MONTANA DEPARTMENT OF TRANSPORTATION
WETLAND MITIGATION MONITORING REPORT: YEAR 2009

Ringling - Galt
Ringling, Montana

Prepared for:

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

Prepared by:

POST, BUCKLEY, SCHUH, AND JERNIGAN
820 North Montana Avenue, Suite A
Helena, MT 59601

December 2009

PBS&J Project No: 0B4308802.03.06

MONTANA DEPARTMENT OF TRANSPORTATION

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MDT Project Number F 59-2(4)49
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TABLE OF CONTENTS

1.0 INTRODUCTION.....1

2.0 METHODS.....1

2.1 Monitoring Dates and Activities.....1

2.2 Hydrology.....3

2.3 Vegetation.....3

2.4 Soils.....3

2.5 Wetland Delineation.....4

2.6 Mammals, Reptiles and Amphibians.....4

2.7 Birds.....4

2.8 Macroinvertebrates.....4

2.9 Functional Assessment.....4

2.10 Photographs.....5

2.11 GPS Data.....5

2.1.2 Maintenance Needs.....5

3.0 RESULTS.....5

3.1 Hydrology.....5

3.2 Vegetation.....6

3.3 Soils.....8

3.4 Wetland Delineation.....8

3.5 Wildlife.....8

3.6 Macroinvertebrates.....9

3.7 Functional Assessment.....9

3.8 Photographs.....9

3.9 Maintenance Needs / Recommendations.....9

3.10 Current Credit Summary.....10

4.0 REFERENCES.....11

TABLES

Table 1 *Vegetation species observed from 2001 to 2006 and in 2009 at the Ringling - Galt Wetland Mitigation Site.*

Table 2 *Fish and wildlife species observed at the Ringling – Galt Wetland Mitigation Site from 2001 to 2006 and in 2009.*

FIGURES

Figure 1 *Project Site Location Map*

Figure 2 *Monitoring Activity Locations 2009*

Figure 3 *Mapped Site Features 2009*

CHART

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.*

APPENDICES

Appendix A *Figures 2 & 3*

Appendix B *2009 Wetland Mitigation Site Monitoring Form*
2009 Bird Survey Form
2009 COE Wetland Delineation Form

Appendix C *2009 Representative Photographs*

Appendix D *Bird Survey Protocol*
GPS Protocol

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.

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, 2006, and 2009 but was not monitored in 2002, 2005, 2007 or 2008 due to extreme drought conditions and lack of surface water. Under guidance from MDT, 2009 is to be the last year of monitoring at this site.

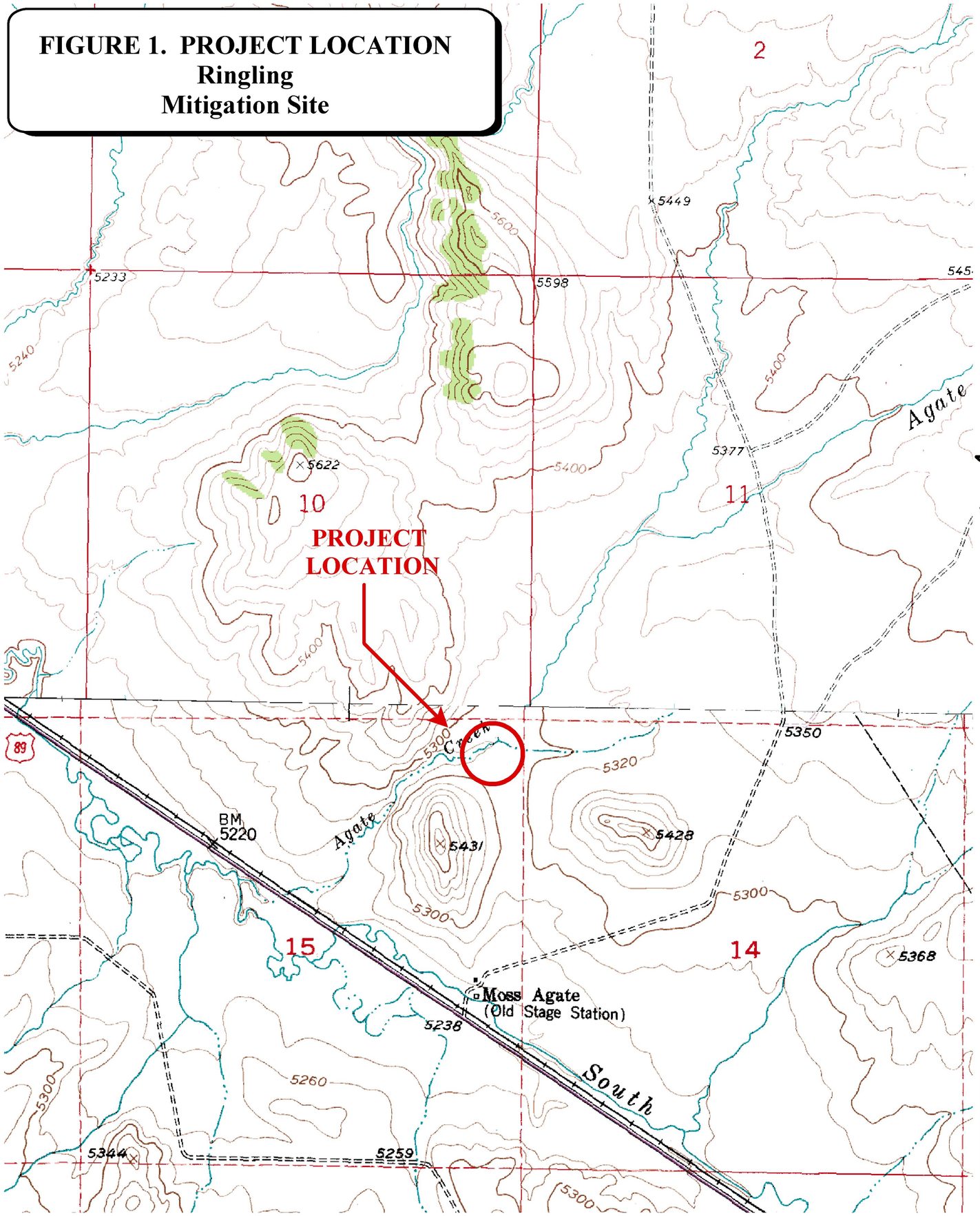
In May 2000, the U.S. Army Corps of Engineers (COE) determined that this site could not be used as permanent mitigation for the Ringling – North project due to the lack of a perpetual conservation easement (COE 2000). Periodic monitoring of the site proceeded in order to document the establishment of 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**).

