
**MONTANA DEPARTMENT OF TRANSPORTATION
WETLAND MITIGATION MONITORING REPORT: YEAR 2007**

*Woodson Creek
Ringling, Montana*



Prepared for:

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

Prepared by:

POST, BUCKLEY, SCHUH, AND JERNIGAN
801 North Last Chance Gulch, Suite 101
Helena, MT 59601-3360

December 2007

PBS&J Project No: B43088.00 - 0212



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1.0 INTRODUCTION

This report presents the results of the first year (2007) of wetland monitoring at the Woodson Creek wetland mitigation project. This mitigation site was constructed in 2006 in Meagher County in the south-eastern portion of the Missouri-Sun-Smith watershed (Watershed #7). Approximately 50 acres of wetland credit at this site is to be provided to the Montana Department of Transportation (MDT) through a credit purchase agreement. It is anticipated that this site will compensate for wetland impacts resulting from MDT highway and bridge reconstruction projects in the watershed. Woodson Creek was constructed on the Ringling Land and Cattle Company property. The goal of the project is to restore Woodson Creek to its original configuration (i.e., increase sinuosity), improve wetland hydrology within some portions of the site, and create wetlands in other portions of the site. It is anticipated that the project will ultimately provide a maximum of 75.14 acres of palustrine emergent and scrub-shrub wetland within the confines of the 105-acre site (ADC Services 2005).

The site occurs at an elevation of approximately 5,390 feet above mean sea level and is located roughly three miles northeast of Ringling, MT in Meagher County (**Figure 1**). The Woodson Creek project area can be located on the Hamen, MT U.S. Geological Survey 7.5 minute topographic quadrangle at Township 6 North, Range 8 East, Sections 9 and 16. The approximate universal transverse mercator (UTM) coordinates (NAD83) for the central portion of the site are (Zone 12N) 5,126,147 Northing, 520,656 Easting. The approximate site boundary is illustrated on **Figure 2 (Appendix A)** and on the plan sheet in **Appendix D**.

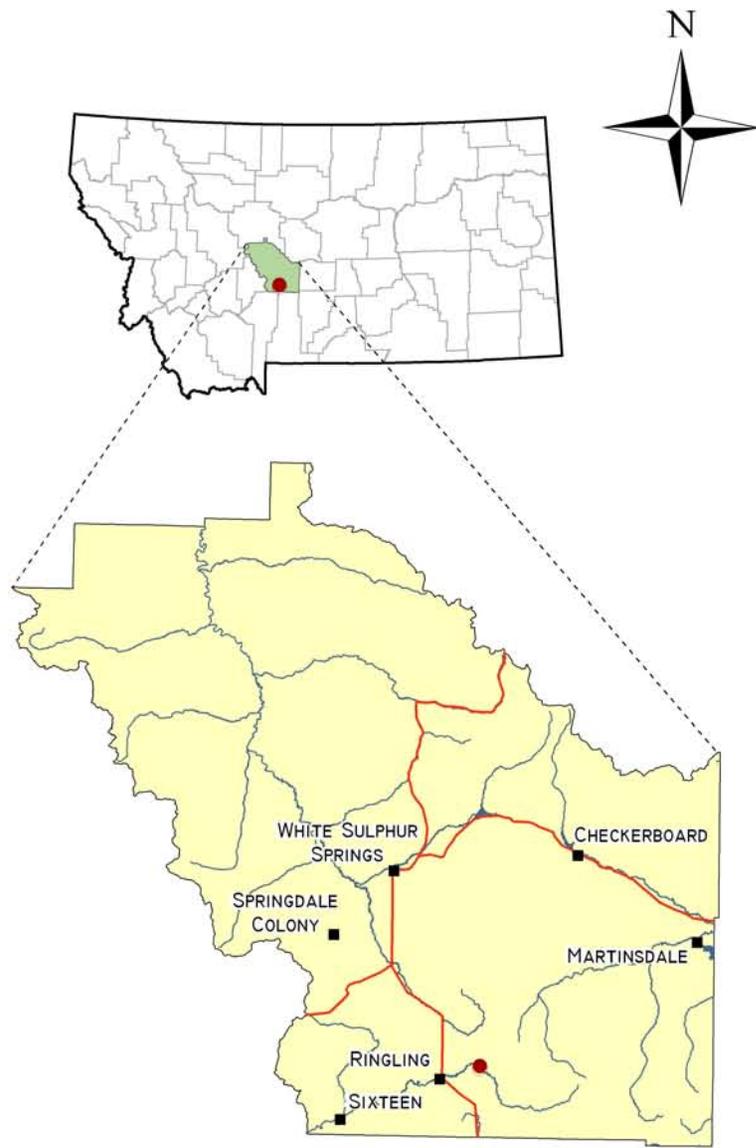
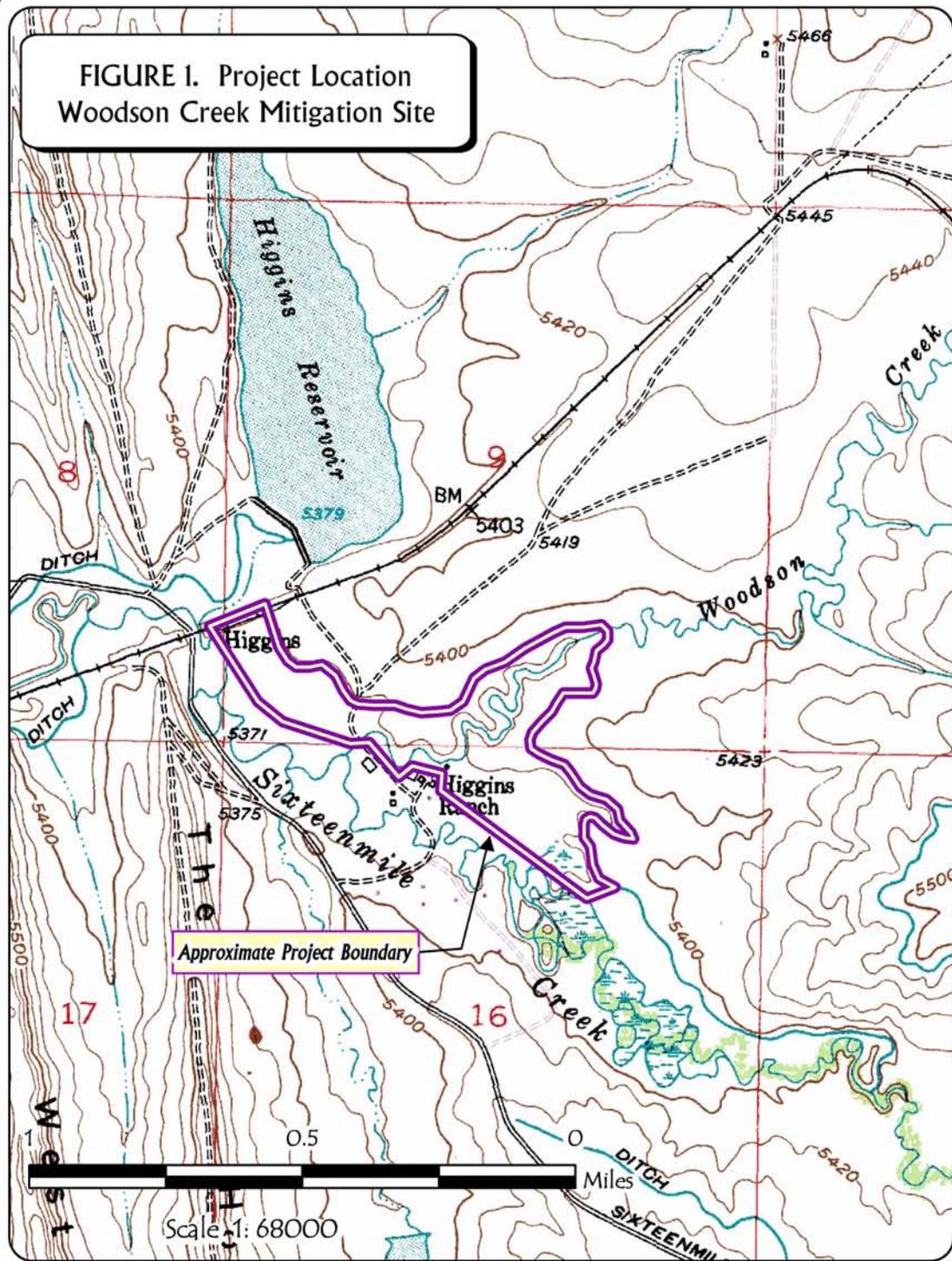
Crediting for the project is relatively complex. Seven different crediting areas were developed, each with their own specific performance standards. In general terms, if the standards are met, credit ratios are 1:1 for restoration and creation and 1.5:1 for rehabilitation. Success criteria for each credit area are summarized in Section 3.12 of this report.

2.0 METHODS

2.1 Monitoring Dates and Activities

The site was visited on May 16, 2007 (reconnaissance visit) and July 18 and 20, 2007 (mid-season visit). The mid-season visit was conducted to document vegetation, soil, and hydrologic conditions used to map jurisdictional wetlands. The majority of the information contained on the Wetland Mitigation Site Monitoring Form (**Appendix B**) was collected at this time. Activities and information conducted/collected included: wetland delineation; wetland/open water boundary mapping; vegetation community mapping; vegetation transects; channel cross-sections, stream bank erosion pins, soils data; hydrology data; bird and general wildlife use; photograph points; macroinvertebrate sampling; functional assessment; and survival of planted woody vegetation.

FIGURE 1. Project Location
Woodson Creek Mitigation Site



PROJECT #: B43088.00 0212
 DATE: September 2007
 LOCATION: Woodson Creek
 PROJECT MANAGER: R. McElDowney
 DRAWN BY: MSA

PBSJ &
 801 N. Last Chance Gulch, Ste. 101 Helena, MT 59601

2.2 Hydrology

Hydrologic indicators were primarily evaluated at the site during the mid-season visit, but additional notes were also taken during reconnaissance visit. Wetland hydrology indicators were recorded using procedures outlined in the Corps of Engineers (COE) Wetlands Delineation Manual (Environmental Laboratory 1987) and hydrology data were recorded on COE Routine Wetland Delineation Data Forms (**Appendix B**).

All additional hydrologic data were recorded on the mitigation site monitoring form (**Appendix B**). The boundary between wetlands and open water (no rooted vegetation) aquatic habitats was mapped on the aerial photograph and an estimate of the average water depth at this boundary was recorded.

2.3 Vegetation

General dominant species-based vegetation community types (e.g., *Alopecurus arundinacea*) were delineated on an aerial photograph. Standardized community mapping was not employed as many of these systems are geared towards climax vegetation and may not reflect yearly changes. Estimated percent cover of the dominant species in each community type was listed on the site monitoring form (**Appendix B**).

Three 10-foot wide belt transects were established (**Figure 2 in Appendix A**). Within the transect belts percent cover were estimated for each vegetative species for each vegetation community 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 locations were marked on the aerial photo and all data recorded on the mitigation site monitoring form. Transect endpoints were recorded with a global positioning system (GPS) unit. Metal fence posts were installed to physically mark the transect ends. Photos of each of the three transects were taken from both ends during the mid-season visit. A comprehensive plant species list for the site was compiled.

Willows were planted at this mitigation site. Observers recorded the number of dead individuals observed and compared them to the total number of planted willows found.

2.4 Soils

Soils were evaluated during the mid-season visit according to hydric soils determination procedures outlined in the COE 1987 Wetland Delineation Manual. Soil data were recorded for each wetland determination point on the COE Routine Wetland Delineation Data Form (**Appendix B**). The most current terminology used by NRCS was used to describe hydric soils (USDA 2003).

2.5 Wetland Delineation

A wetland delineation of the mitigation site was conducted during the 2007 mid-season visit according to guidelines in the 1987 COE of Engineers Wetland Delineation Manual. Wetland and upland areas within the monitoring area were investigated for the presence of wetland hydrology, hydrophytic vegetation and hydric soils. The indicator status of vegetation was derived from the National List of Plant Species that occur in Wetlands: Northwest (Region 9) (Reed 1988).

The information was recorded on COE Routine Wetland Delineation Data Forms (**Appendix B**). The wetland/upland boundary was GPS'd during the July 2007 mid-season visit. The wetland/upland boundary was used to calculate the wetland area that has developed within the monitoring area.

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 each visit. Indirect use indicators, including tracks; scat; burrows; eggshells; skins; bones; etc., were also recorded. Observations were recorded as the observer traversed the site while conducting other required activities. In addition, the property manager, Dick Sellers, and wetland consultant, Tom Coleman (Oasis Environmental) were consulted as to the different animal species they have observed within the monitoring site at different times of the year. Direct sampling methods, such as snap traps, live traps, and pitfall traps, were not implemented. A comprehensive list of observed species was compiled. Observations from past monitoring is compared to this data.

2.7 Birds

Bird observations were recorded during each visit. No formal census plots, spot mapping, point counts, or strip transects were conducted. During the mid-season visit, bird observations were recorded incidental to other monitoring activities. Observations were categorized by species, activity code, and general habitat association (**Bird Survey Field Data Sheets in Appendix B**). In addition, the property manager, Dick Sellers, was consulted as to the different animal species that he had observed throughout the year at the monitoring site.

2.8 Macroinvertebrates

Two macroinvertebrate samples were collected during the mid-season site visit and data recorded on the wetland mitigation monitoring form. Macroinvertebrate sampling procedures and analysis are included in **Appendix F**. The approximate location of the sample points, within emergent marsh habitat and within the restored stream channel, are shown on **Figure 2 in Appendix A**. The samples were preserved as outlined in the sampling procedure and sent to a laboratory for analysis.

2.9 Functional Assessment

Functional assessment forms were completed for various assessment areas within the monitoring area using the 1999 MDT Montana Wetland Assessment Method (Berglund 1999). Field data necessary for this assessment were collected during the mid-season site visit. The remainder of the functional assessment was completed in the office. For each wetland or group of wetlands (that share similar functions and values) a Functional Assessment form was completed (**Appendix B**)

2.10 Cross-sections

Two permanent cross-sections were established during the reconnaissance visit by installing rebar stakes on either side of the restored creek channel at both locations. One cross-section location was established near the upper end of the project area, and one at the lower end of the project area (**Figure 2**). Sites were monitored during the mid-season visit.

2.11 Streambank Erosion Pins

Streambank erosion pins were installed at two locations during the reconnaissance site visit. Smooth, 4-foot long, ¼ inch steel bars were pounded horizontally into streambanks at the outside of meander bends where bank erosion would be expected to be highest. Similar to the cross-section placement, one location was selected at the upper end of the stream channel and one more toward the lower end of the stream channel (**Figure 2**). The erosion pins were pounded in so that they were flush against the streambanks during the reconnaissance site visit and monitored during the mid-season site visit. Once monitored they were tapped flush again with the streambanks, as needed. The lower site was specifically selected because it exhibited the most potential for erosion of any banks in the project area.

2.12 Photographs

Photographs were taken during the mid-season visit showing the current land use surrounding the site, the upland buffer, the monitored area, macroinvertebrate sampling location, and the vegetation transect (**Appendix C**). Each photograph point location was recorded with a GPS. The approximate location of photo points is shown on **Figure 2** in **Appendix A**. All photographs were taken using a digital camera, with no optical zoom used. A description and compass direction for each photograph was recorded on the wetland monitoring form.

2.13 GPS Data

During the 2007 monitoring season, point data were collected with a Garmin GPS 60 unit at the vegetation transect beginning and ending locations, at all photograph locations, and wetland sample points. Wetland/upland boundaries were collected using a resource grade Magellan MobileMapper[®]. Eleven ground control points were collected in order to orthorectify the 2007 aerial photography. Procedures used for GPS mapping and aerial photography referencing are included in **Appendix E**.

2.14 Maintenance Needs

Where encountered, current or potential future problems were documented and conveyed to MDT.

3.0 RESULTS

3.1 Hydrology

The NRCS estimates that the growing season in White Sulfur Springs, the closest weather station to the project area, extends from May 23rd through September 17th, and is approximately 117 days long (NRCS 2003). Therefore, wetland hydrology requirements are met if the site remains saturated to the soil surface for a minimum of six consecutive days (5 percent of the growing season). Both surface and ground water are the primary hydrologic components of the water budget for the Woodson Creek Mitigation Site.

The closest active weather station to the wetland monitoring area is White Sulfur Springs 2 (station #248930-4). According to the Western Regional Climate Center (WRCC) (2007), mean annual precipitation at this station is approximately 12.77 inches; with the majority of precipitation occurring in April, May, June, and July. The annual precipitation total through October 2007 at the White Sulfur Springs weather station was 7.61 inches (WRCC 2007). Average annual reference evapotranspiration rates between April 2nd and September 29th in recent years (2002 – 2006) are estimated to be approximately 37.1 inches at White Sulfur Springs (BOR 2007), nearly three times the yearly precipitation rate, indicating that precipitation alone is insufficient to supply wetland hydrology.

3.2 Vegetation

Vegetation species identified on the site are presented in **Table 1** and on the **Monitoring Form (Appendix B)**. A total of 66 plant species were identified on site. Garrison creeping meadow foxtail (*Alopecurus arundinaceus*) is the dominant species on the site. A total of six different vegetation communities were identified (**Figure 3**). The most prevalent is community type 1 - *Alopecurus arundinaceus*/Mixed graminoids, followed by community type 3 - *Alopecurus arundinaceus*, community type 2 – Mixed graminoids, community type 4 – Upland grasses, community type 5- Open water/Aquatic bed, and community type 6 – *Phalaris arundinaceae*/*Carex utriculata*. Dominant mixed graminoid species in both community types 1 and 2 include common spikerush (*Eleocharis palustris*), Nebraska sedge (*Carex nebrascensis*), clustered field sedge (*Carex praegracilis*), redtop (*Agrostis stolonifera*), and wiregrass (*Juncus balticus*). Garrison creeping foxtail is a dominant in the mixed graminoids community type (#2) as well, but comprises less than 50% of the total cover; whereas in community type 1 this species comprises more than 50% of the total cover. The *Alopecurus arundinaceus* community type (#3) occurs in the western parcel and is differentiated from community type 1 as being a monoculture (>90% cover). The *Phalaris arundinaceae*/*Carex utriculata* community type occurs in the eastern side of the project area in a narrow swale approximately 2 feet below the surrounding landscape that appears to be a historic stream channel.

Table 1: 2007 vegetation species list for the Woodson Creek Wetland Mitigation Site.

Scientific Name	1988 Region 9 (Northwest) Wetland Indicator
<i>Achillea millefolium</i>	FACU
<i>Agropyron cristatum</i>	--
<i>Agrostis exarata</i> (?)	FACW
<i>Agropyron repens</i>	FACU
<i>Agrostis stolonifera</i>	FAC+
<i>Alopecurus arundinaceus</i>	NI
<i>Alopecurus aequalis</i>	OBL
<i>Beckmannia syzigachne</i>	OBL
<i>Bromus inermis</i>	--
<i>Carex lasiocarpa</i>	OBL
<i>Carex nebrascensis</i>	OBL
<i>Carex praegracilis</i>	FACW
<i>Carex utriculata</i>	OBL
<i>Chenopodium album</i>	FAC
<i>Cicuta douglasii</i>	OBL
<i>Cirsium arvense</i>	FACU
<i>Deschampsia cespitosa</i>	FACW
<i>Distichlis spicata</i>	FACW
<i>Dodecatheon pulchellum</i>	FACW
<i>Eleocharis palustris</i>	OBL
<i>Elymus lanceolatus</i>	FACU-
<i>Elymus trachycaulus</i>	FAC
<i>Epilobium</i> spp.	NI to OBL
<i>Equisetum hyemale</i>	FACW
<i>Galium aparine</i>	FACU
<i>Glycyrrhiza lepidota</i>	FAC+
<i>Halogeton glomeratus</i>	--
<i>Helianthus annuus</i>	FACU
<i>Hieracium</i> spp.	--
<i>Hordeum jubatum</i>	FAC+
<i>Iris missouriensis</i>	FACW+
<i>Juncus balticus</i>	OBL
<i>Juncus filiformis</i>	FACW+
<i>Lactuca serriola</i>	FAC-
<i>Linum lewisii</i>	--
<i>Melilotus officinalis</i>	FACU
<i>Mentha arvensis</i>	FAC
<i>Muhlenbergia richardsonis</i> *	FACW
<i>Panicum virgatum</i>	FAC+
<i>Pascopyrum smithii</i>	FACU
<i>Phalaris arundinacea</i>	FACW
<i>Phleum alpinum</i>	FAC
<i>Phleum pratense</i>	FACU
<i>Plantago major</i>	FAC+
<i>Poa compressa</i>	FACU
<i>Poa palustris</i>	FAC
<i>Poa pratensis</i>	FACU+
<i>Polygonum amphibium</i>	OBL
<i>Potentilla anserine</i>	OBL
<i>Potentilla</i> spp.	FACU - OBL

*Identified by ADC Services (2005).

Table 1 (continued): 2007 vegetation species list for the Woodson Creek Wetland Mitigation Site.

Scientific Name	1988 Region 9 (Northwest) Wetland Indicator
<i>Ranunculus</i> spp.	---
<i>Rumex crispus</i>	FACW
<i>Salix exigua</i> (planted)	OBL
<i>Salix</i> spp. (planted)	---
<i>Salsola kali</i> *	FACU
<i>Scirpus microcarpus</i>	OBL
<i>Solidago</i> spp.	FACU to FACW
<i>Sporobolus cryptandrus</i>	FACU
<i>Taraxacum officinale</i>	FACU
<i>Thlaspi arvense</i>	NI
<i>Trifolium pratense</i>	FACU
<i>Triglochin</i> spp.	OBL
<i>Typha latifolia</i>	OBL
forb, unidentified species	---
aster, yellow	---
aster, purple	---

*Identified by ADC Services (2005).

The upland grasses community type (#4) is dominated by smooth brome (*Bromus inermis*), quackgrass (*Agropyron repens*), Canada bluegrass (*Poa compressa*), foxtail barley (*Hordeum jubatum*), yarrow (*Achillea millefolium*), prickly lettuce (*Lactuca serriola*), and field clover (*Trifolium pratense*). The Open water/Aquatic bed community type (#5) is semi-permanently flooded and dominated primarily by filamentous algae.

Vegetation data were recorded from three transects (**Monitoring Forms** in **Appendix B**) and summarized in **Table 2** and **Chart 2**. The total length of transects completed is 1,487 feet.

A total of 25 willow cuttings were observed. It is likely that more cuttings were planted, but they could not be located due to the extremely thick Garrison creeping foxtail cover found at the site. Two species of willow were observed, sandbar willow (*Salix exigua*), and a second unidentified willow. None of the cuttings appeared to be doing well, and 15 out of the 25 appeared to be alive, which is a survival rate of 60 percent.

3.3 Soils

Soils sampled in wetland areas were comprised of sandy clay loams and clays. In addition, an organic horizon was found at one sample location. Matrix colors of the mineral soils were dark (10YR 3/1 and 10YR 2/1). Mottles were found at one location (SP-2) and were 10YR 4/6 in color and considered to be large, common, and distinct. A sulfidic odor was detected at sample point 3. Soil saturation and/or inundation occurred at both wetland sample points (SP-2 and SP-3). Specific information is provided on the data forms in **Appendix B**.

Table 2: 2007 vegetation transect data summary.

2007	Transect 1	Transect 2	Transect 3
Transect Length (feet)	526	583	378
# Vegetation Community Transitions along Transect	2	0	0
# Vegetation Communities along Transect	3	1	1
# Hydrophytic Vegetation Communities along Transect	3	1	1
Total Vegetative Species	31	17	3
Total Hydrophytic Species	20*	14*	2*
Total Upland Species	11	2	1
Estimated % Total Vegetative Cover	90	95	80
% Transect Length Comprised of Hydrophytic Vegetation Communities	100	100	100
% Transect Length Comprised of Upland Vegetation Communities	0	0	0
% Transect Length Comprised of Unvegetated Open Water	6	2	0
% Transect Length Comprised of Bare Substrate	0	0	0

*Includes *Alopecurus arundinaceus*, but does not include unidentified species.

