Describe in Remarks): <u>N/A</u> Stream, Lake, or Tide Gauge <u>No</u> Aerial Photographs <u>N/A</u> Other <u>No</u> No Recorded Data	Wetland Hydrology Indicators Primary Indicators: <u>NO</u> Inundated <u>YES</u> Saturated in Upper 12 Inches <u>NO</u> Water Marks <u>YES</u> Drift Lines <u>NO</u> Sediment Deposits <u>YES</u> Drainage Patterns in Wetland Secondary Indicators (2 or more required): <u>NO</u> Oxidized Root Channels in Upper 12 inches <u>NO</u> Water-Stained Leaves <u>NO</u> Local Soil Survey Data <u>NO</u> FAC-Neutral Test <u>NO</u> Other (Explain in Remarks)
Field Observations: Depth of Surface Water <u>N/A</u> ____ (in.) Depth to Free Water in Pit = <u>10</u> (in.) Depth to Saturated Soil = <u>6</u> (in.)	
Remarks: <u>For first time since monitoring began, plot along Agate Creek was saturated in upper 12"</u>	

SOILS

Map Unit Name (Series and Phase): **Martinsdale Meagher cobbly loams**
 Map Symbol: **554B** Drainage Class: **na** Mapped Hydric Inclusion? **_**
 Taxonomy (Subgroup): **na** Field Observations confirm Mapped Type? **Yes**

Profile Description					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color(s) (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
6	A	10 YR 3/2	/	N/A	Loam
			/	N/A	
12	B	10 YR 4/2	/	N/A	Clay Loam
			/	N/A	
		/	/	N/A	
		/	/	N/A	
		/	/	N/A	
		/	/	N/A	

Hydric Soil Indicators:

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

Remarks: **Soils were unchanged in 2006 in spite of being saturated. Prolonged saturation is needed in order to develop hydric soil characteristics.**

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <u>NO</u>	Is this Sampling Point within a Wetland? <u>NO</u>
Wetland Hydrology Present? <u>YES</u>	
Hydric Soils Present? <u>NO</u>	

Remarks: **Hydrology was present in 2006 but not the vegetation or hydric soils. No wetland on site.**

Appendix C

2006 REPRESENTATIVE PHOTOGRAPHS

*MDT Wetland Mitigation Monitoring
Ringling-Galt
Ringling, Montana*

2006 RINGLING – GALT WETLAND MITIGATION SITE



Photo Point 2, 85 degrees E. Photo Date: 8/15/06



Photo Point 3, 180 degrees S. Photo Date: 8/15/06



Photo Point 2, 200 degrees SW. Photo Date: 8/15/06



Photo Point 1, 0 degrees N. Photo Date: 8/15/06



Vegetation Transect Start, 330 degrees NW. Photo Date: 8/15/06



Vegetation Transect End, 150 degrees SE. Photo Date: 8/15/06

Appendix D

BIRD SURVEY PROTOCOL GPS PROTOCOL

*MDT Wetland Mitigation Monitoring
Ringling-Galt
Ringling, Montana*

BIRD SURVEY PROTOCOL

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

Species Use within the Mitigation Wetland: Survey Method

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

Sites that can be circumambulated or walked throughout.

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

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

Sites that cannot be circumambulated.

These types of sites will include large-bodied waters, such as reservoirs, particularly those with deep water habitat (>6 ft) close to the shore and no wetland development in that area of the shoreline. If one area of the reservoir was graded in such a way to create or enhance the development of a wetland, then that will be the area in which the

ambulatory bird survey is conducted. The team member must then determine the length of the shoreline that will be surveyed during each visit.

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

Species Use within the Mitigation Wetland: Data Recording

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

1. Bird Species List

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

2. Bird Density

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

3. Bird Behavior

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

4. Bird Species Habitat Use

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

GPS MAPPING AND AERIAL PHOTO REFERENCING PROCEDURE

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

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

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

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