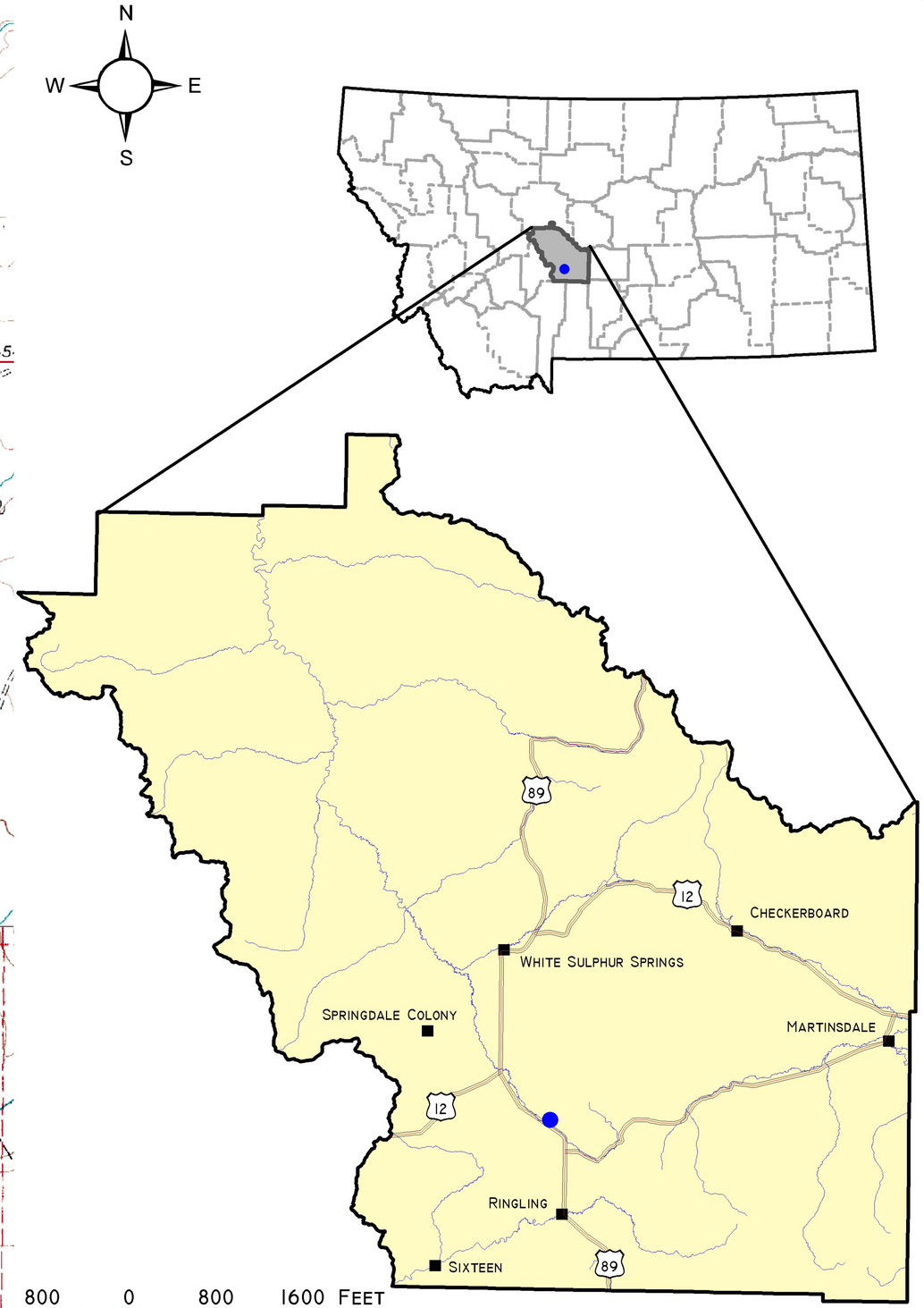
2.0 METHODS

2.1 Monitoring Dates and Activities

The site was visited on August 19, 2009. All information contained on the Wetland Mitigation Site Monitoring Form was collected during this site visit (**Appendix B**).

FIGURE 1. PROJECT LOCATION
Ringling
Mitigation Site





800 0 800 1600 Feet

1: 24,000

PROJECT #: 0B4308802.03.06
DATE: October 2009
LOCATION: Ringling, MT
PROJ. MANAGER: Jeff Berglund
DRAWN BY: B. Noecker / MSA

PBS&J
1120 Cedar Street
Missoula, MT 59802

Activities and information conducted/collected included: vegetation community mapping; vegetation transect; soils data; hydrology data; wetland delineation; 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, 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 fifth 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 was 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 a global positioning system (GPS) unit. Photographs were taken along the transect from both end points.

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 site 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 (NRCS 20068). 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 the 1987 COE Wetland Delineation Manual. In July 2008, consultation with the COE (Steinle pers. comm.) confirmed that, where the 1987 manual was used to establish baseline wetland conditions at MDT wetland mitigation sites, it should continue to be applied at such sites for the duration of the monitoring period. Consequently, application of the *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (COE 2008) was not required or undertaken at this site in 2009. 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 Mitigation Monitoring Form during the site visit (**Appendix B**). 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.