Chart 1: Transect maps showing vegetation types from the start of transect to the end of transects 1, 2, and 3 for 2007.

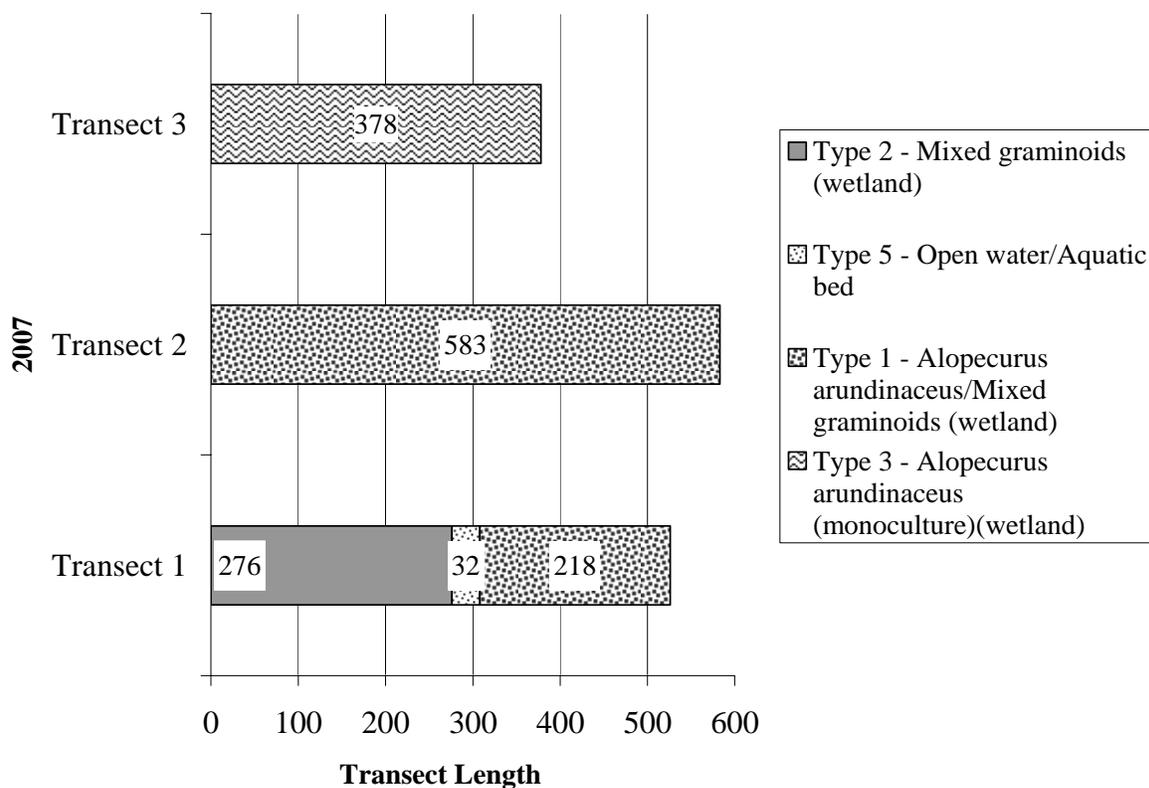
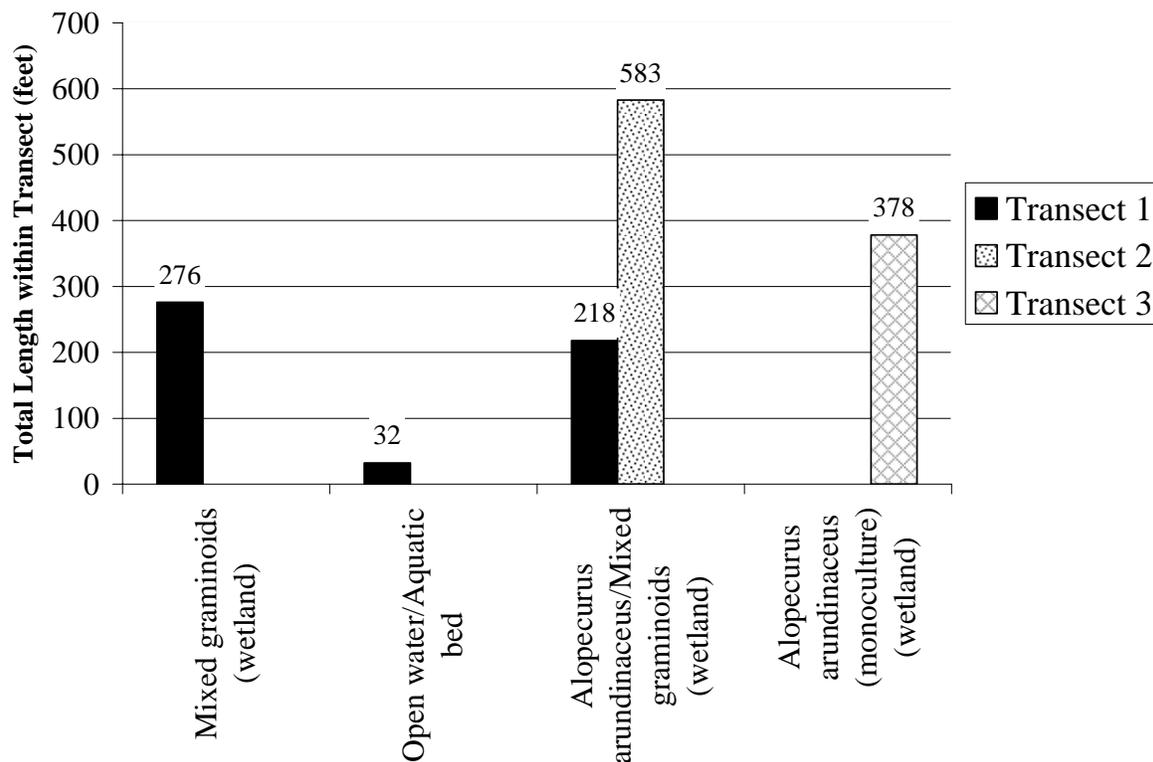


Chart 2: Length of vegetation communities within Transects 1, 2, and 3 for 2007.



3.4 Wetland Delineation

Delineated wetland boundaries are illustrated on **Figure 3 (Appendix A)**. Completed COE Wetland Delineation Forms are included in **Appendix B**. Soils, vegetation, and hydrology were discussed in preceding sections. Total aquatic habitat on the site in 2007 was 64.41 acres (**Figure 3 in Appendix A**). Wetlands comprised 61.86 acres of the 64.41-acre total.

Open water/aquatic bed areas occur as small irregular depressions and comprised 2.55 acres (4%) of the 64.41-acre total. Credits that have developed to date are discussed below in **Section 3.10**.

3.5 Wildlife

Though only constructed in 2006, the wetland complex created on the site provides habitat for several wildlife species. Ten mammal, one reptile, one amphibian, and 30 bird species have been observed at the site (**Table 3**). The habitat value of the site is expected to increase as vegetation diversifies and more shrubs are planted on the site.

Table 3: Fish and wildlife species observed at the Woodson Creek Wetland Mitigation Site during 2007.

FISH	
none	
AMPHIBIANS	
Columbia spotted frog (<i>Rana luteiventris</i>)	
REPTILES	
Western garter snake (<i>Thamnophis elegans</i>)	
BIRDS	
American Avocet (<i>Recurvirostra americana</i>) ¹	Lesser Scaup (<i>Aythya affinis</i>) ¹
American Kestrel (<i>Falco sparverius</i>) ²	Long-billed Curlew (<i>Numenius americanus</i>) ¹
American Pelican (<i>Pelecanus erythrorhynchos</i>) ¹	Mallard (<i>Anas platyrhynchos</i>)
American Wigeon (<i>Anas americana</i>) ¹	Northern Harrier (<i>Circus cyaneus</i>) ¹
Bald Eagle (<i>Haliaeetus leucocephalus</i>) ¹	Northern Pintail (<i>Anas acuta</i>)
Barn Swallow (<i>Hirundo rustica</i>)	Northern Shoveler (<i>Anas clypeata</i>) ²
Blue-winged Teal (<i>Anas discors</i>) ¹	Red-tailed Hawk (<i>Buteo jamaicensis</i>)
Cinnamon Teal (<i>Anas cyanoptera</i>) ¹	Red-winged Blackbird (<i>Agelaius phoeniceus</i>)
Cliff Swallow (<i>Hirundo pyrrhonota</i>)	Ring-necked Pheasant (<i>Phasianus colchicus</i>) ¹
Common Snipe (<i>Gallinago gallinago</i>)	Rock Dove (<i>Columba livia</i>)
Double-crested Cormorant (<i>Phalacrocorax auritus</i>) ¹	Sandhill Crane (<i>Grus canadensis</i>) ¹
Eastern Kingbird (<i>Tyranus tyrannus</i>) ¹	Savannah Sparrow (<i>Passerculus sandwichensis</i>) ¹
Gadwall (<i>Anas strepera</i>) ¹	Sora (<i>Porzana carolina</i>) ²
Golden Eagle (<i>Aquila chrysaetos</i>) ²	Yellow headed Blackbird (<i>Xanthocephalus xanthocephalus</i>) ¹
Great Blue Heron (<i>Ardea herodias</i>) ¹	Whistling Swan (<i>Cygnus columbianus</i>) ¹
Great-horned Owl (<i>Bubo virginianus</i>) ¹	Willet (<i>Catoptrophorus semipalmatus</i>) ¹
Green-winged Teal (<i>Anas crecca</i>) ¹	Wilson's phalarope (<i>Phalaropus tricolor</i>) ¹
Killdeer (<i>Charadrius vociferous</i>)	
MAMMALS	
Black-tailed Jack Rabbit (<i>Lepus californicus</i>) ²	Raccoon (<i>Procyon lotor</i>) ¹
Bobcat (<i>Lynx rufus</i>) ¹	Red Fox (<i>Vulpes vulpes</i>) ¹
Coyote (<i>Canis latrans</i>) ¹	Striped skunk (<i>Mephitis mephitis</i>)
Moose (<i>Alces alces</i>) ¹	Voles, mice, shrews ¹
Mule deer (<i>Odocoileus hemionus</i>) ¹	White-tail deer (<i>Odocoileus virginianus</i>)
Porcupine (<i>Erethizon dorsatum</i>) ¹	

¹ Species observed by property manager or Oasis Environmental.

² Species observed by MDT.

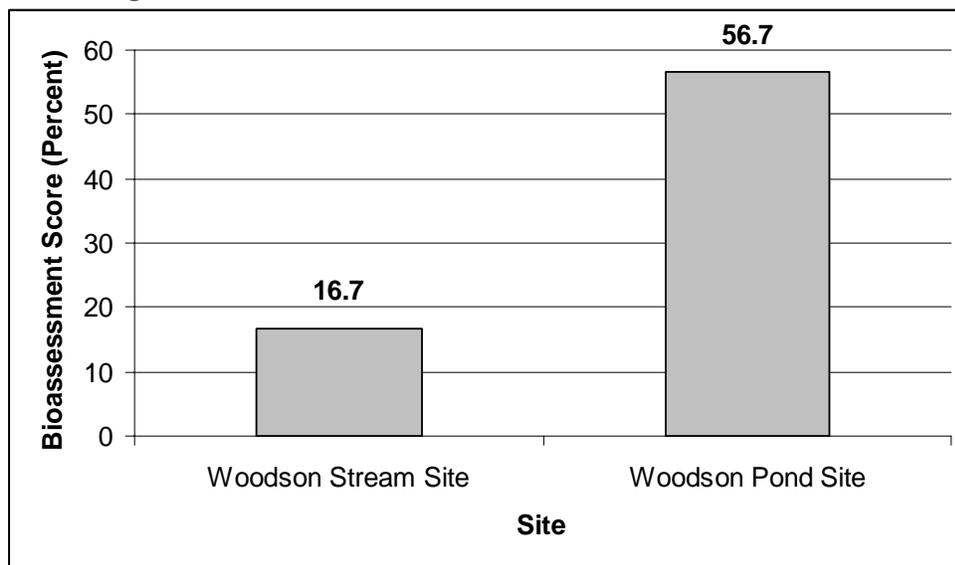
3.6 Macroinvertebrates

Macroinvertebrates were sampled at two locations; one sample taken from standing water and one from Woodson Creek. Sample locations are shown on **Figure 2**. Sampling results are provided in **Appendix F** and were summarized by Rhithron Associates in the italicized sections below (Bollman 2007). A total of 105 individuals were collected at the pond site with the vast majority being chironimids. At the stream site a total of 108 individuals were collected with the dominant taxa being amphipods, diptera, and chironimids. Bioassessment scores are shown in **Chart 3**. Results are typical for recently-constructed sites and improvement is anticipated.

***Pond Site:** This site supported a simple fauna suggestive of monotonous habitats. Although abundance was high, taxa richness was low. No macrophyte-associated taxa were collected. Open water and hypoxic benthic substrates appear to have been the major colonization space, with the presence of some filamentous algae possible. Sub-optimal biotic conditions were indicated by the bioassessment scores.*

***Stream Site:** Rheophilic taxa were abundant in the collection made at this site, but lentic organisms were also present. It appears that neither the MVFP index nor the wetland index for lotic sites is entirely appropriate for evaluating this fauna. Both indices, however, give similar results: severe impairment is indicated by MVFP scores; wetland index scores indicate poor biotic conditions. Macrophyte-associated taxa were present, and filamentous algae may also have been prominent.*

Chart 3: Macroinvertebrate bioassessment scores for the Woodson Creek Wetland Mitigation Site during 2007.



3.7 Functional Assessment

Completed functional assessment forms are presented in **Appendix B** and are summarized in **Table 4**. For comparative purposes, the functional assessment results for baseline conditions prepared by Oasis Environmental in 2005 are also included in **Table 4**.

The restored wetlands at Woodson Creek were ranked as Category II and III wetlands in 2007 as compared to Category III and IV in 2005. Functions that increased over 2005 baseline conditions include sensitive species habitat, general wildlife habitat, flood attenuation, short and long term surface water storage, sediment/nutrient/toxicant removal, bank/shoreline stabilization, and production export. The pre-project site provided a total of about 141.8 functional units within the monitoring area, the post-project site currently provides about 410 functional units, for a conservative gain of approximately 268 functional units.

Table 4: Summary of 2005 and 2007 wetland function/value ratings and functional points ¹ at the Woodson Creek Wetland Mitigation Site.

Function and Value Parameters from the 1999 MDT Montana Wetland Assessment Method ¹	Woodson Floodplain		East Parcel*		West Parcel*	
	2005	2007	2005	2007	2005	2007
Listed/Proposed T&E Species Habitat	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)
MNHP Species Habitat	Low (0.1)	Mod (0.7)	Low (0.1)	High (1.0)	Low (0.1)	Mod (0.7)
General Wildlife Habitat	Low (0.3)	High (0.9)	Low (0.3)	High (0.9)	Low (0.3)	Mod (0.5)
General Fish/Aquatic Habitat	Low (0.3)	Low (0.2)	NA	NA	NA	NA
Flood Attenuation	Low (0.1)	Mod (0.6)	NA	NA	NA	NA
Short and Long Term Surface Water Storage	Low (0.3)	High (0.9)	NA	High (0.8)	NA	Mod (0.5)
Sediment, Nutrient, Toxicant Removal	Mod (0.6)	High (1.0)	Mod (0.7)	High (0.9)	Mod (0.7)	Mod (0.9)
Sediment/Shoreline Stabilization	Mod (0.7)	High (1.0)	NA	NA	NA	NA
Production Export/Food Chain Support	Mod (0.4)	High (0.9)	Mod (0.7)	High (0.9)	Mod (0.7)	Mod (0.7)
Groundwater Discharge/Recharge	High (1.0)	High (1.0)	Low (0.1)	High (1.0)	Low (0.1)	High (1.0)
Uniqueness	Low (0.2)	Low (0.2)	Low (0.2)	Low (0.2)	Low (0.2)	Low (0.2)
Recreation/Education Potential	Low (0.1)	Low (0.1)	Low (0.1)	Low (0.1)	Low (0.1)	Low (0.1)
Actual Points/Possible Points	4.1 / 12	7.5 / 12	2.2 / 8	5.8 / 9	2.2 / 8	4.6 / 9
% of Possible Score Achieved	34.0	62.5	27.5	64.4	27.5	51.0
Overall Category	III	II	IV	II	IV	III
Total Acreage of Assessed Aquatic Habitat within AA Boundaries	0.48	27.84	51.00	27.27	6.00	9.00
Functional Units (acreage x actual points)	16.40	208.80	112.20	158.20	13.20	42.80
Net Acreage Gain	NA	27.36	NA	NA	NA	4.00
Net Functional Unit Gain	NA	192.40	NA	46.00	NA	29.60

¹ See completed MDT functional assessment forms in **Appendix B** for further detail.

*The East and West Parcels were combined for the 2005 assessment, therefore their values are the same.

3.8 Channel Cross-sections

Two channel cross-sections were performed during the mid-season site visit. The locations of the cross-sections are depicted on **Figure 2**. These cross-sections are considered baseline information for subsequent monitoring. Comparisons of these baseline cross-sections in subsequent years will be used as one indicator of channel stability. 2007 cross-sections are depicted in **Charts 4 and 5**.

Chart 4. Cross-section 1 at Woodson Creek Wetland Mitigation Site.

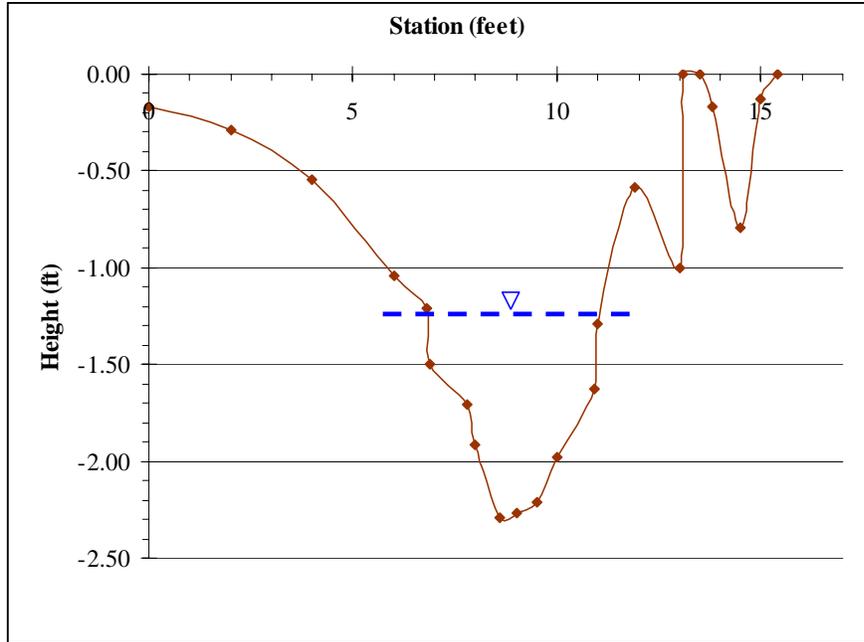
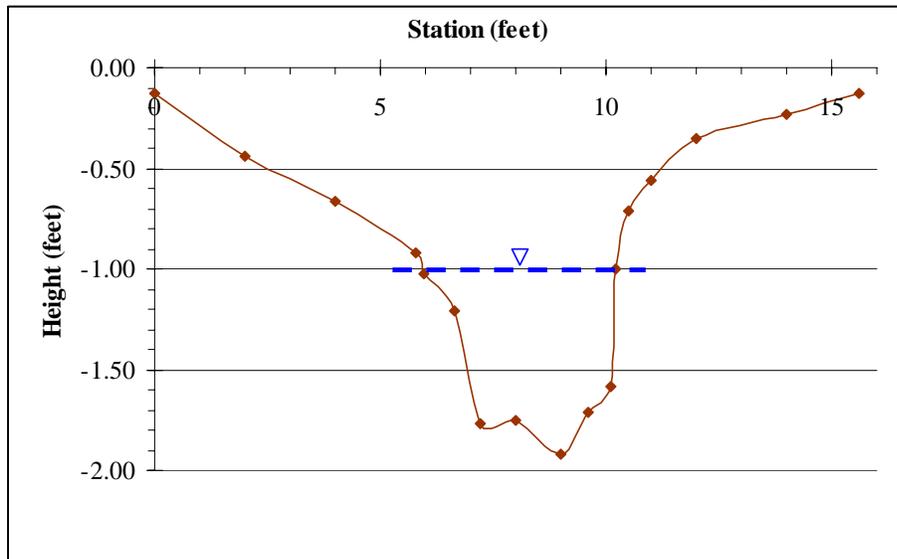


Chart 5. Cross-section 2 at Woodson Creek Wetland Mitigation Site.



3.9 Streambank Erosion Pins

Streambank erosion pins were installed at two locations (upstream and downstream, see **Figure 2** in **Appendix A**) along the outside of meanders in newly constructed channel. The pins were installed after the majority of runoff had occurred. The downstream location was specifically chosen because it showed the most severe signs of bank erosion of any bank observed in the project area. The only erosion observed was approximately 0.5 inches at the lower pin at the upstream site. No bank erosion was observed at the downstream site. Monitoring in future years will provide a more accurate idea of bank stability because they will go through the main runoff event of the year (spring snowmelt).

3.10 Photographs

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

3.11 Maintenance Needs/Recommendations

The lower dike on the eastern parcel was breached in June causing the majority of the ponded water to drain. The cause of the failure is unknown. The breach is approximately 10 feet wide. A photograph of the breach is included in **Appendix C**, and the location is shown in **Figure 2**.

Garrison creeping foxtail continues to dominate the majority of the site. As part of the mitigation agreement, much of the existing Garrison creeping foxtail is to be eliminated at the site. Eradication measures are expected to occur this fall (personal communication, Tom Coleman, Oasis Environmental).

Canada thistle has become established in disturbed areas. It is especially prevalent in and around where Woodson Creek enters the mitigation site, on the dikes, and in the vicinity of the outlet culvert at the southern end of the restored creek channel.

The installation of monitoring wells needs to be completed to fulfill success criteria requirements. Similarly, woody cuttings need to be planted to fulfill success criteria requirements. A map of the planting locations should be provided along with information on the species planted and the number of each species planted.

3.12 Current Credit Summary

Crediting for the Woodson Creek Mitigation Site is complex and comprised of seven different credit areas, each with their own success criteria. **Table 5** summarizes the success criteria for each credit area and what was observed in 2007. In the strictest terms, none of the seven credit areas achieved all of their success criteria in 2007. Credit area 6 (swale area) did not have any monitoring wells, but otherwise achieved all of the success criteria. Partial credit may be possible for some of the areas upon negotiation between MDT and the COE.

Overall the site has improved considerably over pre-construction conditions, but there are specific actions that need to be implemented in order to fulfill the success criteria. Generally these actions are:

- Improve plant species diversity by killing Garrison creeping meadow foxtail and seeding/planting other hydrophytic species.
- Plant woody cuttings at the specified densities and provide a map so that they can be located and monitored in the field. The density of the Garrison creeping meadow foxtail makes finding (and monitoring) woody cuttings almost impossible.
- Install groundwater monitoring wells so that soil saturation requirements can be verified.

