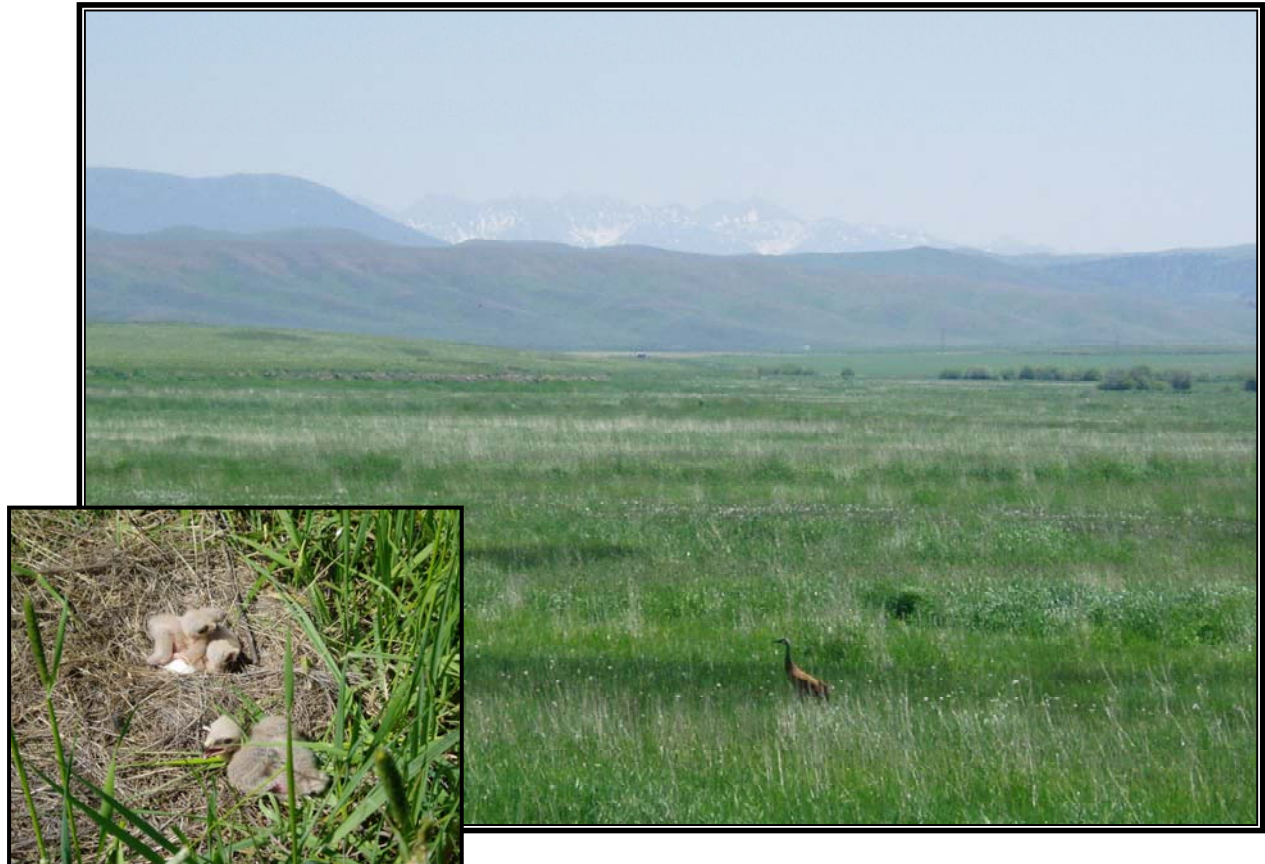

MONTANA DEPARTMENT OF TRANSPORTATION WETLAND MITIGATION MONITORING REPORT: YEAR 2008

*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 2008

PBS&J Project No: 0B4308801.03.05



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- Appendix B *2008 Wetland Mitigation Site Monitoring Form*
 2008 Bird Survey Form
 2008 COE Wetland Delineation Forms
 2008 Functional Assessment Forms
- Appendix C *2008 Representative Photographs*
- Appendix D *Plan Sheet and Credit Areas*
- Appendix E *GPS Protocol*
- Appendix F *Macroinvertebrate Sampling Protocol and Data*

Cover Photographs: Sandhill Crane in the floodplain of Woodson Creek; Northern Harrier nest with chicks in the West Parcel.

1.0 INTRODUCTION

This report presents the results of the second year (2008) 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**.

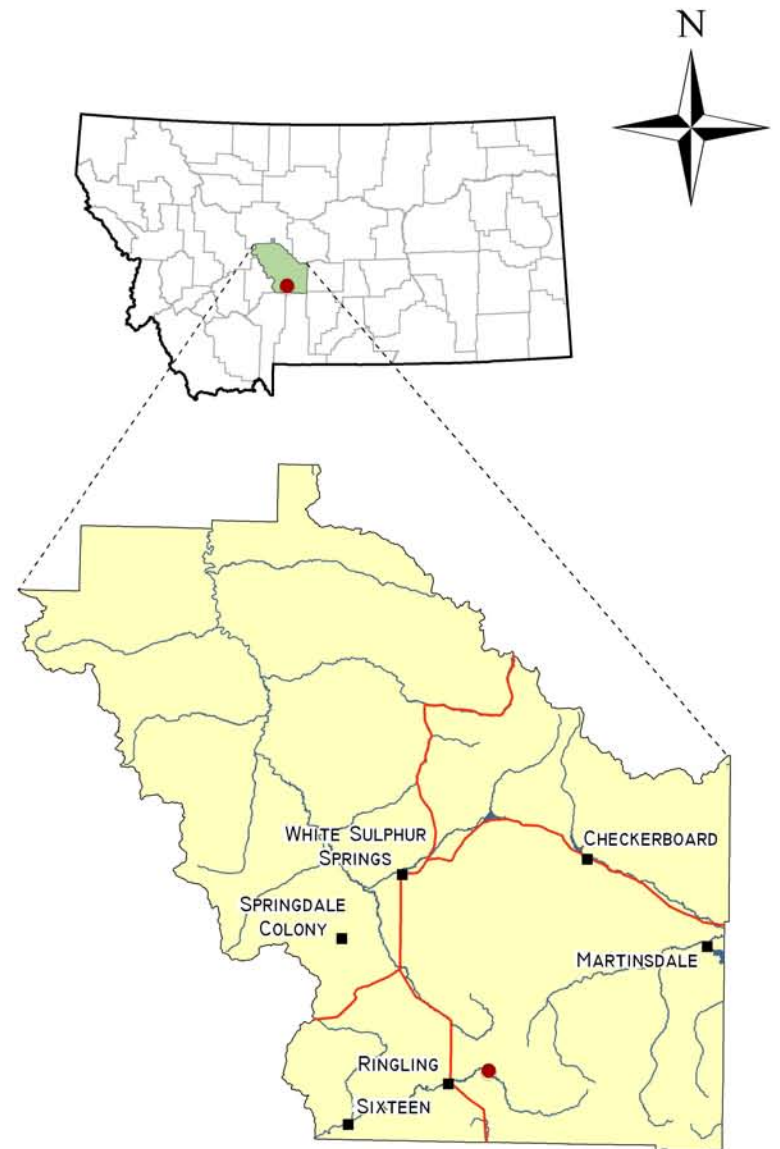
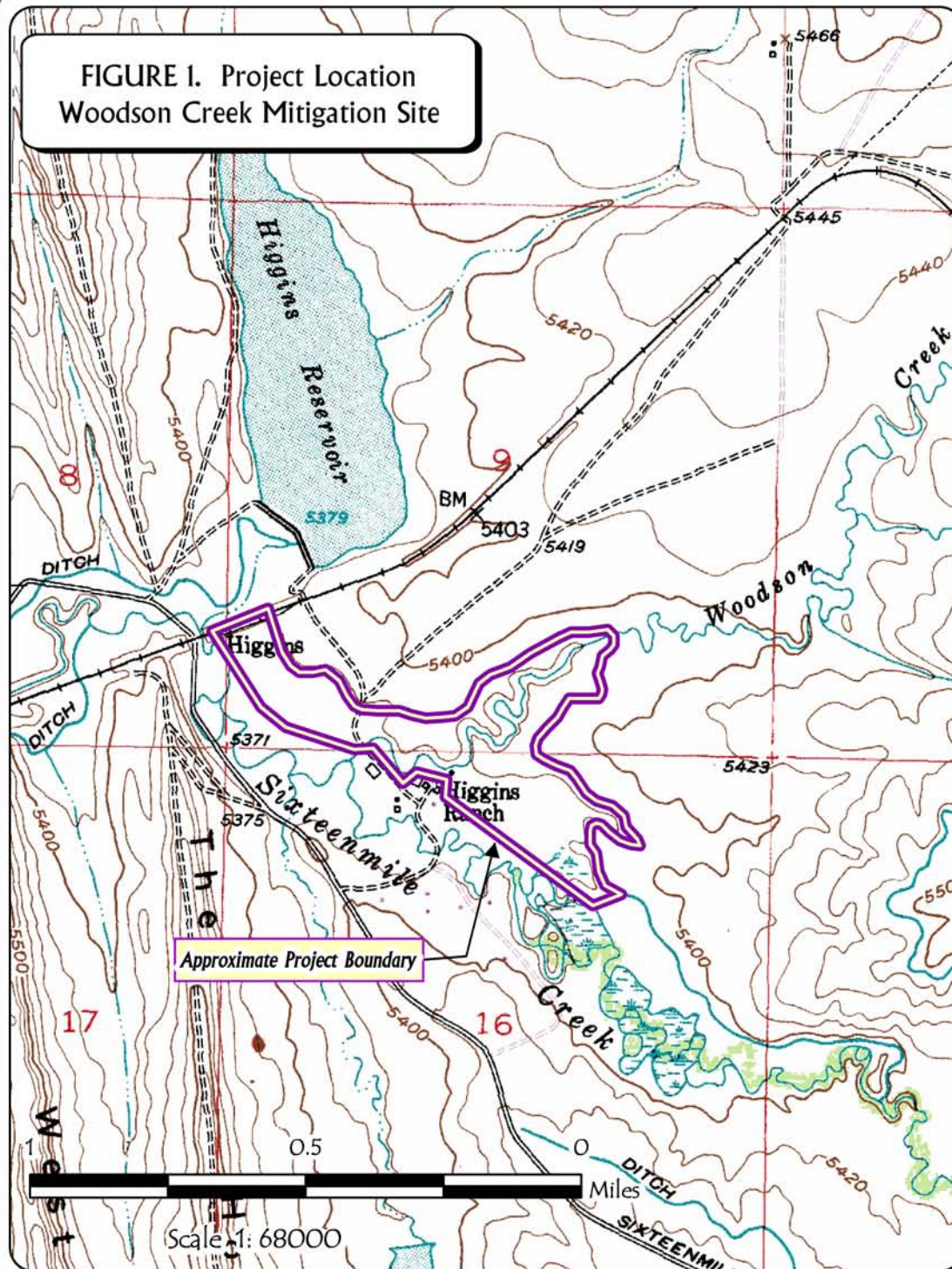
Crediting for the project is relatively complex. Seven different crediting areas were developed, each with their own specific performance standards. In general terms, if the standards are met, credit ratios are 1:1 for restoration and creation and 1.5:1 for rehabilitation. The maximum acres of credit on the site is expected to be 73.3 acres of credit (ADC Services 2005). Success criteria for each credit area are summarized in **Section 3.12** of this report.

2.0 METHODS

2.1 Monitoring Dates and Activities

In 2008 the site was visited on July 3rd and 4th (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 evaluated at the site during the mid-season 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 recorded onto the Wetland Mitigation Site Monitoring Form (**Appendix B**).

Three 10-foot wide belt transects were established. 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-NRCS 2006).

2.5 Wetland Delineation

Wetland delineation was conducted during the mid-season visit in accordance with the 1987 COE Wetland Delineation Manual. In July 2008, consultation with the COE (Steinle pers. comm.) confirmed that, where the 1987 manual was used to establish baseline wetland conditions at MDT wetland mitigation sites, it should continue to be applied at such sites for the duration of the monitoring period. Consequently, application of the new *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region* (COE 2008) was not required or undertaken at this site in 2008. 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**). Changes in the wetland/upland boundary since 2007 were mapped using a global positioning system (GPS) unit during the July 2008 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 was 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 the mid-season 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. The samples were collected and preserved according to the Macroinvertebrate Sampling Protocol (**Appendix F**). The approximate location of the sample points were mapped with a GPS.

2.9 Functional Assessment

Functional assessment forms were completed for the three 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. 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

The two permanent cross-sections established in 2007 were monitored again in 2008. One cross-section is located near the upper end of the project area; the second at the lower end of the project area. Sites were monitored during the mid-season visit.

2.11 Streambank Erosion Pins

In 2007 streambank erosion pins were installed at two locations. Smooth, 4-foot long, ¼ inch steel bars were pounded horizontally into streambanks at the outside of meander bends where bank erosion was expected to be high. 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. The length of erosion pins protruding from the bank was measured during the mid-season visit and then were pounded as flush as possible to the streambank without actually damaging the bank. If any of the erosion pin remained protruding from the bank, the length protruding from the bank was measured again so that accurate measurement could be made in 2009.

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. Each photograph point location was recorded with a GPS in 2007. The approximate location of photo points were mapped onto the 2008 aerial photograph of the site. All photographs were taken using a digital camera, with no optical zoom used. A description and azimuth bearing 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 also collected in order to orthorectify the aerial photography. In 2008 additional GPS data were collected for any changes observed to habitat boundaries. 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

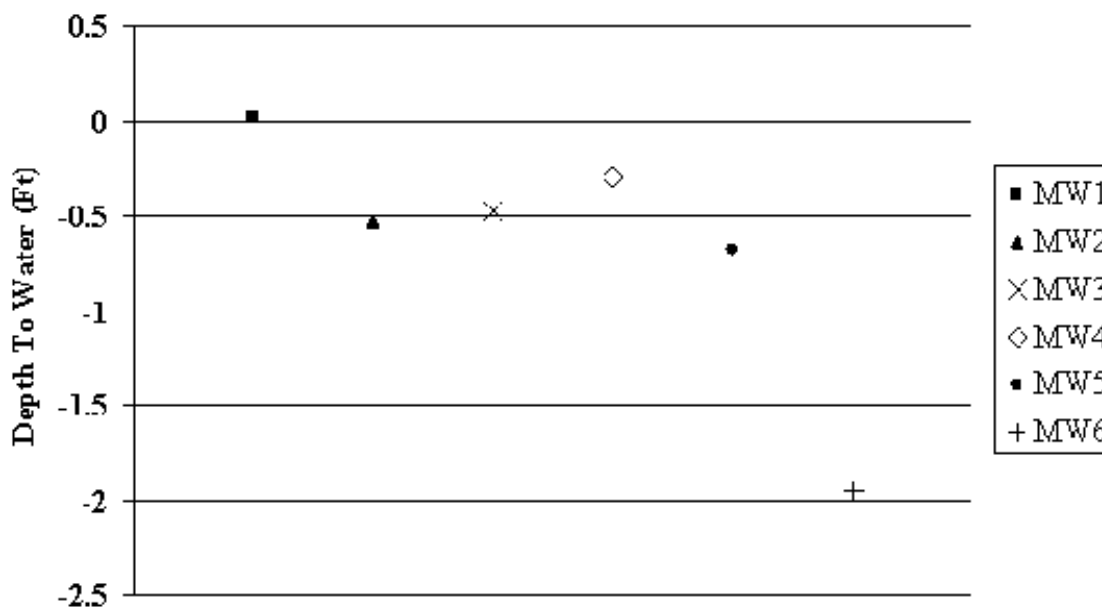
The NRCS estimates that the growing season in White Sulphur Springs, the closest weather station to the project area, extends from May 23rd through September 17th, and is approximately 117 days long (NRCS 2003). Therefore, wetland hydrology requirements are met if the site remains saturated to the soil 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 Sulphur Springs 2 (station #248930-4). According to the Western Regional Climate Center (WRCC) (2008), 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 2008 (excluding June when no data was collected) at the White Sulphur Springs weather station was 8.29 inches (WRCC 2008). If the minimum amount recorded for June at the station is used, a conservative estimate of the total precipitation at the site is 8.89 inches. 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 Sulphur Springs (BOR 2007), nearly three times the yearly precipitation rate, indicating that precipitation alone is insufficient to supply wetland hydrology.

Seven groundwater monitoring wells were installed on the site in the spring of 2008 (T. Coleman, personal communication). Six of these were located during the mid-season visit and were monitored (**Chart 1**). As depicted, with the exception of monitoring well #6, all of the wells show water levels were within 12 inches of the soil surface during mid-season monitoring. The area where monitoring well #6 occurs has been delineated as an upland area; therefore, the groundwater data support the delineation in this portion of the mitigation site.

The Sixteenmile Ditch was reported as being cleaned in the fall of 2007, which appears to have decreased seepage from the ditch into the West Parcel (personal communication, D. Sellers, ranch manager).

Chart 1: Groundwater levels at the Woodson Creek Wetland Mitigation Site on July 3-4, 2008.



3.2 Vegetation

Vegetation species identified on the site are presented in **Table 1** and on the **Monitoring Form (Appendix B)**. A total of 77 plant species were identified on site. Garrison creeping foxtail (*Alopecurus arundinaceus*) was the dominant species on the site. A total of six different vegetation communities were identified (**Figure 3**). The most prevalent was 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 typically comprises less than 50% of the total cover; whereas in Community Type 1 this species generally 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 narrow swales approximately 2 feet below the surrounding landscape in what appears to be a historic stream channel. The mixed graminoid Community Type became more prevalent in the floodplain area and east parcel in 2008 (**Figure 3**).