2.7 Birds

Bird observations were recorded during the site visit. 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 as a general guideline (**Appendix D**). Observations were categorized by species, activity code, and general habitat association (**Bird Survey Form** in **Appendix B**).

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 2009 monitoring season.

2.10 Photographs

The July 9, 2009 aerial photograph was used as the base for **Figures 2** and **3** (**Appendix A**). Photographs were taken in 2009 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. 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, vegetation transect beginning and ending locations and all photograph locations were mapped using a resource grade GPS unit. Procedures used for GPS mapping and aerial photography referencing are included in **Appendix D**. No new GPS data were collected during the 2009 monitoring year.

2.12 Maintenance Needs

The dike near the north end of the site was examined during the 2009 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 August site visit, standing water was documented on the site for the third time since monitoring began in 2001 (water was also documented during the spring of 2003 and summer 2006). The solid blue line on **Figure 3** shows the extent of inundation during the August visit (**Appendix A**). However, the extent of inundation earlier in the summer extended beyond this line as clearly shown on the aerial photograph. Inundation levels during the site visit were encouraging. Strong numbers of waterfowl and shorebirds used the site; cattle were clearly using the site as a watering hole.

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 and 2009 is likely due to average to above average precipitation in May and June. According to the Western Regional Climate Center (WRCC), White Sulphur Springs yearly precipitation totals for 2001 (9.62 inches (in)), 2002 (10.9 in), 2003 (10.22 in), 2004 (11.15 in), 2005 (13.42 in), 2006 (11.45 in), 2007 (9.28 in), and 2008 (12.76 in) were 76, 86, 81, 88, 106, 93, 75, and 103 percent, respectively, of the total annual mean precipitation (12.31 in). Through September of 2009, precipitation levels were about average for this region of Montana.

Surface water retention in 2009 was encouraging, as it was the first time since 2006 that water had been documented on the site. Continued inundation for consecutive years should result in the establishment of wetland habitat. To date, periodic inundation sandwiched between dry years has not resulted in the establishment of wetland habitat.

3.2 Vegetation

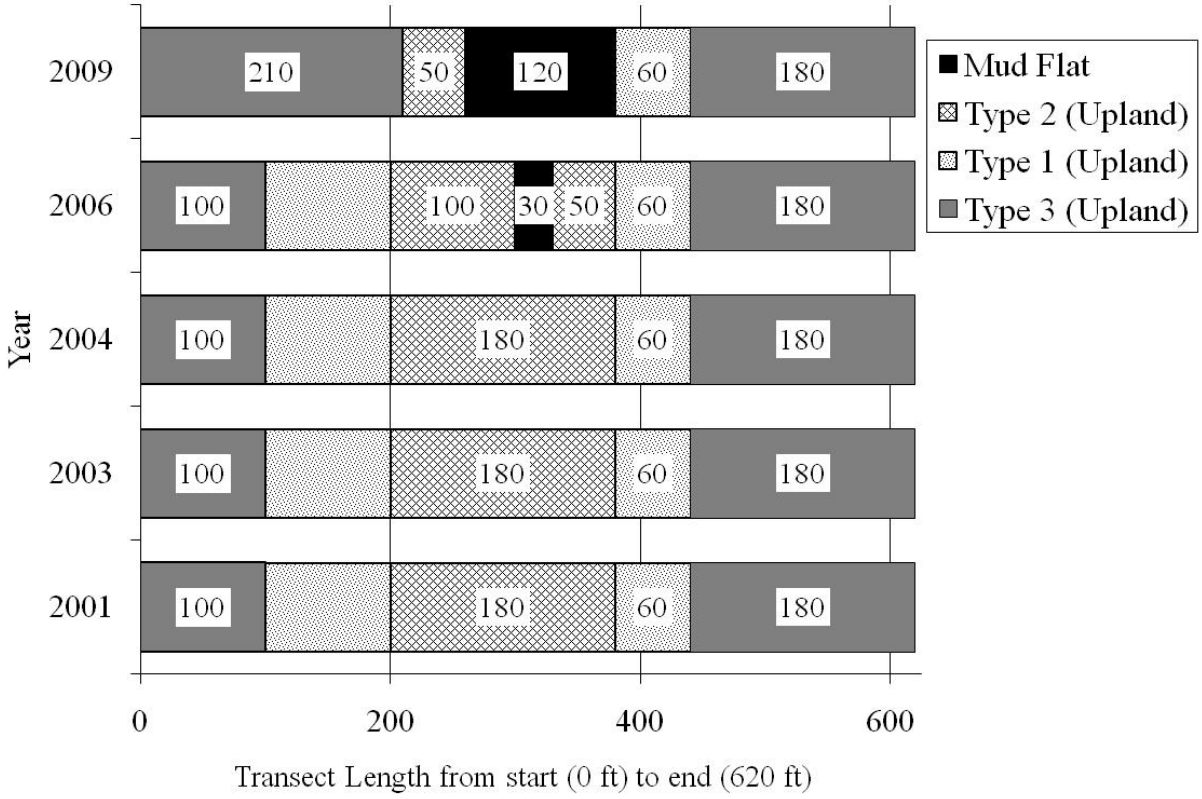
Vegetation species identified on the site are presented in **Table 1** and in the **Monitoring Form** in **Appendix B**. No new species were identified in 2009 at the site. Although containing a few hydrophytic species, the site is dominated by upland vegetation. Common species include big sagebrush (*Artemesia 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*).