The Corps of Engineers will determine which crediting ratios are applicable to the site. However, using the credit ratios listed, **Table 7** summarizes compensatory mitigation credits developed to date at the Woodson Creek Wetland Mitigation Site. Because the success criteria have not been achieved credit areas 1-5 and 7, no wetland mitigation credits are considered to have developed at these areas site in their first year of monitoring. The possible exception to this is Credit Area 6, which has accomplished all of the success criteria but no monitoring wells have been installed in the area as specified in the crediting arrangement with the COE, and therefore the success criteria for hydrology cannot be completely confirmed. However, wetland hydrology was assumed based on typical field indicators, and credits were tentatively assigned to Credit Area 6 on this basis. Actual crediting will need to be negotiated between MDT and the COE.

The pre-project site provided a total of about 141.8 functional units within the monitoring area, the post-project site currently provides about 410 functional units, for a conservative gain of approximately 268 functional units.

Table 5: Credit summary for seven credit areas at the MDT Woodson Creek Wetland Mitigation Site.

CREDIT AREA	CREDIT CATEGORY	PLANNED ACREAGE ^A	2007 ACREAGE*	SUCCESS CRITERIA ^A	MONITORING YEAR 1 COMMENTS
1 – Woodson Creek Ditch and Spoils	Restoration (Re-establishment)	4.02	4.02	<ol style="list-style-type: none"> To meet all three wetland criteria by end of 5-year monitoring period. 80 percent cover of desirable herbaceous plant species; no more than 10% cover of non-preferred species (e.g., reed canarygrass). 1,000 stems/acre woody stem density in woody planting zones. 	<p>One of the three success criteria has been achieved.</p> <ol style="list-style-type: none"> All three wetland criteria have been met. Garrison creeping foxtail is by far the most dominant species in this area and is considered undesirable. A minimum number of woody stems were found during monitoring, much below the 1,000 stems/acre requirement. To effectively monitor these plantings a map showing where they are is needed from the planters.
2 – Upland Areas in Floodplain and East site (excluding ditch and spoils)	Restoration (Re-establishment)	8.50	Approximately 4.57 acres converted to wetland. 3.93 acres remain as upland.	<ol style="list-style-type: none"> To meet all three wetland criteria by end of 5-year monitoring period. 80 percent cover of desirable herbaceous plant species; no more than 10% cover of non-preferred species (e.g., reed canarygrass). 1,000 stems/acre woody stem density in woody planting zones. Soil saturation in the upper 12 inches of soil profile for a minimum of 12.5% of the growing season. Monitoring well will be installed to verify these conditions. 	<p>None of the success criteria have been achieved.</p> <ol style="list-style-type: none"> All three wetland criteria have been met in approximately 4.57 acres of previously identified upland areas, but has not been met in 3.93 acres of upland areas. Former upland areas have roughly 80 percent cover but Garrison creeping foxtail is by far the most dominant species in the newly formed wetland areas and is considered undesirable. No woody stems were found during monitoring. Some areas appear to have wetland hydrology. No monitoring wells had been installed when the site was monitored in July 2007.
3 – New Meander Belt Corridor	Restoration (Rehabilitation / Re-establishment)	18.30	18.27 - wetland	<ol style="list-style-type: none"> To meet all three wetland criteria by end of 5-year monitoring period. Flooding should access portions of the floodplain during floods greater than the 2 year flood event. 80 percent cover of desirable herbaceous plant species; no more than 10% cover of non-preferred species (e.g., reed canarygrass) 1,000 stems/acre woody stem density in woody planting zones. Soil saturation in the upper 12 inches of soil profile for a minimum of 12.5% of the growing season. Monitoring well will be installed to verify these conditions. “Oxbow” ponds will comprise less than 10% of the total wetland project area. Achieve a functional lift to a Category II wetland by achieving 65% or more of the total possible points or a general wildlife rating of 0.9 or 1.0. 	<p>Three (#1, #5, and #6) of the success criteria have been achieved.</p> <ol style="list-style-type: none"> All three wetland criteria have been achieved. Flooding also appears to have been achieved – site was flooded by high flows in April. The site has 80 percent cover or higher, but has a minimum of 50% cover of Garrison creeping meadow foxtail, an undesirable species. A minimal number of woody stems were found during monitoring. Wetland hydrology appears to have been achieved but no monitoring wells have been installed to verify this. Seasonally flooded areas have been created. “Oxbow” ponds and other open water areas comprise approximately 4% of the total wetland project area. Site was rated a Category II wetland in 2007. General wildlife rated as 0.9.
4 – Marginal PEM Wetlands Outside of Floodprone Area (East Site)	Restoration (Rehabilitation / Re-establishment)	23.00	22.70 - wetland	<ol style="list-style-type: none"> To meet all three wetland criteria by end of 5-year monitoring period. 80 percent cover of desirable herbaceous plant species; no more than 10% cover of non-preferred species (e.g., reed canarygrass) Soil saturation in the upper 12 inches of soil profile for a minimum of 12.5% of the growing season. A monitoring well will be installed to verify these conditions. Seasonally flooded areas will comprise less than 10% of the total wetland project area. Achieve a functional lift to a Category II wetland by achieving 65% or more of the total possible points or a general wildlife rating of 0.9 or 1.0. 	<p>Three (#1, #4, and #5) of the success criteria have been achieved. Criteria #5 may have been achieved, but needs to be clarified.</p> <ol style="list-style-type: none"> All three wetland criteria have been achieved. The site has 80 percent cover or higher, but has a minimum of 50% cover of Garrison creeping meadow foxtail, an undesirable species. Wetland hydrology appears to have been achieved but no monitoring wells have been installed to verify this. Seasonally flooded areas have been created. Open water areas comprise approximately 4% of the total wetland project area. Site was rated as a Category II wetland in 2007 due to a general wildlife rating of 0.9 and the presence of nesting Sandhill Cranes.
5 - Marginal PEM Wetlands Outside of Floodprone Area (West Site)	Restoration (Rehabilitation / Re-establishment)	9.77	9.30 - wetland	<ol style="list-style-type: none"> To meet all three wetland criteria by end of 5-year monitoring period. Flooding should access portions of the floodplain during floods greater than the 2 year flood event. 80 percent cover of desirable herbaceous plant species; no more than 10% cover of non-preferred species (e.g., reed canarygrass) Soil saturation in the upper 12 inches of soil profile for a minimum of 12.5% of the growing season. A monitoring well will be installed to verify these conditions. Seasonally flooded areas will comprise less than 10% of the total wetland project area. Achieve a functional lift to a Category II wetland by achieving 65% or more of the total possible points or a general wildlife rating of 0.9 or 1.0. 	<p>Two (#1 and #4) of the success criteria have been achieved.</p> <ol style="list-style-type: none"> All three wetland criteria have been achieved. The site has 80 percent cover or higher, but has a minimum of 50% cover of Garrison creeping meadow foxtail, an undesirable species. Wetland hydrology appears to have been achieved but no monitoring wells have been installed to verify this. Seasonally flooded areas have been created. Open water areas comprise approximately 4% of the total wetland project area. Site was a Category III wetland in 2007.

Table 5: Credit summary for seven credit areas at the MDT Woodson Creek Wetland Mitigation Site.

CREDIT AREA	CREDIT CATEGORY	PLANNED ACREAGE ^A	2007 ACREAGE*	SUCCESS CRITERIA ^A	MONITORING YEAR 1 COMMENTS
6 – Swale PEM Wetlands within Meander Belt Corridor	Restoration (Rehabilitation)	5.55	5.55 - wetland	1. To meet all three wetland criteria by end of 5-year monitoring period. Flooding should access portions of the floodplain during floods greater than the 2 year flood event. 2. 80 percent cover of desirable herbaceous plant species; no more than 10% cover of non-preferred species (e.g., reed canarygrass) 3. Soil saturation in the upper 12 inches of soil profile for a minimum of 12.5% of the growing season. Monitoring wells will be installed to verify these conditions. 4. “Oxbow” ponds will comprise less than 10% of the total wetland project area.	With the exception of the installation of monitoring wells all success criteria have been achieved. 1. All three wetland criteria have been achieved. 2. The site has 80 percent cover or higher and has good species diversity. 3. Wetland hydrology appears to have been achieved but no monitoring wells have been installed to verify this. 4. Seasonally flooded areas have been created. “Oxbow” ponds and other open water areas comprise approximately 4% of the total wetland project area.
7 – West Site Upland Areas	Creation	6.00	10.02 - upland (no credit)	1. To meet all three wetland criteria by end of 5-year monitoring period. 2. 80 percent cover of desirable herbaceous plant species; no more than 10% cover of non-preferred species (e.g., reed canarygrass) 3. Soil saturation in the upper 12 inches of soil profile for a minimum of 12.5% of the growing season. Monitoring wells will be installed to verify these conditions. 4. Seasonally flooded areas will comprise less than 10% of the total wetland project area.	Two (#1 and #4) of the success criteria have been achieved. 1. All three wetland criteria have been achieved in some areas. 2. The site has 80 percent cover or higher, but the site is a monoculture of Garrison creeping meadow foxtail. 3. Wetland hydrology appears to have been achieved in some areas, but no monitoring wells have been installed to verify this. 4. Seasonally flooded areas have been created. Open water areas comprise approximately 4% of the total wetland project area.

^ASuccess Criteria summarized from ADC (2005).

*Acreages for these credit areas are preliminary and will be refined in subsequent years. A map of the credit areas has been requested from Oasis Env. to enable this refinement.

Table 6. Summary of open water and wetland acreages at the Woodson Creek Wetland Mitigation Site.

YEAR	OPEN WATER/AQUATIC BED (acre)	WETLAND (acre)	TOTAL AQUATIC HABITAT (acre)
2004 (pre-mitigation)	0.00	57.48	57.48
2007 (post-construction)	2.55	61.86	64.42

Table 7: 2007 mitigation credit summary for the Woodson Creek Wetland Mitigation Site.

CREDIT AREA	CREDIT CATEGORY	ACRE	ASSUMED CREDIT RATIO ^A	CREDIT ACRE ^{A,C}
1	Restoration (Re-establishment)	4.02	1:1	0.00
2	Restoration (Re-establishment)	4.57	1:1	0.00
3	Restoration (Rehabilitation/Re-establishment)	18.27	1:1 ^b	0.00
4	Restoration (Rehabilitation/Re-establishment)	22.70	1:1 ^b	0.00
5	Restoration (Rehabilitation/Re-establishment)	9.30	1:1 ^b	0.00
6	Restoration (Rehabilitation)	5.55	1.5:1	3.70
7	Creation	0.00	1:1	0.00
TOTAL		64.42		3.70

^aThe Corps of Engineers is the regulatory authority and will determine the actual mitigation ratios.

^bRestoration (Rehabilitation/Re-establishment) will be credited at 1:1 if a functional replacement performance standard is met; otherwise, they will be credited at 1.5:1 if the remaining performance criteria are met.

^cAll conditions in the success criteria have not been fulfilled, therefore credits have not been calculated. Crediting is at discretion of COE and MDT.

4.0 REFERENCES

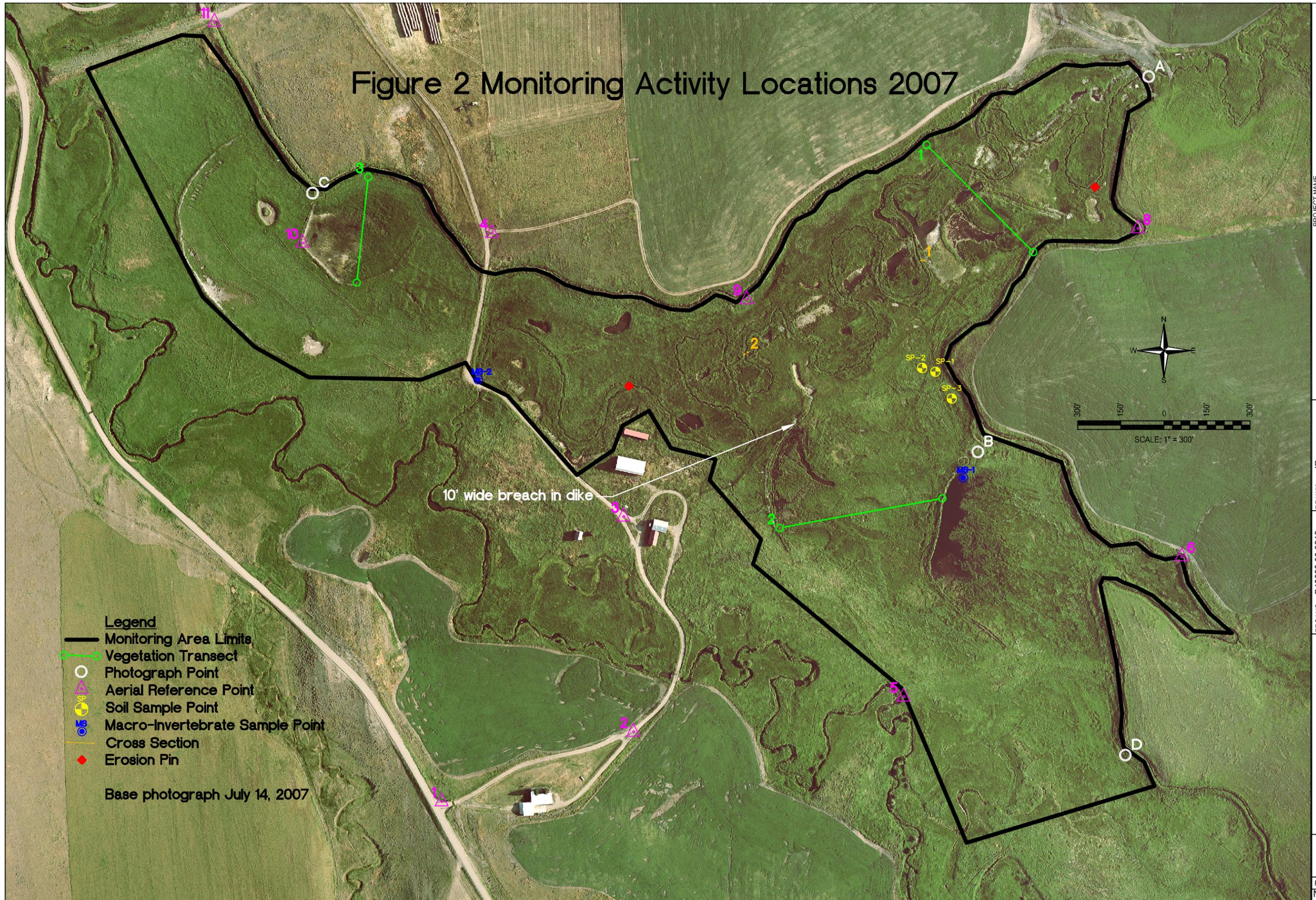
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Appendix A

FIGURES 2 & 3

*MDT Wetland Mitigation Monitoring
Woodson Creek
Ringling, Montana*

Figure 2 Monitoring Activity Locations 2007

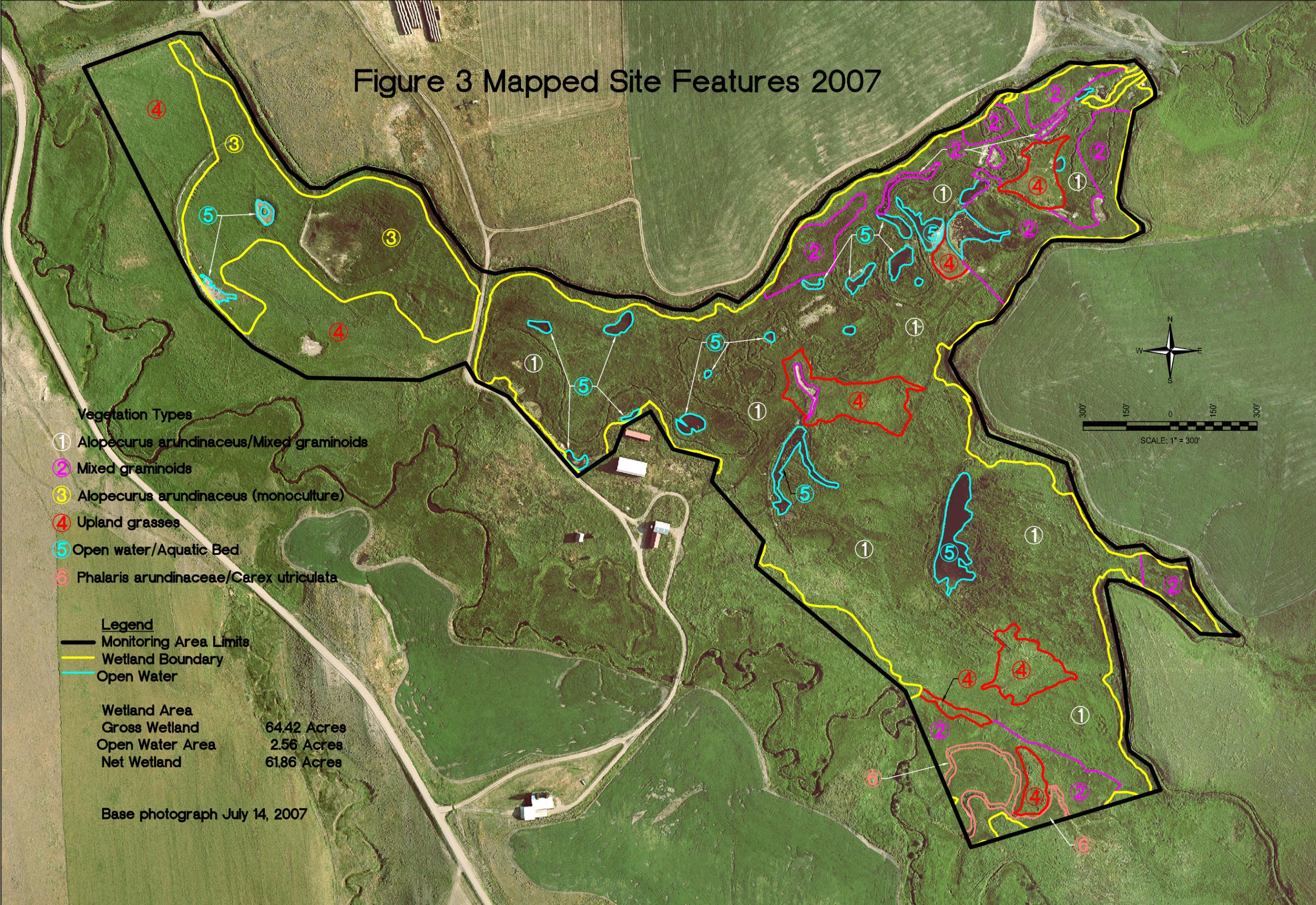


- Legend**
- Monitoring Area Limits
 - Vegetation Transect
 - Photograph Point
 - △ Aerial Reference Point
 - Soil Sample Point
 - Macro-Invertebrate Sample Point
 - Cross Section
 - ◆ Erosion Pin

Base photograph July 14, 2007

		3810 Valley Commons Drive Suite 4 Bozeman, MT 59718
PROJ NO: B43088.00 0212 LOCATION: . MT SCALE: NOTED FILE NAME: 2007 BASE.dwg	DRAWN: JR PROJ MGR: J. BERGLUND CHECKED: RM APPVD: JB	PROJECT NAME MDT WOODSON CREEK WETLAND MITIGATION DRAWING TITLE MONITORING ACTIVITY LOCATIONS 2007
FIGURE 2 OF		REV - Nov/13/2007

Figure 3 Mapped Site Features 2007



- Vegetation Types**
- ① Alopecurus arundinaceus/Mixed graminoids
 - ② Mixed graminoids
 - ③ Alopecurus arundinaceus (monoculture)
 - ④ Upland grasses
 - ⑤ Open water/Aquatic Bed
 - ⑥ Phalaris arundinaceae/Carex utriculata

- Legend**
- Monitoring Area Limits
 - Wetland Boundary
 - Open Water

Wetland Area
 Gross Wetland 64.42 Acres
 Open Water Area 2.56 Acres
 Net Wetland 61.86 Acres

Base photograph July 14, 2007

3810 Valley Commons Drive Suite 4 Bozeman, MT 59718	
PROJ NO: B43088.00 0212 LOCATION: . MT SCALE: NOTED FILE NAME: 2007 BASE.dwg	DRAWN: JR PROJ MGR: J. BERGLUND CHECKED: RM APPVD: JB
PROJECT NAME MDT WOODSON CREEK WETLAND MITIGATION	
DRAWING TITLE MAPPED SITE FEATURES 2007	
FIGURE 3 OF	
REV - Nov/21/2007	

Appendix B

2007 WETLAND MITIGATION SITE MONITORING FORMS
2007 COE WETLAND DELINEATION FORMS
2007 FUNCTIONAL ASSESSMENT FORMS

MDT Wetland Mitigation Monitoring
Woodson Creek
Ringling, Montana

PBS&J / MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name: Woodson Creek Project Number: PBS&J Proj. No. B43088.00
Assessment Date: July 18, 2007 Person(s) conducting the assessment: McEldowney
Location: Ringling, MT MDT District: Billings Milepost: _____
Legal Description: T 6N R 8E Section 6&9
Weather Conditions: Clear, calm, 105 deg F Time of Day: 8 am - 6 pm
Initial Evaluation Date: July 18, 2007 Monitoring Year: 1 # Visits in Year: 1
Size of evaluation area: 100+ acres Land use surrounding wetland: Agricultural

HYDROLOGY

Surface Water Source: Woodson Creek
Inundation: Present Average Depth: 0.2 feet Range of Depths: 0 to 2 ft
Percent of assessment area under inundation: 20%
Depth at emergent vegetation-open water boundary: 0.5 feet
If assessment area is not inundated then are the soils saturated within 12 inches of surface: Yes
Other evidence of hydrology on the site (ex. – drift lines, erosion, stained vegetation, etc.):
OBL and FACW vegetation, soil mottling

Groundwater Monitoring Wells: Absent
Record depth of water below ground surface (in feet):

Well Number	Depth	Well Number	Depth	Well Number	Depth

Additional Activities Checklist:

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

COMMENTS / PROBLEMS:

Groundwater monitoring wells were supposed to be present, but were not located during the monitoring event.

VEGETATION COMMUNITIES

Community Number: **1** Community Title (main spp): **Alopecurus arundinaceus/Mixed Graminoids**

Dominant Species	% Cover	Dominant Species	% Cover
Alopecurus arundinaceus	5 = > 50%	Potentilla anserina	1 = 1-5%
Eleocharis palustris	1 = 1-5%		
Carex nebrascensis	1 = 1-5%		
Agrostis stolonifera	1 = 1-5%		
Juncus balticus	1 = 1-5%		
Carex praegracilis	1 = 1-5%		

Comments / Problems: **This habitat type is a combination of habitat types 2 and 3. May represent a transition stage to a mixed graminoid community type due to restoartion actions, but a trend cannot be determined at this time.**

Community Number: **2** Community Title (main spp): **Mixed graminoids**

Dominant Species	% Cover	Dominant Species	% Cover
Alopecurus arundinaceus	3 = 11-20%	Potentilla anserina	1 = 1-5%
Eleocharis palustris	1 = 1-5%		
Carex nebrascensis	1 = 1-5%		
Agrostis stolonifera	2 = 6-10%		
Juncus balticus	3 = 11-20%		
Carex praegracilis	2 = 6-10%		

Comments / Problems: _____

Community Number: **3** Community Title (main spp): **Alopecurus arundinaceus**

Dominant Species	% Cover	Dominant Species	% Cover
Alopecurus arundinaceus	5 = > 50%		

Comments / Problems: **Monoculture (>90% cover) of Garrison creeping foxtail**

Community Number: **4** Community Title (main spp): **Upland Grasses**

Dominant Species	% Cover	Dominant Species	% Cover
Bromus inermis	5 = > 50%	Latuca serriola	+ = < 1%
Alopecurus arundinaceus	1 = 1-5%	Achillea millefolium	1 = 1-5%
Poa compressa	1 = 1-5%	Melilotus officinale	1 = 1-5%
Agropyron repens	1 = 1-5%	Glycorrhiza lepidota	1 = 1-5%
Hordeum jubatum	2 = 6-10%	Trifolium pratense	1 = 1-5%
Panicum virgatum	+ = < 1%	Cirsium arvense	+ = < 1%

Comments / Problems: _____

VEGETATION COMMUNITIES (continued)

Community Number: **5** Community Title (main spp): **Open water/Aquatic Bed**

Dominant Species	% Cover	Dominant Species	% Cover
Filamentous green algae	1 = 1-5%		

Comments / Problems: _____

Community Number: **6** Community Title (main spp): **Phalaris arundinaceae/Carex utriculata**

Dominant Species	% Cover	Dominant Species	% Cover
Phalaris arundinaceae	5 = > 50%		
Carex utriculata	4 = 21-50%		

Comments / Problems: **Occurs in a swale in the SE portion of site.**

Community Number: _____ Community Title (main spp): _____

Dominant Species	% Cover	Dominant Species	% Cover

Comments / Problems: _____

Community Number: _____ Community Title (main spp): _____

Dominant Species	% Cover	Dominant Species	% Cover

Comments / Problems: _____

VEGETATION COMMUNITIES (continued)

Community Number: _____ Community Title (main spp): _____

Dominant Species	% Cover	Dominant Species	% Cover

Comments / Problems: _____

Community Number: _____ Community Title (main spp): _____

Dominant Species	% Cover	Dominant Species	% Cover

Comments / Problems: _____

Community Number: _____ Community Title (main spp): _____

Dominant Species	% Cover	Dominant Species	% Cover

Comments / Problems: _____

Community Number: _____ Community Title (main spp): _____

Dominant Species	% Cover	Dominant Species	% Cover

Comments / Problems: _____

Additional Activities Checklist:

- Record and map vegetative communities on aerial photograph.

