
MONTANA DEPARTMENT OF TRANSPORTATION WETLAND MITIGATION MONITORING REPORT: YEAR 2001

Ringling - Galt
Ringling, 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

July 2002

Project No: 130091.015



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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.

MDT has conducted no formal monitoring; however, MDT personnel have visited the site intermittently over the last year. 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. This site will be monitored two times per year over the 3-year contract period to document wetland and other biological attributes.

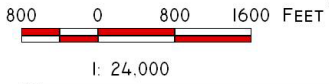
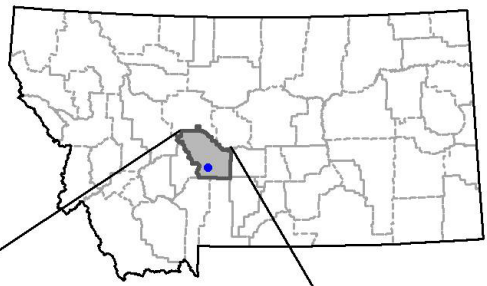
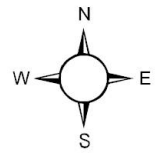
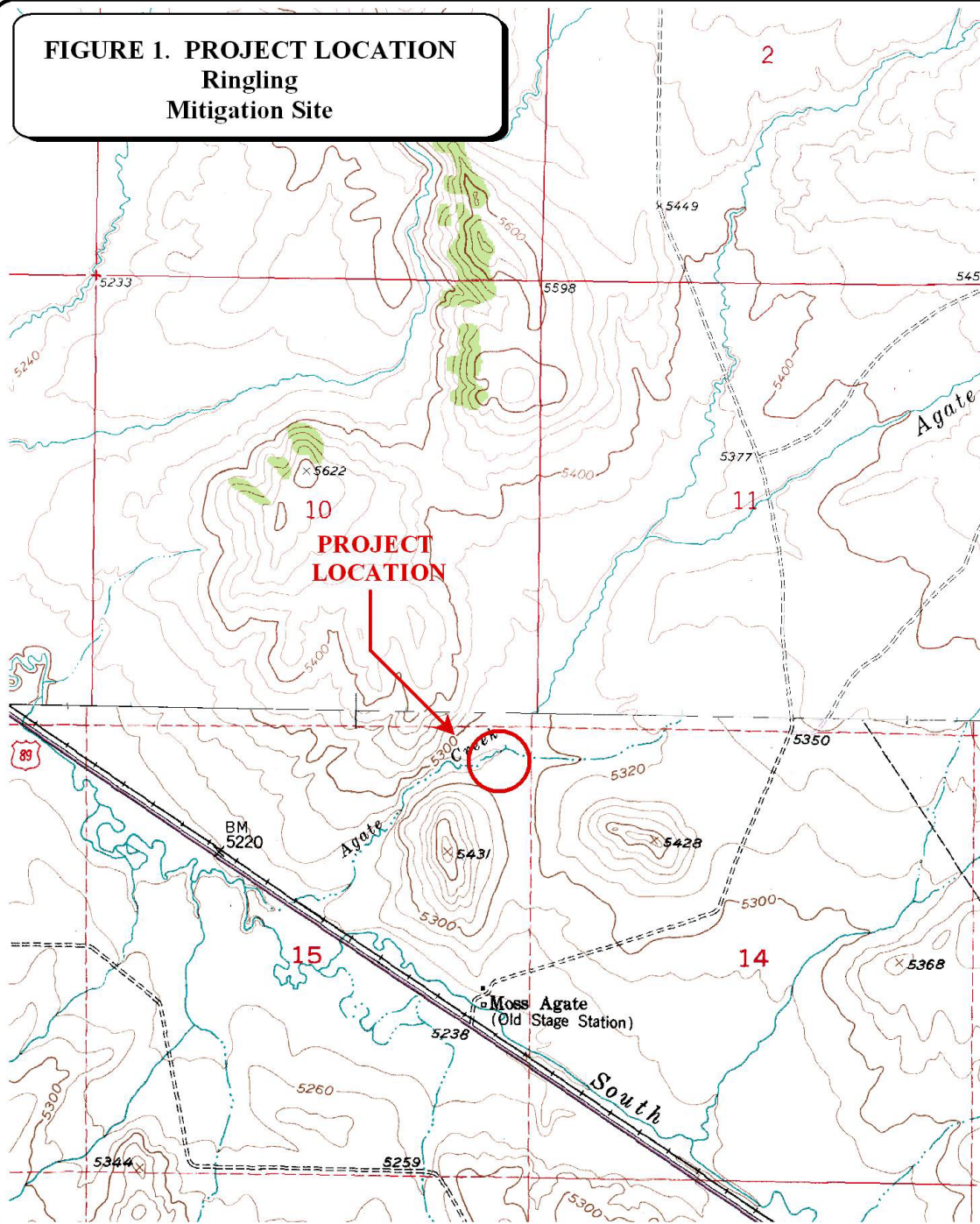
In May 2000, the U.S. Army Corps of Engineers (COE) determined that this site could not be used as permanent mitigation for the Ringling – North project due to the lack of a perpetual conservation easement (COE 2000). Monitoring of the site will proceed, to document the establishment of wetland habitat 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 May 29 and August 3, 2001. All information contained on the Wetland Mitigation Site Monitoring Form (**Appendix B**) was collected during these two site visits. Activities and information conducted/collected included: vegetation community mapping; vegetation transect; soils data; hydrology data; bird and general wildlife use; photograph points;