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 little change in 2009 with trace amounts of hydrophytic vegetation appearing 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 2009 by emergent wetland species except in trace amounts as previously mentioned. Continued inundation in 2010 and beyond would further advance the conversion to wetland habitat in the analysis area

Table 1: ***Vegetation species observed from 2001 to 2006 and in 2009 at the Ringling - Galt Wetland Mitigation Site.***

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

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.***



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 saturated to the surface 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 the site in 2003, 2006, and 2009 the site has not had sufficient and consistent hydrology to begin wetland development; thus, no wetlands were delineated within the monitoring area. Continued inundation in future years may result in wetland establishment behind the dike; however, this might take several consecutive years of inundation. Consistent inundation has not been documented in the eight years of monitoring at the site.

3.5 Wildlife

A comprehensive list of wildlife species (or their sign) observed during each monitoring year has been compiled for the project site (**Table 4**). Details on wildlife observations for 2009 are in the **Monitoring Form** and **Bird Survey Form** in **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 and shorebirds in 2009, with nesting documented during the site visit. When inundated this site serves as waterfowl pair bonding and nesting habitat during the spring and summer months, as documented in 2009.

Table 2: ***Fish and wildlife species observed at the Ringling – Galt Wetland Mitigation Site from 2001 to 2006 and in 2009.***

FISH, AMPHIBIAN, and REPTILE None	
BIRD American Kestrel (*Falco sparverius*) **American Wigeon (*Anas americana*)** **Blue-winged Teal (*Anas discors*)** **Cinnamon Teal (*Anas cyanoptera*)** Cliff Swallow (*Petrochelidon pyrrhonota*) Common Goldeneye (*Bucephala clangula*) Common Raven (*Corvus corax)* **Green-winged Teal (*Anas crecca*)** **Killdeer (*Charadrius vociferous*)**	**Mallard (*Anas platyrhynchos*)** Mourning Dove (*Zenaida macroura*) Northern Pintail (*Anas acuta*) Northern Shoveler (*Anas clypeata*) Redhead (*Aythya americana*) Red-tailed Hawk (*Buteo jamaicensis)* **Spotted Sandpiper (*Actitis macularia*)** Western Meadowlark (*Sturnella neglecta*) Wilson's Phalarope (*Phalaropus tricolor*)-
MAMMAL **Pronghorn Antelope (*Antilocapra americana*)** **Mule Deer (*Odocoileus hemionus*)** **Elk (*Cervus elaphus*)**	**Richardson's Ground Squirrel (*Spermophilus richardsonii*)** **Chipmunk (*Tamias* sp.)**

Bolded species were documented during the 2009 monitoring year. All other species have been documented during one or more of the previous monitoring years.

3.6 Macroinvertebrates

Macroinvertebrate sampling was not conducted at the Ringling - Galt 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.

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. 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. In August 2009, the site supported 2.24 acres of non-wetland aquatic habitat (open water) and up to 3.00 acres earlier in the spring/summer.

Given the lack of wetland development since the project was constructed in 2000, and the lack of a perpetual conservation easement at the site, MDT has decided to terminate monitoring at this site (Urban pers. comm.).

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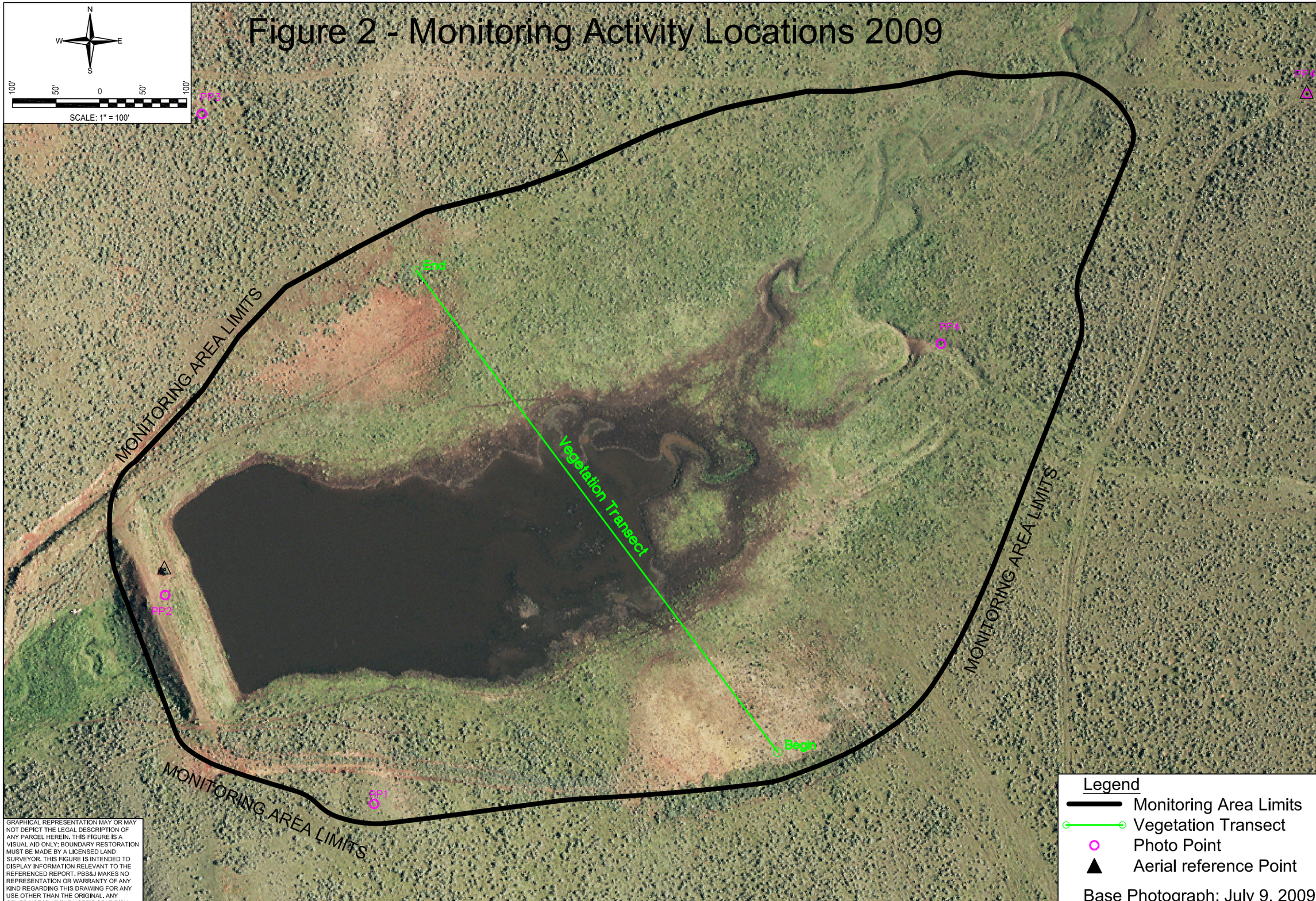
Appendix A