COMPREHENSIVE VEGETATION LIST

Plant Species	Vegetation Community Number (s)	Plant Species	Vegetation Community Number (s)
<i>Achillea millefolium</i>	2,4	<i>Juncus balticus</i>	1,2
<i>Agropyron cristatum</i>	4	<i>Juncus filiformis</i>	1,2
<i>Agropyron repens</i>	3,4	<i>Lactuca serriola</i>	1,2,4
<i>Agrostis exarata</i>	2,5	<i>Linum lewisii</i>	4
<i>Agrostis stolonifera</i>	1,2	<i>Melilotus officinalis</i>	2,4
<i>Alopecurus arundinaceus</i>	1,2,3	<i>Mentha arvensis</i>	1,2
<i>Alopecurus aequalis</i>	2	<i>Muhlenbergia richardsonis*</i>	1,2
<i>Beckmannia syzigachne</i>	2	<i>Panicum virgatum</i>	4
<i>Bromus inermis</i>	4	<i>Pascopyrum smithii</i>	4
<i>Carex nebrascensis</i>	1,2	<i>Phalaris arundinaceae</i>	6
<i>Carex praegracilis</i>	1,2	<i>Phleum alpinum</i>	2
<i>Carex utriculata</i>	6	<i>Phleum pratense</i>	1
<i>Chenopodium album</i>	4	<i>Plantago major</i>	2
<i>Cicuta douglasii</i>	1,2	<i>Poa compressa</i>	4
<i>Cirsium arvense</i>	4	<i>Poa palustris</i>	1,2
<i>Deschampsia cespitosa</i>	1,2	<i>Poa pratensis</i>	1,2,4
<i>Distichlis spicata</i>	1,2,4	<i>Polygonum amphibium</i>	1,5
<i>Dodecatheon pulchellum</i>	1,2	<i>Potentilla anserina</i>	1,2
<i>Eleocharis palustris</i>	1,2,5	<i>Potentilla sp.</i>	2
<i>Elymus lanceolatus</i>	4	<i>Rumex crispus</i>	2
<i>Elymus trachycaulus</i>	1,2	<i>Salix exigua (planted)</i>	1
<i>Epilobium sp.</i>	1,2	<i>Salix sp. (planted)</i>	1
<i>Equisetum hyemale</i>	1,2	<i>Salsola kali*</i>	4
<i>Galium aparine</i>	2	<i>Scirpus microcarpus</i>	1,2
<i>Glycyrrhiza lepidota</i>	4	<i>Solidago sp.</i>	2,4
<i>Halogeton glomeratus</i>	4	<i>Sporobolus cryptandrus</i>	4
<i>Helianthus annuus</i>	4	<i>Taraxacum officinale</i>	2,4
<i>Hieracium sp.</i>	2	<i>Thlaspi arvense</i>	4
<i>Hordeum jubatum</i>	1,4	<i>Trifolium pratense</i>	1,2,4
<i>Iris missouriensis</i>	1,4	<i>Triglochin sp.</i>	2
		<i>Typha latifolia</i>	1

Comments / Problems: _____

WILDLIFE

Birds

Were man-made nesting structures installed? **No**

If yes, type of structure: _____ How many? _____

Are the nesting structures being used? **NA**

Do the nesting structures need repairs? _____

Mammals and Herptiles

Mammal and Herptile Species	Number Observed	Indirect Indication of Use			
		Tracks	Scat	Burrows	Other
Columbia spotted frog	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Direct obs.
Western garter snake	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Direct obs.
Raccoon		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Striped skunk	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Direct obs.
White-tail deer	3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Direct obs.

Additional Activities Checklist:

Yes Macroinvertebrate Sampling (if required)

Comments / Problems: _____

PHOTOGRAPHS

Using a camera with a 50mm lens and color film take photographs of the following permanent reference points listed in the check list below. Record the direction of the photograph using a compass. When at the site for the first time, establish a permanent reference point by setting a ½ inch rebar or fencepost extending 2-3 feet above ground. Survey the location with a resource grade GPS and mark the location on the aerial photograph.

Photograph Checklist:

- One photograph for each of the four cardinal directions surrounding the wetland.
- At least one photograph showing upland use surrounding the wetland. If more than one upland exists then take additional photographs.
- At least one photograph showing the buffer surrounding the wetland.
- One photograph from each end of the vegetation transect, showing the transect.

Location	Photograph Frame #	Photograph Description	Compass Reading (°)
Photopoint A	1	North end of site at Woodson Creek inlet; looking toward the left edge of the silos in the distance.	208
Photopoint A	2	North end of site at Woodson Creek inlet, looking toward the left edge of the big red barn	226
Photopoint A	3	North end of site at Woodson Creek inlet, looking toward a whitish telephone pole	249
Photopoint B	1	East-central portion of site at a T-post near upper dike, looking toward a pond	197
Photopoint B	2	East-central portion of site at a T-post near upper dike, looking toward the ranch house	230
Photopoint B	3	East-central portion of site at a T-post near upper dike, looking toward the barn	266
Photopoint C	1	West portion of site at Sixteen mile ditch, looking toward a fence	95
Photopoint C	2	West portion of site at Sixteen mile ditch, looking toward the barn	132
Photopoint C	3	West portion of site at Sixteen mile ditch, looking toward the right side of the ranch house	173
Photopoint C	4	West portion of site at Sixteen mile ditch, looking toward a shrub on the far side of the project area	224
Photopoint C	5	West portion of site at Sixteen mile ditch, looking toward a pole	288
Photopoint D	1	East portion of the site, looking toward a lone shrub between 2 clumps of shrubs	203
Photopoint D	2	East portion of the site, looking toward a lone shrub	225
Photopoint D	3	East portion of site, looking toward the spruce adjacent to main house	262
Photopoint D	4	East portion of the site, looking toward the big red barn	296
Photopoint D	5	East portion of the site, looking toward north and west side of site, 'V' on the horizon.	324
Transect 1	1	Looking west from east end (start)	314

Location	Photograph Frame #	Photograph Description	Compass Reading (°)
Transect 1	2	Looking east from west end (end)	134
Transect 2	1	Looking northeast from southern end	74
Transect 2	2	Looking southwest from northern end	254
Transect 3	1	Looking north from southern end (May 17, 2007)	353
Transect 3	2	Looking south from northern end (May 17, 2007)	173
Cross-section 1	1	Looking upstream	
Cross-section 2	1	Looking upstream	
East side	1	East side, breach in lower dike	
Macro #1	1	Macroinvertebrate sampling location at upper pond on east parcel	
Macro #2	1	Macroinvertebrate sampling location in creek at culvert outfall	
Erosion #1	1	Bank erosion site #1, upper site (May 17, 2007)	
Erosion #2	1	Bank erosion site #2, lower site (May 17, 2007)	

Comments / Problems: _____

GPS SURVEYING

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

GPS Checklist:

- Jurisdictional wetland boundary.
- 4-6 landmarks that are recognizable on the aerial photograph.
- Start and End points of vegetation transect(s).
- Photograph reference points.
- Groundwater monitoring well locations.

Comments / Problems: _____

WETLAND DELINEATION

(attach COE delineation forms)

At each site conduct these checklist items:

- Delineate wetlands according to the 1987 Army COE manual.
 - Delineate wetland – upland boundary onto aerial photograph.
- Yes** Survey wetland – upland boundary with a resource grade GPS survey.

Comments / Problems: _____

FUNCTIONAL ASSESSMENT

(Complete and attach full MDT Montana Wetland Assessment Method field forms.)
(Also attach any completed abbreviated field forms, if used)

Comments / Problems: _____

MAINTENANCE

Were man-made nesting structure installed at this site? **No**

If yes, do they need to be repaired? **NA**

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

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

If yes, are the structures working properly and in good working order? **No**

If no, describe the problems below.

Comments / Problems: **Breach on lower dike on eastern part of site. Canada thistle has infested most areas that were disturbed during the construction of the site, such as around the water control structure at the site's inlet, the culvert at the outlet of the site, dikes, temporary roads, and staging areas.**

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: Woodson Creek Date: July 18, 2007 Examiner: RRM

Transect Number: 1 Approximate Transect Length: 526 feet Compass Direction from Start: 314° Note: E to W

Vegetation Type A: Mixed graminoids	
Length of transect in this type: 0-25 feet	
Plant Species	Cover
ALOARU	3 = 11-20%
AGROSTO	4 = 21-50%
DESCES	1 = 1-5%
ELEPAL	1 = 1-5%
PHLPRA	+ = < 1%
TRIPRA	3 = 11-20%
TRIGLOCHIN SP.	+ = < 1%
JUNBAL	1 = 1-5%
MENARV	+ = < 1%
POTANS	+ = < 1%
CARNEB	+ = < 1%
Total Vegetative Cover:	85%

Vegetation Type B: Mixed graminoids	
Length of transect in this type: 25-85 feet	
Plant Species	Cover
JUNBAL AND ALOARU (EACH)	4 = 21-50%
DESCES	1 = 1-5%
RUMCRI	+ = < 1%
CARNEB	+ = < 1%
POTANS	+ = < 1%
CICDOU	1 = 1-5%
MENARV	2 = 6-10%
TRIGLOCHIN SP., CIRARV, POAPAL (EACH)	+ = < 1%
LATSER	1 = 1-5%
CARLAS	1 = 1-5%
Total Vegetative Cover:	90%

Vegetation Type C: Mixed graminoids	
Length of transect in this type: 85-118 feet	
Plant Species	Cover
JUNBAL	4 = 21-50%
CARNEB	2 = 6-10%
Open wtr (96.5' to 117.5' - not included in cvr total)	2 = 6-10%
TAROFF	+ = < 1%
LATSER	+ = < 1%
DESCES, POA SP., CICDOU, ALOARU (EACH)	+ = < 1%
TRIGLOCHIN SP. AND RUMCRI (EACH)	+ = < 1%
CARLAS	3 = 11-20%
AGREXA	1 = 1-5%
Total Vegetative Cover:	70%

Vegetation Type D: Mixed graminoids	
Length of transect in this type: 118-257 feet	
Plant Species	Cover
ALOARU	4 = 21-50%
JUNBAL	5 = > 50%
CARLAS	2 = 6-10%
AGREXA (?)	1 = 1-5%
MENARV	1 = 1-5%
TRIGLOCHIN SP.	1 = 1-5%
CARPRA	2 = 6-10%
LATSER	+ = < 1%
RUMCRI AND HORJUB (EACH)	+ = < 1%
POTANS	1 = 1-5%
UNIDENT. GRASS (POA SP?)	1 = 1-5%
UNIDENT FORB	+ = < 1%
Total Vegetative Cover:	90%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Woodson Creek** Date: **July 18, 2007** Examiner: **RRM**

Transect Number: **1** Approximate Transect Length: **526 feet** Compass Direction from Start: **314°** Note: **E to W**

Vegetation Type E: Mixed graminoids	
Length of transect in this type: 257-276 feet	
Plant Species	Cover
MELOFF	1 = 1-5%
TRIPRA	2 = 6-10%
ALOARU	3 = 11-20%
BROINE	2 = 6-10%
BECSZY	1 = 1-5%
SOLIDAGO SP., POAPRA (EACH)	+ = < 1%
CARNEB, AGROSTO, CIRARV, POTANS (EACH)	+ = < 1%
LATSER	1 = 1-5%
ACHMIL, HORJUB, PLAMAJ , POAPAL (EACH)	1 = 1-5%
JUNBAL	1 = 1-5%
CARPRA, MENARV, EQUHYM, SCIRPUS SP (EA)	+ = < 1%
Total Vegetative Cover:	85%

Vegetation Type F: Open water/Aquatic bed	
Length of transect in this type: 276 - 308 feet	
Plant Species	Cover
Filamentous green algae (open water)	5 = > 50%
ELEPAL	1 = 1-5%
AGREXA (?)	+ = < 1%
Total Vegetative Cover:	95%

Vegetation Type G: Alopecurus arundinaceus/Mixed graminoids	
Length of transect in this type: 308 - 525.5 feet	
Plant Species	Cover
ALOARU	5 = > 50%
MELOFF	+ = < 1%
CIRARV	+ = < 1%
TRIPRA	+ = < 1%
JUNBAL	4 = 21-50%
HORJUB	+ = < 1%
CARPRA	2 = 6-10%
AGRSTO	+ = < 1%
POTANS	1 = 1-5%
LATSER	+ = < 1%
POAPRA	+ = < 1%
SCIMIC	+ = < 1%
Total Vegetative Cover:	95%

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

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: Woodson Creek Date: July 18, 2007 Examiner: RRM

Transect Number: 2 Approximate Transect Length: 583 feet Compass Direction from Start: 74° Note: SW to NE

Vegetation Type A: <i>Alopecurus arundinaceus</i> /Mixed graminoids	
Length of transect in this type: 0 - 40 feet	
Plant Species	Cover
ALOARU	5 = > 50%
BECSZY	+ = < 1%
ALOAEQ	+ = < 1%
RUMCRI	1 = 1-5%
RANUNCULUS SP.	+ = < 1%
PURPLE ASTER	+ = < 1%
ELEPAL	+ = < 1%
Previously flooded, drained due to breach in dike.	
Total Vegetative Cover:	60%

Vegetation Type B: <i>Alopecurus arundinaceus</i> /Mixed graminoids	
Length of transect in this type: 40 - 180 feet	
Plant Species	Cover
ALOARU	5 = > 50%
CARNEB	+ = < 1%
ELEPAL	+ = < 1%
POLAMP	+ = < 1%
SCIMIC	+ = < 1%
Total Vegetative Cover:	85%

Vegetation Type C: <i>Alopecurus arundinaceus</i> /Mixed graminoids	
Length of transect in this type: 180 - 212 feet	
Plant Species	Cover
ALOARU	5 = > 50%
CICDOU	+ = < 1%
Total Vegetative Cover:	100%

Vegetation Type D: <i>Alopecurus arundinaceus</i> /Mixed graminoids	
Length of transect in this type: 212 - 356 feet	
Plant Species	Cover
ALOARU	5 = > 50%
JUNBAL	2 = 6-10%
CARPRA	1 = 1-5%
POTANS	1 = 1-5%
DESCES	+ = < 1%
YELLOW ASTER	+ = < 1%
Total Vegetative Cover:	100%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Cover Estimate

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

Indicator Class

+ = Obligate
- = Facultative/Wet
0 = Facultative

Source

P = Planted
V = Volunteer

Percent of perimeter developing wetland vegetation (excluding dam/berm structures): **100%**

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

Estimate cover within a 10 foot 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.

Comments: _____

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

Project / Site: Woodson Creek MDT Mitigation Site Applicant / Owner: MDT/Ringling Land and Cattle Investigator: PBS&J (RRM)	Date: July 20, 2007 County: Meagher State: MT
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Do Normal Circumstances exist on the site? Yes Is the site significantly disturbed (Atypical Situation)? No Is the area a potential Problem Area? No (If needed, explain on reverse side)	Community ID: _____ Transect ID: _____ Plot ID: SP1
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VEGETATION

Dominant Species	Stratum	Indicator	Dominant Species	Stratum	Indicator
1. <i>Bromus inermis</i>	Herb		11.		
2. <i>Taraxacum officinale</i>	Herb	FACU	12.		
3. <i>Poa pratensis</i>	Herb	FACU+	13.		
4. <i>Trifolium pratense</i>	Herb	FACU	14.		
5. <i>Achillea millefolium</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-): 0 / 0 = 0%			FAC Neutral: 0 / 0 = 0%		
Remarks: Dominated by upland grasses.					

HYDROLOGY

No Recorded Data (Describe in Remarks): <u>N/A</u> Stream, Lake, or Tide Gauge <u>N/A</u> Aerial Photographs <u>N/A</u> Other Yes No Recorded Data	Wetland Hydrology Indicators Primary Indicators: <u>NO</u> Inundated <u>NO</u> Saturated in Upper 12 Inches <u>NO</u> Water Marks <u>NO</u> Drift Lines <u>NO</u> Sediment Deposits <u>NO</u> Drainage Patterns in Wetland Secondary Indicators (2 or more required): <u>YES</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 None ____ (in.) Depth to Free Water in Pit None ____ (in.) Depth to Saturated Soil None ____ (in.)	
Remarks: No evidence of wetland hydrology. Site is subirrigated by leakage from the Sixteenmile irrigation ditch.	

SOILS

Map Unit Name (Series and Phase): **Martinsdale loam, 1 to 4 percent slopes**
 Map Symbol: **54B** Drainage Class: **Well drained** Mapped Hydric Inclusion? **No**
 Taxonomy (Subgroup): **Typic Arguistolls** Field Observations confirm Mapped Type? **No**

Profile Description					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color(s) (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
8	A	10 YR 3/1	10 YR 4/1 /	Common N/A	Sandy Clay Loam
12	B	10 YR 2/1	/	N/A	Clay
		/	/	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>YES</u> Gleyed or Low-Chroma Colors	<u>NO</u> Other (Explain in Remarks)

Remarks: **Low chroma in B horizon. Mottling in A horizon occurs at the lower portion of the A horizon. Soil was moist throughout soil profile.**

WETLAND DETERMINATION

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

Remarks: **Upland sample point. Site is subirrigated by the Sixteenmile irrigation ditch. Sample point does not exhibit hydrophytic vegetation or have strong indicators of wetland hydrology.**

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

Project / Site: Woodson Creek MDT Mitigation Site Applicant / Owner: MDT/Ringling Land and Cattle Investigator: PBS&J (RRM)	Date: July 20, 2007 County: Meagher State: MT
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Do Normal Circumstances exist on the site? Yes Is the site significantly disturbed (Atypical Situation)? No Is the area a potential Problem Area? No (If needed, explain on reverse side)	Community ID: _____ Transect ID: _____ Plot ID: SP2
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VEGETATION

Dominant Species	Stratum	Indicator	Dominant Species	Stratum	Indicator
1. <i>Alopecurus arundinaceus</i>	Herb	NI	11.		
2. <i>Potentilla anserina</i>	Herb	OBL	12.		
3. <i>Taraxacum officinale</i>	Herb	FACU	13.		
4. <i>Carex praegracilis</i>	Herb	FACW	14.		
5. <i>Poa paulstris</i>	Herb	FAC	15.		
6. <i>Juncus balticus</i>	Herb	OBL	16.		
7.			17.		
8.			18.		
9.			19.		
10.			20.		
Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): 4 / 6 = 67%			FAC Neutral: 3 / 6 = 50%		
Remarks: Site is dominated by clustered field sedge and silverweed.					

HYDROLOGY

No Recorded Data (Describe in Remarks): <u>N/A</u> Stream, Lake, or Tide Gauge <u>N/A</u> Aerial Photographs <u>N/A</u> Other Yes 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>NO</u> Drift Lines <u>NO</u> Sediment Deposits <u>NO</u> Drainage Patterns in Wetland Secondary Indicators (2 or more required): <u>YES</u> Oxidized Root Channels in Upper 12 inches <u>NO</u> Water-Stained Leaves <u>NO</u> Local Soil Survey Data <u>YES</u> FAC-Neutral Test <u>NO</u> Other (Explain in Remarks)
Field Observations: Depth of Surface Water None ____ (in.) Depth to Free Water in Pit None ____ (in.) Depth to Saturated Soil = 8 (in.)	
Remarks: Soil saturated at approximately 8 inches below soil surface. Site is subirrigated by leakage from the Sixteenmile irrigation ditch.	

SOILS

Map Unit Name (Series and Phase): **Martinsdale loam, 1 to 4 percent**
 Map Symbol: **54B** Drainage Class: **Well drained** Mapped Hydric Inclusion? **No**
 Taxonomy (Subgroup): **Typic Arguistolls** Field Observations confirm Mapped Type? **No**

Profile Description					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color(s) (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
10	A	10 YR 3/1	10 YR 4/6	Common	Clay
		/	/	N/A	
		/	/	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>YES</u> Gleyed or Low-Chroma Colors	<u>NO</u> Other (Explain in Remarks)

Remarks: **Low chroma and mottles in upper 10 inches of the soil profile. Soil was saturated at approximately 8 inches, very moist above this.**

WETLAND DETERMINATION

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

Remarks: **Wetland sample point - palustrine emergent. Site is subirrigated by the Sixteenmile irrigation ditch. Sample point exhibits dominance by hydrophytic vegetation, has strong indicators of wetland hydrology and hydric soils.**

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

Project / Site: Woodson Creek MDT Mitigation Site Applicant / Owner: MDT/Ringling Land and Cattle Investigator: PBS&J (RRM)	Date: July 20, 2007 County: Meagher State: MT
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Do Normal Circumstances exist on the site? Yes Is the site significantly disturbed (Atypical Situation)? Yes Is the area a potential Problem Area? No (If needed, explain on reverse side)	Community ID: _____ Transect ID: _____ Plot ID: SP3
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VEGETATION

Dominant Species	Stratum	Indicator	Dominant Species	Stratum	Indicator
1. <i>Alopecurus arundinaceus</i>	Herb	NI	11.		
2. <i>Carex praeegracilis</i>	Herb	FACW	12.		
3. <i>Juncus balticus</i>	Herb	OBL	13.		
4. <i>Carex nebrascensis</i>	Herb	OBL	14.		
5.			15.		
6.			16.		
7.			17.		
8.			18.		
9.			19.		
10.			20.		
Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): 3 / 4 = 75%			FAC Neutral: 3 / 4 = 75%		
Remarks: Dominated (>90% cover) by Garrison creeping foxtail. American slughgrass (OBL) and spikerush (OBL) occur in topographic low areas.					

HYDROLOGY

No Recorded Data (Describe in Remarks): <u>N/A</u> Stream, Lake, or Tide Gauge <u>N/A</u> Aerial Photographs <u>N/A</u> Other Yes 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>NO</u> Drift Lines <u>NO</u> Sediment Deposits <u>NO</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>YES</u> FAC-Neutral Test <u>NO</u> Other (Explain in Remarks)
Field Observations: Depth of Surface Water = 0.5 (in.) Depth to Free Water in Pit None ____ (in.) Depth to Saturated Soil = 0 (in.)	
Remarks: Site is inundated and is subirrigated by leakage from the Sixteenmile irrigation ditch.	