FIGURE 1. PROJECT LOCATION
Ringling
Mitigation Site



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



1120 CEDAR PO BOX 8254 MISSOULA, MT 59807

GPS data points; and (non-engineering) examination of the dike structure. As no wetland habitat has yet established within the monitoring area, a wetland delineation was not performed. Consequently, a wetland functional assessment was not performed and no macroinvertebrate samples were taken.

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 was recorded on COE Routine Wetland Delineation Data Forms (**Appendix B**). All additional hydrologic data was recorded on the 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. The Montana Natural Resource Information System (NRIS) online database was queried for watershed snow/water equivalents for the year 2001 (NRIS 2002).

2.3 Vegetation

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

A single 10-foot wide belt transect was established during the mid-season monitoring event to represent the range of current vegetation conditions. Percent cover was estimated for each vegetative species encountered within the “belt” using the following values: + (<1%); 1 (1-5%); 2 (6-10%); 3 (11-20%); 4 (21-50%); and 5 (>50%).

The transect location, depicted on **Figure 2 (Appendix A)**, was marked on an aerial photograph and all data recorded on the mitigation site monitoring form. Transect endpoint locations were recorded with a GPS unit. Photos of 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 was 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.

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 (see data forms in **Appendix B**). A comprehensive bird list was compiled using these observations.

2.8 Macroinvertebrates

Due to the presumed presence of significant surface water features within the analysis area, a macroinvertebrate sample collection was originally proposed. However, since surface water was not present during the August 3, 2001 visit, no macroinvertebrate sample was collected. Macroinvertebrate sampling procedures to be followed in subsequent years are provided in **Appendix D**.

2.9 Functional Assessment

A functional assessment, using the 1999 MDT Montana Wetland Assessment Method, was proposed for this site prior to monitoring. 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 2001 monitoring season.

2.10 Photographs

Photographs were taken showing the current land use surrounding the site, the upland buffer, the monitored area, and the vegetation transect. Four photograph points were established and shot during 2001. Each photograph point location was recorded with a resource grade GPS unit. The approximate locations of these photo points are shown on **Figure 2 (Appendix A)**. All photographs were taken using a 50 mm lens. A description and compass direction for each photograph was recorded on the wetland monitoring form.

2.11 GPS Data

During the 2001 monitoring season, survey points were collected with a resource grade GPS unit at the vegetation transect beginning and ending locations and all photograph locations.

2.12 Maintenance Needs

The dike near the north end of the site was examined during the 2001 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 May and August site visits, no surface water was observed upstream of the dike in the monitoring area. Additionally, inundation in the upper 18 inches of the soil was absent from the site during the August site monitoring. Specific recorded values are provided on the attached data forms.

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, a substantial amount of 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.

A faint waterline was visible on the dike face during the May site visit, indicating that water may have been impounded behind the dike for a short time in the early spring. The short period of inundation was insufficient to alter the vegetative characteristics behind the dike. Snow/water equivalent data is not available specifically for this drainage, but data for the overall watershed, indicates that levels in 2000 and 2001 were considerably below the average for this area. The drought conditions are likely responsible for the overall lack of water being retained behind the dike.