FIGURES 2 & 3

MDT Wetland Mitigation Monitoring
Ringling-Galt
Ringling, Montana

Figure 2 - Monitoring Activity Locations 2009



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MDT RINGLING GALT WETLAND MITIGATION

MONITORING ACTIVITY LOCATIONS 2009

PROJ NO: 0B4308802 03.06	DRAWN: JR		
LOCATION: RINGLING, MT	PROJ MGR: J. BERGLUND		
SCALE: NOTED	CHECKED: MT	APPVD: JB	
FILE NAME: BASE 2009.dwg	PLOTTED: Nov/20/2009		

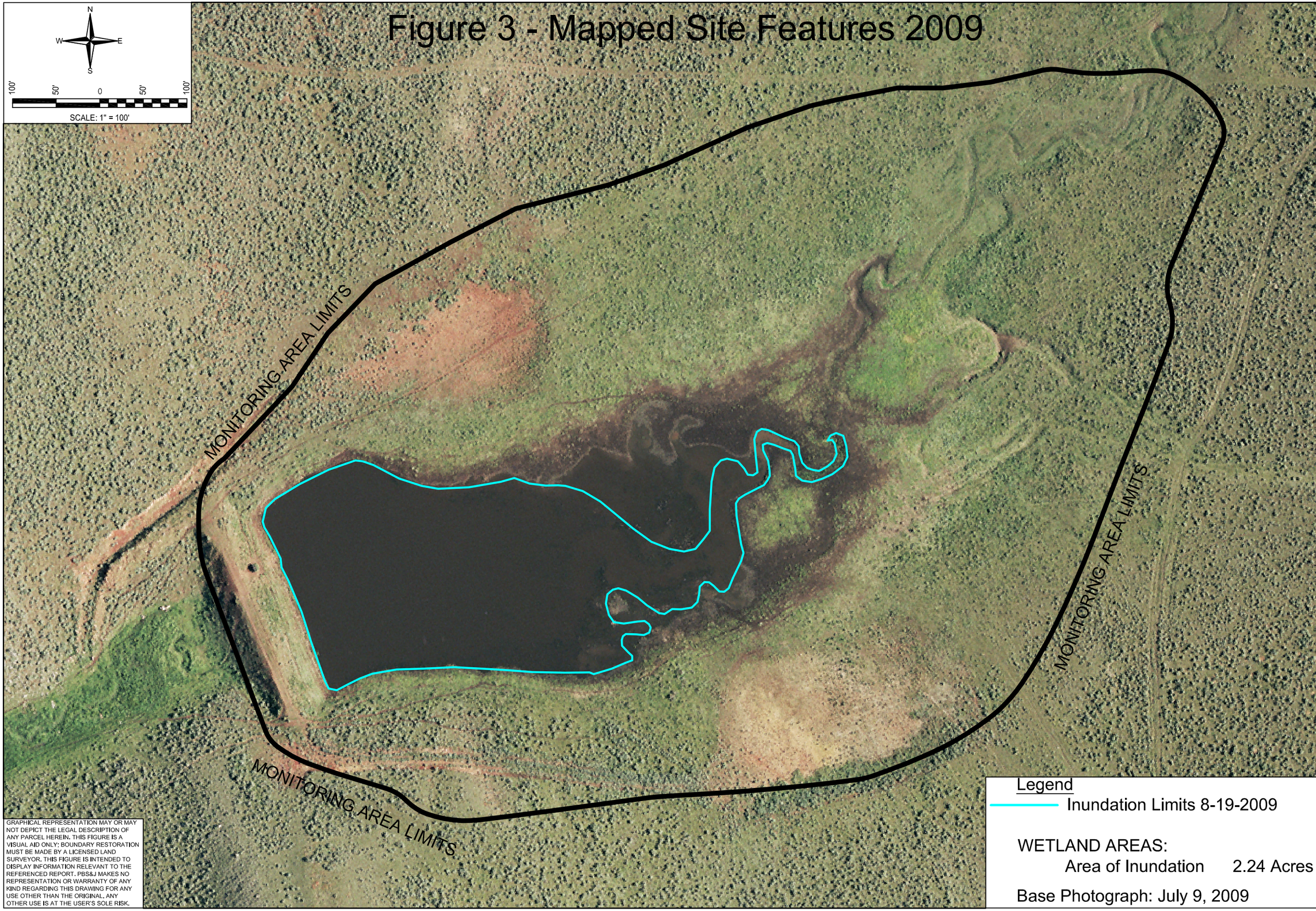
PBSJ
801 N. Last Chance Gulch
Suite 100
Helena, MT 59601

FIGURE 2

REV -

DATE 10/09/2009

Figure 3 - Mapped Site Features 2009



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MDT RINGLING GALT WETLAND MITIGATION