SOILS

Map Unit Name (Series and Phase): Martinsdale loam, 1 to 4 percent					
Map Symbol: 54B Drainage Class: Well drained Mapped Hydric Inclusion? No					
Taxonomy (Subgroup): Typic Arguistolls Field Observations confirm Mapped Type? No					
Profile Description					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color(s) (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
6	Organic	/	/ /	N/A N/A	Organic Sapric
10	B	10 YR 2/1	/ /	N/A N/A	Clay
		/	/ /	N/A N/A	
		/	/ /	N/A N/A	
		/	/ /	N/A N/A	
Hydric Soil Indicators:					
NO Histosol		NO Concretions			
NO Histic Epipedon		NO High Organic Content in Surface Layer in Sandy Soils			
YES Sulfidic Odor		NO Organic Streaking in Sandy Soils			
NO Aquic Moisture Regime		NO Listed on Local Hydric Soils List			
NO Reducing Conditions		NO Listed on National Hydric Soils List			
YES Gleyed or Low-Chroma Colors		NO Other (Explain in Remarks)			
Remarks: Low chroma and mottles in upper 10 inches of the soil profile. Soil was saturated at approximately 8 inches, very moist above this.					

WETLAND DETERMINATION

Hydrophytic Vegetation Present? YES	Is this Sampling Point within a Wetland? YES
Wetland Hydrology Present? YES	
Hydric Soils Present? YES	
Remarks: Wetland sample point - palustrine emergent. Site is subirrigated by the Sixteenmile irrigation ditch. Site was inundated/saturated to the soil surface, had a sulfidic odor, and was dominated by Garrison creeping foxtail with FACW or OBL vegetation occurring in minor amounts. Site is considered an atypical situation because of the dominance of Garrison creeping foxtail, however, due to the presence of wetland hydrology, strong indicators of hydric soils, and the presence of OBL and FACW vegetation, though minor, the sample point is considered to be within a wetland. In fact, it should be noted that the site has six inches of organic soil in its epipedon, which is relatively close to the 8 inches required for classification as a histic epipedon.	

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

1. Project Name: MDT- Wetland Mitigation Monitoring 2. Project #: _____ Control #: _____
 3. Evaluation Date: 7/18/2007 4. Evaluator(s): RRM (PBS&J) 5. Wetland / Site #(s): Woodson Creek-EAST
 6. Wetland Location(s) i. T: 6 S R: 8 E S: 9, 16 T: __ N R: __ E S: _____
 ii. Approx. Stationing / Mileposts: _____
 iii. Watershed: 7 - Missouri / Sun / Smith GPS Reference No. (if applies): 46.28858 N, -110.73184 W
 Other Location Information: Meagher County, east of Ringling, MT

7. A. Evaluating Agency PBS&J 8. Wetland Size (total acres): 55.1 (visually estimated)
 _____ (measured, e.g. GPS)
 B. Purpose of Evaluation:
 Wetlands potentially affected by MDT project
 Mitigation wetlands; pre-construction
 Mitigation wetlands; post-construction
 Other
 9. Assessment Area (total acres): 27.27 (visually estimated)
 _____ (measured, e.g. GPS)
 Comments: _____

10. CLASSIFICATION OF WETLAND AND AQUATIC HABITATS IN AA

HGM CLASS ¹	SYSTEM ²	SUBSYSTEM ²	CLASS ²	WATER REGIME ²	MODIFIER ²	% OF AA
Depression	Palustrine		Aquatic Bed	Semipermanently Flooded	Excavated	2
Slope	Palustrine	---	Emergent Wetland	Seasonally Flooded	---	98
---	---	---	---	---	---	
---	---	---	---	---	---	

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

Comments: Site is a mitigation wetland.

11. ESTIMATED RELATIVE ABUNDANCE (of similarly classified sites within the same Major Montana Watershed Basin)

Abundant Comments: _____

12. GENERAL CONDITION OF AA

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

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

Comments: (types of disturbance, intensity, season, etc.) Wetland mitigation site constructed in 2006. Site is overwhelmingly dominated by Garrison creeping foxtail.

ii. Prominent weedy, alien, & introduced species: Some patches of heavy Canada thistle infestation occurs in areas that were disturbed during construction.

iii. Briefly describe AA and surrounding land use / habitat: AA is a wet meadow primarily dominated by Garrison creeping foxtail. Surrounding land use is predominantly agricultural - wheat, alfalfa, and livestock production. Rolling topography. Main sources of water are Woodson Creek and leakage from the Sixteen mile irrigation ditch.

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

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

Comments: Palustrine aquatic bed and palustrine emergent.

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

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

- Primary or Critical habitat (list species) D S _____
- Secondary habitat (list species) D S _____
- Incidental habitat (list species) D S _____
- No usable habitat D S _____

ii. **Rating** (Based on the strongest habitat chosen in 14A(i) above, find the corresponding rating of High (H), Moderate (M), or Low (L) for this function.

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	none
Functional Point and Rating	---	---	---	---	---	---	0 (L)

If documented, list the source (e.g., observations, records, etc.): _____

14B. HABITAT FOR PLANTS AND ANIMALS RATED AS S1, S2, OR S3 BY THE MONTANA NATURAL HERITAGE PROGRAM.

Do not include species listed in 14A(i).

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

- Primary or Critical habitat (list species) D S Sandhill crane (S2N) nesting.
- Secondary habitat (list species) D S _____
- Incidental habitat (list species) D S American white pelican (S3B)
- No usable habitat D S _____

iii. **Rating** Based on the strongest habitat chosen in 14B(i) above, find the corresponding rating of High (H), Moderate (M), or Low (L) for this function.

Highest Habitat Level:	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	none
Functional Point and Rating	1 (H)	---	---	---	.2 (L)	---	---

If documented, list the source (e.g., observations, records, etc.): Observed by ranch manager (Dick Sellers) and Oasis Env. staff.

14C. General Wildlife Habitat Rating

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

Substantial (based on any of the following)

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

Low (based on any of the following)

- few or no wildlife observations during peak use periods
- little to no wildlife sign
- sparse adjacent upland food sources
- interviews with local biologists with knowledge of AA

Moderate (based on any of the following)

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

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

Structural Diversity (from #13)	<input type="checkbox"/> High								<input checked="" type="checkbox"/> Moderate								<input type="checkbox"/> Low			
Class Cover Distribution (all vegetated classes)	<input type="checkbox"/> Even				<input checked="" type="checkbox"/> Uneven				<input type="checkbox"/> Even				<input checked="" type="checkbox"/> Uneven				<input type="checkbox"/> Even			
Duration of Surface Water in ≥ 10% of AA	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A
Low disturbance at AA (see #12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Moderate disturbance at AA (see #12)	--	--	--	--	--	--	--	--	--	--	--	--	H	--	--	--	--	--	--	--
High disturbance at AA (see #12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

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

Evidence of Wildlife Use from 14C(i)	Wildlife Habitat Features Rating from 14C(ii)			
	<input type="checkbox"/> Exceptional	<input checked="" type="checkbox"/> High	<input type="checkbox"/> Moderate	<input type="checkbox"/> Low
Substantial	--	--	--	--
Moderate	--	.7 (M)	--	--
Low	--	--	--	--

Comments: Site is used by migrating waterfowl.

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

If the AA is not or was not historically used by fish due to lack of habitat or excessive gradient, then check the NA box above.

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

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

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

ii. **Modified Habitat Quality:** Is fish use of the AA precluded or significantly reduced by a culvert, dike, other man-made structure or activity or is the waterbody included on the 'MDEQ list of waterbodies in need of TMDL development' with 'Probable Impaired Uses' listed as cold or warm water fishery or aquatic life support?

Y N If yes, reduce the rating from 14D(i) by one level and check the modified habitat quality rating: E H M L

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

Types of Fish Known or Suspected Within AA	Modified Habitat Quality from 14D(ii)			
	<input type="checkbox"/> Exceptional	<input type="checkbox"/> High	<input type="checkbox"/> Moderate	<input type="checkbox"/> Low
Native game fish	--	--	--	--
Introduced game fish	--	--	--	--
Non-game fish	--	--	--	--
No fish	--	--	--	--

Comments: The restored portion of Woodson Creek does not contain a lot of aquatic cover or much variety in aquatic habitat, such as pools. Aquatic habitat is expected to form over time as the channel evolves and is subject to more runoff events. Site contains some non-game fish, but are minimal.

14E. FLOOD ATTENUATION NA (proceed to 14G)

Applies only to wetlands subject to flooding via in-channel or overbank flow.

If wetlands in AA do not flood from in-channel or overbank flow, then check NA above.

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

Estimated wetland area in AA subject to periodic flooding	<input type="checkbox"/> ≥ 10 acres			<input type="checkbox"/> <10, >2 acres			<input checked="" type="checkbox"/> ≤2 acres		
% of flooded wetland classified as forested, scrub/shrub, or both	75%	25-75%	<25%	75%	25-75%	<25%	75%	25-75%	<25%
AA contains no outlet or restricted outlet	--	--	--	--	--	--	--	--	--
AA contains unrestricted outlet	--	--	--	--	--	--	--	--	--

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

Y N **Comments:**

14F. SHORT AND LONG TERM SURFACE WATER STORAGE NA (proceed to 14G)

Applies to wetlands that flood or pond from overbank or in-channel flow, precipitation, upland surface flow, or groundwater flow.

If no wetlands in the AA are subject to flooding or ponding, then check NA above.

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

Abbreviations: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral.

Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding.	<input type="checkbox"/> >5 acre feet			<input checked="" type="checkbox"/> <5, >1 acre feet			<input type="checkbox"/> ≤1 acre foot		
Duration of surface water at wetlands within the AA	P/P	S/I	T/E	P/P	S/I	T/E	P/P	S/I	T/E
Wetlands in AA flood or pond ≥ 5 out of 10 years	--	--	--	.8 (H)	--	--	--	--	--
Wetlands in AA flood or pond < 5 out of 10 years	--	--	--	--	--	--	--	--	--

Comments: _____

14G. SEDIMENT/NUTRIENT/TOXICANT RETENTION AND REMOVAL NA (proceed to 14H)

Applies to wetlands with the potential to receive excess sediments, nutrients, or toxicants through influx of surface or ground water or direct input.

If no wetlands in the AA are subject to such input, check NA above.

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

Sediment, Nutrient, and Toxicant Input Levels Within AA	AA receives or surrounding land use has potential to deliver low to moderate levels of sediments, nutrients, or compounds such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.				Waterbody on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants or AA receives or surrounding land use has potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.			
	<input checked="" type="checkbox"/> ≥ 70%		<input type="checkbox"/> < 70%		<input type="checkbox"/> ≥ 70%		<input type="checkbox"/> < 70%	
% cover of wetland vegetation in AA	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Evidence of flooding or ponding in AA	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No
AA contains no or restricted outlet	--	--	--	--	--	--	--	--
AA contains unrestricted outlet	.9 (H)	--	--	--	--	--	--	--

Comments: AA has potential to receive runoff and groundwater seepage from adjacent agricultural fields.

14H. SEDIMENT/ShORELINE STABILIZATION NA (proceed to 14I)

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

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

% Cover of wetland streambank or shoreline by species with deep, binding rootmasses.	Duration of Surface Water Adjacent to Rooted Vegetation		
	<input type="checkbox"/> Permanent / Perennial	<input type="checkbox"/> Seasonal / Intermittent	<input type="checkbox"/> Temporary / Ephemeral
≥ 65 %	--	--	--
35-64 %	--	--	--
< 35 %	--	--	--

Comments: _____

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT

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

A = acreage of vegetated component in the AA. B = structural diversity rating from #13. C = Yes (Y) or No (N) as to whether or not the AA contains a surface or subsurface outlet; P/P = permanent/perennial; S/I = seasonal/intermittent; T/E/A= temporary/ephemeral/absent.

A	<input checked="" type="checkbox"/> Vegetated component >5 acres						<input type="checkbox"/> Vegetated component 1-5 acres						<input type="checkbox"/> Vegetated component <1 acre					
B	<input type="checkbox"/> High		<input checked="" type="checkbox"/> Moderate		<input type="checkbox"/> Low		<input type="checkbox"/> High		<input type="checkbox"/> Moderate		<input type="checkbox"/> Low		<input type="checkbox"/> High		<input type="checkbox"/> Moderate		<input type="checkbox"/> Low	
C	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N
P/P	--	--	.9H	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S/I	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
T/E/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Comments: _____

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

i. **Discharge Indicators**

- Springs are known or observed.
- Vegetation growing during dormant season/drought.
- Wetland occurs at the toe of a natural slope.
- Seeps are present at the wetland edge.
- AA permanently flooded during drought periods.
- Wetland contains an outlet, but no inlet.
- Other _____

ii. **Recharge Indicators**

- Permeable substrate presents without underlying impeding layer.
- Wetland contains inlet but not outlet.
- Other _____

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

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

Comments: The majority of the site is supported by groundwater seepage from the Sixteen mile irrigation ditch.

14K. UNIQUENESS

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

Replacement Potential	AA contains fen, bog, warm springs or mature (>80 yr-old) forested wetland or plant association listed as "S1" by the MTNHP.			AA does not contain previously cited rare types and structural diversity (#13) is high or contains plant association listed as "S2" by the MTNHP.			AA does not contain previously cited rare types or associations and structural diversity (#13) is low-moderate.		
Estimated Relative Abundance from #11	<input type="checkbox"/> rare	<input type="checkbox"/> common	<input type="checkbox"/> abundant	<input type="checkbox"/> rare	<input type="checkbox"/> common	<input type="checkbox"/> abundant	<input type="checkbox"/> rare	<input type="checkbox"/> common	<input checked="" type="checkbox"/> abundant
Low disturbance at AA (#12i)	--	--	--	--	--	--	--	--	--
Moderate disturbance at AA (#12i)	--	--	--	--	--	--	--	--	.2L
High disturbance at AA (#12i)	--	--	--	--	--	--	--	--	--

Comments: _____

14L. RECREATION / EDUCATION POTENTIAL

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

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

iii. Based on the location, diversity, size, and other site attributes, is there a strong potential for recreational or educational use?

- Yes [Proceed to 14L (ii) and then 14L(iv)]
- No [Rate as low in 14L(iv)]

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

Ownership	Disturbance at AA from #12(i)		
	<input type="checkbox"/> Low	<input type="checkbox"/> Moderate	<input type="checkbox"/> High
Public ownership	--	--	--
Private ownership	--	--	.1(L)

Comments: The site is far from population centers and is on private land, and so there is not a strong potential for education or recreation.

FUNCTION, VALUE SUMMARY, AND OVERALL RATING

Function and Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units (Actual Points x Estimated AA Acreage)
A. Listed/Proposed T&E Species Habitat	low	0.00	1	0
B. MT Natural Heritage Program Species Habitat	high	1.00	1	27.27
C. General Wildlife Habitat	high	0.9	1	24.54
D. General Fish/Aquatic Habitat	N/A	--	--	NA
E. Flood Attenuation	N/A	--	--	NA
F. Short and Long Term Surface Water Storage	high	0.80	1	21.82
G. Sediment/Nutrient/Toxicant Removal	high	0.90	1	24.54
H. Sediment/Shoreline Stabilization	N/A	0.00	--	NA
I. Production Export/Food Chain Support	high	0.90	1	24.54
J. Groundwater Discharge/Recharge	high	1.00	1	27.27
K. Uniqueness	low	0.20	1	5.45
L. Recreation/Education Potential	low	0.1	1	2.73
Totals:		<u>5.8</u>	<u>9.00</u>	<u>158.17</u>
Percent of Total Possible Points:			64% (Actual / Possible) x 100 [rd to nearest whole #]	

<p>Category I Wetland: (Must satisfy one of the following criteria. If not satisfied, proceed to Category II.)</p> <p><input type="checkbox"/> Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; or</p> <p><input type="checkbox"/> Score of 1 functional point for Uniqueness; or</p> <p><input type="checkbox"/> Score of 1 functional point for Flood Attenuation and answer to Question 14E(ii) is "yes"; or</p> <p><input type="checkbox"/> Percent of total Possible Points is > 80%.</p>
<p>Category II Wetland: (Criteria for Category I not satisfied and meets any one of the following Category II criteria. If not satisfied, proceed to Category IV.)</p> <p><input checked="" type="checkbox"/> Score of 1 functional point for Species Rated S1, S2, or S3 by the MT Natural Heritage Program; or</p> <p><input checked="" type="checkbox"/> Score of .9 or 1 functional point for General Wildlife Habitat; or</p> <p><input type="checkbox"/> Score of .9 or 1 functional point for General Fish/Aquatic Habitat; or</p> <p><input type="checkbox"/> "High" to "Exceptional" ratings for both General Wildlife Habitat and General Fish / Aquatic Habitat; or</p> <p><input type="checkbox"/> Score of .9 functional point for Uniqueness; or</p> <p><input type="checkbox"/> Percent of total possible points is > 65%.</p>
<p><input type="checkbox"/> Category III Wetland: (Criteria for Categories I, II, or IV not satisfied.)</p>
<p>Category IV Wetland: (Criteria for Categories I or II are not satisfied and <u>all</u> of the following criteria are met; If not satisfied, return to Category III.)</p> <p><input type="checkbox"/> "Low" rating for Uniqueness; and</p> <p><input type="checkbox"/> "Low" rating for Production Export / Food Chain Support; and</p> <p><input type="checkbox"/> Percent of total possible points is < 30%.</p>

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

I II III IV

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

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

- Primary or Critical habitat (list species) D S _____
- Secondary habitat (list species) D S _____
- Incidental habitat (list species) D S _____
- No usable habitat D S _____

ii. **Rating** (Based on the strongest habitat chosen in 14A(i) above, find the corresponding rating of High (H), Moderate (M), or Low (L) for this function.

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	none
Functional Point and Rating	---	---	---	---	---	---	---

If documented, list the source (e.g., observations, records, etc.): No T&E species listed for Meagher County.

14B. HABITAT FOR PLANTS AND ANIMALS RATED AS S1, S2, OR S3 BY THE MONTANA NATURAL HERITAGE PROGRAM.

Do not include species listed in 14A(i).

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

- Primary or Critical habitat (list species) D S _____
- Secondary habitat (list species) D S Sandhill crane (S2N)
- Incidental habitat (list species) D S American white pelican (S3B), Bald Eagle (S3)
- No usable habitat D S _____

iii. **Rating** Based on the strongest habitat chosen in 14B(i) above, find the corresponding rating of High (H), Moderate (M), or Low (L) for this function.

Highest Habitat Level:	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	none
Functional Point and Rating	---	---	.7 (M)	---	---	---	---

If documented, list the source (e.g., observations, records, etc.): Observed by ranch manager (Dick Sellers).

14C. General Wildlife Habitat Rating

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

Substantial (based on any of the following)

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

Low (based on any of the following)

- few or no wildlife observations during peak use periods
- little to no wildlife sign
- sparse adjacent upland food sources
- interviews with local biologists with knowledge of AA

Moderate (based on any of the following)

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

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

Structural Diversity (from #13)	<input type="checkbox"/> High								<input type="checkbox"/> Moderate								<input checked="" type="checkbox"/> Low			
Class Cover Distribution (all vegetated classes)	<input type="checkbox"/> Even				<input type="checkbox"/> Uneven				<input type="checkbox"/> Even				<input type="checkbox"/> Uneven				<input checked="" type="checkbox"/> Even			
Duration of Surface Water in ≥ 10% of AA	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A
Low disturbance at AA (see #12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Moderate disturbance at AA (see #12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	M	--	--
High disturbance at AA (see #12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

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

Evidence of Wildlife Use from 14C(i)	Wildlife Habitat Features Rating from 14C(ii)			
	<input type="checkbox"/> Exceptional	<input type="checkbox"/> High	<input checked="" type="checkbox"/> Moderate	<input type="checkbox"/> Low
Substantial	--	--	--	--
Moderate	--	--	.5 (M)	--
Low	--	--	--	--

Comments: Site is used somewhat by migrating waterfowl. Whitetail deer observed bedded down within AA.

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

If the AA is not or was not historically used by fish due to lack of habitat or excessive gradient, then check the NA box above.

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

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

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

ii. **Modified Habitat Quality:** Is fish use of the AA precluded or significantly reduced by a culvert, dike, other man-made structure or activity or is the waterbody included on the 'MDEQ list of waterbodies in need of TMDL development' with 'Probable Impaired Uses' listed as cold or warm water fishery or aquatic life support?

Y N If yes, reduce the rating from 14D(i) by one level and check the modified habitat quality rating: E H M L

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

Types of Fish Known or Suspected Within AA	Modified Habitat Quality from 14D(ii)			
	<input type="checkbox"/> Exceptional	<input type="checkbox"/> High	<input type="checkbox"/> Moderate	<input type="checkbox"/> Low
Native game fish	--	--	--	--
Introduced game fish	--	--	--	--
Non-game fish	--	--	--	--
No fish	--	--	--	--

Comments: The restored portion of Woodson Creek does not contain a lot of aquatic cover or much variety in aquatic habitat, such as pools. Aquatic habitat is expected to form over time as the channel evolves and is subject to more runoff events. Site contains some non-game fish, but are minimal.

14E. FLOOD ATTENUATION NA (proceed to 14G)

Applies only to wetlands subject to flooding via in-channel or overbank flow.

If wetlands in AA do not flood from in-channel or overbank flow, then check NA above.

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

Estimated wetland area in AA subject to periodic flooding	<input type="checkbox"/> ≥ 10 acres			<input type="checkbox"/> <10, >2 acres			<input type="checkbox"/> ≤2 acres		
% of flooded wetland classified as forested, scrub/shrub, or both	75%	25-75%	<25%	75%	25-75%	<25%	75%	25-75%	<25%
AA contains no outlet or restricted outlet	--	--	--	--	--	--	--	--	--
AA contains unrestricted outlet	--	--	--	--	--	--	--	--	--

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

Y N **Comments:**

14F. SHORT AND LONG TERM SURFACE WATER STORAGE NA (proceed to 14G)

Applies to wetlands that flood or pond from overbank or in-channel flow, precipitation, upland surface flow, or groundwater flow.

If no wetlands in the AA are subject to flooding or ponding, then check NA above.

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

Abbreviations: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral.

Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding.	<input type="checkbox"/> >5 acre feet			<input type="checkbox"/> <5, >1 acre feet			<input type="checkbox"/> ≤1 acre foot		
Duration of surface water at wetlands within the AA	P/P	S/I	T/E	P/P	S/I	T/E	P/P	S/I	T/E
Wetlands in AA flood or pond ≥ 5 out of 10 years	--	--	--	--	.6 (M)	--	--	--	--
Wetlands in AA flood or pond < 5 out of 10 years	--	--	--	--	--	--	--	--	--

Comments: _____

14G. SEDIMENT/NUTRIENT/TOXICANT RETENTION AND REMOVAL NA (proceed to 14H)

Applies to wetlands with the potential to receive excess sediments, nutrients, or toxicants through influx of surface or ground water or direct input.

If no wetlands in the AA are subject to such input, check NA above.

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

Sediment, Nutrient, and Toxicant Input Levels Within AA	AA receives or surrounding land use has potential to deliver low to moderate levels of sediments, nutrients, or compounds such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.				Waterbody on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants or AA receives or surrounding land use has potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.			
	<input checked="" type="checkbox"/> ≥ 70%		<input type="checkbox"/> < 70%		<input type="checkbox"/> ≥ 70%		<input type="checkbox"/> < 70%	
% cover of wetland vegetation in AA	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Evidence of flooding or ponding in AA	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No
AA contains no or restricted outlet	--	--	--	--	--	--	--	--
AA contains unrestricted outlet	.9 (H)	--	--	--	--	--	--	--

Comments: AA has potential to receive groundwater seepage from adjacent agricultural fields.