Table 1: 2007-2008 vegetation species list for the Woodson Creek Wetland Mitigation Site.

Scientific Name	1988 Region 9 (Northwest) Wetland Indicator	Scientific Name	1988 Region 9 (Northwest) Wetland Indicator
<i>Achillea millefolium</i>	FACU	<i>Juncus effusus</i>	FACW+
<i>Agropyron cristatum</i>	--	<i>Juncus filiformis</i>	FACW+
<i>Agrostis exarata</i> (?)	FACW	<i>Lactuca serriola</i>	FAC-
<i>Agropyron repens</i>	FACU	<i>Linum lewisii</i>	--
<i>Agrostis stolonifera</i>	FAC+	<i>Melilotus officinalis</i>	FACU
<i>Alopecurus arundinaceus</i>	NI	<i>Mentha arvensis</i>	FAC
<i>Alopecurus aequalis</i>	OBL	<i>Muhlenbergia richardsonis</i> *	FACW
<i>Aster</i> spp. [yellow]	--	<i>Panicum virgatum</i>	FAC+
<i>Aster</i> spp. [purple]	--	<i>Pascopyrum smithii</i>	FACU
<i>Beckmannia syzigachne</i>	OBL	<i>Phalaris arundinaceae</i>	FACW
Brassicaceae	---	<i>Phleum alpinum</i>	FAC
<i>Bromus inermis</i>	--	<i>Phleum pratense</i>	FACU
<i>Carduus nutans</i>	--	<i>Plantago major</i>	FAC+
<i>Carex lasiocarpa</i>	OBL	<i>Poa compressa</i>	FACU
<i>Carex nebrascensis</i>	OBL	<i>Poa palustris</i>	FAC
<i>Carex praegracilis</i>	FACW	<i>Poa pratensis</i>	FACU+
<i>Carex utriculata</i>	OBL	<i>Polygonum amphibium</i>	OBL
<i>Chenopodium album</i>	FAC	<i>Potentilla anserine</i>	OBL
<i>Cicuta douglasii</i>	OBL	<i>Potentilla</i> spp.	FACU - OBL
<i>Cirsium arvense</i>	FACU	<i>Ranunculus</i> spp.	--
<i>Cynoglossum officinale</i>	--	<i>Rumex crispus</i>	FACW
<i>Deschampsia cespitosa</i>	FACW	<i>Salix exigua</i> (planted)	OBL
<i>Descurainia sophia</i>	--	<i>Salix</i> spp. (planted)	--
<i>Distichlis spicata</i>	FACW	<i>Salsola kali</i> *	FACU
<i>Dodecatheon pulchellum</i>	FACW	<i>Scirpus acutus</i>	OBL
<i>Eleocharis palustris</i>	OBL	<i>Scirpus microcarpus</i>	OBL
<i>Elymus lanceolatus</i>	FACU-	<i>Sisyrinchium montanum</i>	NI
<i>Elymus trachycaulus</i>	FAC	<i>Solidago</i> spp.	FACU to FACW
<i>Epilobium</i> spp.	NI to OBL	<i>Sonchus arvensis</i>	FACU+
<i>Equisetum hyemale</i>	FACW	<i>Sporobolus cryptandrus</i>	FACU
<i>Galium aparine</i>	FACU	<i>Taraxacum officinale</i>	FACU
<i>Glycyrrhiza lepidota</i>	FAC+	<i>Thlaspi arvense</i>	NI
<i>Halogeton glomeratus</i>	--	<i>Trifolium longipes</i>	FAC-
<i>Helianthus annuus</i>	FACU	<i>Trifolium pratense</i>	FACU
<i>Hieracium</i> spp.	--	<i>Trifolium repens</i>	FACU+
<i>Hordeum jubatum</i>	FAC+	<i>Triglochin</i> spp.	OBL
<i>Iris missouriensis</i>	FACW+	<i>Typha latifolia</i>	OBL
<i>Juncus balticus</i>	OBL	<i>Valeriana edulis</i>	FAC

*Identified by ADC Services (2005).

Bolded species were observed for the first time in 2008.

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 **Tables 2 to 4 and Charts 2 to 7**. The total length of all transects was 1,487 feet.

Table 2: 2007 and 2008 vegetation Transect 1 data summary.

Monitoring Year	2007	2008
Transect Length (feet)	526	526
# Vegetation Community Transitions along Transect	2	4
# Vegetation Communities along Transect	3	3
# Hydrophytic Vegetation Communities along Transect	3	3
Total Vegetative Species	31	20
Total Hydrophytic Species	20*	18
Total Upland Species	11	2
Estimated % Total Vegetative Cover	90	90
% Transect Length Comprised of Hydrophytic Vegetation Communities	100	100
% Transect Length Comprised of Upland Vegetation Communities	0	0
% Transect Length Comprised of Unvegetated Open Water	6	6
% Transect Length Comprised of Bare Substrate	0	0

*Includes *Alopecurus arundinaceus* and does not include unidentified species.

Chart 2: Transect map showing vegetation types from the start of transect to the end of Transect 1 for 2007 and 2008.

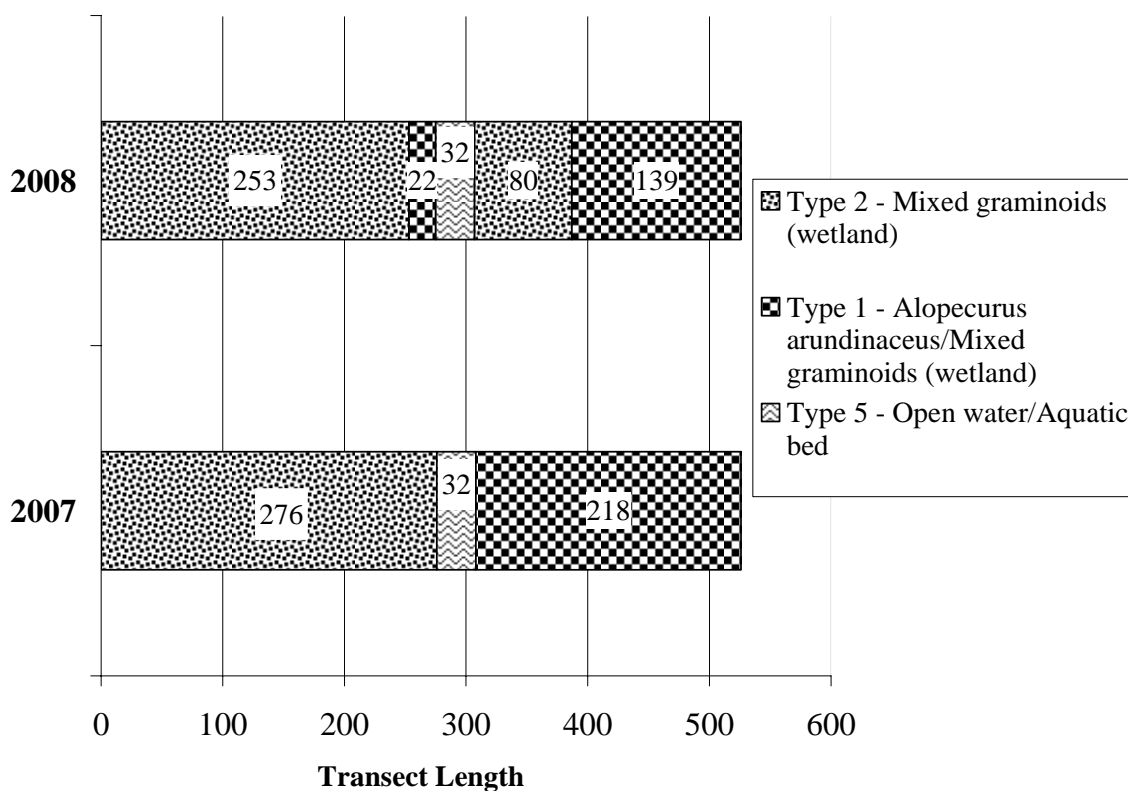
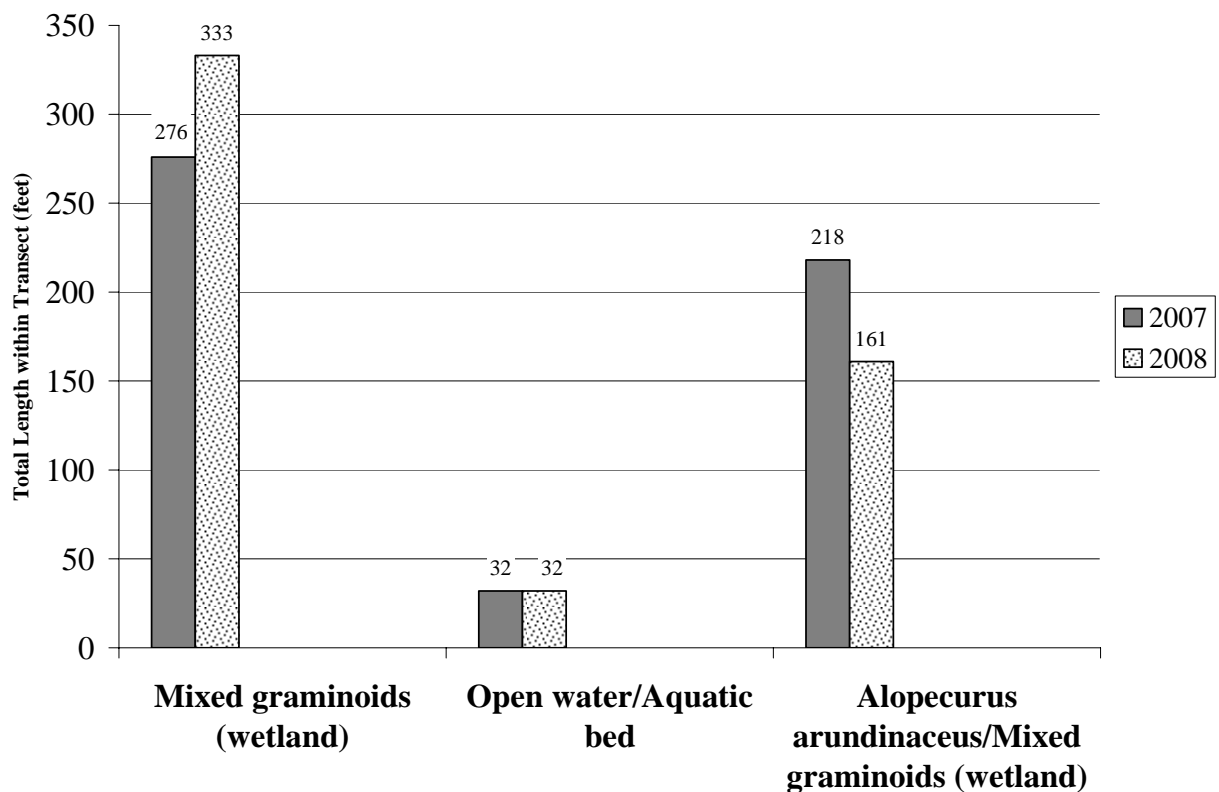


Chart 3: Length of vegetation communities within Transect 1 for 2007 and 2008.**Table 3: 2007 and 2008 vegetation Transect 2 data summary.**

Monitoring Year	2007	2008
Transect Length (feet)	583	583
# Vegetation Community Transitions along Transect	0	2
# Vegetation Communities along Transect	1	2
# Hydrophytic Vegetation Communities along Transect	1	2
Total Vegetative Species	17	13
Total Hydrophytic Species	14*	11
Total Upland Species	2	2
Estimated % Total Vegetative Cover	95	90
% Transect Length Comprised of Hydrophytic Vegetation Communities	100	100
% Transect Length Comprised of Upland Vegetation Communities	0	0
% Transect Length Comprised of Unvegetated Open Water	2	0
% Transect Length Comprised of Bare Substrate	0	0

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

Chart 4: *Transect map showing vegetation types from the start of transect to the end of Transect 2 for 2007 and 2008.*

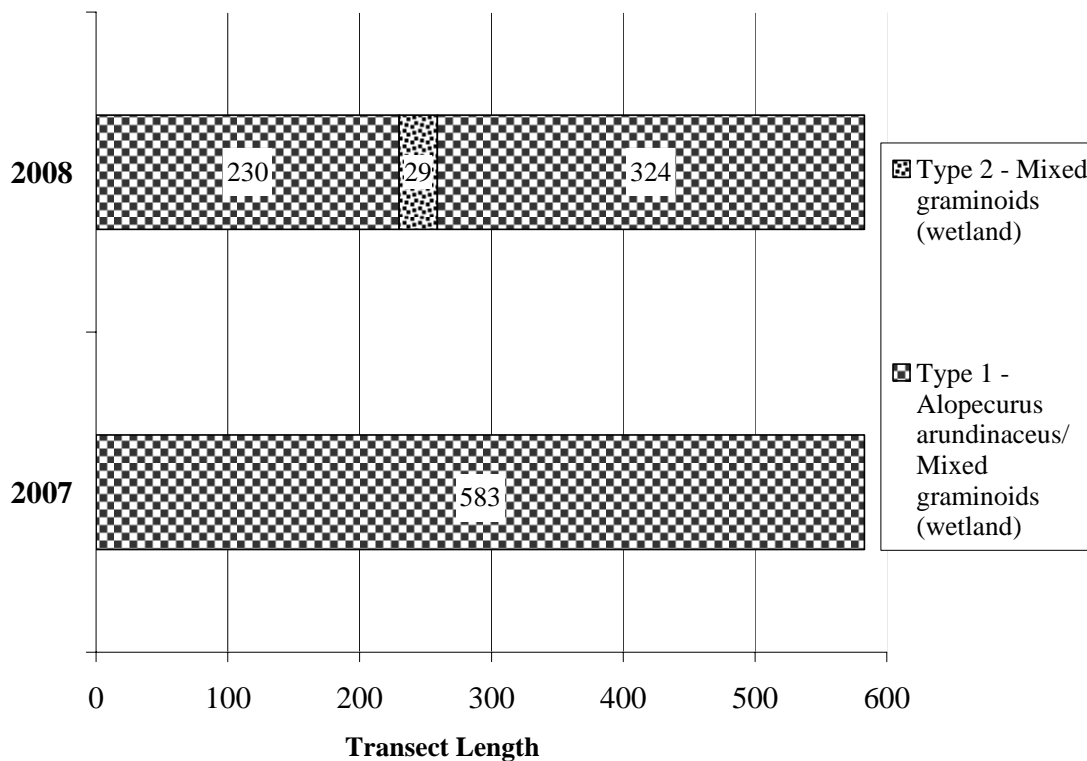


Chart 5: *Length of vegetation communities within Transect 2 for 2007 and 2008.*

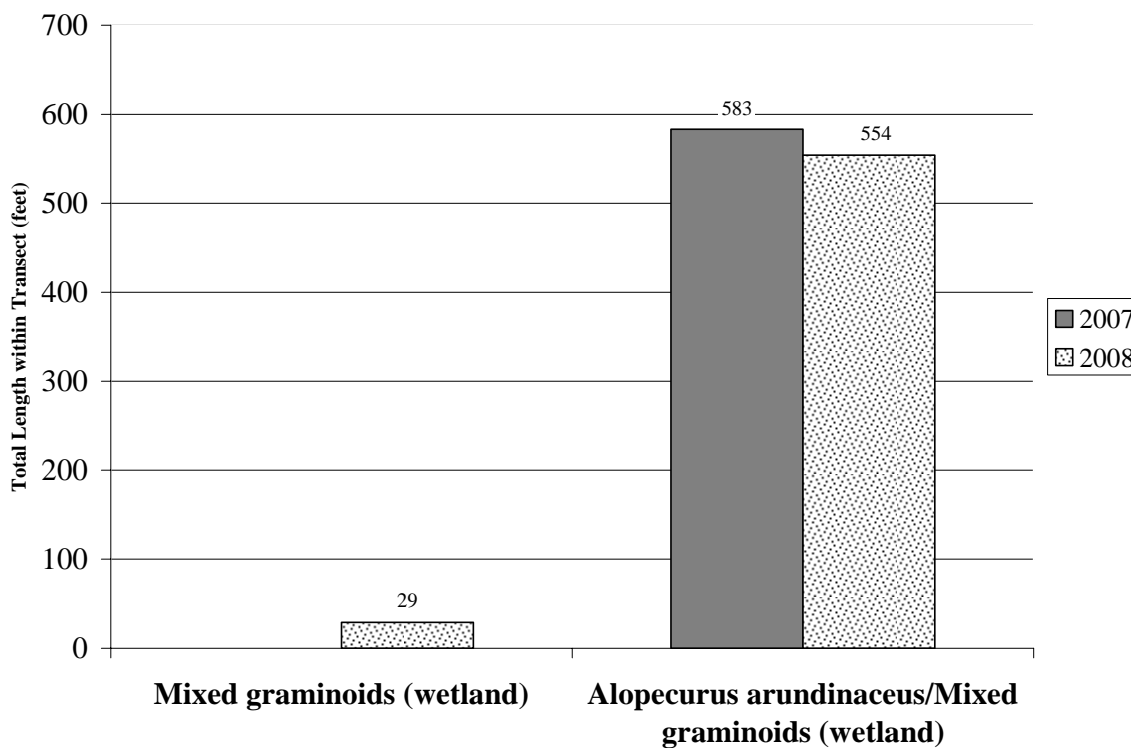


Table 4: 2007 and 2008 vegetation Transect 3 data summary.