MAPPED SITE FEATURES 2009

PROJ NO: 0B4308802 03.06	DRAWN: JR
LOCATION: RINGLING, MT	PROJ MGR: J. BERGLUND
SCALE: NOTED	CHECKED: MT / APPVD: JB
FILE NAME: BASE 2009.dwg	PLOTTED: Oct/27/2009

PBSJ
801 N. Last Chance Gulch
Suite 100
Helena, MT 59601

FIGURE 3

REV -

DATE 10/09/2009

Appendix B

2009 WETLAND MITIGATION SITE MONITORING FORM
2009 BIRD SURVEY FORM
2009 COE WETLAND DELINEATION FORM

MDT Wetland Mitigation Monitoring
Ringling-Galt
Ringling, Montana

PBS&J / MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name: **Ringling - Galt** Project Number: **_0B408802.03.06.02** Assessment Date: **8/19/09**
Location: **7 miles N of Ringling** MDT District: **Butte__** Milepost: _____
Legal description: T**7N** R**7E** 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 #:**__9__** Monitoring Year: **2009 (year 5)**
Size of evaluation area: **__10+_acres** Land use surrounding wetland: **Agriculture, grazing,**

HYDROLOGY

Surface Water Source: **__Agate Creek**_____
Inundation**:** Present**__X_**Absent____ Average depths: **_12”_** Range of depths: **_0-24”**
Assessment area under inundation: **30%**
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**_X**
Record depth of water below ground surface

Well #	Depth	Well #	Depth	Well #	Depth

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

COMMENTS/PROBLEMS:
_____
_____
_____
_____
_____
_____
_____
_____
_____

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 - Upland_____**

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 and 3 converted to mud flat due to prolonged inundation that killed upland plants.

_____

_____

Additional Activities Checklist:

_X__ Record and map vegetative communities on air photo

COMPREHENSIVE VEGETATION LIST

Species	Vegetation Community Number(s)	Species	Vegetation Community Number(s)
Achillea millefolium	1,2		
Agropyron smithii	1		
Agropyron spicatum	1		
Artemisia tridentata	1		
Bouteloua gracilis	1		
Carex aquatilis	2		
Cirsium arvense	2,3		
Cynoglossum officinale	3		
Glycyrrhiza lepidota	2,3		
Hordeum jubatum	2		
Iris missouriensis	2		
Juncus balticus	2		
Lupinus sp.	1,2,3		
Potentilla anserine	2		
Rumex crispus	2		
Solidago cnadensis	1		
Stipa comata	1,2		
Taraxacum officinale	2		

COMMENTS/PROBLEMS: _____

PLANTED WOODY VEGETATION SURVIVAL

Species	Percent Survival	Mortality Causes
NA		

COMMENTS/PROBLEMS: NA

WILDLIFE

BIRDS

(Attach Bird Survey Field Forms)

Were manmade 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, REPTILES, AND AMPBIBIANS

Species	Number Observed	Indirect indication of use			
		Tracks	Scat	Burrows	Other
Mule deer	0	yes	yes		
Antelope	0	yes			
Elk	0	yes	yes		
Badger	0			yes	
Richardson's ground squirrel	2			yes	
Chipmunk	2			yes	

Additional Activities Checklist:
____Macroinvertebrate sampling (if required)

COMMENTS/PROBLEMS:

PHOTOGRAPHS

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

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

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

COMMENTS/PROBLEMS: _____

GPS SURVEYING

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

Checklist:

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

COMMENTS/PROBLEMS: GPS unit was not utilized during the 2009 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: .

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: Ringling - Galt Date: 8/19/09 Examiner: MT Transect # 1

Approx. transect length: 620 feet Compass Direction from Start (Upland): _____

Vegetation type A:	Type 3 - CYNOFF	
Length of transect in this type:	210	feet
Species:		Cover:
SOLCAN		1
GLYLEP		1
CYNOFF		2
Lupinus sp.		1
HORJUB		1
	Total Vegetative Cover:	60%

Vegetation type B:	Type 2 - HORJUB/IRIMIS	
Length of transect in this type:	50	feet
Species:		Cover:
HORJUB		2
ACHMIL		1
IRIMIS		1
JUNBAL		1
	Total Vegetative Cover:	50%

Vegetation type C:	Water – Mud Flat	
Length of transect in this type:	120	feet
Species:		Cover:
ELEPAL		1
	Total Vegetative Cover:	5%

Vegetation type D:	Type 1 - ARTTRI	
Length of transect in this type:	60	feet
Species:		Cover:
ARTTRI		2
AGRSPI		1
AGRSMI		1
Lupinus sp.		1
HORJUB		2
	Total Vegetative Cover:	60%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: Ringling - Galt Date: 8/19/09 Examiner: MT Transect # 1

Approx. transect length: 620 feet Compass Direction from Start (Upland): _____

Vegetation type E:	Type 3 - CYNOFF	
Length of transect in this type:	180	feet
Species:		Cover:
SOLCAN		2
GLYLEP		2
CYNOFF		2
	Total Vegetative Cover:	40

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

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

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

MDT WETLAND MONITORING – VEGETATION TRANSECT (back of form)

Cover Estimate		**Indicator Class:**	**Source:**
+ = <1%	3 = 11-20%	+ = Obligate	P = Planted
1 = 1-5%	4 = 21-50%	- = Facultative/Wet	V = Volunteer
2 = 6-10%	5 = >50%	0 = Facultative	

Percent of perimeter 0 % 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:

Standing water in 2009 created a significant amount of mud flat and open water along the transect, as upland vegetation died off due to extensive inundation. Wetland vegetation did not immediately establish in these areas. Would likely take several years of inundation before wetland vegetation replaces upland veg. in these areas. The mud flat areas were heavily trampled by cattle.