14H. SEDIMENT/Shoreline Stabilization NA (proceed to 14I)

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

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

% Cover of wetland streambank or shoreline by species with deep, binding rootmasses.	Duration of Surface Water Adjacent to Rooted Vegetation		
	<input type="checkbox"/> Permanent / Perennial	<input type="checkbox"/> Seasonal / Intermittent	<input type="checkbox"/> Temporary / Ephemeral
≥ 65 %	--	--	--
35-64 %	--	--	--
< 35 %	--	--	--

Comments: _____

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT

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

A = acreage of vegetated component in the AA. B = structural diversity rating from #13. C = Yes (Y) or No (N) as to whether or not the AA contains a surface or subsurface outlet; P/P = permanent/perennial; S/I = seasonal/intermittent; T/E/A = temporary/ephemeral/absent.

A	<input checked="" type="checkbox"/> Vegetated component >5 acres						<input type="checkbox"/> Vegetated component 1-5 acres						<input type="checkbox"/> Vegetated component <1 acre					
B	<input type="checkbox"/> High		<input checked="" type="checkbox"/> Moderate		<input type="checkbox"/> Low		<input type="checkbox"/> High		<input type="checkbox"/> Moderate		<input type="checkbox"/> Low		<input type="checkbox"/> High		<input type="checkbox"/> Moderate		<input type="checkbox"/> Low	
C	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N
P/P	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S/I	--	--	--	.7M	--	--	--	--	--	--	--	--	--	--	--	--	--	--
T/E/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Comments: _____

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

i. **Discharge Indicators**

- Springs are known or observed.
- Vegetation growing during dormant season/drought.
- Wetland occurs at the toe of a natural slope.
- Seeps are present at the wetland edge.
- AA permanently flooded during drought periods.
- Wetland contains an outlet, but no inlet.
- Other _____

ii. **Recharge Indicators**

- Permeable substrate presents without underlying impeding layer.
- Wetland contains inlet but not outlet.
- Other _____

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

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

Comments: The majority of the site is supported by groundwater seepage from the Sixteen mile irrigation ditch.

14K. UNIQUENESS

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

Replacement Potential	AA contains fen, bog, warm springs or mature (>80 yr-old) forested wetland or plant association listed as "S1" by the MTNHP.			AA does not contain previously cited rare types and structural diversity (#13) is high or contains plant association listed as "S2" by the MTNHP.			AA does not contain previously cited rare types or associations and structural diversity (#13) is low-moderate.		
Estimated Relative Abundance from #11	<input type="checkbox"/> rare	<input type="checkbox"/> common	<input type="checkbox"/> abundant	<input type="checkbox"/> rare	<input type="checkbox"/> common	<input type="checkbox"/> abundant	<input type="checkbox"/> rare	<input type="checkbox"/> common	<input checked="" type="checkbox"/> abundant
Low disturbance at AA (#12i)	--	--	--	--	--	--	--	--	--
Moderate disturbance at AA (#12i)	--	--	--	--	--	--	--	--	.2L
High disturbance at AA (#12i)	--	--	--	--	--	--	--	--	--

Comments: _____

14L. RECREATION / EDUCATION POTENTIAL

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

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

iii. Based on the location, diversity, size, and other site attributes, is there a strong potential for recreational or educational use?

- Yes [Proceed to 14L (ii) and then 14L(iv)]
- No [Rate as low in 14L(iv)]

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

Ownership	Disturbance at AA from #12(i)		
	<input type="checkbox"/> Low	<input type="checkbox"/> Moderate	<input type="checkbox"/> High
Public ownership	--	--	--
Private ownership	--	--	.1(L)

Comments: The site is far from population centers and is on private land, and so there is not a strong potential for education or recreation.

FUNCTION, VALUE SUMMARY, AND OVERALL RATING

Function and Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units (Actual Points x Estimated AA Acreage)
A. Listed/Proposed T&E Species Habitat	low	0.00	1	0.0
B. MT Natural Heritage Program Species Habitat	moderate	0.70	1	1.86
C. General Wildlife Habitat	moderate	0.50	1	4.65
D. General Fish/Aquatic Habitat	N/A	0.00	--	NA
E. Flood Attenuation	N/A	--	--	NA
F. Short and Long Term Surface Water Storage	moderate	0.5	1	4.65
G. Sediment/Nutrient/Toxicant Removal	moderate	0.90	1	8.37
H. Sediment/Shoreline Stabilization	N/A	0.000	--	NA
I. Production Export/Food Chain Support	moderate	0.700	1	6.51
J. Groundwater Discharge/Recharge	high	1.00	1	9.3
K. Uniqueness	low	0.20	1	1.86
L. Recreation/Education Potential	low	0.1	1	0.93
Totals:		<u>4.6</u>	<u>9.00</u>	<u>38.13</u>
Percent of Total Possible Points:			51% (Actual / Possible) x 100 [rd to nearest whole #]	

<p>Category I Wetland: (Must satisfy one of the following criteria. If not satisfied, proceed to Category II.)</p> <p><input type="checkbox"/> Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; or</p> <p><input type="checkbox"/> Score of 1 functional point for Uniqueness; or</p> <p><input type="checkbox"/> Score of 1 functional point for Flood Attenuation and answer to Question 14E(ii) is "yes"; or</p> <p><input type="checkbox"/> Percent of total Possible Points is > 80%.</p>
<p>Category II Wetland: (Criteria for Category I not satisfied and meets any one of the following Category II criteria. If not satisfied, proceed to Category IV.)</p> <p><input type="checkbox"/> Score of 1 functional point for Species Rated S1, S2, or S3 by the MT Natural Heritage Program; or</p> <p><input type="checkbox"/> Score of .9 or 1 functional point for General Wildlife Habitat; or</p> <p><input type="checkbox"/> Score of .9 or 1 functional point for General Fish/Aquatic Habitat; or</p> <p><input type="checkbox"/> "High" to "Exceptional" ratings for both General Wildlife Habitat and General Fish / Aquatic Habitat; or</p> <p><input type="checkbox"/> Score of .9 functional point for Uniqueness; or</p> <p><input type="checkbox"/> Percent of total possible points is > 65%.</p>
<p><input checked="" type="checkbox"/> Category III Wetland: (Criteria for Categories I, II, or IV not satisfied.)</p>
<p>Category IV Wetland: (Criteria for Categories I or II are not satisfied and <u>all</u> of the following criteria are met; If not satisfied, return to Category III.)</p> <p><input type="checkbox"/> "Low" rating for Uniqueness; and</p> <p><input type="checkbox"/> "Low" rating for Production Export / Food Chain Support; and</p> <p><input type="checkbox"/> Percent of total possible points is < 30%.</p>

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

I
 II
 III
 IV

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

1. Project Name: MDT- Wetland Mitigation Monitoring 2. Project #: _____ Control #: _____
 3. Evaluation Date: 7/18/2007 4. Evaluator(s): RRM (PBS&J) 5. Wetland / Site #(s): Woodson Creek-FLOODPLAIN
 6. Wetland Location(s) i. T: 6 S R: 8 E S: 9, 16 T: __ N R: __ E S: _____
 ii. Approx. Stationing / Mileposts: _____
 iii. Watershed: 7 - Missouri / Sun / Smith GPS Reference No. (if applies): 46.28858 N, -110.73184 W
 Other Location Information: Meagher County, east of Ringling, MT

7. A. Evaluating Agency PBS&J 8. Wetland Size (total acres): 55.1 (visually estimated)
 _____ (measured, e.g. GPS)
 B. Purpose of Evaluation:
 Wetlands potentially affected by MDT project
 Mitigation wetlands; pre-construction
 Mitigation wetlands; post-construction
 Other
 9. Assessment Area (total acres): 27.84 (visually estimated)
 _____ (measured, e.g. GPS)
 Comments: _____

10. CLASSIFICATION OF WETLAND AND AQUATIC HABITATS IN AA

HGM CLASS ¹	SYSTEM ²	SUBSYSTEM ²	CLASS ²	WATER REGIME ²	MODIFIER ²	% OF AA
Depression	Palustrine		Aquatic Bed	Semipermanently Flooded	Excavated	10
Riverine	Palustrine	---	Emergent Wetland	Seasonally Flooded	Excavated	20
Riverine	Riverine	---	Unconsolidated Bottom	Permanently Flooded	Excavated	5
Slope	Palustrine	---	Emergent Wetland	Seasonally Flooded	---	70

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

Comments: Site is a mitigation wetland.

11. ESTIMATED RELATIVE ABUNDANCE (of similarly classified sites within the same Major Montana Watershed Basin)

Abundant Comments: _____

12. GENERAL CONDITION OF AA

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

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

Comments: (types of disturbance, intensity, season, etc.) Wetland mitigation site constructed in 2006. Site is overwhelmingly dominated by Garrison creeping foxtail.

ii. Prominent weedy, alien, & introduced species: Some patches of heavy Canada thistle infestation occurs in areas that were disturbed during construction.

iii. Briefly describe AA and surrounding land use / habitat: AA is the floodplain of Woodson Creek which is a wet meadow primarily dominated by Garrison creeping foxtail. Surrounding land use is predominantly agricultural - wheat, alfalfa, and livestock production. Rolling topography. Main sources of water are Woodson Creek and leakage from the Sixteen mile irrigation ditch.

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

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

Comments: Palustrine aquatic bed and palustrine emergent.

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

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

- Primary or Critical habitat (list species) D S _____
- Secondary habitat (list species) D S _____
- Incidental habitat (list species) D S _____
- No usable habitat D S _____

ii. **Rating** (Based on the strongest habitat chosen in 14A(i) above, find the corresponding rating of High (H), Moderate (M), or Low (L) for this function.

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	none
Functional Point and Rating	---	---	---	---	---	---	0 (L)

If documented, list the source (e.g., observations, records, etc.):

14B. HABITAT FOR PLANTS AND ANIMALS RATED AS S1, S2, OR S3 BY THE MONTANA NATURAL HERITAGE PROGRAM.

Do not include species listed in 14A(i).

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

- Primary or Critical habitat (list species) D S _____
- Secondary habitat (list species) D S Sandhill crane (S2N)
- Incidental habitat (list species) D S American white pelican (S3B), Bald Eagle (S3)
- No usable habitat D S _____

iii. **Rating** Based on the strongest habitat chosen in 14B(i) above, find the corresponding rating of High (H), Moderate (M), or Low (L) for this function.

Highest Habitat Level:	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	none
Functional Point and Rating	---	---	.7 (M)	---	---	---	---

If documented, list the source (e.g., observations, records, etc.): Observed by ranch manager (Dick Sellers), an avid birder and former Alaskan Fish and Game Biologist. Sandhill cranes documented as nesting by Oasis Environmental.

14C. General Wildlife Habitat Rating

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

Substantial (based on any of the following)

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

Low (based on any of the following)

- few or no wildlife observations during peak use periods
- little to no wildlife sign
- sparse adjacent upland food sources
- interviews with local biologists with knowledge of AA

Moderate (based on any of the following)

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

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

Structural Diversity (from #13)	<input type="checkbox"/> High								<input checked="" type="checkbox"/> Moderate								<input type="checkbox"/> Low			
Class Cover Distribution (all vegetated classes)	<input type="checkbox"/> Even				<input type="checkbox"/> Uneven				<input type="checkbox"/> Even				<input checked="" type="checkbox"/> Uneven				<input type="checkbox"/> Even			
Duration of Surface Water in ≥ 10% of AA	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A
Low disturbance at AA (see #12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Moderate disturbance at AA (see #12)	--	--	--	--	--	--	--	--	--	--	--	--	H	--	--	--	--	--	--	--
High disturbance at AA (see #12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

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

Evidence of Wildlife Use from 14C(i)	Wildlife Habitat Features Rating from 14C(ii)			
	<input type="checkbox"/> Exceptional	<input checked="" type="checkbox"/> High	<input type="checkbox"/> Moderate	<input type="checkbox"/> Low
Substantial	--	.9 (H)	--	--
Moderate	--	--	--	--
Low	--	--	--	--

Comments: Site is used by migrating waterfowl.

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

If the AA is not or was not historically used by fish due to lack of habitat or excessive gradient, then check the NA box above.

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

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

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

ii. **Modified Habitat Quality:** Is fish use of the AA precluded or significantly reduced by a culvert, dike, other man-made structure or activity or is the waterbody included on the 'MDEQ list of waterbodies in need of TMDL development' with 'Probable Impaired Uses' listed as cold or warm water fishery or aquatic life support?

Y N If yes, reduce the rating from 14D(i) by one level and check the modified habitat quality rating: E H M L

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

Types of Fish Known or Suspected Within AA	Modified Habitat Quality from 14D(ii)			
	<input type="checkbox"/> Exceptional	<input type="checkbox"/> High	<input checked="" type="checkbox"/> Moderate	<input type="checkbox"/> Low
Native game fish	--	--	--	--
Introduced game fish	--	--	--	--
Non-game fish	--	--	--	--
No fish	--	--	.2 (L)	--

Comments: The restored portion of Woodson Creek does not contain a lot of aquatic cover or much variety in aquatic habitat, such as pools. Aquatic habitat is expected to form over time as the channel evolves and is subject to more runoff events. Site contains some non-game fish, but are so minimal that the score was reduced to 0.2.

14E. FLOOD ATTENUATION NA (proceed to 14G)

Applies only to wetlands subject to flooding via in-channel or overbank flow.

If wetlands in AA do not flood from in-channel or overbank flow, then check NA above.

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

Estimated wetland area in AA subject to periodic flooding	<input checked="" type="checkbox"/> ≥ 10 acres			<input type="checkbox"/> <10, >2 acres			<input type="checkbox"/> ≤2 acres		
% of flooded wetland classified as forested, scrub/shrub, or both	75%	25-75%	<25%	75%	25-75%	<25%	75%	25-75%	<25%
AA contains no outlet or restricted outlet	--	--	.6 (M)	--	--	--	--	--	--
AA contains unrestricted outlet	--	--	--	--	--	--	--	--	--

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

Y N **Comments:** Culvert restricts outlet of Woodson Creek. Banks along Woodson Creek are relatively high, which will limit the area that will flood.

14F. SHORT AND LONG TERM SURFACE WATER STORAGE NA (proceed to 14G)

Applies to wetlands that flood or pond from overbank or in-channel flow, precipitation, upland surface flow, or groundwater flow.

If no wetlands in the AA are subject to flooding or ponding, then check NA above.

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

Abbreviations: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral.

Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding.	<input checked="" type="checkbox"/> >5 acre feet			<input type="checkbox"/> <5, >1 acre feet			<input type="checkbox"/> ≤1 acre foot		
Duration of surface water at wetlands within the AA	P/P	S/I	T/E	P/P	S/I	T/E	P/P	S/I	T/E
Wetlands in AA flood or pond ≥ 5 out of 10 years	--	--	--	--	--	--	--	--	--
Wetlands in AA flood or pond < 5 out of 10 years	.9 (H)	--	--	--	--	--	--	--	--

Comments: _____

14G. SEDIMENT/NUTRIENT/TOXICANT RETENTION AND REMOVAL NA (proceed to 14H)

Applies to wetlands with the potential to receive excess sediments, nutrients, or toxicants through influx of surface or ground water or direct input.

If no wetlands in the AA are subject to such input, check NA above.

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

Sediment, Nutrient, and Toxicant Input Levels Within AA	AA receives or surrounding land use has potential to deliver low to moderate levels of sediments, nutrients, or compounds such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.				Waterbody on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants or AA receives or surrounding land use has potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.			
% cover of wetland vegetation in AA	<input checked="" type="checkbox"/> ≥ 70%			<input type="checkbox"/> < 70%	<input type="checkbox"/> ≥ 70%			<input type="checkbox"/> < 70%
Evidence of flooding or ponding in AA	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No
AA contains no or restricted outlet	1 (H)	--	--	--	--	--	--	--
AA contains unrestricted outlet	--	--	--	--	--	--	--	--

Comments: AA has potential to receive runoff and groundwater seepage from adjacent agricultural fields. Photos document the site as flooded in April 2007.

14H. SEDIMENT/Shoreline Stabilization NA (proceed to 14I)

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

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

% Cover of wetland streambank or shoreline by species with deep, binding rootmasses.	Duration of Surface Water Adjacent to Rooted Vegetation		
	<input checked="" type="checkbox"/> Permanent / Perennial	<input type="checkbox"/> Seasonal / Intermittent	<input type="checkbox"/> Temporary / Ephemeral
≥ 65 %	1 (H)	--	--
35-64 %	--	--	--
< 35 %	--	--	--

Comments: Streambanks are dominated by Garrison creeping foxtail and some sedge.

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT

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

A = acreage of vegetated component in the AA. B = structural diversity rating from #13. C = Yes (Y) or No (N) as to whether or not the AA contains a surface or subsurface outlet; P/P = permanent/perennial; S/I = seasonal/intermittent; T/E/A= temporary/ephemeral/absent.

A	<input checked="" type="checkbox"/> Vegetated component >5 acres						<input type="checkbox"/> Vegetated component 1-5 acres						<input type="checkbox"/> Vegetated component <1 acre					
B	<input type="checkbox"/> High		<input checked="" type="checkbox"/> Moderate		<input type="checkbox"/> Low		<input type="checkbox"/> High		<input type="checkbox"/> Moderate		<input type="checkbox"/> Low		<input type="checkbox"/> High		<input type="checkbox"/> Moderate		<input type="checkbox"/> Low	
C	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N
P/P	--	--	.9H	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S/I	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
T/E/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Comments: _____

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

i. **Discharge Indicators**

- Springs are known or observed.
- Vegetation growing during dormant season/drought.
- Wetland occurs at the toe of a natural slope.
- Seeps are present at the wetland edge.
- AA permanently flooded during drought periods.
- Wetland contains an outlet, but no inlet.
- Other _____

ii. **Recharge Indicators**

- Permeable substrate presents without underlying impeding layer.
- Wetland contains inlet but not outlet.
- Other _____

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

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

Comments: The majority of the site is supported by groundwater seepage from the Sixteen mile irrigation ditch.

14K. UNIQUENESS

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

Replacement Potential	AA contains fen, bog, warm springs or mature (>80 yr-old) forested wetland or plant association listed as "S1" by the MTNHP.			AA does not contain previously cited rare types and structural diversity (#13) is high or contains plant association listed as "S2" by the MTNHP.			AA does not contain previously cited rare types or associations and structural diversity (#13) is low-moderate.		
Estimated Relative Abundance from #11	<input type="checkbox"/> rare	<input type="checkbox"/> common	<input type="checkbox"/> abundant	<input type="checkbox"/> rare	<input type="checkbox"/> common	<input type="checkbox"/> abundant	<input type="checkbox"/> rare	<input type="checkbox"/> common	<input checked="" type="checkbox"/> abundant
Low disturbance at AA (#12i)	--	--	--	--	--	--	--	--	--
Moderate disturbance at AA (#12i)	--	--	--	--	--	--	--	--	.2L
High disturbance at AA (#12i)	--	--	--	--	--	--	--	--	--

Comments: _____

14L. RECREATION / EDUCATION POTENTIAL

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

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

iii. Based on the location, diversity, size, and other site attributes, is there a strong potential for recreational or educational use?

- Yes [Proceed to 14L (ii) and then 14L(iv)]
- No [Rate as low in 14L(iv)]

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

Ownership	Disturbance at AA from #12(i)		
	<input type="checkbox"/> Low	<input type="checkbox"/> Moderate	<input type="checkbox"/> High
Public ownership	--	--	--
Private ownership	--	--	.1(L)

Comments: The site is far from population centers and is on private land, and so there is not a strong potential for education or recreation.

FUNCTION, VALUE SUMMARY, AND OVERALL RATING

Function and Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units (Actual Points x Estimated AA Acreage)
A. Listed/Proposed T&E Species Habitat	low	0.00	1	0.0
B. MT Natural Heritage Program Species Habitat	moderate	0.70	1	19.49
C. General Wildlife Habitat	high	0.90	1	25.06
D. General Fish/Aquatic Habitat	low	0.20	1	5.57
E. Flood Attenuation	moderate	0.60	1	16.70
F. Short and Long Term Surface Water Storage	high	0.90	1	25.06
G. Sediment/Nutrient/Toxicant Removal	high	1.00	1	27.84
H. Sediment/Shoreline Stabilization	high	1.00	1	27.84
I. Production Export/Food Chain Support	high	0.90	1	25.06
J. Groundwater Discharge/Recharge	high	1.00	1	27.84
K. Uniqueness	low	0.20	1	5.57
L. Recreation/Education Potential	low	0.10	1	2.78
Totals:		<u>7.5</u>	<u>12.00</u>	<u>208.8</u>
Percent of Total Possible Points:			63% (Actual / Possible) x 100 [rd to nearest whole #]	

<p>Category I Wetland: (Must satisfy one of the following criteria. If not satisfied, proceed to Category II.)</p> <input type="checkbox"/> Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; or <input type="checkbox"/> Score of 1 functional point for Uniqueness; or <input type="checkbox"/> Score of 1 functional point for Flood Attenuation and answer to Question 14E(ii) is "yes"; or <input type="checkbox"/> Percent of total Possible Points is > 80%.
<p>Category II Wetland: (Criteria for Category I not satisfied and meets any one of the following Category II criteria. If not satisfied, proceed to Category IV.)</p> <input type="checkbox"/> Score of 1 functional point for Species Rated S1, S2, or S3 by the MT Natural Heritage Program; or <input checked="" type="checkbox"/> Score of .9 or 1 functional point for General Wildlife Habitat; or <input type="checkbox"/> Score of .9 or 1 functional point for General Fish/Aquatic Habitat; or <input type="checkbox"/> "High" to "Exceptional" ratings for both General Wildlife Habitat and General Fish / Aquatic Habitat; or <input type="checkbox"/> Score of .9 functional point for Uniqueness; or <input type="checkbox"/> Percent of total possible points is > 65%.
<p><input type="checkbox"/> Category III Wetland: (Criteria for Categories I, II, or IV not satisfied.)</p>
<p>Category IV Wetland: (Criteria for Categories I or II are not satisfied and <u>all</u> of the following criteria are met; If not satisfied, return to Category III.)</p> <input type="checkbox"/> "Low" rating for Uniqueness; and <input type="checkbox"/> "Low" rating for Production Export / Food Chain Support; and <input type="checkbox"/> Percent of total possible points is < 30%.