According to the Western Regional Climate Center, White Sulphur Springs yearly precipitation totals for 2000 (10.23 inches) and 2001 (9.62 inches) were 80 and 75 percent, respectively, of the total annual mean precipitation (12.8 inches) in this area.

In general, it appears that the water available to the site is insufficient during some years to support the proposed wetland creation. The site will likely remain dry until such time as precipitation levels return to normal.

3.2 Vegetation

Vegetation species identified on the site are presented in **Table 1** and on the attached data form. The entire site was comprised of upland vegetation including big sagebrush (*Artemisia tridentata*), bluebunch wheatgrass (*Agropyron spicatum*), western wheatgrass (*Agropyron smithii*), blue gramma (*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 attached data form. Sagebrush communities dominate the landscape with the exception of a narrow band along the Agate Creek channel, where sagebrush does not persist. The area is actively grazed by cattle and receives substantial use by ground squirrels, elk and mule deer, thus possibly having an effect on species composition.

3.3 Soils

According to the draft Meagher County soil survey (NRCS 2001), soils at the site are comprised of Martinsdale-Meagher cobbly loams. 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 dry, with no inundation or other hydric indicators in the first 18 inches.

3.4 Wetland Delineation

Prior to project implementation, MDT did not document any wetland habitat in the analysis area. Since project inception in 2000, the site has not had sufficient hydrology to begin wetland development and thus no wetlands were delineated within the monitoring area.

Table 1: 2001 Ringling/Galt Mitigation Site Vegetation Species List

Species	Region 9 (Northwest) Wetland Indicator
<i>Achillea millefolium</i>	FACU
<i>Agropyron smithii</i>	--
<i>Agropyron spicatum</i>	FACU
<i>Artemisia tridentata</i>	--
<i>Bouteloua gracilis</i>	--
<i>Cirsium arvense</i>	FAC-
<i>Cynoglossum officinale</i>	--
<i>Hordeum jubatum</i>	FAC-
<i>Glycyrrhiza lepidota</i>	FAC+
<i>Iris missouriensis</i>	FACW+
<i>Lupinus sp.</i>	FACU
<i>Solidago Canadensis</i>	FACU
<i>Stipa comata</i>	--
<i>Taraxacum officinale</i>	FACU

3.5 Wildlife

Wildlife species, or evidence of wildlife, observed on the site during 2001 monitoring effort are listed in **Table 2**. Specific evidence observed, as well as activity codes pertaining to birds, are provided on the completed monitoring form in **Appendix B**. Ground squirrels (*Spermophilus richardsonii*) are prevalent in the monitoring area, while elk (*Cervus elaphus*) and mule deer (*Odocoileus hemionus*) use the area on a seasonal basis. Bird sightings were low during both field visits in 2001, partially due to inclement weather conditions on both surveys and the overall lack of habitat diversity on the site. No reptiles or amphibians were observed.

3.6 Macroinvertebrates

Macroinvertebrate sampling was not conducted during the 2001 monitoring season, as no open water habitat occurs within the monitoring area.

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. Ground squirrels are burrowing into the lower part of the dike, especially in the vicinity of the inlet pipe. Disturbance of the dike by ground squirrels could leave the dike vulnerable to erosion during a heavy stormwater or runoff event.

Table 2: Fish and Wildlife Species Observed on the Ringling – Galt Mitigation Site during 2001

FISH
None
AMPHIBIANS
None
REPTILES
None
BIRDS
Mourning Dove (<i>Zenaida macroura</i>) Common Raven (<i>Corvus corax</i>) Red-tailed Hawk (<i>Buteo jamaicensis</i>) Western Meadowlark (<i>Sturnella neglecta</i>)
MAMMALS
Mule Deer (<i>Odocoileus hemionus</i>) (scat only) Elk (<i>Cervus elaphus</i>) (scat only) Richardson's Ground Squirrel (<i>Spermophilus richardsonii</i>)

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 over the contract period so as 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.