3/01

BIRD SURVEY – FIELD DATA SHEET

Page **1** of **1**
Date: 8/19/09
Survey Time: 1200

SITE: Ringling-Galt

Bird Species	#	Behavior	Habitat	Bird Species	#	Behavior	Habitat
American Wigeon	10	F,L,N	OW				
Blue-winged Teal	4	F,L	OW				
Cinnamon Teal	4	F,L	OW				
Mallard	10	F,L,N	OW				
Green-winged Teal	2	F,L,N	OW				
Killdeer	2	F	MF				
Spotted sandpiper	1	F	MF				

Notes: Conditions: Mostly sunny, approximately 65 degrees
Wildlife observations: antelope scat, 8 young waterfowl, pair of chipmunks near outlet structure

Significant standing water behind berm for third time since monitoring began. 2003, 2006 were other years.

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: **Ringling - Galt** Applicant / Owner: **MDT** Investigator: **PBSJ - Traxler**	Date: **August 19, 2009** County: **Meagher** State: **Montana**

Do Normal Circumstances exist on the site? **No** Is the site significantly disturbed (Atypical Situation)? **No** Is the area a potential Problem Area? **No** (If needed, explain on reverse side)	Community ID: **Upland** Transect ID: _____ Plot ID: **1**

VEGETATION (USFWS Region 9: Northwest)

Dominant Species	Stratum	Indicator	Dominant Species	Stratum	Indicator
1. *Agropyron spicatum*	Herb	FACU-	11.		
2. *Glycyrrihiza lepidota*	Herb	FAC+	12.		
3. *Achellia millefolium*	Herb	FACU	13.		
4. *Iris missouriensis*	Herb	FACW+	14.		
5. *Agropyron smithii*	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: **Upland plot near Agate Creek channel - prolonged inundation in 2009 resulted in some upland vegetation to die off. No new wetland species noted.**

HYDROLOGY

No Recorded Data (Describe in Remarks): **N/A** Stream, Lake, or Tide Gauge **No** Aerial Photographs **N/A** Other **No** No Recorded Data	Wetland Hydrology Indicators Primary Indicators: **NO** Inundated **YES** Saturated in Upper 12 Inches **NO** Water Marks **YES** Drift Lines **NO** Sediment Deposits **YES** Drainage Patterns in Wetland
Field Observations: Depth of Surface Water **N/A** ____ (in.) Depth to Free Water in Pit = **6** (in.) Depth to Saturated Soil = **0** (in.)	Secondary Indicators (2 or more required): **NO** Oxidized Root Channels in Upper 12 inches **NO** Water-Stained Leaves **NO** Local Soil Survey Data **NO** FAC-Neutral Test **NO** Other (Explain in Remarks)

Remarks: **Soil was saturated to surface in 2009.**

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 N/A	Loam
12	B	10 YR 4/2	/ /	N/A N/A	Clay Loam
		/	/ /	N/A N/A	
		/	/ /	N/A N/A	
		/	/ /	N/A N/A	

Hydric Soil Indicators:

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

Remarks: **Soils were unchanged in 2009 in spite of being saturated. Prolonged saturation is needed in order to develop hydric soil characteristics.**

WETLAND DETERMINATION

Hydrophytic Vegetation Present? **NO** Wetland Hydrology Present? **YES** Hydric Soils Present? **NO**	Is this Sampling Point within a Wetland? **NO**

Remarks: **Hydrology was present in 2009 but not the vegetation or hydric soils. No wetland on site.**

Appendix C

2009 REPRESENTATIVE PHOTOGRAPHS

MDT Wetland Mitigation Monitoring
Ringling-Galt
Ringling, Montana

2009 RINGLING – GALT WETLAND MITIGATION SITE

Photo Point 2, 85 degrees E. Photo Date: 8/18/09

Photo Point 3, 180 degrees S. Photo Date: 8/18/09

Photo Point 4, 200 degrees SW. Photo Date: 8/18/09

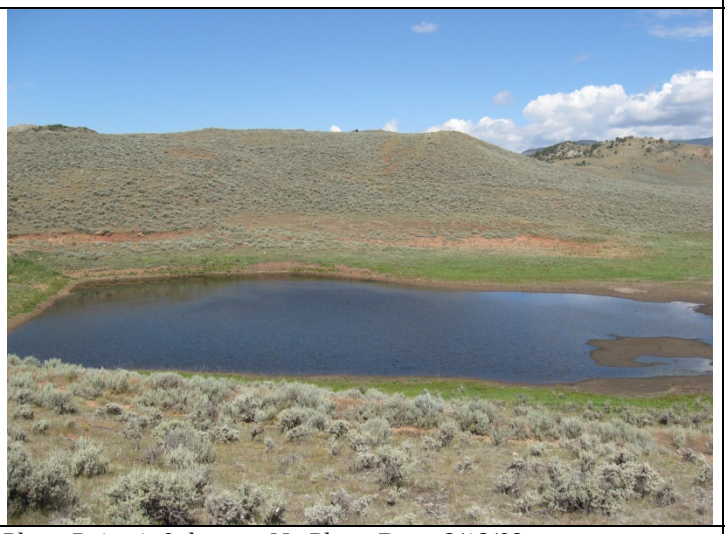

Photo Point 1, 0 degrees N. Photo Date: 8/18/09

Vegetation Transect Start, 330 degrees NW. Photo Date: 8/18/09

Vegetation Transect End, 150 degrees SE. Photo Date: 8/18/09

Appendix D

BIRD SURVEY PROTOCOL
GPS PROTOCOL

MDT Wetland Mitigation Monitoring
Ringling-Galt
Ringling, Montana

BIRD SURVEY PROTOCOL

This protocol was developed by the Montana Department of Transportation (MDT) to monitor bird use within their Wetland Mitigation Sites. Though each wetland mitigation site is vastly different, the bird survey data collection methods were standardized to order to increase repeatability. The protocol uses an "area search within a restricted time frame" to collect data on bird species, density, behavior, and habitat-type use.