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

I

 II

 III

 IV

Appendix C

2007 REPRESENTATIVE PHOTOGRAPHS

*MDT Wetland Mitigation Monitoring
Woodson Creek
Ringling, Montana*

WOODSON CREEK WETLAND MITIGATION SITE 2007



Photo Point A – Photo 1 Location: North Side
Compass bearing: 208 degrees



Photo Point A – Photo 2 Location: North Side
Compass bearing: 226 degrees



Photo Point A – Photo 3 Location: North Side
Compass bearing: 249 degrees



Photo Point B – Photo 1 Location: East-central
Compass bearing: 197 degrees



Photo Point B – Photo 2 Location: East-central
Compass bearing: 230 degrees



Photo Point B – Photo 3 Location: East-central
Compass bearing: 266 degrees



Photo Point C – Photo 1 Location: West Side
Compass bearing: 95 degrees



Photo Point C – Photo 2 Location: West Side
Compass bearing: 132 degrees

WOODSON CREEK WETLAND MITIGATION SITE 2007



Photo Point C – Photo 3 Location: West Side
Compass bearing: 173 degrees



Photo Point C – Photo 4 Location: West Side
Compass bearing: 224 degrees



Photo Point C – Photo 5 Location: West Side
Compass bearing: 288 degrees



Photo Point D – Photo 1 Location: East Side
Compass bearing: 203 degrees



Photo Point D – Photo 2 Location: East Side
Compass bearing: 225 degrees



Photo Point D – Photo 3 Location: East Side
Compass bearing: 262 degrees



Photo Point D – Photo 4 Location: East Side
Compass bearing: 296 degrees



Photo Point D – Photo 5 Location: East Side
Compass bearing: 324 degrees

WOODSON CREEK WETLAND MITIGATION SITE 2007



Transect 1 – Photo 1 Location: East end
Compass bearing: 314 degrees



Transect 1 – Photo 2 Location: West end
Compass bearing: 134 degrees



Transect 2 – Photo 1 Location: South end
Compass bearing: 74 degrees



Transect 2 – Photo 2 Location: Northern end
Compass bearing: 254 degrees



Transect 3 – Photo 1 Location: South end (May 17, 2007)
Compass bearing: 353 degrees



Transect 3 – Photo 2 Location: North end (May 17, 2007)
Compass bearing: 173 degrees



Cross-section #1 Location: Upper end of Woodson Creek
– looking downstream (May 17, 2007)



Cross-section #1 Location: Upper end of Woodson Creek
– looking upstream

WOODSON CREEK WETLAND MITIGATION SITE 2007



Cross-section #2 Location: Middle portion of Woodson Creek – looking downstream (May 17, 2007)



Cross-section #2 Location: Middle portion of Woodson Creek – looking upstream



Bank Erosion Pins #1 Location: Upstream site (May 17, 2007)



Bank Erosion Pins #2 Location: Downstream site (May 17, 2007)



Macroinvertebrate Sample Location #1 Location: Upper dike on east side



Macroinvertebrate Sample Location #2 Location: Upstream of outfall culvert at lower end of east parcel

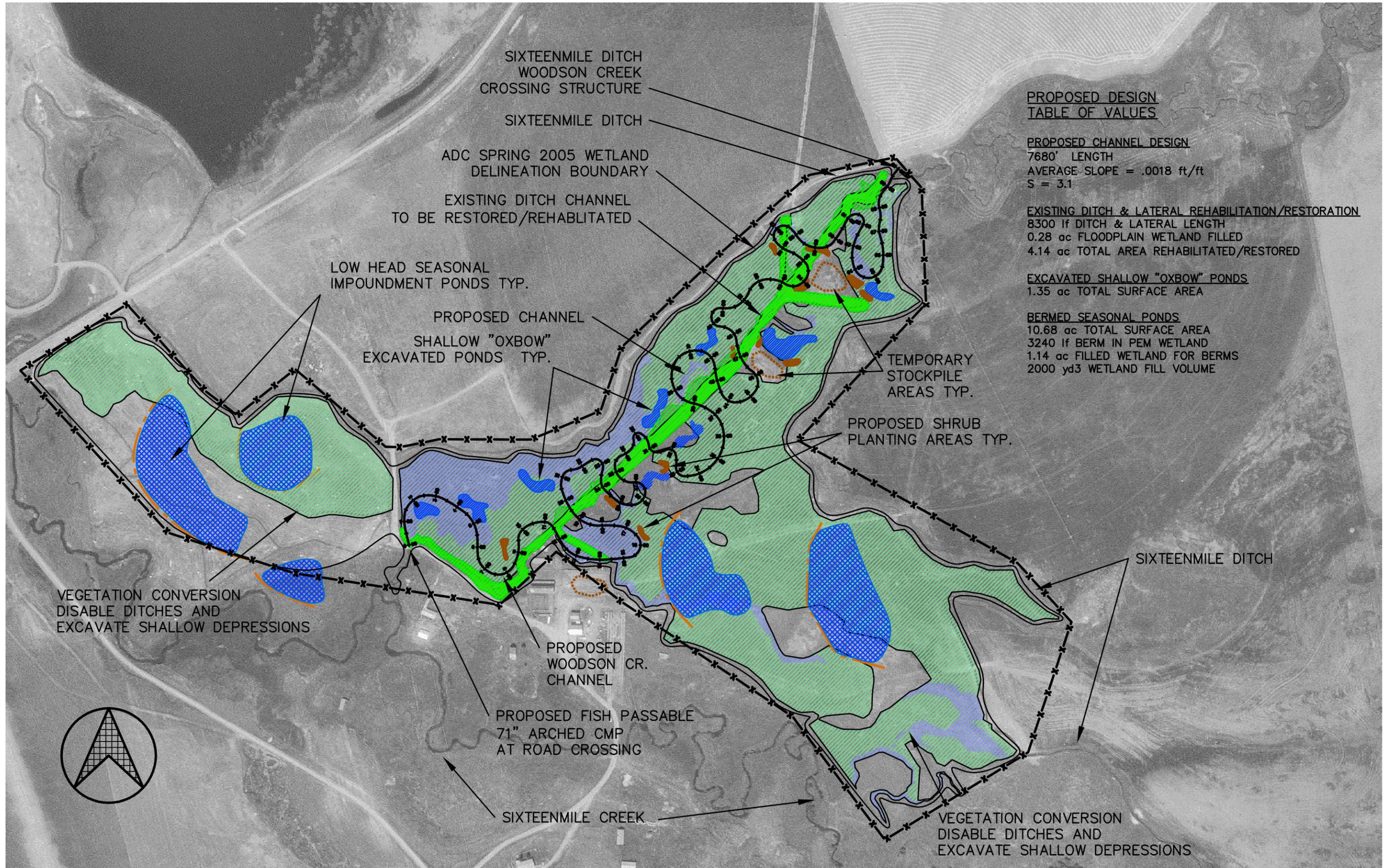


Breach in lower dike on east parcel.

Appendix D

PLAN SHEET

*MDT Wetland Mitigation Monitoring
Woodson Creek
Ringling, Montana*



**PROPOSED DESIGN
TABLE OF VALUES**

PROPOSED CHANNEL DESIGN
 7680' LENGTH
 AVERAGE SLOPE = .0018 ft/ft
 S = 3.1

EXISTING DITCH & LATERAL REHABILITATION/RESTORATION
 8300 lf DITCH & LATERAL LENGTH
 0.28 ac FLOODPLAIN WETLAND FILLED
 4.14 ac TOTAL AREA REHABILITATED/RESTORED

EXCAVATED SHALLOW "OXBOW" PONDS
 1.35 ac TOTAL SURFACE AREA

BERMED SEASONAL PONDS
 10.68 ac TOTAL SURFACE AREA
 3240 lf BERM IN PEM WETLAND
 1.14 ac FILLED WETLAND FOR BERMS
 2000 yd³ WETLAND FILL VOLUME

DESIGN PAGE

**Woodson Creek
Stream Channel Restoration**
 Sixteen Mile Road
 Meagher County, MT
 Sections 9 & 16 T6N R8E
 woodson 404 plans

SCALE:	1" = 300'
PROJECT NO.	205
DRAWN	bz
CHECK	--
DATE	7/05/05
REV. NO.	
DESCRIPTION	
BY	
REVISION DATE	

Appendix E

GPS PROTOCOL

*MDT Wetland Mitigation Monitoring
Woodson Creek
Ringling, Montana*

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 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, some sites continued to be mapped using the Trimble GEO III GPS unit while most 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.

Appendix F

2007 MACROINVERTEBRATE SAMPLING PROTOCOL AND DATA

*MDT Wetland Mitigation Monitoring
Woodson Creek
Ringling, Montana*

AQUATIC INVERTEBRATE SAMPLING PROTOCOL

Equipment List

- D-frame sampling net with 1 mm mesh.
- 1-liter, wide-mouth, plastic sample jars provided by Rhithron Associates, Inc. (Quart sized, wide-mouthed canning jars can be substituted.)
- 95% ethanol (alternatively isopropyl alcohol).
- Pre-printed sample labels (printed on rite-in-the-rain paper); two labels per sample.
- Pencil.
- Clear packaging tape.
- 3-5 gallon plastic pail.
- Large tea strainer or framed screen.
- Cooler with ice for storing sample.

Site Selection

Select a site that is accessible with hip waders or rubber boots. If the substrate is too soft, place a wide board down to walk on. Choose a site that is representative of the overall condition of the wetland. Annual sampling should occur at the same site within the wetland.

Sampling Procedure

Wetland invertebrates (macroinvertebrates) inhabit the substrate, the water column, the stems and leaves of aquatic vegetation, and the water surface. At the given location, each habitat type is sampled and combined into a single 1-liter sample jar. Pre-cautions are made to minimize disturbing the sample site in order to maximize the number of animals collected.

Fill the pail with approximately 1 gallon of wetland water. Ideally, sample the water column from near-shore outward to a depth of 3 feet. Sample the water column using a long sweep of the net, keeping the net at about half the depth of the water. Sample the water surface with a long sweep of the net. Aquatic vegetation is sampled by pulling the net beneath the water surface, for at least a meter in distance. The substrate is sampled by pulling the net along the bottom, bumping it against the substrate several times as you pull. Be sure to place some muck, mud, and/or vegetation into the jar. After sampling a habitat, rinse the net in the bucket and look for insects, crustaceans, and other aquatic invertebrates. It is not necessary to sample habitats in any specific order, but all habitats, if present, are to be sampled. Habitats can be sampled more than once.

Fill about 1 cup of ethanol into the sample jar. Sieve the contents of the bucket through the straining device and pour or carefully scrape the contents of the strainer into the sample jar. Top off the jar with enough ethanol to cover all the material and leave as little headroom as possible. Alternatively, sampled materials can be lifted out of the net and put directly into the jar. Be sure to include some muck, mud, and/or vegetation into the jar. Each macroinvertebrate sampling site should have only one sampling jar.

Using pencil, complete two labels with the required information: project name, project number, date, collector's name, and habitats sampled. Do not complete the label with ink as it will dissolve in ethanol. For wetlands with at least two macroinvertebrate sampling sites, number the site consecutively followed by the total number of sites (e.g. Sample 2 of 3 sites). Place one label into the jar and seal the jar. Dry the jar off, if necessary, and tape the second label to the outside of the jar.

Photograph each macroinvertebrate sampling site.

Sample Handling/Delivery

In the field, keep sample jars cool by placing in a cooler with a small amount of ice.

Deliver samples to the PBS&J office in Missoula, where they will be inventoried and delivered to Rhithron Associates, Inc.

**MDT Mitigated Wetland Monitoring Project: Aquatic Invertebrate Monitoring
Summary 2001 – 2007**

Prepared for Post, Buckley, Schuh, and Jernigan (PBS&J)
Prepared by W.Bollman, Rhithron Associates, Inc.

INTRODUCTION

Aquatic invertebrate assemblages were collected at a number of mitigated wetlands throughout Montana. This report summarizes data generated from seven years of collection. Over all years of sampling, a total of 182 invertebrate samples were collected. Table 1 lists the currently monitored sites at which aquatic invertebrates were collected in 2007, and summarizes the sampling history of each.

METHODS

Sample processing

Aquatic invertebrate samples were collected at mitigated wetland sites in the summer months of 2001, 2002, 2003, 2004, 2005, 2006 and 2007 by personnel of PBS&J. Sampling procedures utilized were based on the protocols developed by the Montana Department of Environmental Quality (MT DEQ) for wetland sampling. Sampling consisted of D-frame net sweeps through emergent vegetation (when present), the water column, and over the water surface, and included disturbing and scraping substrates at each sampled site. These sample components were composited and preserved in ethanol at each wetland site. Samples were delivered to Rhithron Associates, Inc. for processing, taxonomic determinations, and data analysis.

Standard sorting protocols were applied to achieve representative subsamples of a minimum of 100 organisms. Caton sub-sampling devices (Caton 1991), divided into 30 grids, each approximately 5 cm by 6 cm, were used. Grid contents were examined under stereoscopic microscopes using 10x-30x magnification. All aquatic invertebrates from each selected grid were sorted from the substrate, and placed in 95% ethanol for subsequent identification. Grid selection, examination, and sorting continued until at least 100 organisms were sorted. A large/rare search was conducted to collect any taxa not found in the subsampling procedure.

Organisms were individually examined using 10x – 80x stereoscopic dissecting scopes (Leica S8E and S6E) and identified to the lowest practical taxonomic levels using appropriate published taxonomic references. Identification, counts, life stages, and information about the condition of specimens were recorded on bench sheets. To obtain accuracy in richness measures, organisms that could not be identified to the target level specified in MDEQ protocols were designated as “not unique” if other specimens from the same group could be taken to target levels. Organisms designated as “unique” were those that could be definitively distinguished from other organisms in the sample. Identified organisms were preserved in 95% ethanol in labeled vials, and archived at the Rhithron laboratory. Midges were morphotyped using 10x – 80x stereoscopic dissecting microscopes (Leica S8E and S6E) and representative specimens were slide mounted and examined at 200x – 1000x magnification using an Olympus BX 51 compound microscope. Slide mounted organisms were also archived at the Rhithron laboratory.

Quality assurance systems

Quality control procedures for initial sample processing and subsampling involved checking sorting efficiency. These checks were conducted on 96% of the samples by independent observers who microscopically re-examined 20% of sorted substrate from each sample. All organisms that were missed were counted and this number was added to the total number obtained in the original sort. Sorting efficiency was evaluated by applying the following calculation:

$$SE = \frac{n_1}{n_{1+2}} \times 100$$

where: SE is the sorting efficiency, expressed as a percentage, n_1 is the total number of specimens in the first sort, and n_{1+2} is the total number of specimens in the first and second sorts combined.

Quality control procedures for taxonomic determinations of invertebrates involved checking accuracy, precision and enumeration. At least 10% of samples are targeted for quality assurance procedures. For this project, three samples were randomly selected and all organisms re-identified and counted by an independent taxonomist. Taxa lists and enumerations were compared by calculating a Bray-Curtis similarity statistic (Bray and Curtis 1957) for each

selected sample. Routinely, discrepancies between the original identifications and the QC identifications are discussed among the taxonomists, and necessary rectifications to the data are made. Discrepancies that cannot be rectified by discussions are routinely sent out to taxonomic specialists for identification. However, taxonomic certainty for identifications in this project was high, and no external verifications were necessary.

Assessment

The method employed to assess these wetlands is based on an index incorporating a battery of 12 bioassessment metrics or attributes (Table 1) tested and recommended by Stribling et al. (1995) in a report to the Montana Department of Health and Environmental Science. In that study, it was determined that some of the metrics were of limited use in some geographic regions, and for some wetland types. Despite that finding, all 12 metrics are used in this evaluation of mitigated wetlands, since detailed geographic information and wetland classifications were unavailable. Scoring criteria for the 12 metrics were developed specifically for this project, since mitigated wetlands were not included in original criteria development.

Scoring criteria for wetland metrics were developed by generally following the tactic used by Stribling et al. (1995). Boxplots were generated using a statistical software package (Statistica™), and distributions, median values, ranges, and quartiles for each metric were examined. For the wetland sites, “optimal” scores were generally those that fell above the 75th percentile (for those metrics that decrease in value in response to stress) or below the 25th percentile (for metrics that respond to stress by an increase in value) of all scores. Additional scoring ranges were established by bisecting the range below the 75th percentile for decreasing scores (or above the 25th percentile for increasing scores) into “sub-optimal” and “poor” assessment categories. A score of 5, 3, or 1 was assigned to optimal, sub-optimal, and poor metric performance, respectively. In this way, metric values were translated into normalized metric scores, and scores for all metrics were summed to produce a total bioassessment score, which is expressed as a percentage of the maximum possible score (60). Total bioassessment scores were classified according to a similar process, using the ranges and distributions of total scores for all sites studied in all years. Data from a total of 167 samples were used to develop criteria.

Several sites in this study supported aquatic fauna characteristic of lotic habitats rather than lentic wetland habitats; these sites were excluded from mitigated wetland scoring criteria development, and were evaluated with a metric battery specific to flowing water habitats. In 2007, the lotic sites were Camp Creek (2 sites), Cloud Ranch stream, Kleinschmidt stream, Jack Creek, and Woodson Creek-Ringling stream. Invertebrate assemblages at these sites were generally characteristic of montane or foothill stream conditions and were assessed using the tested metric battery developed for montane streams of Western Montana (Bollman 1998).

The purpose of constructing an index from biological attributes or metrics is to provide a means of integrating information to facilitate the determination of whether management action is needed. However, the nature of the action needed is not determined solely by the index score or impairment classification, but by consideration of an analysis of the component metrics, the taxonomic composition of the assemblages, and other issues. The diagnostic functions of the metrics and taxonomic data need more study since our understanding of the interrelationships of natural environmental factors and anthropogenic disturbances is tentative. Thus, the further interpretive remarks accompanying the raw taxonomic and metric data in this summary are offered cautiously. Year-to-year comparisons depend on an assumption that specific sites were revisited in each year, and that equivalent sampling methods were utilized at each site revisit.

Bioassessment metrics - wetlands

An index based on the performance of 12 metrics was constructed, as described above. Table 2 lists those metrics, describes their calculation and the expected response of each to increased degradation or impairment of the wetland.

In addition to the summed scores of each metric and the associated impairment classification described above, each individual metric informs the bioassessment to some degree. The four richness metrics (Total taxa, POET, Chironomidae taxa, and Crustacea taxa + Mollusca taxa) can be interpreted to express habitat complexity as well as water quality. Complex, diverse habitats consist of variable substrates, emergent vegetation, variable water depths and other factors, and are potential features of long-established stable wetlands with minimal human disturbance. In the study conducted by Stribling et al. (1995), all four richness metrics were found to be significantly associated with water quality parameters including conductance, salinity, and total dissolved solids.

Four composition metrics (%Chironomidae, %Orthocladiinae of Chironomidae, %Crustacea + %Mollusca, and %Amphipoda) measure the relative contributions of certain taxonomic groups that may have significant responses to habitat and/or water quality impacts. For example, amphipods have been demonstrated to increase in abundance in

alkaline conditions. Short-lived, relatively mobile taxa such as chironomids dominate ephemeral environments; many are hemoglobin-bearers capable of tolerating de-oxygenated conditions.

Two tolerance metrics (the Hilsenhoff Biotic Index and %Dominant taxon) were included in the bioassessment battery. The HBI indicates the overall invertebrate assemblage tolerance to nutrient enrichment, warm water, and/or low dissolved oxygen conditions. The percent abundance of the dominant taxon has been demonstrated to be strongly associated with pH, conductance, salinity, total organic carbon, and total dissolved solids.

Two trophic measures (%Collector-gatherers and %Filterers) may be helpful in expressing functional integrity of the invertebrate assemblage, which can be impacted by poor water quality or habitat degradation. High proportions of filtering organisms suggest nutrient and/or organic enrichment, while abundant collectors suggest more positive functional conditions and well-developed wetland morphology. These organisms graze periphyton growing on stable surfaces such as macrophytes.

Summary metric values and scores for the 2007 samples are given in Tables 4a-4c and 5.

In 2007, thermal preference of the invertebrate assemblages was calculated when possible, using the tool developed by Brandt 2001.

Bioassessment metrics – lotic habitats

For sites supporting rheophilic invertebrate assemblages, bioassessment was based on a metric battery and scoring criteria developed for montane regions of Montana (MVFP index: Bollman 1998). The six metrics constituting the bioassessment index used for MVFP sites in this study were selected because, both individually and as an integrated metric battery, they are robust at distinguishing impaired sites from relatively unimpaired sites (Bollman 1998). They have been demonstrated to be more variable with anthropogenic disturbance than with natural environmental gradients (Bollman 1998). Each of the six metrics, and their expected responses to various stressors is described below.

1. Ephemeroptera (mayfly) taxa richness. The number of mayfly taxa declines as water quality diminishes. Impairments to water quality which have been demonstrated to adversely affect the ability of mayflies to flourish include elevated water temperatures, heavy metal contamination, increased turbidity, low or high pH, elevated specific conductance and toxic chemicals. Few mayfly species are able to tolerate certain disturbances to instream habitat, such as excessive sediment deposition.
2. Plecoptera (stonefly) taxa richness. Stoneflies are particularly susceptible to impairments that affect a stream on a reach-level scale, such as loss of riparian canopy, streambank instability, channelization, and alteration of morphological features such as pool frequency and function, riffle development and sinuosity. Just as all benthic organisms, they are also susceptible to smaller scale habitat loss, such as by sediment deposition, loss of interstitial spaces between substrate particles, or unstable substrate.
3. Trichoptera (caddisfly) taxa richness. Caddisfly taxa richness has been shown to decline when sediment deposition affects habitat. In addition, the presence of certain case-building caddisflies can indicate good retention of woody debris and lack of scouring flow conditions.
4. Number of sensitive taxa. Sensitive taxa are generally the first to disappear as anthropogenic disturbances increase. The list of sensitive taxa used here includes organisms sensitive to a wide range of disturbances, including warmer water temperatures, organic or nutrient pollution, toxic pollution, sediment deposition, substrate instability and others. Unimpaired streams of western Montana typically support at least four sensitive taxa (Bollman 1998).
5. Percent filter feeders. Filter-feeding organisms are a diverse group; they capture small particles of organic matter, or organically enriched sediment material, from the water column by means of a variety of adaptations, such as silken nets or hairy appendages. In forested montane streams, filterers are expected to occur in insignificant numbers. Their abundance increases when canopy cover is lost and when water temperatures increase and the accompanying growth of filamentous algae occurs. Some filtering organisms, specifically the Arctopsyche caddisflies (*Arctopsyche* spp. and *Parapsyche* spp.) build silken nets with large mesh sizes that capture small organisms such as chironomids and early-instar mayflies. Here they are considered predators, and, in this study, their abundance does not contribute to the percent filter feeders metric.
6. Percent tolerant taxa. Tolerant taxa are ubiquitous in stream sites, but when disturbance increases, their abundance increases proportionately. The list of taxa used here includes organisms tolerant of a wide range of disturbances, including warmer water temperatures, organic or nutrient pollution, toxic pollution, sediment deposition, substrate instability and others.

Table 1. Montana Department of Transportation Mitigated Wetlands Monitoring Project sites: sampling history. Only those sites monitored in 2007 are included. An asterisk (*) indicates lotic sites.

Site Identifier	2001	2002	2003	2004	2005	2006	2007
Roundup	+	+	+	+	+	+	+
Ridgeway	+	+	+	+	+	+	+
Hoskins Landing MS-1		+	+	+	+		+
Hoskins Landing MS-2							+
Peterson Ranch pond 1		+	+	+	+	+	+
Peterson Ranch pond 2		+		+	+	+	+
Peterson Ranch pond 4		+	+	+	+	+	+
Peterson Ranch pond 5		+	+	+	+	+	+
Camp Creek MS-1*		+	+	+	+	+	+
Camp Creek MS-2*						+	+
Kleinschmidt		+	+	+	+	+	+
Kleinschmidt – stream*			+	+	+	+	+
Cloud Ranch Pond				+	+		+
Cloud Ranch Stream*				+			+
Jack Creek – pond				+	+		+
Jack Creek – McKee*							+
Norem				+	+	+	+
Rock Creek Ranch					+	+	+
Wagner Marsh					+	+	+
Alkali Lake 1						+	+
Charley Creek							+
Woodson pond MI 1							+
Woodson stream MI 2*							+
Little Muddy Creek							+
Selkirk Ranch							+
DH Ranch							+

Table 2. Aquatic invertebrate metrics employed for wetland (lentic) invertebrate assemblages in the MDT mitigated wetlands study, 2001 – 2007.

Metric	Metric calculation	Expected response to degradation or impairment
Total taxa	Count of unique taxa identified to lowest recommended taxonomic level	Decrease
POET	Count of unique Plecoptera, Trichoptera, Ephemeroptera, and Odonata taxa identified to lowest recommended taxonomic level	Decrease
Chironomidae taxa	Count of unique midge taxa identified to lowest recommended taxonomic level	Decrease
Crustacea taxa + Mollusca taxa	Count of unique Crustacea taxa and Mollusca taxa identified to lowest recommended taxonomic level	Decrease
% Chironomidae	Percent abundance of midges in the subsample	Increase
Orthoclaadiinae / Chironomidae	Number of individual midges in the sub-family Orthoclaadiinae / total number of midges in the subsample.	Decrease
% Amphipoda	Percent abundance of amphipods in the subsample	Increase
% Crustacea + % Mollusca	Percent abundance of crustaceans in the subsample plus percent abundance of molluscs in the subsample	Increase
HBI	Relative abundance of each taxon multiplied by that taxon's modified Hilsenhoff Biotic Index (tolerance) value. These numbers are summed over all taxa in the subsample.	Increase
% Dominant taxon	Percent abundance of the most abundant taxon in the subsample	Increase
% Collector-Gatherers	Percent abundance of organisms in the collector-gatherer functional group	Decrease
% Filterers	Percent abundance of organisms in the filterer functional group	Increase

RESULTS

(Note: Individual site discussions were removed from this report by PBS&J and are included in the macroinvertebrate section of individual project monitoring reports. Summary tables for lentic (4a – 4c) and lotic (5) sites and project specific taxa listings and metrics reports are provided on the following pages.)