4.0 REFERENCES

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- US Army Corps of Engineers. 2000. 404 Permit, Action ID Number 2000-90-311 for MDT's proposed Ringling North highway reconstruction. Helena, MT.
- USDA Natural Resources Conservation Service. 2001. Draft Meagher County soil mapping. White Sulpher Springs, MT. Unpublished Data.
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Appendix A

FIGURE 2

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

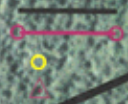
Figure 2 - Monitoring Activity Locations



Scale 1" = 100 ft.

LEGEND

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



MONITORING AREA LIMITS

Vegetation Transect

MONITORING AREA LIMITS

MONITORING AREA LIMITS

PP3

PP2

PP1

PP4

End

Begin

NOT TO SCALE

PROJECT NAME		MDT Ringling/Gault Wetland Mitigation	
DRAWN		RA	
CHECKED		BD	
APP'D		BD	
PROJECT		BD	
FILE NAME	TASK/IBASE.gwg	SCALE	1"=100'
LOCATION	Ringling/Gault	PROJECT	
SHEET NUMBER			
2			
DATE 12-17-07			



Appendix B

**COMPLETED 2001 WETLAND MITIGATION SITE
MONITORING FORM
COMPLETED 2001 BIRD SURVEY FORMS
COMPLETED 2001 WETLAND DELINEATION FORMS**

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

VEGETATION COMMUNITIES

Community No.: 1 Community Title (main species): Artemesia tridentata

Dominant Species	% Cover	Dominant Species	% Cover
ART TRI	30		
AGR SPI	50		
AGR SME	50		
LUP sp.	25		

COMMENTS/PROBLEMS: _____

Community No.: 2 Community Title (main species): Hordeum jubatum/Iris Missouriensis

Dominant Species	% Cover	Dominant Species	% Cover
HOR JUB	30		
IRI MIS	25		
ACH MIL	30		
STE COM	20		

COMMENTS/PROBLEMS: This community occurs along the drainage bottom.

Community No.: 3 Community Title (main species): Cynoglossum officinale

Dominant Species	% Cover	Dominant Species	% Cover
CYN OFF	30		
SOL CAN	20		

COMMENTS/PROBLEMS: Disturbed areas where dike material was obtained. These areas have < 50% vegetative cover

Additional Activities Checklist:

Record and map vegetative communities on air photo

Communities were not mapped on photos

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: Ringling-Galt Continued Date: 8/3/01 Examiner: MT Transect # 1

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

Vegetation type 1: 5		<u>Disturbed upland</u>	
Length of transect in this type:	<u>180</u>	feet	
<u>SOL CAN</u>	<u>6-10 %</u>		
<u>GLY LEP</u>	<u>6-10 %</u>		
<u>CYN OFF</u>	<u>6-10 %</u>		
Total Vegetative Cover:	<u>< 30%</u>		

Vegetation type 2:			
Length of transect in this type:		feet	
Total Vegetative Cover:			

Vegetation type 3:			
Length of transect in this type:		feet	
Total Vegetative Cover:			

Vegetation type 4:			
Length of transect in this type:		feet	
Total Vegetative Cover:			

WETLAND DELINEATION



At each site conduct the items on the checklist below:

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

COMMENTS/PROBLEMS: _____

FUNCTIONAL ASSESSMENT

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

Jeff is completing this section

COMMENTS/PROBLEMS: _____

MAINTENANCE

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

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

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

Were man-made structures build or installed to impound water or control water flow into or out of the wetland?
YES NO ___

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

If no, describe the problems below.

COMMENTS/PROBLEMS: Ground squirrels are burrowing into lower part of dike -
probably will not cause significant structural 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 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
P1 A			0° N
P1 B			45° NE
P1 C			90° E
P2 D			30° NE
P2 E			90° E
P2 F			120° SE
P3 G			120° SE
P3 H			200° SW

COMMENTS/PROBLEMS: P4, 270°W/Veg Transect start 230°NW/Veg transect End 150°SE

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: _____

Field Data Sheet for 1999 MDT Wetland Assessment Form Site: _____ Date: _____ By: _____
 Estimated AA Size (Circle Ac.): <1 1-5 >5 Brief Description:

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

RELATIVE ABUNDANCE: rare com. abun. DISTURBANCE is: High Moderate Low _____

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

Does AA contain surface or subsurface outlet? Y N If outlet present, is it restricted (subsurface will always be "yes")? Y N

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

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

Estimated wetland area subject to periodic flooding (acres): ≥10 2-10 <2
 Estimated % of flooded wetland classified SS, FO or both: ≥75 25-74 <25

*Evidence of groundwater discharge or recharge? Y N List: _____

HABITAT

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

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

Primary or critical habitat (list species) D S T/E: _____ D S MNHP: _____
 Secondary habitat (list species) D S T/E: _____ D S MNHP: _____
 Incidental habitat (list species) D S T/E: _____ D S MNHP: _____
 No usable habitat D S T/E: _____ D S MNHP: _____

Wildlife observations? _____

Fish observations? _____

OTHERS

Do wetlands have potential to receive excess sediments, nutrients, or toxicants? Y N From: _____
 Potential to receive: low to moderate levels high levels On TMDL List? Y N

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

List: _____

Is AA a known recreation / education site? Y N Type: _____

Does AA offer strong potential for use as recreation / education site? Y N Type: _____

Appendix C

REPRESENTATIVE PHOTOGRAPHS

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



Photo Point 1, 45 degrees NE



Photo Point 2, 85 degrees E
Photo taken from top of dike.



Photo Point 3, 180 degrees S

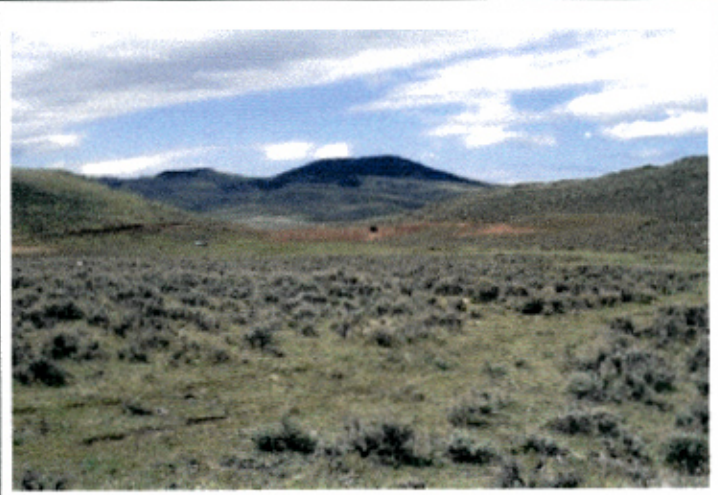
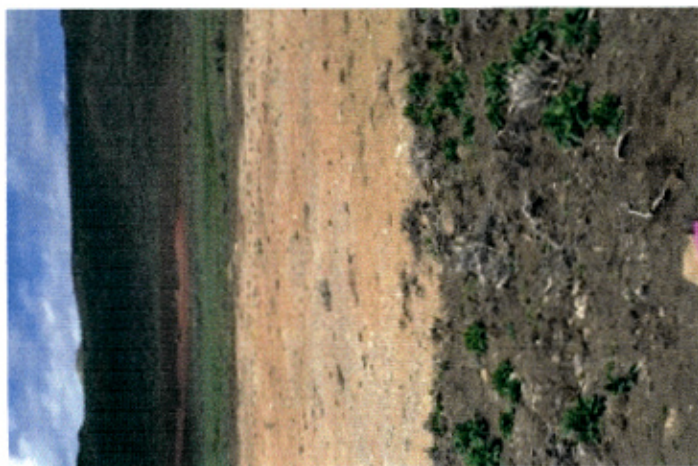


Photo Point 4, 270 degrees W



Vegetation Transect Start, 330 degrees NW
Picture is vertical.



Vegetation Transect End, 150 degrees SE
Picture is vertical.

Appendix D

BIRD SURVEY PROTOCOL MACROINVERTEBRATE SAMPLING 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.

AQUATIC INVERTEBRATE SAMPLING PROTOCOL

Equipment List

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

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

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

Site Selection

Select the sampling site with these considerations in mind:

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

Sampling

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

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

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

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

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

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

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

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

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

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

Photograph the sampled site.

Sample Handling/Shipping

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

GPS Mapping and Aerial Photo Referencing Procedure

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

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

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

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