Monitoring Year	2007	2008
Transect Length (feet)	378	378
# Vegetation Community Transitions along Transect	0	0
# Vegetation Communities along Transect	1	1
# Hydrophytic Vegetation Communities along Transect	1	1
Total Vegetative Species	3	3
Total Hydrophytic Species	2*	3
Total Upland Species	1	0
Estimated % Total Vegetative Cover	80	90
% Transect Length Comprised of Hydrophytic Vegetation Communities	100	100
% Transect Length Comprised of Upland Vegetation Communities	0	0
% Transect Length Comprised of Unvegetated Open Water	0	0
% Transect Length Comprised of Bare Substrate	0	0

*Includes *Alopecurus arundinaceus* and does not include unidentified species.

Chart 6: Transect map showing vegetation types from the start of transect to the end of Transect 3 for 2007 and 2008.

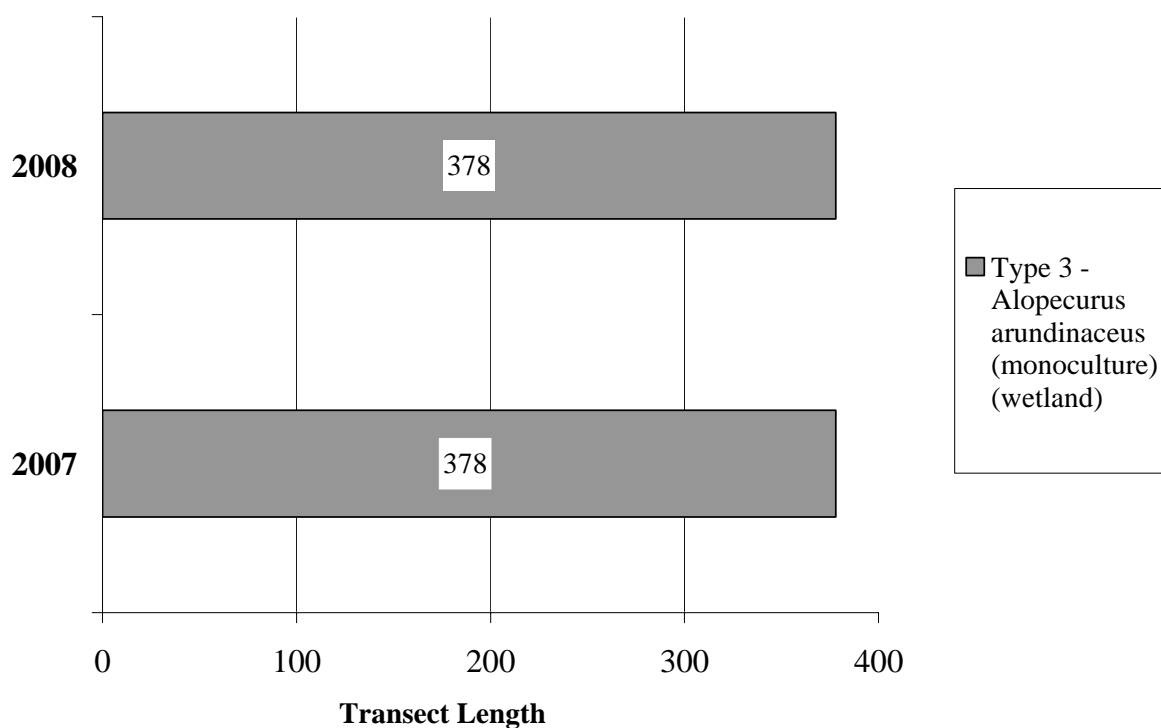
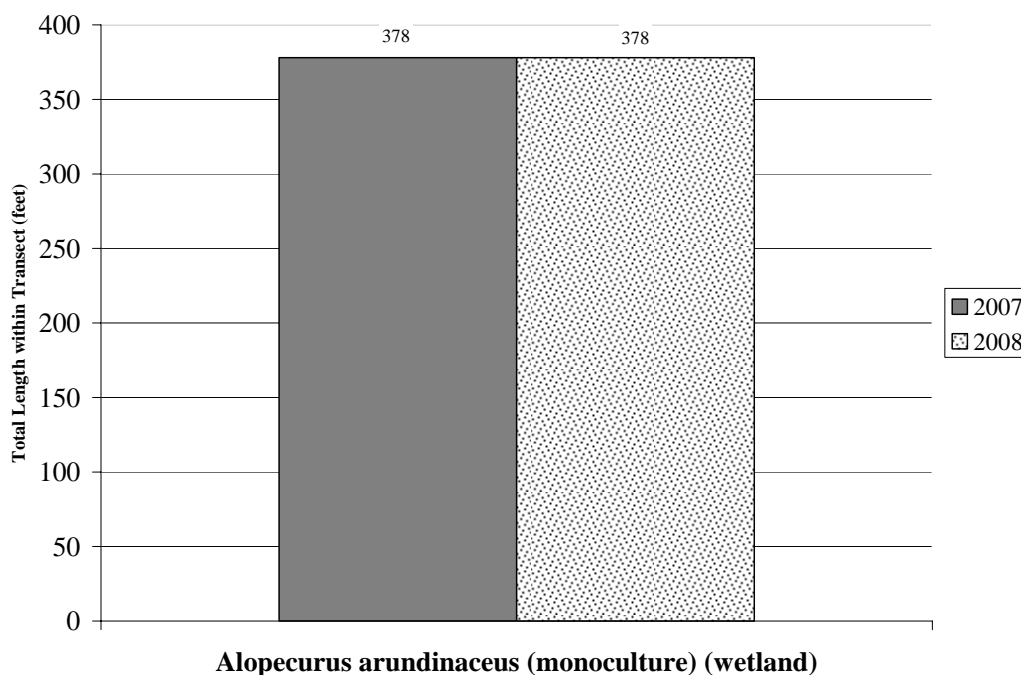


Chart 7: Length of vegetation communities within Transect 3 for 2007 and 2008.

A total of 69 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 very well. However, it is significant that a total of 47 out of the 69 cuttings (68 percent survival) were alive in this second year of monitoring. The majority of these surviving willows are expected to survive indefinitely, though their growth and contribution to structural diversity of the site may be slow in developing.

3.3 Soils

Soils sampled in wetland areas in 2008 were comprised of silty clay and clay. In addition, an organic horizon was found at one sample location. Matrix colors of the mineral soils were dark (10YR 3/1 and 10YR 5/1). Soil was very moist at the time of the evaluation and saturation and/or inundation was assumed to have occurred at SP-1 earlier in the growing season. Specific information is provided on the data forms in **Appendix B**.

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. The exact location of a corner post in the southeastern portion of the site was located with a GPS, which, from a mapping perspective, had the effect of slightly increasing the wetland area in this portion of the site and the overall area of the site.

Total aquatic habitat on the site in 2008 was 61.75 acres (**Figure 3 in Appendix A**), which is an overall decrease of 2.66 acres from the 64.41 acres in 2007 (**Table 5**). In 2008 wetlands comprised 59.02 acres, a decrease of 2.84 acres from the 61.86 acres of wetland mapped in 2007 (**Table 5**). The majority of these changes in acreages can be attributed to a more refined delineation as the site hydrology became better understood. Substantial refinements to the delineation were made on the West Parcel.

Open water/aquatic bed areas occur as small irregular depressions and comprised 2.73 acres (approximately 4%) of the 61.75-acre total (**Table 5**). Potential credits that have developed to date are discussed in *Section 3.12*.

Table 5. 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
2008 (on-going establishment)	2.73	59.02	61.75

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 6**). One fish of approximately 4 inches was also observed in the creek (**Table 6**). The habitat value of the site is expected to increase as vegetation diversifies and more shrubs are planted on the site.

Table 6: Fish and wildlife species observed at the Woodson Creek Wetland Mitigation Site during 2007-2008.

FISH	
Fish, likely brook trout (<i>Salvelinus fontinalis</i>)	
AMPHIBIAN	
Columbia spotted frog (<i>Rana luteiventris</i>)	Western toad (<i>Bufo boreas</i>) Adult and tadpoles
REPTILE	
Western garter snake (<i>Thamnophis elegans</i>)	
BIRD	
American Avocet (<i>Recurvirostra americana</i>) ¹	Lesser Scaup (<i>Aythya affinis</i>) ¹
American Kestrel (<i>Falco sparverius</i>) ¹	Long-billed Curlew (<i>Numenius americanus</i>) ¹
American Pelican (<i>Pelecanus erythrorhynchos</i>)	Mallard (<i>Anas platyrhynchos</i>)
American Wigeon (<i>Anas americana</i>)	Northern Harrier (<i>Circus cyaneus</i>)
Bald Eagle (<i>Haliaeetus leucocephalus</i>) ¹	Northern Pintail (<i>Anas acuta</i>) ¹
Barn Swallow (<i>Hirundo rustica</i>)	Northern Shoveler (<i>Anas clypeata</i>)
Blue-winged Teal (<i>Anas discors</i>) ¹	Red-tailed Hawk (<i>Buteo jamaicensis</i>) ¹

Table 6 (continued): Fish and wildlife species observed at the Woodson Creek Wetland Mitigation Site during 2007-2008.

BIRD (continued) Canada Goose (<i>Grus canadensis</i>) ¹ Cinnamon Teal (<i>Anas cyanoptera</i>) ¹ Cliff Swallow (<i>Hirundo pyrrhonota</i>) Common Snipe (<i>Gallinago gallinago</i>) Double-crested Cormorant (<i>Phalacrocorax auritus</i>) ¹ Eastern Kingbird (<i>Tyrannus tyrannus</i>) ¹ Gadwall (<i>Anas strepera</i>) ¹ Golden Eagle (<i>Aquila chrysaetos</i>) ² Great Blue Heron (<i>Ardea herodias</i>) ¹ Great-horned Owl (<i>Bubo virginianus</i>) Green-winged Teal (<i>Anas crecca</i>) ¹ Killdeer (<i>Charadrius vociferous</i>)	Red-winged Blackbird (<i>Agelaius phoeniceus</i>) Ring-necked Pheasant (<i>Phasianus colchicus</i>) ¹ Rock Dove (<i>Columba livia</i>) Sandhill Crane (<i>Grus canadensis</i>) Savannah Sparrow (<i>Passerculus sandwichensis</i>) Sora (<i>Porzana carolina</i>) ² Swainson's Hawk (<i>Buteo swainsoni</i>) ¹ Yellow headed Blackbird (<i>Xanthocephalus xanthocephalus</i>) ¹ Whistling Swan (<i>Cygnus columbianus</i>) ¹ Willet (<i>Catoptrophorus semipalmatus</i>) Wilson's phalarope (<i>Phalaropus tricolor</i>)
MAMMAL Black-tailed Jack Rabbit (<i>Lepus californicus</i>) ² Bobcat (<i>Lynx rufus</i>) ¹ Coyote (<i>Canis latrans</i>) ¹ Moose (<i>Alces alces</i>) ¹ Mouse Mule deer (<i>Odocoileus hemionus</i>) ¹ Porcupine (<i>Erethizon dorsatum</i>) ¹	Raccoon (<i>Procyon lotor</i>) ¹ Red Fox (<i>Vulpes vulpes</i>) ¹ Shrew Striped skunk (<i>Mephitis mephitis</i>) Vole White-tail deer (<i>Odocoileus virginianus</i>)

¹Species observed by property manager or Oasis Environmental.²Species observed by MDT.**Bolded** species were observed in 2008.

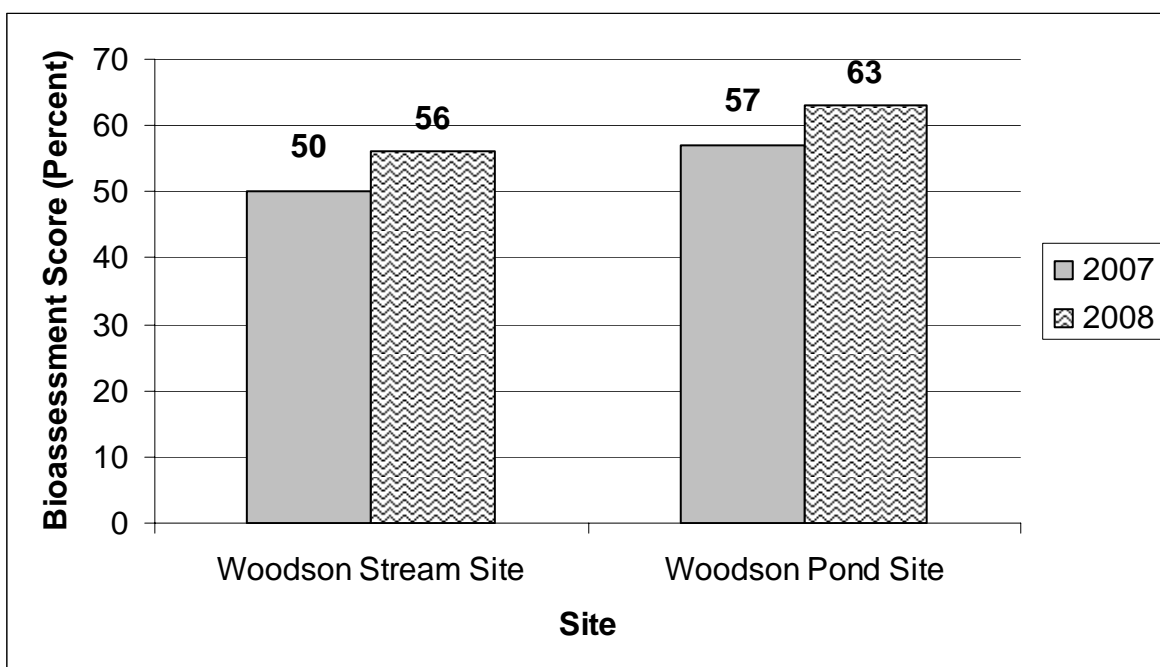
3.6 Macroinvertebrates

Macroinvertebrates were sampled at two locations; one sample was collected in standing water and the other in Woodson Creek (**Figure 2** in **Appendix A**). Complete sampling results are provided in **Appendix F** and were summarized by Rhithron Associates in the italicized sections and in **Chart 8** (Bollman 2008). A total of 110 individuals were collected at the pond site with the dominant taxa being chironomids and ostracoda (**Appendix F**). At the stream site a total of 13 individuals were collected with the dominant taxa being trichoptera and diptera (**Appendix F**).

Pond Site: *Although invertebrate abundance was high at this site, taxa richness was low. Since 2007, taxa associated with filamentous algae have disappeared, but the macrophyte-associated odonate Lestes sp. was collected in 2008. Both air-breathers (e.g. Dytiscidae) and hemoglobin-bearers (e.g. Chironomus sp.) were abundant this year, suggesting hypoxic substrates and water. There is some evidence that waters were relatively salty here: brine flies (Ephydriidae) and Lestes sp. are known to tolerate high salinity, and the snail Stagnicola sp. is unusual among snails in its tolerance of salty habitats. Predators remained abundant in 2008, suggesting complex aquatic habitats. Thermal preference of the assemblage collected here was calculated at 14.8°C.*

Stream Site: This site continued to harbor rheophilic taxa in 2008, but invertebrate abundance was very low: only 13 individuals were present in the sample collected here. The abundant amphipod fauna of 2007 was poorly represented in 2008, and not a single midge was collected this year, compared to the abundant fauna of 2007. This suggests poorly developed aquatic habitats, or possible dewatering between the 2 sampling events. Similar to 2007, both rheophilic (e.g. *Paraleptophlebia* sp. and *Simulium* sp.) and still-water taxa were present. It appears that neither the MVFP index nor the wetland index for lotic sites is entirely appropriate for evaluating this fauna.

Chart 8: Bioassessment scores for the Woodson Creek Wetland Mitigation Site during 2007 and 2008.



3.7 Functional Assessment

Functional assessment forms were completed for wetlands in 2008 using the 1999 MDT Montana Wetland Assessment Method (MWAM) (**Appendix B**). Since the functional assessment plays a quantitative role in the success criteria for wetlands, the 2008 MWAM was not used. The functional assessment results for 2005 and 2008 were summarized (**Table 7**). The functional assessment results from the baseline conditions in 2005 were prepared by Oasis Environmental in 2005 (**Table 7**).

The restored wetlands at Woodson Creek were ranked as Category II and III wetlands in 2008 as compared to Category III and IV in 2005 (**Table 7**). Functions that increased over 2005 baseline conditions included the MTNHP sensitive species habitat, general wildlife habitat, flood attenuation, short and long term surface water storage, sediment/nutrient/ toxicant removal, streambank/shoreline stabilization, and production export. The pre-project site provided a total of about 141 functional units within the monitoring area, in 2008 the post-project site currently

Table 7: Summary of 2005 and 2008 wetland function/value ratings and functional points ¹ at the Woodson Creek Wetland Mitigation Site.