Quality Assurance

Table 3 gives the results of quality assurance procedures for sample sorting efficiency (SE) and Bray-Curtis similarity statistics for comparisons of taxonomic determinations and enumeration. Sorting efficiency averaged 97.54% for the project, and taxonomic similarity averaged 97.44%.

Table 3. Results of quality control procedures for subsampling and taxonomic and enumeration similarity.

Site name	SE	Bray-Curtis similarity
Roundup	100.00%	
Ridgeway	100.00%	
Hoskins Landing MS-1	100.00%	
Hoskins Landing MS-2	93.40%	
Peterson Ranch pond 1	100.0%	95.38%
Peterson Ranch pond 2	96.64%	
Peterson Ranch pond 4	91.66%	
Peterson Ranch pond 5	96.64%	
Camp Creek MS-1	100.00%	
Camp Creek MS-2	100.00%	96.94%
Kleinschmidt – pond	100.00%	
Kleinschmidt – stream	99.10%	
Cloud Ranch Pond	95.65%	
Cloud Ranch Stream	91.61%	
Jack Creek – pond	n.a.	
Jack Creek - McKee	96.49%	
Norem	100.00%	100.00%
Rock Creek Ranch	100.00%	
Wagner Marsh	100.00%	
Alkali Lake 1	98.04%	
Charley Creek	100.00%	
Woodson pond	91.37%	
Woodson stream	100.00%	
Little Muddy Creek	92.31%	
Selkirk Ranch	95.56%	
DH Ranch	100.00%	

Table 4a. Metric values and scores for wetland (lentic) sites in the MDT mitigated wetland study – 2007 sampling.

	ROUNDUP	RIDGEWAY	HOSKINS LANDING MS-1	HOSKINS LANDING MS-2	PETERSON RANCH 1	PETERSON RANCH 2	PETERSON RANCH 4	PETERSON RANCH 5
Total taxa	7	13	18	21	17	18	26	18
POET	0	2	3	5	2	0	6	4
Chironomidae taxa	5	5	2	8	8	12	12	6
Crustacea + Mollusca	1	2	5	4	4	5	4	4
% Chironomidae	7.62%	30.00%	18.75%	52.68%	36.45%	51.79%	42.59%	14.78%
Orthoclaadiinae/Chir	0.38	0.17	0.00	0.03	0.08	0.16	0.09	0.12
% Amphipoda	0.00%	10.00%	0.00%	0.00%	0.93%	0.00%	21.30%	1.74%
% Crustacea + % Mollusca	89.52%	15.00%	26.79%	8.04%	10.28%	43.75%	28.70%	37.39%
HBI	8.02	7.11	7.23	6.55	7.42	7.76	6.53	7.23
% Dominant taxon	89.52%	30.00%	17.86%	35.71%	39.25%	23.21%	17.59%	30.43%
% Collector-Gatherers	92.38%	70.00%	78.57%	82.14%	49.53%	71.43%	38.89%	26.96%
% Filterers	0.00%	0.00%	0.89%	6.25%	9.35%	3.57%	1.85%	5.22%
Total taxa	1	1	3	5	3	3	5	3
POET	1	1	3	5	1	1	5	5
Chironomidae taxa	3	3	1	5	5	5	3	3
Crustacea + Mollusca	1	1	3	3	3	3	1	3
% Chironomidae	5	3	3	1	3	1	1	5
Orthoclaadiinae/Chir	3	1	1	1	1	1	3	1
% Amphipoda	5	3	5	5	5	5	5	5
% Crustacea + % Mollusca	1	5	5	5	5	3	5	3
HBI	1	3	3	5	3	1	5	3
% Dominant taxon	1	5	5	3	3	5	1	5
% Collector-Gatherers	5	3	3	5	3	3	3	1
% Filterers	3	3	3	1	1	3	5	3
Total score	30	32	38	44	36	34	42	40
Percent of maximum score	50.00%	53.33%	63.33%	73.33%	60.00%	56.67%	70.00%	66.67%
Impairment classification	poor	sub-optimal	optimal	optimal	sub-optimal	sub-optimal	optimal	optimal

Table 4b. Metric values and scores for wetland (lentic) sites in the MDT mitigated wetland study – 2007 sampling.

	KLEIN-SCHMIDT POND	CLOUD RANCH POND	JACK CREEK POND	NOREM	ROCK CREEK RANCH	WAGNER MARSH	ALKALI LAKE 1	CHARLEY CREEK
Total taxa	25	13	9	6	18	11	9	13
POET	5	2	0	1	2	2	0	0
Chironomidae taxa	8	11	5	2	4	4	2	3
Crustacea + Mollusca	8	1	4	1	4	0	2	3
% Chironomidae	18.63%	81.54%	92.79%	31.58%	4.76%	11.39%	1.96%	27.17%
Orthoclaadiinae/Chir	0.53	0.38	0.03	0.00	0.60	0.44	0.50	0.68
% Amphipoda	10.78%	3.08%	0.00%	0.00%	17.14%	0.00%	0.00%	22.83%
%Crustacea + %Mollusca	36.27%	3.08%	7.21%	21.05%	23.81%	0.00%	61.76%	53.26%
HBI	7.35	7.22	9.73	6.63	6.33	7.28	8.07	6.88
%Dominant taxon	13.73%	18.46%	62.16%	26.32%	29.52%	45.57%	60.78%	29.35%
%Collector-Gatherers	53.92%	84.62%	70.27%	57.89%	29.52%	15.19%	70.59%	32.61%
%Filterers	11.76%	9.23%	0.90%	0.00%	0.95%	0.00%	0.00%	0.00%
Total taxa	5	1	1	1	3	1	1	1
POET	5	1	1	1	1	1	1	1
Chironomidae taxa	5	5	3	1	3	3	1	3
Crustacea + Mollusca	5	1	3	1	3	1	1	1
% Chironomidae	3	1	1	3	5	5	5	3
Orthoclaadiinae/Chir	5	3	1	1	5	3	5	5
% Amphipoda	3	5	5	5	3	5	5	3
%Crustacea + %Mollusca	3	5	5	5	5	5	3	3
HBI	3	3	1	5	5	3	1	5
%Dominant taxon	5	5	1	5	5	3	1	5
%Collector-Gatherers	3	5	3	3	1	1	3	1
%Filterers	1	1	3	3	3	3	3	3
Total score	46	36	28	34	42	34	30	34
Percent of maximum score	76.67%	60.00%	46.67%	56.67%	70.00%	56.67%	50.00%	56.67%
Impairment classification	optimal	sub-optimal	poor	sub-optimal	poor	sub-optimal	poor	sub-optimal

Table 4c. Metric values and scores for wetland (lentic) sites in the MDT mitigated wetland study – 2007 sampling.

	WOODSON POND	LITTLE MUDDY CREEK	SELKIRK RANCH	DH RANCH
Total taxa	12	2	16	8
POET	0	0	2	1
Chironomidae taxa	9	0	8	4
Crustacea + Mollusca	1	1	2	2
% Chironomidae	85.71%	0.00%	77.27%	27.50%
Orthocladinae/Chir	0.32	0.00	0.61	0.00
% Amphipoda	0.00%	0.00%	0.00%	0.00%
%Crustacea + %Mollusca	2.86%	75.00%	8.18%	64.17%
HBI	9.34	8.50	7.82	7.38
%Dominant taxon	33.33%	75.00%	46.36%	39.17%
%Collector-Gatherers	55.24%	75.00%	32.73%	27.50%
%Filterers	0.00%	0.00%	8.18%	17.50%
Total taxa	1	1	3	1
POET	1	1	1	1
Chironomidae taxa	5	1	5	3
Crustacea + Mollusca	1	1	1	1
% Chironomidae	1	5	1	3
Orthocladinae/Chir	3	1	5	1
% Amphipoda	5	5	5	5
%Crustacea + %Mollusca	5	1	5	1
HBI	1	1	1	3
%Dominant taxon	5	1	3	3
%Collector-Gatherers	3	3	1	1
%Filterers	3	3	1	1
Total score	34	24	32	24
Percent of maximum score	56.67%	40.00%	53.33%	40.00%
Impairment classification	sub-optimal	poor	sub-optimal	poor

Table 5. Metric values and scores for stream (lotic) sites in the MDT mitigated wetland study – 2007 sampling.

	CAMP CREEK MS-1	CAMP CREEK MS-2	KLEIN- SCHMIDT STREAM	CLOUD RANCH STREAM	JACK CREEK - MCKEE	WOODSON STREAM
E Richness	6	6	0	2	1	1
P Richness	0	0	0	2	0	0
T Richness	4	6	2	4	4	0
Pollution Sensitive Richness	3	4	0	1	0	0
Filterer Percent	4.85%	5.56%	7.14%	3.57%	2.83%	16.67%
Pollution Tolerant Percent	32.04%	34.26%	9.82%	14.29%	58.49%	8.33%
E Richness	3	3	0	1	0	0
P Richness	0	0	0	2	0	0
T Richness	2	3	1	2	2	0
Pollution Sensitive Richness	2	3	0	1	0	0
Filterer Percent	3	2	2	3	3	1
Pollution Tolerant Percent	1	1	2	1	0	2
Total score	11	12	5	10	5	3
Percent of maximum score	61.11%	66.67%	27.78%	55.56%	27.78%	16.67%
Impairment classification	slight	slight	moderate	slight	moderate	severe

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Taxa Listing

Project ID: MDT07PBSJ
RAI No.: MDT07PBSJ019

RAI No.: MDT07PBSJ019

Sta. Name: Woodson Creek-Ringling Pond MI 1

Client ID:

Date Coll.: 7/20/2007

No. Jars: 1

STORET ID:

Taxonomic Name	Count	PRA	Unique	Stage	Qualifier	BI	Function
Non-Insect							
Acari	1	0.95%	Yes	Unknown		5	PR
Ostracoda	3	2.86%	Yes	Unknown		8	CG
Heteroptera							
Corixidae							
Corixidae	9	8.57%	Yes	Larva		10	PH
Coleoptera							
Hydrophilidae							
<i>Berosus</i> sp.	1	0.95%	Yes	Larva		5	PR
Diptera							
Ephydriidae							
Ephydriidae	1	0.95%	Yes	Pupa		6	CG
Chironomidae							
Chironomidae							
<i>Acricotopus</i> sp.	15	14.29%	Yes	Larva		10	CG
Chironomidae	1	0.95%	No	Pupa		10	CG
<i>Chironomus</i> sp.	35	33.33%	Yes	Larva		10	CG
<i>Cricotopus (Isocladius)</i> sp.	10	9.52%	Yes	Larva		7	SH
<i>Cricotopus bicinctus</i>	1	0.95%	Yes	Larva		7	SH
<i>Cryptochironomus</i> sp.	2	1.90%	Yes	Larva		8	PR
<i>Glyptotendipes</i> sp.	11	10.48%	Yes	Larva		10	SH
Orthoclaadiinae	3	2.86%	No	Larva	Early Instar	6	CG
<i>Psectrotanypus</i> sp.	12	11.43%	Yes	Larva		10	PR
Sample Count	105						

Metrics Report

Project ID: MDT07PBSJ
 RAI No.: MDT07PBSJ019
 Sta. Name: Woodson Creek-Ringling Pond MI 1
 Client ID:
 STORET ID:
 Coll. Date: 7/20/2007

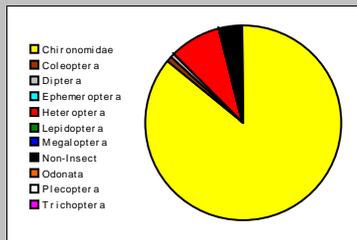
Abundance Measures

Sample Count: 105
 Sample Abundance: 1,400.00 7.50% of sample used

Coll. Procedure:
 Sample Notes:

Taxonomic Composition

Category	R	A	PRA
Non-Insect	2	4	3.81%
Odonata			
Ephemeroptera			
Plecoptera			
Heteroptera	1	9	8.57%
Megaloptera			
Trichoptera			
Lepidoptera			
Coleoptera	1	1	0.95%
Diptera	1	1	0.95%
Chironomidae	7	90	85.71%

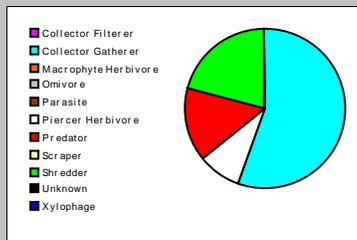


Dominant Taxa

Category	A	PRA
Chironomus	35	33.33%
Acricotopus	15	14.29%
Psectrotanypus	12	11.43%
Glyptotendipes	11	10.48%
Cricotopus (Isocladius)	10	9.52%
Corixidae	9	8.57%
Ostracoda	3	2.86%
Orthoclaadiinae	3	2.86%
Cryptochironomus	2	1.90%
Ephydriidae	1	0.95%
Cricotopus bicinctus	1	0.95%
Chironomidae	1	0.95%
Berosus	1	0.95%
Acari	1	0.95%

Functional Composition

Category	R	A	PRA
Predator	4	16	15.24%
Parasite			
Collector Gatherer	4	58	55.24%
Collector Filterer			
Macrophyte Herbivore			
Piercer Herbivore	1	9	8.57%
Xylophage			
Scraper			
Shredder	3	22	20.95%
Omnivore			
Unknown			

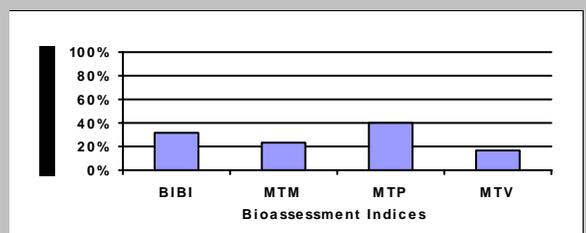


Metric Values and Scores

Metric	Value	BIBI	MTP	MTV	MTM
<i>Composition</i>					
Taxa Richness	12	1	1		0
Non-Insect Percent	3.81%				
E Richness	0	1		0	
P Richness	0	1		0	
T Richness	0	1		0	
EPT Richness	0		0		0
EPT Percent	0.00%		0		0
Oligochaeta+Hirudinea Percent					
Baetidae/Ephemeroptera	0.000				
Hydropsychidae/Trichoptera	0.000				
<i>Dominance</i>					
Dominant Taxon Percent	33.33%		2		2
Dominant Taxa (2) Percent	47.62%				
Dominant Taxa (3) Percent	59.05%	3			
Dominant Taxa (10) Percent	96.19%				
<i>Diversity</i>					
Shannon H (loge)	1.954				
Shannon H (log2)	2.820		2		
Margalef D	2.383				
Simpson D	0.179				
Evenness	0.110				
<i>Function</i>					
Predator Richness	4		2		
Predator Percent	15.24%	3			
Filterer Richness	0				
Filterer Percent	0.00%			3	
Collector Percent	55.24%		3		3
Scraper+Shredder Percent	20.95%		2		0
Scraper/Filterer	0.000				
Scraper/Scraper+Filterer	0.000				
<i>Habit</i>					
Burrower Richness	2				
Burrower Percent	43.81%				
Swimmer Richness	2				
Swimmer Percent	9.52%				
Clinger Richness	2	1			
Clinger Percent	10.48%				
<i>Characteristics</i>					
Cold Stenotherm Richness	0				
Cold Stenotherm Percent	0.00%				
Hemoglobin Bearer Richness	4				
Hemoglobin Bearer Percent	57.14%				
Air Breather Richness	1				
Air Breather Percent	0.95%				
<i>Voltinism</i>					
Univoltine Richness	2				
Semivoltine Richness	1	1			
Multivoltine Percent	89.52%		0		
<i>Tolerance</i>					
Sediment Tolerant Richness	0				
Sediment Tolerant Percent	0.00%				
Sediment Sensitive Richness	0				
Sediment Sensitive Percent	0.00%				
Metals Tolerance Index	4.255				
Pollution Sensitive Richness	0		1		0
Pollution Tolerant Percent	47.62%		3		0
Hilsenhoff Biotic Index	9.343		0		0
Intolerant Percent	0.00%				
Supertolerant Percent	83.81%				
CTQa	103.500				

Bioassessment Indices

BioIndex	Description	Score	Pct	Rating
BIBI	B-IBI (Karr et al.)	16	32.00%	
MTP	Montana DEQ Plains (Bukantis 1998)	12	40.00%	Moderate
MTV	Montana Revised Valleys/Foothills (Bollman 1998)	3	16.67%	Severe
MTM	Montana DEQ Mountains (Bukantis 1998)	5	23.81%	Moderate



Taxa Listing

Project ID: MDT07PBSJ
RAI No.: MDT07PBSJ020

RAI No.: MDT07PBSJ020

Sta. Name: Woodson Creek-Ringling Stream MI 2

Client ID:

Date Coll.: 7/20/2007

No. Jars: 1

STORET ID:

Taxonomic Name	Count	PRA	Unique	Stage	Qualifier	BI	Function
Non-Insect							
Enchytraeidae							
Enchytraeidae	1	0.93%	Yes	Unknown		4	CG
Erpobdellidae							
Erpobdellidae	1	0.93%	Yes	Immature		8	PR
Hyalellidae							
<i>Hyalella</i> sp.	50	46.30%	Yes	Unknown		8	CG
Ephemeroptera							
Leptohyphidae							
<i>Tricorythodes</i> sp.	8	7.41%	Yes	Larva		4	CG
Coleoptera							
Dytiscidae							
Dytiscidae	1	0.93%	Yes	Larva		5	PR
Diptera							
Simuliidae							
<i>Simulium</i> sp.	18	16.67%	Yes	Larva		6	CF
Chironomidae							
Chironomidae							
<i>Cricotopus bicinctus</i>	9	8.33%	Yes	Larva		7	SH
<i>Micropsectra</i> sp.	1	0.93%	Yes	Larva		4	CG
Orthoclaadiinae	3	2.78%	No	Larva	Damaged	6	CG
<i>Orthocladus</i> sp.	7	6.48%	Yes	Larva		6	CG
<i>Paratanytarsus</i> sp.	2	1.85%	Yes	Larva		6	CG
<i>Thienemanniella</i> sp.	1	0.93%	Yes	Larva		6	CG
Thienemannimyia Gr.	6	5.56%	Yes	Larva		5	PR
	Sample Count	108					

Metrics Report

Project ID: MDT07PBSJ
 RAI No.: MDT07PBSJ020
 Sta. Name: Woodson Creek-Ringling Stream MI 2
 Client ID:
 STORET ID:
 Coll. Date: 7/20/2007

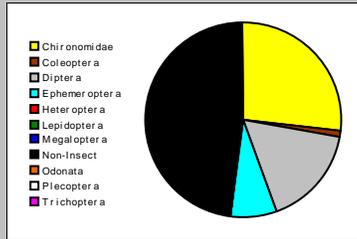
Abundance Measures

Sample Count: 108
 Sample Abundance: 446.90 24.17% of sample used

Coll. Procedure:
 Sample Notes:

Taxonomic Composition

Category	R	A	PRA
Non-Insect	3	52	48.15%
Odonata			
Ephemeroptera	1	8	7.41%
Plecoptera			
Heteroptera			
Megaloptera			
Trichoptera			
Lepidoptera			
Coleoptera	1	1	0.93%
Diptera	1	18	16.67%
Chironomidae	6	29	26.85%

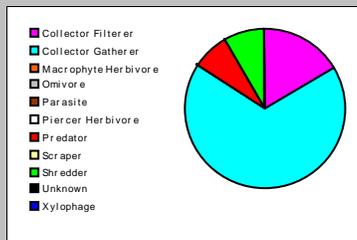


Dominant Taxa

Category	A	PRA
Hyaella	50	46.30%
Simulium	18	16.67%
Cricotopus bicinctus	9	8.33%
Tricorythodes	8	7.41%
Orthocladius	7	6.48%
Thienemannimvia Gr.	6	5.56%
Orthocladinae	3	2.78%
Paratanytarsus	2	1.85%
Thienemanniella	1	0.93%
Micropsectra	1	0.93%
Erbobdellidae	1	0.93%
Enchytraeidae	1	0.93%
Dytiscidae	1	0.93%

Functional Composition

Category	R	A	PRA
Predator	3	8	7.41%
Parasite			
Collector Gatherer	7	73	67.59%
Collector Filterer	1	18	16.67%
Macrophyte Herbivore			
Piercer Herbivore			
Xylophage			
Scraper			
Shredder	1	9	8.33%
Omnivore			
Unknown			



Metric Values and Scores

Metric	Value	BIBI	MTP	MTV	MTM
<i>Composition</i>					
Taxa Richness	12	1	1		0
Non-Insect Percent	48.15%				
E Richness	1	1		0	
P Richness	0	1		0	
T Richness	0	1		0	
EPT Richness	1		0		0
EPT Percent	7.41%		0		0
Oligochaeta+Hirudinea Percent	1.85%				
Baetidae/Ephemeroptera	0.00%				
Hydropsychidae/Trichoptera	0.00%				
<i>Dominance</i>					
Dominant Taxon Percent	46.30%		1		0
Dominant Taxa (2) Percent	62.96%				
Dominant Taxa (3) Percent	71.30%	3			
Dominant Taxa (10) Percent	97.22%				
<i>Diversity</i>					
Shannon H (log _e)	1.704				
Shannon H (log ₂)	2.458		2		
Margalef D	2.364				
Simpson D	0.271				
Evenness	0.112				
<i>Function</i>					
Predator Richness	3		1		
Predator Percent	7.41%	1			
Filterer Richness	1				
Filterer Percent	16.67%			1	
Collector Percent	84.26%		1		0
Scraper+Shredder Percent	8.33%		1		0
Scraper/Filterer	0.00%				
Scraper/Scraper+Filterer	0.00%				
<i>Habit</i>					
Burrower Richness	0				
Burrower Percent	0.00%				
Swimmer Richness	0				
Swimmer Percent	0.00%				
Clinger Richness	2	1			
Clinger Percent	25.00%				
<i>Characteristics</i>					
Cold Stenotherm Richness	0				
Cold Stenotherm Percent	0.00%				
Hemoglobin Bearer Richness					
Hemoglobin Bearer Percent					
Air Breather Richness	1				
Air Breather Percent	0.93%				
<i>Voltinism</i>					
Univoltine Richness	4				
Semivoltine Richness	1	1			
Multivoltine Percent	26.85%		3		
<i>Tolerance</i>					
Sediment Tolerant Richness	1				
Sediment Tolerant Percent	7.41%				
Sediment Sensitive Richness	0				
Sediment Sensitive Percent	0.00%				
Metals Tolerance Index	3.644				
Pollution Sensitive Richness	0				
Pollution Tolerant Percent	8.33%	5		2	
Hilsenhoff Biotic Index	6.778		1		0
Intolerant Percent	0.00%				
Supertolerant Percent	47.22%				
CTQa	104.000				

Bioassessment Indices

BioIndex	Description	Score	Pct	Rating
BIBI	B-IBI (Karr et al.)	16	32.00%	
MTP	Montana DEQ Plains (Bukantis 1998)	11	36.67%	Moderate
MTV	Montana Revised Valleys/Foothills (Bollman 1998)	3	16.67%	Severe
MTM	Montana DEQ Mountains (Bukantis 1998)	0	0.00%	Severe