Survey Area

Sites that can be entirely walked: Sites where the entire perimeter or area can be walked include, but are not limited to: small ponds, enhanced historic river channels, and wet meadows. If the wetland is not uncomfortably inundated, walk several meandering transects to sufficiently cover the wetland. Meandering transects can be used, even if a small portion of the area is inaccessible (e.g. cannot cross due to inundation). Use binoculars to identify the bird species, to count the number of individuals, and to identify their behavior and habitat type. Data can be recorded directly onto the bird survey form or into a field notebook. The number of meandering transects and their direction (or location) should be recorded in the field notebook and/or drawn onto the aerial photograph or topographic map. Meandering transects are not formal and should not be staked. Each site should be walked and surveyed to the fullest extent within the set time limit.

Sites than cannot be entirely walked: Sites where the entire perimeter or area cannot be walked include, but are not limited to: very large sites (i.e. perimeter of 2-3 miles), and large-bodied waters (i.e. reservoirs), where deep water habitat (> 6 feet) is close to shore. For large-bodied waters where only one area was graded to create or enhance the development of wetland, bird surveys should be walked along meandering transects within or around the graded area (see above.). For sites that cannot be walked, bird surveys should be conducted from many lookout posts, established at key vantage points. The general location of lookout posts should be recorded in the field notebook or drawn onto the aerial photograph or topographic map. Lookout post locations do not need to be staked. Both binoculars and spotting scopes may be used in order to accurately identify and count the birds. Depending upon the size of the open water, more time may be spent viewing the mitigation area from lookout posts than is spent traveling between posts.

Survey Time

Ideally, bird surveys should be conducted in the morning hours when bird activity is often greatest (i.e. sunrise to no later than 11:00 am). Surveys can be completed before 11am if all transects have been walked or all lookout posts have been viewed with no new bird activity observed. For some sites bird surveys may need to be performed in the late afternoon or evening due to traveling constraints or weather. The overall limiting time factor will be the number of budgeted hours for the project.

Data Recording

Bird Species List: Record each bird species observed onto the Bird Survey-Field Data Sheet (or field notebook). Record the bird's common name using the appropriate 4-letter code. The 4-letter code uses the first two letters of the first two word's of the bird's common name or if one name, the first four letters. For example, Mourning Dove is coded as MODO while Mallard is coded as MALL. If an unknown individual is observed, use the 4-letter protocol, but define your

abbreviation at the bottom of the field data sheet. For example, unknown shorebird is UNSB; unknown brown bird is UNBR; unknown warbler is UNWA; and unknown waterfowl is 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 parenthesis; do not fill in the habitat column. For example, a flock of black, medium-sized birds could be coded as UNBB / FO (25).

Bird Density: For each observation record the actual or estimated number of individuals observed per species and per behavior. Totals can be tallied in the office and entered onto the Bird Survey-Field Data Sheet.

Bird Behavior: Bird behavior must be identified by what is known. When a species is observed, the behavior that is immediately exhibited is recorded. Only behaviors that have discreet descriptive terms should be used. The following terms are recommended: breeding pair (BP); foraging (F); flyover (FO); loafing (L), which is defined as sleeping, roosting, or floating with head tucked under wing; and nesting (N). If other behaviors that have a specific descriptive word are observed then it can be used and should later be added to the protocol. Descriptive words or phrases such as "migrating" or "living on site" are unknown behaviors.

Bird Species Habitat Use: When a species is observed, the habitat is also recorded. The following broad habitat categories are used:

- aquatic bed (AB), defined as rooted-floating, floating-leaved, or submergent vegetation.
- marsh (MA), defined as emergent (e.g. cattail, bulrush) vegetation with surface water.
- wet meadow (WM), defined as grasses, sedges, or rushes with little to no surface water.
- scrub-shrub (SS), defined as shrub covered wetland.
- forested (FO), defined as tree covered wetland.
- open water (OW), defined as unvegetated surface water.
- upland (UP), defined as the upland buffer.

Other categories can be used and defined on the data sheet and should later be added to the protocol.

Other Fields

Bird Visit: Each bird survey (i.e. spring, fall, and mid-season) should be completed on separate Bird Survey-Field Data Sheets.

Time: Record the start time and end time on the Bird Survey-Field Data Sheet.

Date: Record the date of the bird survey.

Weather: Record the weather conditions (i.e. temperature, wind, condition).

Notes: Note if a particular individual bird is using a constructed nest box and note the condition of constructed nest box(es). Also record any comments about the site, wildlife, wetland conditions, etc.

GPS MAPPING AND AERIAL PHOTO REFERENCING PROCEDURE

From 2001 through 2006, PBS&J mapped the vegetation community boundaries, photograph points, and other sampling locations in the field using the resource-grade Trimble GEO III GPS (Global Positioning System) unit. The data were collected with a minimum of three positions per feature using Course/Acquisition code. The collected data were then transferred to a personal computer (PC) and differentially corrected to the nearest operating Community Base Station. The corrected data were then exported to ACAD drawings in Montana State Plain Coordinates NAD 83 international feet. The Trimble GEO III GPS unit was also used for some sites in 2007.

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

In 2007 and 2008 sites were mapped using the resource-grade Magellan MobileMapper Office GPS unit. The Magellan GPS unit has a comparable accuracy level to the Trimble Geo III unit.

Each year, MDT photographs each mitigation site from the air. These aerial photographs are not geo-referenced, but serve as a visual aid to map wetland development and vegetation communities, and to show approximate locations for various monitoring activities (i.e. photograph points, transects, or macroinvertebrate sampling). Reference points that are observable on the aerial photo (i.e. road, stream channel, or fence) were also marked with the GPS unit in order to better position the aerial photograph. This positioning did not remove any of the distortion inherent to all photos. All mapped features and community boundaries were reviewed by the wetland biologist, to increase the figure's accuracy.

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.