Function and Value Parameters from the MDT Montana Wetland Assessment Method	2005 Baseline		2008 ¹		
	Woodson Floodplain	East & West Parcel	New Woodson Floodplain	East Parcel	West Parcel
Listed/Proposed T&E Species Habitat	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)
MNHP Species Habitat	Low (0.1)	Low (0.1)	High (1.0)	High (1.0)	Mod (0.6)
General Wildlife Habitat	Low (0.3)	Low (0.3)	High (0.9)	Mod (0.7)	Mod (0.7)
General Fish/Aquatic Habitat	Low (0.3)	NA	Mod (0.6)	NA	NA
Flood Attenuation	Low (0.1)	NA	Mod (0.6)	NA	NA
Short and Long Term Surface Water Storage	Low (0.3)	NA	High (1.0)	High (0.8)	Low (0.3)
Sediment/Nutrient/Toxicant Removal	Mod (0.6)	Mod (0.7)	High (1.0)	High (1.0)	High (1.0)
Sediment/Shoreline Stabilization	Mod (0.7)	NA	High (1.0)	NA	NA
Production Export/Food Chain Support	Mod (0.4)	Mod (0.7)	High (0.9)	High (0.9)	Mod (0.6)
Groundwater Discharge/Recharge	High (1.0)	Low (0.1)	Mod (1.0)	Mod (1.0)	High (1.0)
Uniqueness	Low (0.2)	Low (0.2)	Low (0.2)	Low (0.2)	Low (0.3)
Recreation/Education Potential	Low (0.1)	Low (0.1)	Low (0.1)	Low (0.1)	Low (0.1)
Actual Points / Possible Points	4.1 / 12	2.2 / 8	8.3 / 12	5.7 / 9	4.6 / 9
% of Possible Score Achieved	34.0	27.5	69	63	51.0
Overall Category	III	IV	II	II	III
Total Acreage of Assessed Aquatic Habitat within AA Boundaries	0.48	57.00	28.08	27.77	5.90
Functional Unit (acreage x actual points)	16.40	124.70	233.06	158.29	27.14
Net Acreage Gain (from baseline conditions)	NA	NA	4.27		
Net Functional Unit Gain (from baseline conditions)	NA	NA	277.39		

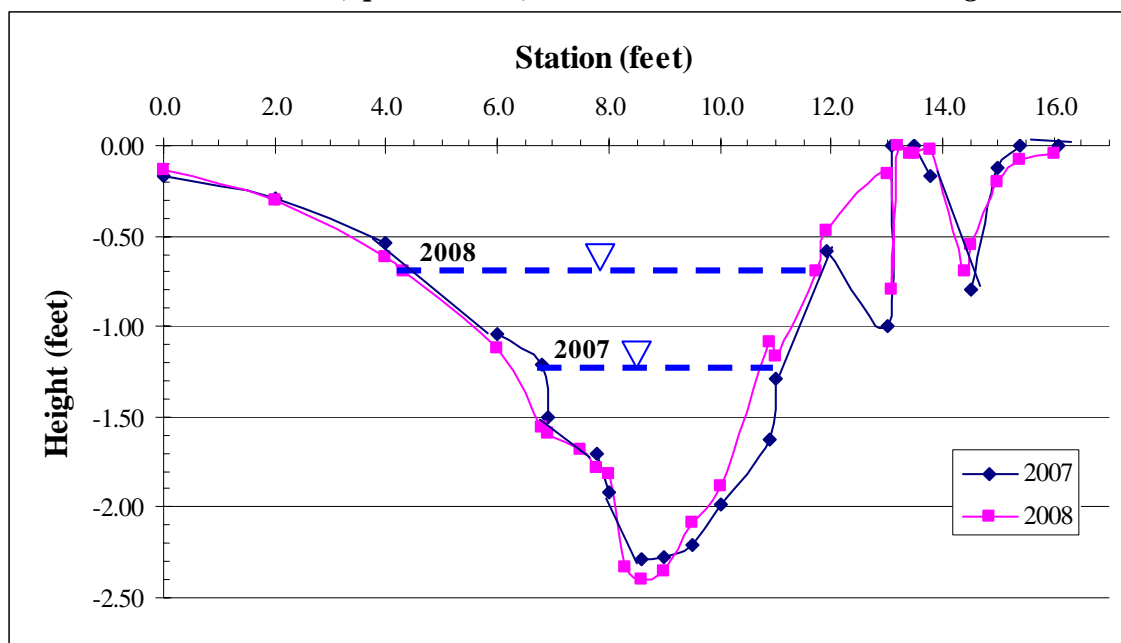
¹ See completed MDT MWAM in **Appendix B**.

provides about 418 functional units, for a conservative gain of approximately 277 functional units. This represents a slight increase of approximately 8 functional units from 2007.

3.8 Channel Cross-sections

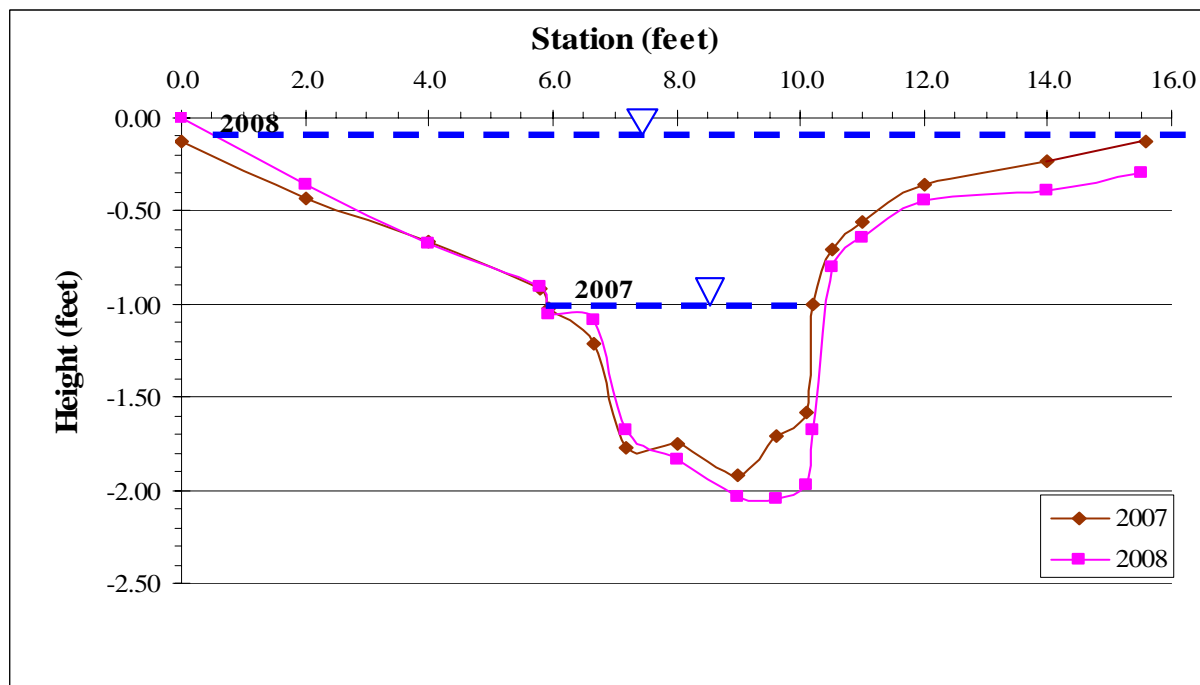
Locations of the channel cross-sections are shown on **Figure 2**. Graphical representations were made of the 2007 and 2008 cross-sections (**Charts 9 and 10**). Slight increases in depth and width of the channel since 2007 were observed at both locations. The cause of these changes is unclear, but is assumed to be primarily the result of minor adjustments of the creek to the channel geometry and settling of the banks. The channel carried substantially more water during monitoring in 2008 than observed in 2007. The estimated 2008 discharge at cross-section 1 was 7.4 cfs and greater than 11 cfs at cross-section 2. This increase in flow at cross-section 2 is attributed to return flows from upstream flooding and additional water entering the site from leakage on the Sixteen Mile irrigation ditch upgradient from cross-section 2.

Chart 9. Cross-section 1 (upstream site) at Woodson Creek Wetland Mitigation Site.



Note: The dashed blue line and inverted blue triangle indicate the water level at the time of monitoring.

Chart 10. Cross-section 2 (downstream site) at Woodson Creek Wetland Mitigation Site.



Note: The dashed blue line and inverted blue triangle indicate the water level at the time of monitoring.

3.9 Streambank Erosion Pins

Streambank erosion pins were installed at an upstream and downstream location (**Figure 2** in **Appendix A**) along the outside of meanders in the 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. Bank erosion was observed at both locations. At the upstream site approximately 0.11 feet of erosion occurred at the upper pin and 0.47 feet at the lower pin, for an average erosion rate of 0.29 feet/year. Water depth at the pins was 1.96 feet. At the lower site approximately 0.08 feet of erosion occurred at the upper pin and 0.2 feet at the lower pin for an average of 0.14 feet/year.

3.10 Photographs

Representative photographs were taken from photo-points and transect ends (**Appendix C**).

3.11 Maintenance Needs/Recommendations

Subsequent to the submittal of the 2007 monitoring report it was communicated to PBS&J that a reported 'breach' in the lower dike on the eastern parcel was purposefully enacted by Oasis to reduce water levels in this area; thus, no repair or adjustment is recommended.

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 using herbicides were begun in June 2008 (personal communication, Tom Coleman, Oasis Environmental).

Canada thistle has become established in some of the previously disturbed areas, though it had been eradicated in the area where Woodson Creek enters the mitigation site and in the vicinity of the outlet culvert at the southern end of the restored creek channel. It does still occur in small patches on the dikes.

The lack of monitoring wells noted in 2007 was rectified in 2008 by the installation of seven monitoring wells. Six of these wells were located and monitored during the mid-season monitoring.

If shrub dominated areas are desired, then woody species need to be planted to fulfill success criteria requirements. A map of the woody planting locations is needed. The willows that have been planted were observed to be stunted and growing slowly. This is likely due to the willows being planted in locations that are too wet, and perhaps due to the tight clay soils. It is suggested that if additional willows are planted, that planting them in the upland 'islands' to the depth of shallow groundwater and/or soil saturation, could lead to more vigorous willow growth and add considerable value to birds and wildlife in the area, and could increase functional assessment scores. In addition, due to the pumping action of their root systems, planting willows in these upland islands may help to raise water table depths closer to the soil surface and thereby increase overall wetland acreage at the site. Mature willow transplants might be a better option than

cuttings. Due to its ability to better cope with clayey soils, yellow willow (*Salix lutea*) may be better adapted for use at the Woodson Creek Mitigation site than other willow species.

3.12 Current Credit Summary

Crediting for the Woodson Creek Mitigation Site is complex and comprised of seven different credit zones, each with their own success criteria (**Table 8**). Locations of the credit zones are provided in **Appendix D**. **Table 8** summarizes the success criteria for each credit zone and what was observed in 2008. The results differ somewhat from results presented in the 2007 monitoring report. This is due to a better understanding of the credit zones and the site itself. In the strictest terms, none of the seven credit zones achieved all of their ultimate individual success criteria as of 2008. Partial credit may be possible for some of the zones 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 foxtail and seeding/planting other hydrophytic species.
- Plant woody cuttings at the specified densities and provide an ‘as-built’ map so that they can be located and monitored in the field. The density of the Garrison creeping foxtail makes finding (and monitoring) woody cuttings almost impossible without a map.

The Corps of Engineers will determine which crediting ratios are applicable to the site. Up to 59.89 interim credit-acres have developed on the site in the absence of full ultimate success criteria application (**Table 9**). *Though many of the success criteria have been achieved in each of the seven credit zones, none of the credit zones had yet achieved all of the ultimate success criteria established for them.* Actual credits will need to be negotiated between MDT and the COE.

The pre-construction project site provided a total of about 141 functional units within the monitoring area, in 2008 the post-project site currently provides about 418 functional units, for a conservative gain of approximately 277 functional units over pre-construction conditions.

Table 8: Credit summary for seven zones at the MDT Woodson Creek Wetland Mitigation Site.

Credit Zone	Credit Category	Planned Total Acreage ^a	2008 Aquatic Habitat Acreage	Success Criteria ^a	Monitoring Year 2 Comments
1 – Woodson Creek Ditch and Spoils	Restoration (Re-establishment)	4.02	2.80 acres wetland 0.61 acre open water/aquatic bed	<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 (#1) of the three success criteria has been achieved.</p> <ol style="list-style-type: none">All three wetland criteria have been met in 3.41 acres.Garrison creeping foxtail is by far the most dominant species in this area and is considered undesirable; however, mixed graminoid cover type has increased substantially in this area since 2007.A minimum number of woody stems were found during monitoring. To effectively monitor these plantings a map showing where they are is needed from the planters.
			3.41 acres total aquatic habitat		
2 – Upland Areas in Floodplain and East site (excluding ditch and spoils)	Restoration (Re-establishment)	8.50	4.97 acres wetland 0.38 acre open water/aquatic bed	<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>Two (#1 and #4) of the three success criteria has been achieved.</p> <ol style="list-style-type: none">All three wetland criteria have been met in approximately 5.35 acres.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.Monitoring wells were installed in 2008. Monitoring on July 3 and 4, 2008 confirmed presence of wetland hydrology in most locations.
			5.35 acres total aquatic habitat		
3 – New Meander Belt Corridor	Restoration (Rehabilitation / Re-establishment)	18.30	17.54 acres wetland 0.66 acre open water/aquatic bed	<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>Four (#1, #4, #5, and #6) of the success criteria have been achieved.</p> <ol style="list-style-type: none">All three wetland criteria have been achieved in 18.2 acres. Flooding was observed during the 2008 mid-season visit.The site has 80 percent cover or higher, but has a minimum of 50% cover of Garrison creeping meadow foxtail, an undesirable species. The mixed graminoid cover type did increase substantially in this credit area in 2008.A minimal number of woody stems were found during monitoring.Monitoring wells were installed in 2008. Monitoring on July 3 and 4, 2008 confirmed presence of wetland hydrology.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 and 2008. The general wildlife function was rated as 0.9.
			18.2 acres total aquatic habitat		
4 – Marginal PEM Wetlands Outside of Floodprone Area (East Site)	Restoration (Rehabilitation / Re-establishment)	23.00	20.37 acres wetland 0.82 acre open water/aquatic bed	<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, #3, #4) of the success criteria have been achieved.</p> <ol style="list-style-type: none">All three wetland criteria have been achieved in 21.19 acres.The site has 80 percent cover or higher, but has a minimum of 50% cover of Garrison creeping meadow foxtail, an undesirable species. The mixed graminoid cover type did increase in extent in 2008 within this credit area.Monitoring wells were installed in 2008. Monitoring on July 3 and 4, 2008 confirmed presence of wetland hydrology.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 2008.
			21.19 acres total aquatic habitat		
5 - Marginal PEM Wetlands Outside of Floodprone Area (West Site)	Restoration (Rehabilitation / Re-establishment)	9.77	5.43 acres wetland 0.09 acre open water/aquatic bed	<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>Three (#1, #3, and #4) of the success criteria have been achieved.</p> <ol style="list-style-type: none">All three wetland criteria have been achieved in 5.52 acres.The site has 80 percent cover or higher, but this credit area has a monoculture of Garrison creeping meadow foxtail, an undesirable species.One monitoring well was installed in 2008 in this credit area. Monitoring on July 3 and 4, 2008 confirmed the presence of wetland hydrology.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 and 2008.
			5.52 acres total aquatic habitat		

Table 8 (continued): Credit summary for seven zones at the MDT Woodson Creek Wetland Mitigation Site.

Credit Zone	Credit Category	Planned Total Acreage ^a	2008 Aquatic Habitat Acreage	Success Criteria ^a	Monitoring Year 2 Comments
6 – Swale PEM Wetlands within Meander Belt Corridor	Restoration (Rehabilitation)	5.55	7.51 acres wetland 0.17 acre open water/aquatic bed	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.	Three (#1, #3, and #4) of the four success criteria have been achieved. 1. All three wetland criteria have been achieved in 7.68 acres. 2. The site has 80 percent cover or higher but does not have good species diversity in the largest credit area #6 polygon. Reed canarygrass is common in the swales on the southeast portion of the site. Good species diversity does occur in other credit area #6 polygons in the floodplain of Woodson Creek. 3. Monitoring wells were installed in 2008. Monitoring on July 3 and 4, 2008 confirmed presence of wetland hydrology. 4. Seasonally flooded areas have been created. “Oxbow” ponds and other open water areas comprise approximately 4% of the total wetland project area.
			7.68 acres total aquatic habitat		
7 – West Site Upland Areas	Creation	6.00	0.38 acre wetland 0.00 acre open water/aquatic bed	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.	One (#1) of the success criteria have been achieved. 1. All three wetland criteria have been achieved in 0.38 acres of this credit area. 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. No seasonally flooded areas were observed during the 2008 mid-season visit in this credit area. This may be due to reduced seepage from the Sixteenmile Irrigation Ditch caused by routine ditch maintenance in the fall of 2007.
			0.38 acres total aquatic habitat		

^a Planned credit zone acreages and success criteria summarized from ADC (2005). PBS&J acreage estimates for credit areas are based on a digitized version of the credit areas and then best fit to match wetland and project boundaries found on the ground.

Table 9: 2008 mitigation credit summary for the Woodson Creek Wetland Mitigation Site.

Credit Zone	Credit Category	Planned Credit Acreage	Onsite Aquatic Acreage	Credit Ratio ^a	Interim Maximum Credit Acreage ^{a,c}
1	Restoration (Re-establishment)	4.02	3.41	1:1	3.41
2	Restoration (Re-establishment)	8.50	5.35	1:1	5.35
3	Restoration (Rehabilitation/Re-establishment)	18.30	18.2	1:1 ^b	18.20
4	Restoration (Rehabilitation/Re-establishment)	23.00	21.19	1:1 ^b	21.19
5	Restoration (Rehabilitation/Re-establishment)	9.77	5.52	1.5:1 ^b	3.68
6	Restoration (Rehabilitation)	5.55	7.68	1:1	7.68
7	Creation	6.00	0.38	1:1	0.38
TOTAL		75.14	61.73		59.89

^a The Corps of Engineers is the regulatory authority and will determine the actual mitigation ratios and interim and/or final credits as they pertain to the success criteria.

^b Restoration (Rehabilitation/Re-establishment) areas 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. Interim credits reflect 2008 functional assessment categories for these sites.

^c All conditions in the success criteria have not been fulfilled, therefore final 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

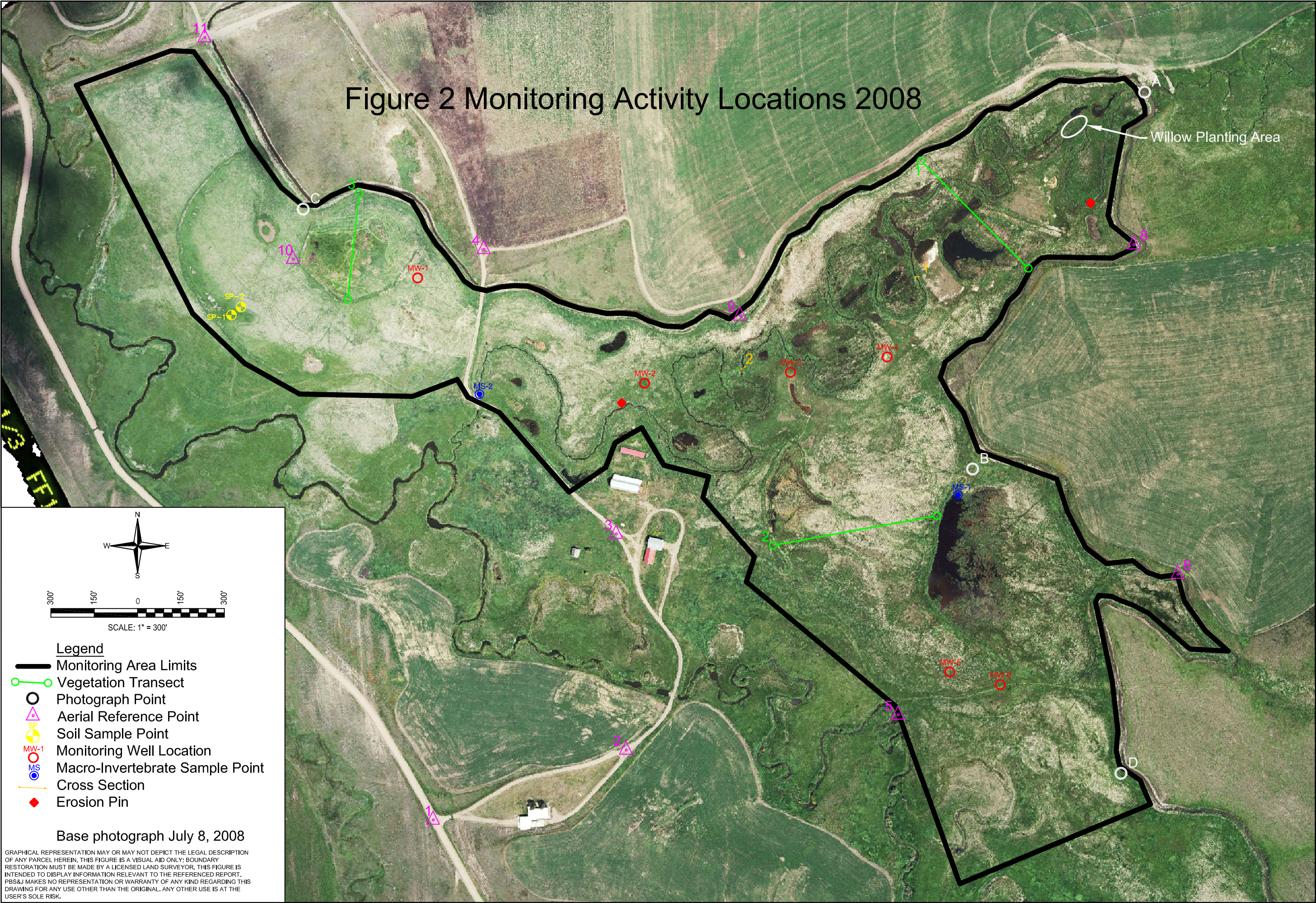
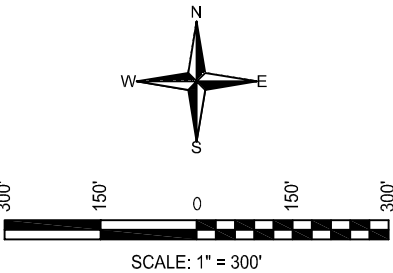


Figure 2 Monitoring Activity Locations 2008

Willow Planting Area



Legend

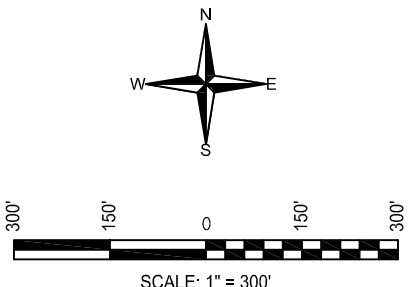
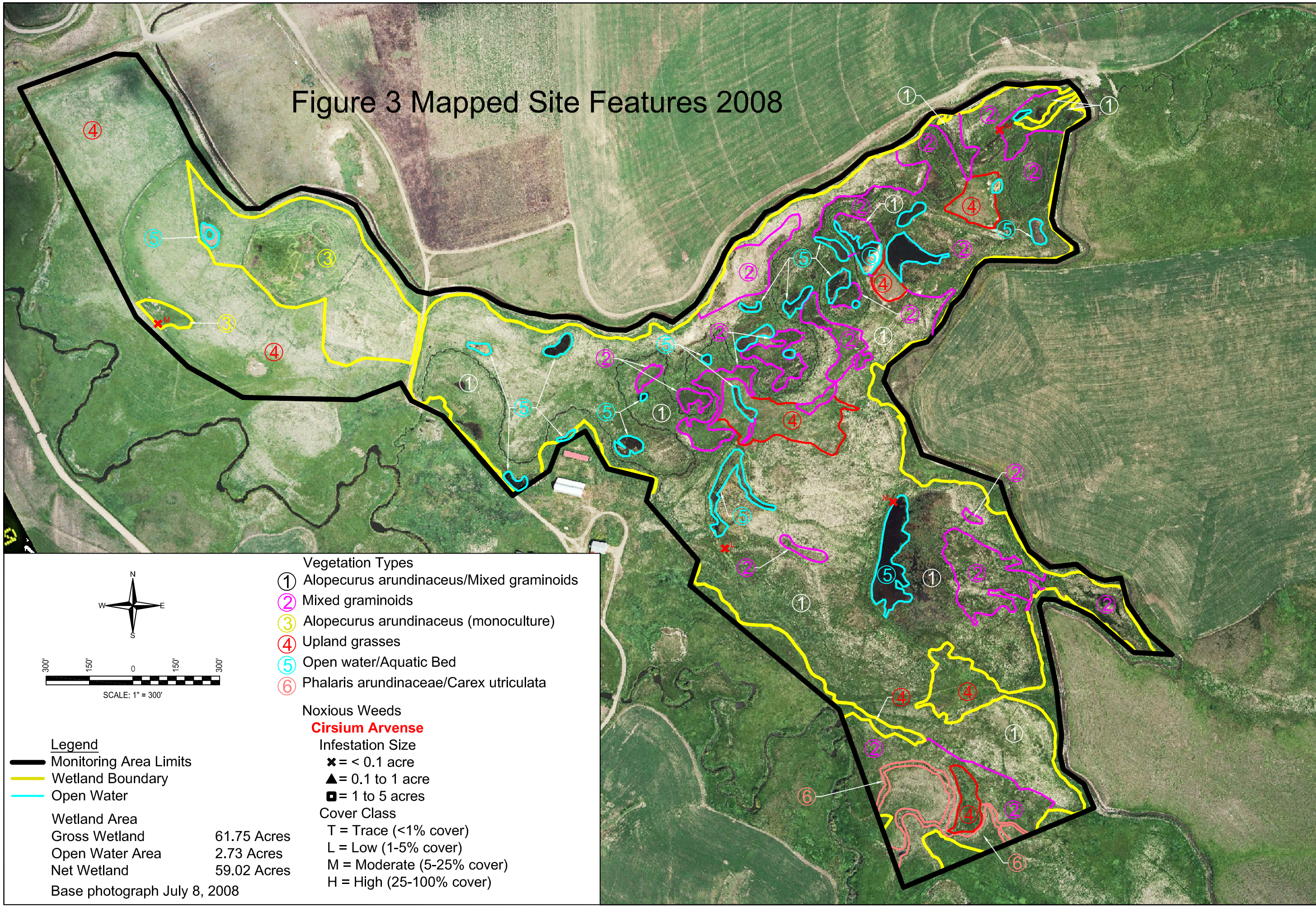
- Monitoring Area Limits
- Vegetation Transect
- Photograph Point
- Aerial Reference Point
- Soil Sample Point
- Monitoring Well Location
- Macro-Invertebrate Sample Point
- Cross Section
- Erosion Pin

Base photograph July 8, 2008

GRAPHICAL REPRESENTATION MAY OR MAY NOT DEPICT THE LEGAL DESCRIPTION OF ANY PARCEL HEREIN. THIS FIGURE IS A VISUAL AID ONLY. BOUNDARY RESTORATION MUST BE MADE BY A LICENSED LAND SURVEYOR. THIS FIGURE IS INTENDED TO DISPLAY INFORMATION RELEVANT TO THE REFERENCED REPORT. PBS&J MAKES NO REPRESENTATION OR WARRANTY OF ANY KIND REGARDING THIS DRAWING FOR ANY USE OTHER THAN THE ORIGINAL. ANY OTHER USE IS AT THE USER'S SOLE RISK.

PROJECT NAME		MDT WOODSON CREEK WETLAND MITIGATION	
DRAWING TITLE		MONITORING ACTIVITY LOCATIONS 2008	
PROJ NO:	0B4308801 03.05	DRAWN:	JR
LOCATION:	MT	PROJ MGR:	J. BERGLUND
SCALE:	NOTED	CHECKED:	RM
FILE NAME:	03.05 2008 BASE.dwg	APP'D:	JB
3810 Valley Commons Drive Suite 4 Bozeman, MT 59718			
FIGURE			
2 OF			
REV -			
Nov/25/2008			

Figure 3 Mapped Site Features 2008



Legend

- Monitoring Area Limits
- Wetland Boundary
- Open Water

Wetland Area
Gross Wetland 61.75 Acres
Open Water Area 2.73 Acres
Net Wetland 59.02 Acres

Base photograph July 8, 2008

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

Noxious Weeds

Cirsium Arvense

Infestation Size

- ✕ = < 0.1 acre
- ▲ = 0.1 to 1 acre
- = 1 to 5 acres

Cover Class

- T = Trace (<1% cover)
- L = Low (1-5% cover)
- M = Moderate (5-25% cover)
- H = High (25-100% cover)

PROJECT NAME		MDT WOODSON CREEK WETLAND MITIGATION	
DRAWING TITLE		MAPPED SITE FEATURES 2008	
PROJ NO:	0B4308801 03.05	DRAWN:	JR
LOCATION:	MT	PROJ MGR:	J. BERGLUND
SCALE:	NOTED	CHECKED:	RM
FILE NAME:	03.05 2008 BASE.dwg	APP'D:	JB
3810 Valley Commons Drive Suite 4 Bozeman, MT 59718			
FIGURE 3 OF 3			
REV - Nov/25/2008			

Appendix B

2008 WETLAND MITIGATION SITE MONITORING FORMS

2008 BIRD SURVEY FORM

2008 COE WETLAND DELINEATION FORMS

2008 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. B43088001 0305
Assessment Date: July 3&4, 2008 Person(s) conducting the assessment: McEldowney
Location: Ringling, MT MDT District: Billings Milepost: NA
Legal Description: T 6N R 8E Section 6&9
Weather Conditions: Clear, calm, 80 deg F Time of Day: 8 am - 6 pm
Initial Evaluation Date: July 18, 2007 Monitoring Year: 2 # 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 2.5 ft
Percent of assessment area under inundation: 35%
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

Groundwater Monitoring Wells: Present

Record depth of water below ground surface (in feet): - *Well numbers correspond to Figure 2 of report.*

Well Number	Depth	Well Number	Depth	Well Number	Depth
<u>1</u>	<u>-0.02</u>	<u>5</u>	<u>0.682</u>		
<u>2</u>	<u>0.531</u>	<u>6</u>	<u>1.948</u>		
<u>3</u>	<u>0.479</u>				
<u>4</u>	<u>0.297</u>				

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:

Six of 7 groundwater monitoring wells were found during monitoring.

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: _____

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

Comments / Problems: _____

PLANTED WOODY VEGETATION SURVIVAL

[illegible]

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
Western toad - adult & tadpoles	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Direct obs.
White-tail deer	4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Direct obs.
Vole	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Direct obs.
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

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

PHOTOGRAPHS (continued)

Location	Photograph Frame #	Photograph Description	Compass Reading (°)
Transect 1	1	Looking west from east end (start)	314
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: **Some infestations of Canada thistle were mapped.**

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Woodson Creek** Date: **July 3, 2008** 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: 0-19 feet	
Plant Species	Cover
ALOARU	5 = > 50%
AGROSTO	2 = 6-10%
DESCES	+ = < 1%
ELEPAL	1 = 1-5%
SONARV	+ = < 1%
TRIREP	+ = < 1%
TRIGLOCHIN SP.	+ = < 1%
JUNBAL	2 = 6-10%
CARPRA AND Carex sp. 1 (CARLAS?)	+ = < 1%
POTANS	+ = < 1%
DODPUC	+ = < 1%
Total Vegetative Cover:	90%

Vegetation Type B: Mixed graminoids	
Length of transect in this type: 19-83 feet	
Plant Species	Cover
JUNBAL AND ALOARU (EACH)	4 = 21-50%
DODPUC	1 = 1-5%
Carex sp. 1 (CARLAS?)	+ = < 1%
CARPRA	+ = < 1%
TRIREP AND POAPAL EACH	+ = < 1%
CICDOU AND POTANS EACH	+ = < 1%
TRILON	1 = 1-5%
TRIGLOCHIN SP.,	+ = < 1%
TAROFF	1 = 1-5%
Total Vegetative Cover:	90%

Vegetation Type C: Mixed graminoids	
Length of transect in this type: 83-253 feet	
Plant Species	Cover
JUNBAL	4 = 21-50%
CARNEB	1 = 1-5%
Open wtr (96.5' to 117.5' - not included in cvr total)	2 = 6-10%
ALOARU	3 = 11-20%
TRIGLOCHIN SP.	1 = 1-5%
DESCES, DODPUC, POAPAL (EACH)	+ = < 1%
POTANS	2 = 6-10%
POA SP. 1	2 = 6-10%
IRIMIS, RUMEX SP., SALLUT, ELEPAL (EACH)	+ = < 1%
SONARV	+ = < 1%
Total Vegetative Cover:	85%

Vegetation Type D: ALOARU/Mixed graminoids	
Length of transect in this type: 253-275 feet	
Plant Species	Cover
ALOARU	5 = > 50%
JUNBAL	+ = < 1%
CAREX SP. 1 (CARLAS?)	+ = < 1%
CARPRA	+ = < 1%
ELEPAL	1 = 1-5%
SCIMIC	1 = 1-5%
Total Vegetative Cover:	95%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Woodson Creek** Date: **July 3, 2008** Examiner: **RRM**

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

Vegetation Type E: Open water/Aquatic bed	
Length of transect in this type: 275-307 feet	
Plant Species	Cover
Aq. Macrophytes	5 = > 50%
ELEPAL	+ = < 1%
SCIMIC	+ = < 1%
Total Vegetative Cover:	70%

Vegetation Type F: Mixed graminoids	
Length of transect in this type: 307 - 387 feet	
Plant Species	Cover
ALOARU	4 = 21-50%
SCIMIC	+ = < 1%
DODPUC	+ = < 1%
POA SP. 1	1 = 1-5%
JUNBAL	4 = 21-50%
TRIGLOCHIN SP.	+ = < 1%
POTANS	+ = < 1%
TRILON	+ = < 1%
Total Vegetative Cover:	95%

Vegetation Type G: ALOARU/Mixed graminoids	
Length of transect in this type: 387 - 526 feet	
Plant Species	Cover
ALOARU	5 = > 50%
JUNBAL	3 = 11-20%
SCIMIC	+ = < 1%
POTANS	+ = < 1%
CARNEB	1 = 1-5%
Total Vegetative Cover:	90%

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 4, 2008** Examiner: **RRM**

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

Vegetation Type A: Alopecurus arundinaceus/Mixed graminoids	
Length of transect in this type: 0 - 180 feet	
Plant Species	Cover
ALOARU	5 = > 50%
ELEPAL	+ = < 1%
CARNEB	+ = < 1%
Total Vegetative Cover:	80%

Vegetation Type B: Alopecurus arundinaceus/Mixed graminoids	
Length of transect in this type: 180 - 230 feet	
Plant Species	Cover
ALOARU	5 = > 50%
POTANS	+ = < 1%
ELEPAL	+ = < 1%
Total Vegetative Cover:	80%

Vegetation Type C: Mixed graminoids	
Length of transect in this type: 230 - 259 feet	
Plant Species	Cover
ALOARU	5 = > 50%
JUNBAL	3 = 11-20%
DODPUC	1 = 1-5%
CAREX SP.	+ = < 1%
POTANS	+ = < 1%
CARPRA	1 = 1-5%
TRILON	1 = 1-5%
UNIDENT. FORB (FLESHY)	+ = < 1%
TRIGLOCHIN SP.	+ = < 1%
Total Vegetative Cover:	90%

Vegetation Type D: Alopecurus arundinaceus/Mixed graminoids	
Length of transect in this type: 259 - 583 feet	
Plant Species	Cover
ALOARU	5 = > 50%
JUNBAL	1 = 1-5%
POTANS	+ = < 1%
DODPUC	+ = < 1%
TRILON	1 = 1-5%
UNIDENT. FORB (FLESHY)	+ = < 1%
TAROFF	+ = < 1%
CARPRA	1 = 1-5%
ELEPAL	+ = < 1%
Total Vegetative Cover:	95%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Woodson Creek** Date: **July 3, 2008** Examiner: **RRM**

Transect Number: **3** Approximate Transect Length: **378 feet** Compass Direction from Start: **353°** Note: **SW to NE**

Vegetation Type A: Alopecurus arundinaceus	
Length of transect in this type: 0 - 77 feet	
Plant Species	Cover
ALOARU	5 = > 50%
HORJUB	2 = 6-10%
Total Vegetative Cover:	95%

Vegetation Type B: Alopecurus arundinaceus	
Length of transect in this type: 77 - 98 feet	
Plant Species	Cover
ALOARU	3 = 11-20%
HORJUB	1 = 1-5%
ELEPAL	1 = 1-5%
Total Vegetative Cover:	100%

Vegetation Type C: Alopecurus arundinaceus	
Length of transect in this type: 98 - 185 feet	
Plant Species	Cover
ALOARU	5 = > 50%
ELEPAL	2 = 6-10%
MOSS	1 = 1-5%
Total Vegetative Cover:	90%

Vegetation Type D: Alopecurus arundinaceus	
Length of transect in this type: 185 - 238 feet	
Plant Species	Cover
ALOARU	4 = 21-50%
ELEPAL	2 = 6-10%
MOSS	5 = > 50%
Moss not included in cvr total.	
Total Vegetative Cover:	55%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Woodson Creek** Date: **July 3, 2008** Examiner: **RRM**

Transect Number: **3** Approximate Transect Length: **378 feet** Compass Direction from Start: **353°** Note: **S to N**

Vegetation Type E: Alopecurus arundinaceus	
Length of transect in this type: 235 - 269 feet	
Plant Species	Cover
ALOARU	5 = > 50%
ELEPAL	1 = 1-5%
MOSS	2 = 6-10%
Total Vegetative Cover:	90%

Vegetation Type F: Alopecurus arundinaceus	
Length of transect in this type: 269 - 378 feet	
Plant Species	Cover
ALOARU	5 = > 50%
Total Vegetative Cover:	95%

Vegetation Type G:	
Length of transect in this type: feet	
Plant Species	Cover
Total Vegetative Cover:	100%

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

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: _____

BIRD SURVEY – FIELD DATA SHEET

Site: **Woodson Creek** Date: **7/3&4/08**

Survey Time: **8 am** to **6 pm**

Bird Species	#	Behavior	Habitat	Bird Species	#	Behavior	Habitat
American Widgeon	2	FO	WM				
Common Snipe	3	FO	MA				
Willet	1	N	OW				
Wilson's Phalarope	2	F	OW				
Cliff Swallow	10	F	UP MA				
Barn Swallow	12	F	UP MA				
Red-winged Blackbird	5	F	MA UP				
Sandhill Crane	2	F	MA				
Mallard	8	F	OW				
N. Shoveller	1	F	OW				
Canada Geese	9	FO					
Great Horned Owl	2	L	UP				
Northern Harrier	4	N FO F	UP MA MA				
American White Pelican	2	FO					
Savannah Sparrow	1	F	UP				
Rock Dove	3	F	MA UP				

BEHAVIOR CODES

BP = One of a breeding pair

BD = Breeding display

F = Foraging

FO = Flyover

L = Loafing

N = Nesting

HABITAT CODES

AB = Aquatic bed

FO = Forested

I = Island

MA = Marsh

MF = Mud Flat

OW = Open Water

SS = Scrub/Shrub

UP = Upland buffer

WM = Wet meadow

US = Unconsolidated shore

Weather: **80 deg F, calm, clear**

Notes: .

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

Project / Site: <u>Woodson Creek MDT Mitigation Site</u> Applicant / Owner: <u>MDT/Ringling Land and Cattle</u> Investigator: <u>PBS&J (RRM)</u>	Date: <u>July 3, 2008</u> County: <u>Meagher</u> State: <u>MT</u>
---	--

Do Normal Circumstances exist on the site? <u>Yes</u> Is the site significantly disturbed (Atypical Situation)? <u>Yes</u> Is the area a potential Problem Area? <u>No</u> (If needed, explain on reverse side)	Community ID: _____ Transect ID: _____ Plot ID: <u>SP1</u>
--	---

Located on West parcel at the lower impoundment.

VEGETATION

Dominant Species	Stratum	Indicator	Dominant Species	Stratum	Indicator
1. <i>Alopecurus arundinaceus</i>	Herb		11.		
2. <i>Potentiall anserina</i>	Herb	OBL	12.		
3. <i>Carex praegracilis</i>	Herb	FACW	13.		
4. <i>Eleocharis palustris</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: ALOARU is listed as NI for this region, but has a national listing of FACW?.					

HYDROLOGY

<u>Yes</u> Recorded Data (Describe in Remarks): <u>No</u> Stream, Lake, or Tide Gauge <u>Yes</u> Aerial Photographs <u>No</u> Other <u>No</u> No Recorded Data	Wetland Hydrology Indicators Primary Indicators: <u>NO</u> Inundated <u>YES</u> Saturated in Upper 12 Inches <u>NO</u> Water Marks <u>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 <u>None</u> ____ (in.) Depth to Free Water in Pit <u>None</u> ____ (in.) Depth to Saturated Soil <u>None</u> ____ (in.)	
Remarks: Topographic low point. Soils were likely saturated/inundated earlier in the growing season.	

SOILS

Map Unit Name (Series and Phase): **Soapcreek - Fairway complex, 0 to 2 percent slopes**
 Map Symbol: **3A** Drainage Class: **Somewhat poorly drained** Mapped Hydric Inclusion? **No**
 Taxonomy (Subgroup): **Typic Fluvaquents** 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.
7.5	A	10 YR 3/1	/	N/A	Silty Clay
15	B	10 YR 5/1	/	N/A	Clay
		/	/	N/A	
		/	/	N/A	
		/	/	N/A	
		/	/	N/A	

Hydric Soil Indicators:

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

Remarks: **Low chroma in B horizon. Soil was very moist throughout soil profile.**

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <u>YES</u> Wetland Hydrology Present? <u>YES</u> Hydric Soils Present? <u>YES</u>	Is this Sampling Point within a Wetland? <u>YES</u>
--	--

Remarks: **Wetland sample point. PEM. Occurs in a topographic depression. Water had clearly ponded in this area earlier in the season. Site is dominated by FACW and OBL vegetation. Area has been planted with ARUALO.**

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 3, 2008 County: Meagher State: MT
--	---

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: SP2
--	--

Located on West parcel near the lower impoundment.

VEGETATION

Dominant Species	Stratum	Indicator	Dominant Species	Stratum	Indicator
1. <i>Alopecurus arundinaceus</i>	Herb		11.		
2.			12.		
3.			13.		
4.			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-): **0 / 0 = 0%**

FAC Neutral: **0 / 0 = 0%**

Remarks: **ALOARU is listed as NI for this region, but has a national listing of FACW?. Since this is a monoculture in this area there are no other species to make a determination on. ALOARU is more stressed than at SP1.**

HYDROLOGY

Yes Recorded Data (Describe in Remarks): No Stream, Lake, or Tide Gauge Yes Aerial Photographs No Other No No Recorded Data	Wetland Hydrology Indicators Primary Indicators: NO Inundated NO Saturated in Upper 12 Inches NO Water Marks NO Drift Lines NO Sediment Deposits NO Drainage Patterns in Wetland Secondary Indicators (2 or more required): NO Oxidized Root Channels in Upper 12 inches NO Water-Stained Leaves NO Local Soil Survey Data NO FAC-Neutral Test NO Other (Explain in Remarks)
Field Observations: Depth of Surface Water None ____ (in.) Depth to Free Water in Pit None ____ (in.) Depth to Saturated Soil None ____ (in.)	
Remarks: No indicators of wetland hydrology observed. Is not a topographic depression. Much drier than SP1.	

SOILS

Map Unit Name (Series and Phase): **Soapcreek - Fairway complex, 0 to 2 percent slopes**
 Map Symbol: **3A** Drainage Class: **Somewhat poorly drained** Mapped Hydric Inclusion? **No**
 Taxonomy (Subgroup): **Typic Fluvaquents** 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.
11	A	10 YR 3/1	/	N/A	Silty Clay
			/	N/A	
15	B	10 YR 5/1	/	N/A	Clay
			/	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>YES</u> Listed on Local Hydric Soils List
<u>NO</u> Reducing Conditions	<u>YES</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. 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. A monoculture of Garrison creeping foxtail with no evidence of wetland hydrology.**

1. Project Name: Woodson Creek Wetland Mitigation Site 2. Project #: _____ Control #: _____

3. Evaluation Date: 7/4/2008 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): 60 (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): _____ (visually estimated)
28.08 (measured, e.g. GPS)

Comments: _____

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

Comments: Site is a mitigation wetland.

Abundant **Comments:**

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 dominated by Garrison creeping foxtail.

ii. Prominent weedy, alien, & introduced species: Some patches of Canada thistle infestation.

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.): The USFWS has not listed any T&E species as potentially occurring in 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 Sandhill Cranes (S2N)
 Secondary habitat (**list species**) ☐ D ☐ S _____
 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	1 (H)	---	---	---	---	---	---

If documented, list the source (e.g., observations, records, etc.): Direct observations during mid-season visits or by ranch manager.**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	--	--	.6 (M)	--
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, and brook trout are suspected to also occur.

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.

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	1 (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.			
% 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 Sixteenmile 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	high	1.00	1	28.08
C. General Wildlife Habitat	high	0.90	1	25.27
D. General Fish/Aquatic Habitat	moderate	0.60	1	16.85
E. Flood Attenuation	moderate	0.60	1	16.85
F. Short and Long Term Surface Water Storage	high	1.00	1	28.08
G. Sediment/Nutrient/Toxicant Removal	high	1.00	1	28.08
H. Sediment/Shoreline Stabilization	high	1.00	1	28.08
I. Production Export/Food Chain Support	high	0.90	1	25.27
J. Groundwater Discharge/Recharge	high	1.00	1	28.08
K. Uniqueness	low	0.20	1	5.62
L. Recreation/Education Potential	low	0.10	1	2.81
Totals:		<u>8.3</u>	<u>12.00</u>	<u>233.06</u>
Percent of Total Possible Points:		<u>69%</u> (Actual / Possible) x 100 [rd to nearest whole #]		

Category I Wetland: (Must satisfy **one** of the following criteria. If not satisfied, proceed to Category II.)

- ☐ Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; **or**
- ☐ Score of 1 functional point for Uniqueness; **or**
- ☐ Score of 1 functional point for Flood Attenuation **and** answer to Question 14E(ii) is "yes"; **or**
- ☐ Percent of total Possible Points is > 80%.

Category II Wetland: (Criteria for Category I not satisfied **and** meets any **one** of the following Category II criteria. If not satisfied, proceed to Category IV.)

- ☒ Score of 1 functional point for Species Rated S1, S2, or S3 by the MT Natural Heritage Program; **or**
- ☒ Score of .9 or 1 functional point for General Wildlife Habitat; **or**
- ☐ Score of .9 or 1 functional point for General Fish/Aquatic Habitat; **or**
- ☐ "High" to "Exceptional" ratings for **both** General Wildlife Habitat **and** General Fish / Aquatic Habitat; **or**
- ☐ Score of .9 functional point for Uniqueness; **or**
- ☒ Percent of total possible points is > 65%.

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

Category IV Wetland: (Criteria for Categories I or II are not satisfied **and** all of the following criteria are met; If not satisfied, return to Category III.)

- ☐ "Low" rating for Uniqueness; **and**
- ☐ "Low" rating for Production Export / Food Chain Support; **and**
- ☐ Percent of total possible points is < 30%.

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

☐ **I**

☒ **II**

☐ **III**

☐ **IV**

2008 SUMMARY: Wet meadow supported by overbank flooding from the reconfigured Woodson Creek and seepage from the Sixteenmile Ditch. Site is dominated by Garrison creeping meadow foxtail, but there is a substantial amount of native hydrophytic graminoids and forbs developing on the site. Functions that appear to be the most significant at the site include habitat for MTNHP species, general wildlife habitat, flood attenuation, short and long-term surface water storage, and sediment/nutrient/toxicant removal.

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

1. Project Name: Woodson Creek Wetland Mitigation Site 2. Project #: _____ Control #: _____
 3. Evaluation Date: 7/4/2008 4. Evaluator(s): RRM (PBS&J) 5. Wetland / Site #(s): Woodson Creek-WEST
 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): Approx. coordinates = 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): _____ (visually estimated)
5.9 (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): _____ (visually estimated)
5.9 (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		Unconsolidated Bottom	Seasonally Flooded	Excavated	2
Slope	Palustrine	---	Emergent Wetland	Seasonally Flooded	Impounded	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.	---	low disturbance	---
AA not cultivated, but moderately grazed or hayed or selectively logged or has been subject to relatively minor clearing, or fill placement, or hydrological alteration; contains few roads or buildings.	---	---	---
AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density.	---	---	---

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

ii. Prominent weedy, alien, & introduced species: Garrison creeping foxtail.

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 is leakage from the Sixteenmile 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	---	---	Low

Comments: Palustrine emergent, the excavated pond (with the island) does not have submergent vegetation.

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.): 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 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	---	---	---	.6 (M)	---	---	---

If documented, list the source (e.g., observations, records, etc.): Direct observations during mid-season visit or observed by ranch manager.

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)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	H	--	--
Moderate disturbance at AA (see #12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
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 somewhat by migrating waterfowl. Whitetail deer observed bedded down within AA. Active N. Goshawk nest observed just outside of the 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:

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 checked="" 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	--	--	--	--	--	--	--	.3 (L)	--
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.			
% 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 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: No wave action is anticipated at the small pond.

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 type="checkbox"/> Moderate		<input checked="" 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 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
P/P	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S/I	--	--	--	--	--	.6M	--	--	--	--	--	--	--	--	--	--	--	--
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)	--	--	--	--	--	--	--	--	.3L
Moderate disturbance at AA (#12i)	--	--	--	--	--	--	--	--	--
High disturbance at AA (#12i)	--	--	--	--	--	--	--	--	--

Comments: _____

14L. RECREATION / EDUCATION POTENTIAL

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

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

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

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

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

Ownership	Disturbance at AA from #12(i)		
	<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	
B. MT Natural Heritage Program Species Habitat	moderate	0.6	1	
C. General Wildlife Habitat	moderate	0.70	1	
D. General Fish/Aquatic Habitat	N/A	--	--	
E. Flood Attenuation	N/A	--	--	
F. Short and Long Term Surface Water Storage	low	0.3	1	
G. Sediment/Nutrient/Toxicant Removal	high	1.0	1	
H. Sediment/Shoreline Stabilization	N/A	--	--	
I. Production Export/Food Chain Support	moderate	0.60	1	
J. Groundwater Discharge/Recharge	high	1.00	1	
K. Uniqueness	low	0.3	1	
L. Recreation/Education Potential	low	0.1	1	
Totals:		<u>4.6</u>	<u>9.00</u>	<u>27.14</u>
Percent of Total Possible Points:			51% (Actual / Possible) x 100 [rd to nearest whole #]	

Category I Wetland: (Must satisfy **one** of the following criteria. If not satisfied, proceed to Category II.)

- ☐ Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; **or**
- ☐ Score of 1 functional point for Uniqueness; **or**
- ☐ Score of 1 functional point for Flood Attenuation **and** answer to Question 14E(ii) is "yes"; **or**
- ☐ Percent of total Possible Points is > 80%.

Category II Wetland: (Criteria for Category I not satisfied **and** meets any **one** of the following Category II criteria. If not satisfied, proceed to Category IV.)

- ☐ Score of 1 functional point for Species Rated S1, S2, or S3 by the MT Natural Heritage Program; **or**
- ☐ Score of .9 or 1 functional point for General Wildlife Habitat; **or**
- ☐ Score of .9 or 1 functional point for General Fish/Aquatic Habitat; **or**
- ☐ "High" to "Exceptional" ratings for **both** General Wildlife Habitat **and** General Fish / Aquatic Habitat; **or**
- ☐ Score of .9 functional point for Uniqueness; **or**
- ☐ Percent of total possible points is > 65%.

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

Category IV Wetland: (Criteria for Categories I or II are not satisfied **and** all of the following criteria are met; If not satisfied, return to Category III.)

- ☐ "Low" rating for Uniqueness; **and**
- ☐ "Low" rating for Production Export / Food Chain Support; **and**
- ☐ Percent of total possible points is < 30%.

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

☐ **I**

☐ **II**

☒ **III**

☐ **IV**

2008 SUMMARY: A nearly monotypic stand of Garrison creeping foxtail supported by groundwater seepage from the Sixteenmile Ditch. Some hydrophytic graminoids are becoming more prevalent but continue to be a very minor component in 2008. Have observed whitetail deer in the wetland and a vole. An active N. Goshawk nest occurred just outside of the AA within the project area. Functions that this site that appear to be most significant are groundwater discharge, production export/aquatic food chain support, short and long term surface water storage and general wildlife habitat.

1. Project Name: Woodson Creek Wetland Mitigation Site 2. Project #: ____ Control #: ____

3. Evaluation Date: 7/4/2008 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

B. Purpose of Evaluation:

☐ Wetlands potentially affected by MDT project

☐ Mitigation wetlands; pre-construction

☒ Mitigation wetlands; post-construction

☐ Other _____

8. **Wetland Size (total acres):** 60 (visually estimated)
_____ (measured, e.g. GPS)

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

Comments: _____

HGM CLASS ¹	SYSTEM ²	SUBSYSTEM ²	CLASS ²	WATER REGIME ²	MODIFIER ²	% OF AA
Depression	Palustrine		Aquatic Bed	Semipermanently Flooded	Excavated	4
Slope	Palustrine	---	Emergent Wetland	Seasonally Flooded	---	96
---	---	---	---	---	---	
---	---	---	---	---	---	

Comments: Site is a mitigation wetland.

Abundant **Comments:**

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. Wet meadow site dominated by Garrison creeping foxtail.

ii. **Prominent weedy, alien, & introduced species:** Some patches of Canada thistle infestation occurs in areas that were disturbed during construction. Garrison creeping foxtail is dominant. Reed canarygrass occurs in narrow swales (likely historic stream channels) in the SE corner.

iii. Briefly describe AA and surrounding land use / habitat: AA is a wet meadow primarily dominated by Garrison creeping foxtail, though areas of mixed graminoids have become more pronounced since 2007. 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.

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	---

1

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.): There are no T&E species listed by the USFWS as potentially occurring in 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 Sandhill crane (S2N) nesting, Western toad (S2) adults and tadpoles.
 Secondary habitat (list species) ☐ D ☐ S _____
 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	1 (H)	---	---	---	---	---	---

If documented, list the source (e.g., observations, records, etc.): Direct observations of species during monitoring events or by ranch manager.

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	--	--	--	--
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: _____

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 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.			
% 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 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: No significant wave action occurs within the AA.

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 Sixteenmile 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	27.77
C. General Wildlife Habitat	moderate	0.7	1	19.44
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	22.22
G. Sediment/Nutrient/Toxicant Removal	high	1.0	1	27.77
H. Sediment/Shoreline Stabilization	N/A	--	--	NA
I. Production Export/Food Chain Support	high	0.90	1	24.99
J. Groundwater Discharge/Recharge	high	1.00	1	27.77
K. Uniqueness	low	0.20	1	5.55
L. Recreation/Education Potential	low	0.1	1	2.78
Totals:		<u>5.7</u>	<u>9.00</u>	<u>158.29</u>
Percent of Total Possible Points:		<u>63%</u> (Actual / Possible) x 100 [rd to nearest whole #]		

Category I Wetland: (Must satisfy one of the following criteria. If not satisfied, proceed to Category II.) <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%.
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.) <input checked="" type="checkbox"/> Score of 1 functional point for Species Rated S1, S2, or S3 by the MT Natural Heritage Program; or <input 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%.
<input type="checkbox"/> Category III Wetland: (Criteria for Categories I, II, or IV not satisfied.)
Category IV Wetland: (Criteria for Categories I or II are not satisfied and <u>all</u> of the following criteria are met; If not satisfied, return to Category III.) <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**

2008 SUMMARY: Primarily a wet meadow supported by groundwater seeping in from the Sixteenmile Ditch, the site also has a small open water/aquatic bed component comprising approximately 1 acre out of the 27.8 acres of the AA. Waterfowl and wading birds utilize the site for breeding and foraging. A whitetail fawn was also observed on both days of the mid-season visit. Site is dominated by Garrison creeping meadow foxtail but areas of hydrophytic mixed graminoids are becoming more prevalent in 2008 than observed in 2007. Functions that appear to be the most significant at this site include habitat for several MTNHP S2 species, general wildlife habitat, short and long term surface water storage and production export/aquatic food chain support.

Appendix C

2008 REPRESENTATIVE PHOTOGRAPHS

MDT Wetland Mitigation Monitoring
Woodson Creek
Ringling, Montana

WOODSON CREEK WETLAND MITIGATION SITE 2008

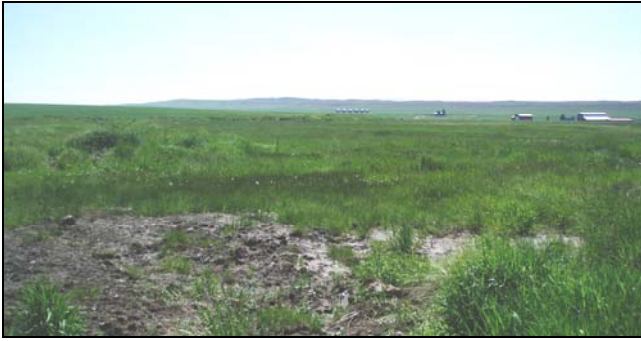


Photo Point A – *Photo 1* Location: North Side
Compass bearing: 208 degrees



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 2008



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

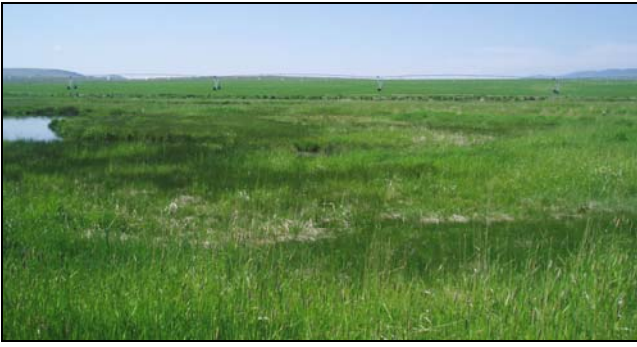


Photo Point D – Photo 4 Location: East Side
Compass bearing: 296 degrees



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

WOODSON CREEK WETLAND MITIGATION SITE 2008



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
Compass bearing: 353 degrees



Transect 3 – Photo 2 Location: North end
Compass bearing: 173 degrees



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



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

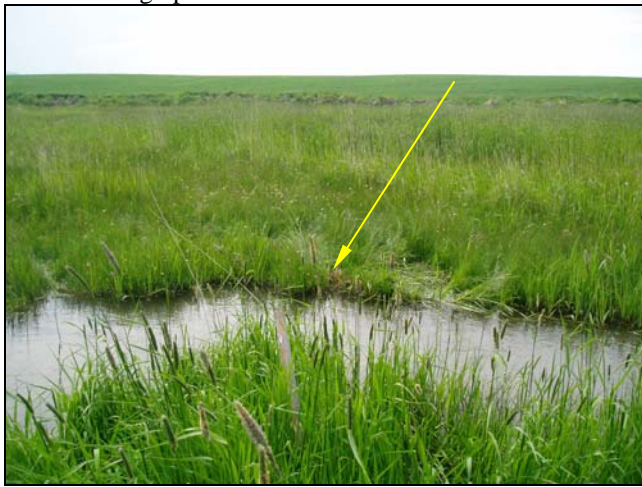
WOODSON CREEK WETLAND MITIGATION SITE 2008



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



Cross-section #2 Location: Middle portion of Woodson Creek – looking across the channel at the left bank.



Bank Erosion Pins #1 Location: Upstream site.



Bank Erosion Pins #2 Location: Downstream site – facing upstream; erosion pins are located in the bank below the shovel.



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

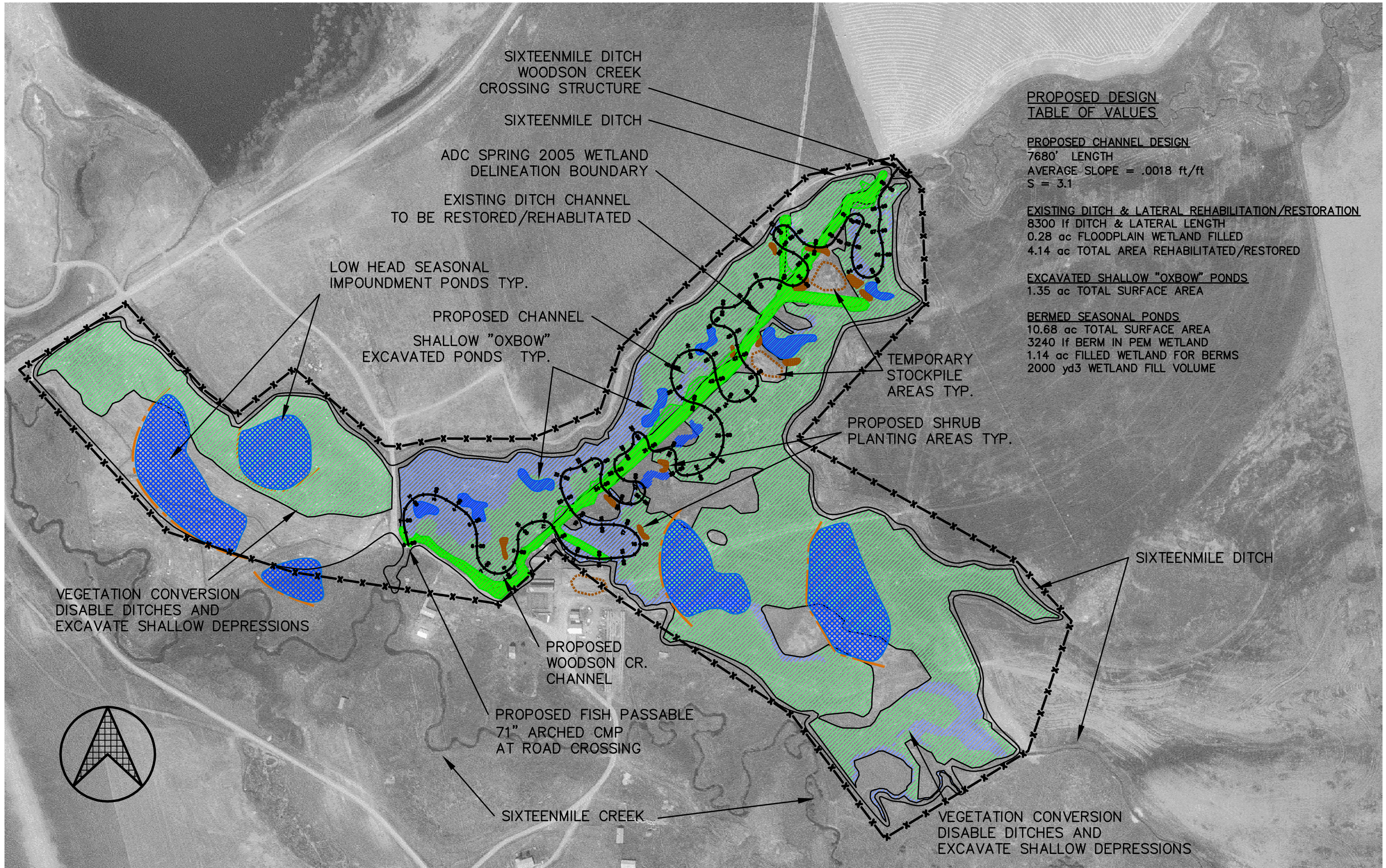


Macroinvertebrate Sample Location #2 Location: Upstream of outfall culvert at lower end of east parcel

Appendix D

PLAN SHEET AND CREDIT ZONES

*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

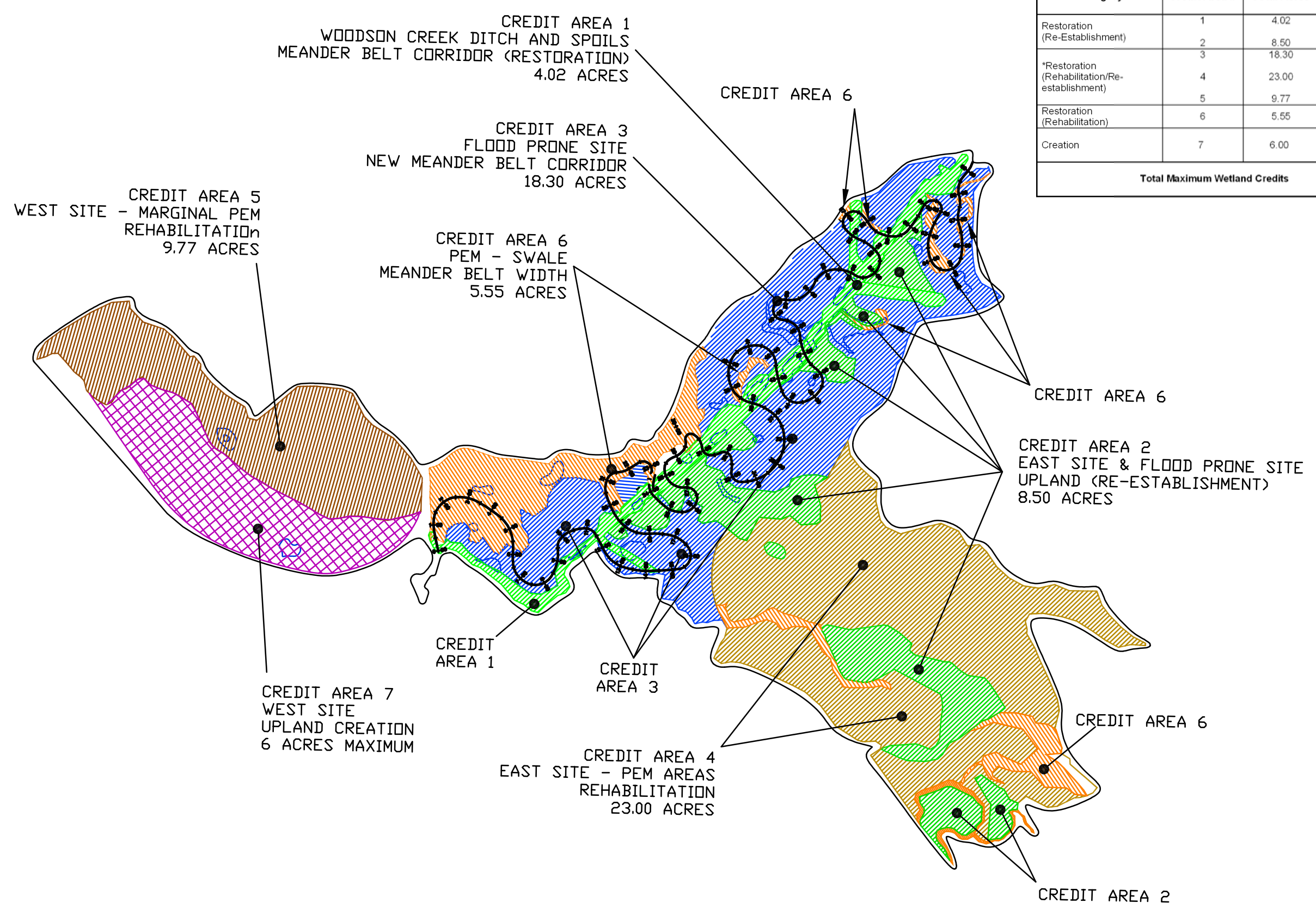
ACOE WETLAND CREDITING
DESIGN PLAN

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

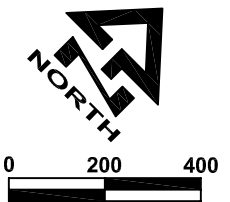
REV NO.	REVISION DESCRIPTION	BY	REVISION DATE	SCALE:	PROJECT NO.	DRAWN	CHECK	DATE
				1" = 300'	205	dz	--	7/05/05

P.O. Box 582 — Livingston MT 59047
Phone 406.222.7600 — Fax 406.222.7677

DRAWING NO.
FIGURE 3



Category	Credit Area #	Total Acres	Credit Ratio	Maximum Acres of Credit
Restoration (Re-Establishment)	1	4.02	1:1	4.02
	2	8.50		8.50
	3	18.30		18.30
*Restoration (Rehabilitation/Re-establishment)	4	23.00	1:1	23.00
	5	9.77		9.77
Restoration (Rehabilitation)	6	5.55	1.5:1	3.70
Creation	7	6.00	1:1	6.00
Total Maximum Wetland Credits				73.3



WETLAND CREDIT AREAS

ACOEWETLAND CREDITING
WETLAND CREDIT AREAS

REVISION

1

1

Woodson Creek
Stream Channel Restoration

Sixteen Mile Road
Meagher County, MT
Sections 9 & 16 T6N R8E

woodson 404 plans

SCALE: 1" = 300'

PROJECT NO. 304-001

DRAWN BY bz

CHECK BY tc

DATE 11/14/07

oasis

ENVIRONMENTAL

PO Box 582 - Livingston MT 59047

Phone 406.222.7600 - Fax 406.222.7677

DRAWING NO. **FIGURE 4**

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 Plane Coordinates NAD 83 international feet. The Trimble GEO III GPS unit was also used for some sites in 2007.

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

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

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

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

Appendix F

2008 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 – 2008**

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

INTRODUCTION

This report summarizes data generated from eight years of mitigated wetland monitoring from sites throughout the State of Montana. Over all years of sampling, a total of 210 invertebrate samples have been collected. Table 1 lists the currently monitored sites at which aquatic invertebrates were collected in 2008, 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, 2007, and 2008 by personnel of PBS&J (Table 1). Sampling procedures were based on the protocols developed by the Montana Department of Environmental Quality (MDEQ) 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.

Assessment

The method employed to assess these wetlands is based on an index incorporating a battery of 12 bioassessment metrics or attributes (Table 2) 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, “good” 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 good, 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.

Six 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 2008, the lotic sites were Camp Creek (2 sites), Cloud Ranch stream, Jack Creek – McKee Spring, and Jocko Spring Creek (2 sites). 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 (MVFP index: 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 (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 2008 samples are given in Tables 4a-4c and 5. Thermal preference of invertebrate assemblages was calculated using 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 sampled in 2008 are included. An asterisk indicates lotic sites.

Site Identifier	2001	2002	2003	2004	2005	2006	2007	2008
Roundup	+	+	+	+	+	+	+	+
Hoskins Landing MS-1		+	+	+	+	+	+	+
Peterson Ranch Pond 2		+		+	+	+	+	+
Peterson Ranch Pond 4		+	+	+	+	+	+	+
Perry Ranch		+			+			+
Camp Creek MS-1*		+	+	+	+	+	+	+
Camp Creek MS-2*						+	+	+
Cloud Ranch Pond				+	+		+	+
Cloud Ranch Stream*				+			+	+
Jack Creek – Pond				+	+	+	+	+
Jack Creek – McKee*							+	+
Norem				+	+	+	+	+
Rock Creek Ranch					+	+	+	+
Wagner Marsh					+	+	+	+
Alkali Lake 1						+	+	+
West Fork of Charley Creek							+	+
Woodson Pond MI 1							+	+
Woodson Stream MI 2*							+	+
Little Muddy Creek							+	+
Selkirk Ranch							+	+
DH Ranch							+	+
Jocko Spring Creek MS-1								+
Jocko Spring Creek MS-2								+
Sportsman's Campground Site #1								+
Sportsman's Campground Site #2								+
Sportsman's Campground Site #3								+
Lonepine #1								+
Lonepine #2								+

Table 2. Aquatic invertebrate metrics employed for wetland (lentic) invertebrate assemblages in the MDT mitigated wetlands study, 2001 – 2008.

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
Orthocladiinae / Chironomidae	Number of individual midges in the sub-family Orthocladiinae / 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 sections of individual monitoring reports. Summary tables for lentic (4a – 4c) and lotic (5) sites and project specific taxa listing(s) and metrics report(s) are provided on the following pages.)

Table 4a. Metric values and scores for wetland (lentic) sites in the MDT mitigated wetland study – 2008 sampling.

METRIC	Roundup	Hoskins Landing MS 1	Peterson Ranch Pond 2	Peterson Ranch Pond 4	Perry Ranch	Cloud Ranch Pond	Jack Creek Pond	Norem
Total taxa	9	18	13	25	11	27	21	14
POET	0	2	1	3	0	5	2	0
Chironomidae taxa	4	5	3	6	5	14	7	6
Crustacea + Mollusca	3	6	3	5	2	4	6	2
% Chironomidae	80.37%	17.00%	3.70%	13.21%	88.79%	49.53%	42.86%	34.69%
Orthocladiinae/Chir	0.63	0.18	1.50	0.21	0.82	0.66	0.40	0.53
% Amphipoda	0.00%	8.00%	0.00%	0.00%	0.00%	6.54%	15.24%	0.00%
% Crustacea + % Mollusca	15.89%	48.00%	86.11%	43.40%	6.54%	10.28%	30.48%	26.53%
HBI	8.01	7.62	7.85	7.40	7.37	5.94	8.17	7.61
% Dominant taxon	50.47%	27.00%	84.26%	25.47%	62.62%	13.08%	19.05%	26.53%
% Collector-Gatherers	31.78%	54.00%	87.96%	20.75%	20.56%	56.07%	65.71%	44.90%
% Filterers	2.80%	10.00%	0.00%	1.89%	0.00%	3.74%	1.90%	0.00%
Total taxa	1	3	1	5	1	5	5	1
POET	1	1	1	3	1	5	1	1
Chironomidae taxa	3	3	3	3	3	5	5	3
Crustacea + Mollusca	1	5	1	3	1	3	5	1
% Chironomidae	1	5	5	5	1	1	1	3
Orthocladiinae/Chir	5	1	5	3	5	5	3	5
% Amphipoda	5	3	5	5	5	3	3	5
% Crustacea + % Mollusca	5	3	1	3	5	5	5	5
HBI	1	1	1	3	3	5	1	1
% Dominant taxon	1	5	1	5	1	5	5	5
% Collector-Gatherers	1	3	5	1	1	3	3	1
% Filterers	3	1	3	3	3	3	3	3
Total Score	28	34	32	42	30	48	40	34
Percent of Maximum Score	46.67%	56.67%	53.33%	70.00%	50.00%	80.00%	66.67%	56.67%
Impairment Classification	poor	sub-optimal	sub-optimal	good	poor	good	sub-optimal	sub-optimal

Table 4b. Metric values and scores for wetland (lentic) sites in the MDT mitigated wetland study – 2008 sampling.

METRIC	Rock Creek Ranch	Wagner Marsh	Alkali Lake	West Fork of Charley Creek	Woodson Pond	Woodson Stream	Little Muddy Creek	Selkirk Ranch
Total taxa	23	11	10	9	13	7	14	17
POET	1	4	0	0	1	3	1	1
Chironomidae taxa	5	2	2	1	7	0	2	8
Crustacea + Mollusca	5	2	3	3	2	2	3	5
% Chironomidae	28.97%	2.83%	5.41%	0.91%	60.00%	0.00%	55.00%	23.38%
Orthoclaadiinae/Chir	0.97	0.00	0.00	0.00	0.52	0	0.64	0.33
% Amphipoda	0.00%	0.00%	0.00%	67.27%	0.00%	7.69%	0.00%	5.19%
% Crustacea + % Mollusca	28.97%	39.62%	32.43%	70.91%	25.45%	15.38%	17.00%	48.05%
HBI	6.91	7.45	8.57	8.19	8.14	4.62	6.97	7.76
% Dominant taxon	22.43%	48.11%	48.65%	67.27%	25.45%	30.77%	35.00%	32.47%
% Collector-Gatherers	30.84%	52.83%	21.62%	68.18%	86.36%	23.08%	29.00%	16.88%
% Filterers	1.87%	0.00%	0.00%	0.00%	0.00%	30.77%	0.00%	32.47%
Total taxa	5	1	1	1	1	1	1	3
POET	1	5	1	1	1	3	1	1
Chironomidae taxa	3	1	1	1	5	1	1	5
Crustacea + Mollusca	3	1	1	1	1	1	1	3
% Chironomidae	3	5	5	5	1	5	1	3
Orthoclaadiinae/Chir	5	1	1	1	5	Not Scored	5	3
% Amphipoda	5	5	5	1	5	3	5	3
% Crustacea + % Mollusca	5	3	5	1	5	5	5	3
HBI	3	3	1	1	1	5	3	1
% Dominant taxon	5	3	3	1	5	5	3	5
% Collector-Gatherers	1	3	1	3	5	1	1	1
% Filterers	3	3	3	3	3	1	3	1
Total Score	42	34	28	20	38	31	30	32
Percent of Maximum Score	70.00%	56.67%	46.67%	33.33%	63.33%	56.36%	50.00%	53.33%
Impairment Classification	good	sub-optimal	poor	poor	sub-optimal	sub-optimal	poor	sub-optimal

Table 4c. Metric values and scores for wetland (lentic) sites in the MDT mitigated wetland study – 2008 sampling.

METRIC	DH Ranch	Sportsman's Campground Site # 1	Sportsman's Campground Site # 2	Sportsman's Campground Site # 3	Lonepine # 1	Lonepine # 2
Total taxa	15	16	9	12	18	4
POET	1	1	0	0	2	0
Chironomidae taxa	6	6	3	7	12	3
Crustacea + Mollusca	2	5	3	4	1	1
% Chironomidae	52.29%	10.91%	41.18%	69.09%	81.82%	57.14%
Orthocladiinae/Chir	0.09	0.17	0.00	0.25	0.13	0.00
% Amphipoda	0.00%	24.55%	5.88%	27.27%	0.00%	0.00%
% Crustacea + % Mollusca	30.28%	83.64%	23.53%	29.09%	7.27%	42.86%
HBI	7.33	7.55	8.76	7.55	7.60	8.14
% Dominant taxon	33.03%	56.36%	29.41%	25.45%	25.45%	42.86%
% Collector-Gatherers	49.54%	20.91%	11.76%	57.27%	55.45%	28.57%
% Filterers	0.92%	63.64%	11.76%	25.45%	22.73%	42.86%
Total taxa	3	3	1	1	3	1
POET	1	1	1	1	1	1
Chironomidae taxa	3	3	3	5	5	3
Crustacea + Mollusca	1	3	1	3	1	1
% Chironomidae	1	5	3	1	1	1
Orthocladiinae/Chir	1	1	1	3	1	1
% Amphipoda	5	1	3	1	5	5
% Crustacea + % Mollusca	5	1	5	5	5	3
HBI	3	3	1	3	3	1
% Dominant taxon	5	1	5	5	5	3
% Collector-Gatherers	3	1	1	3	3	1
% Filterers	3	1	1	1	1	1
Total Score	34	24	26	32	34	22
Percent of Maximum Score	56.67%	40.00%	43.33%	53.33%	56.67%	36.67%
Impairment Classification	sub-optimal	poor	poor	sub-optimal	sub-optimal	poor

Table 5. Metric values and scores for stream (lotic) sites in the MDT mitigated wetland study – 2008 sampling.

METRIC	Camp Creek MS-1	Camp Creek MS-2	Cloud Ranch Stream	Jack Creek – McKee Spring	Jocko Spring Creek MS-1	Jocko Spring Creek MS-2
E Richness	7	5	4	1	0	1
P Richness	2	2	0	0	0	1
T Richness	4	6	5	3	2	5
Pollution Sensitive Richness	0	1	0	0	0	0
Filterer Percent	29.00%	37.00%	5.00%	40.00%	15.00%	11.00%
Pollution Tolerant Percent	5.00%	3.00%	28.00%	1.00%	62.00%	15.00%
E Richness	3	2	2	0	0	0
P Richness	2	2	0	0	0	1
T Richness	2	3	3	2	1	3
Pollution Sensitive Richness	0	1	0	0	0	0
Filterer Percent	1	0	3	0	1	1
Pollution Tolerant Percent	3	3	0	3	0	1
Total score	11	11	8	5	2	6
Percent of maximum score	61%	61%	44%	28%	11%	33%
Impairment classification	slight	slight	moderate	moderate	severe	moderate

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Caton, L. W. 1991. Improving subsampling methods for the EPA's "Rapid Bioassessment" benthic protocols. Bulletin of the North American Benthological Society, 8(3): 317-319.

Stribling, J.B., J. Lathrop-Davis, M.T. Barbour, J.S. White, and E.W. Leppo. 1995. Evaluation of environmental indicators for the wetlands of Montana: the multimetric approach using benthic macroinvertebrates. Report to the Montana Department of Health and Environmental Science, Helena, Montana.

Taxa Listing

Project ID: MDT08PBSJ
RAI No.: MDT08PBSJ014

RAI No.: MDT08PBSJ014

Sta. Name: Woodson Creek (Stream)

Client ID:

Date Coll.: 7/4/2008

No. Jars: 1

STORET ID:

Taxonomic Name	Count	PRA	Unique	Stage	Qualifier	BI	Function
Non-Insect							
Hyalellidae							
<i>Hyalella</i> sp.	1	7.69%	Yes	Unknown		8	CG
Physidae							
Physidae	1	7.69%	Yes	Unknown		8	SC
Ephemeroptera							
Baetidae							
<i>Centroptilum</i> sp.	1	7.69%	Yes	Larva		2	CG
Leptophlebiidae							
<i>Paraleptophlebia</i> sp.	1	7.69%	Yes	Larva		1	CG
Trichoptera							
Limnephilidae							
<i>Limnephilus</i> sp.	4	30.77%	Yes	Larva		3	SH
Coleoptera							
Dytiscidae							
Dytiscidae	1	7.69%	Yes	Larva		5	PR
Diptera							
Simuliidae							
<i>Simulium</i> sp.	4	30.77%	Yes	Larva		6	CF
Sample Count	13						

Metrics Report

Project ID: MDT08PBSJ
RAI No.: MDT08PBSJ014
Sta. Name: Woodson Creek (Stream)
Client ID:
STORET ID:
Coll. Date: 7/4/2008

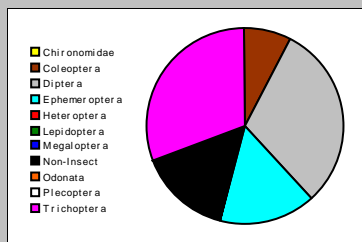
Abundance Measures

Sample Count: 13
Sample Abundance: 13.00 100.00% of sample used

Coll. Procedure:
Sample Notes:

Taxonomic Composition

Category	R	A	PRA
Non-Insect	2	2	15.38%
Odonata			
Ephemeroptera	2	2	15.38%
Plecoptera			
Heteroptera			
Megaloptera			
Trichoptera	1	4	30.77%
Lepidoptera			
Coleoptera	1	1	7.69%
Diptera	1	4	30.77%
Chironomidae			

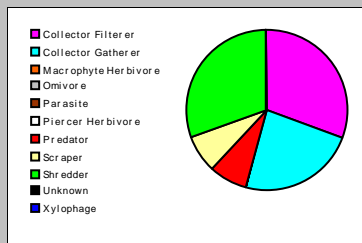


Dominant Taxa

Category	A	PRA
Simulium	4	30.77%
Limnephilus	4	30.77%
Physidae	1	7.69%
Paraleptophlebia	1	7.69%
Hyaella	1	7.69%
Dytiscidae	1	7.69%
Centroptilum	1	7.69%

Functional Composition

Category	R	A	PRA
Predator	1	1	7.69%
Parasite			
Collector Gatherer	3	3	23.08%
Collector Filterer	1	4	30.77%
Macrophyte Herbivore			
Piercer Herbivore			
Xylophage			
Scraper	1	1	7.69%
Shredder	1	4	30.77%
Omnivore			
Unknown			

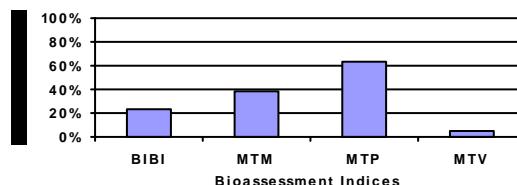


Metric Values and Scores

Metric	Value	BIBI	MTP	MTV	MTM
<i>Composition</i>					
Taxa Richness	7	1	0		0
Non-Insect Percent	15.38%				
E Richness	2	1		1	
P Richness	0	1		0	
T Richness	1	1		0	
EPT Richness	3		1		0
EPT Percent	46.15%		2		1
Oligochaeta+Hirudinea Percent					
Baetidae/Ephemeroptera	0.500				
Hydropsychidae/Trichoptera	0.000				
<i>Dominance</i>					
Dominant Taxon Percent	30.77%		2		2
Dominant Taxa (2) Percent	61.54%				
Dominant Taxa (3) Percent	69.23%	3			
Dominant Taxa (10) Percent	100.00%				
<i>Diversity</i>					
Shannon H (loge)	1.712				
Shannon H (log2)	2.470		2		
Margalef D	2.339				
Simpson D	0.154				
Evenness	0.154				
<i>Function</i>					
Predator Richness	1		0		
Predator Percent	7.69%	1			
Filterer Richness	1				
Filterer Percent	30.77%			0	
Collector Percent	53.85%		3		3
Scraper+Shredder Percent	38.46%		3		1
Scraper/Filterer	0.250				
Scraper/Scraper+Filterer	0.200				
<i>Habit</i>					
Burrower Richness	0				
Burrower Percent	0.00%				
Swimmer Richness	2				
Swimmer Percent	15.38%				
Clinger Richness	1	1			
Clinger Percent	30.77%				
<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	7.69%				
<i>Voltinism</i>					
Univoltine Richness	5				
Semivoltine Richness	1	1			
Multivoltine Percent	7.69%		3		
<i>Tolerance</i>					
Sediment Tolerant Richness	0				
Sediment Tolerant Percent	0.00%				
Sediment Sensitive Richness	0				
Sediment Sensitive Percent	0.00%				
Metals Tolerance Index	3.308				
Pollution Sensitive Richness	0	1		0	
Pollution Tolerant Percent	53.85%	1		0	
Hilsenhoff Biotic Index	4.615		3		1
Intolerant Percent	15.38%				
Supertolerant Percent	15.38%				
CTQa	76.000				

Bioassessment Indices

BioIndex	Description	Score	Pct	Rating
BIBI	B-IBI (Karr et al.)	12	24.00%	
MTP	Montana DEQ Plains (Bukantis 1998)	19	63.33%	Slight
MTV	Montana Revised Valleys/Foothills (Bollman 1998)	1	5.56%	Severe
MTM	Montana DEQ Mountains (Bukantis 1998)	8	38.10%	Moderate



Taxa Listing

Project ID: MDT08PBSJ
RAI No.: MDT08PBSJ008

RAI No.: MDT08PBSJ008

Sta. Name: Woodson Creek (Pond)

Client ID:

Date Coll.: 7/4/2008

No. Jars: 1

STORET ID:

Taxonomic Name	Count	PRA	Unique	Stage	Qualifier	BI	Function
Non-Insect							
Ostracoda	26	23.64%	Yes	Unknown		8	CG
Lymnaeidae							
Lymnaeidae	1	0.91%	No	Immature		6	SC
<i>Stagnicola</i> sp.	1	0.91%	Yes	Unknown		6	SC
Odonata							
Lestidae							
<i>Lestes</i> sp.	4	3.64%	Yes	Larva		9	PR
Coleoptera							
Dytiscidae							
Dytiscidae	7	6.36%	Yes	Larva		5	PR
Hydrophilidae							
Hydrophilidae	2	1.82%	Yes	Larva		5	PR
Diptera							
Ephydriidae							
Ephydriidae	1	0.91%	No	Pupa		6	CG
Ephydriidae	2	1.82%	Yes	Larva		6	CG
Chironomidae							
Chironomidae							
<i>Acricotopus</i> sp.	12	10.91%	Yes	Larva		10	CG
Chironomidae	2	1.82%	No	Pupa		10	CG
<i>Chironomus</i> sp.	28	25.45%	Yes	Larva		10	CG
<i>Corynoneura</i> sp.	12	10.91%	Yes	Larva		7	CG
<i>Micropsectra</i> sp.	1	0.91%	Yes	Larva		4	CG
<i>Paratanytarsus</i> sp.	1	0.91%	Yes	Larva		6	CG
<i>Psectrocladius</i> sp.	1	0.91%	Yes	Larva		8	CG
<i>Pseudosmittia</i> sp.	9	8.18%	Yes	Larva		6	CG
Sample Count	110						

Metrics Report

Project ID: MDT08PBSJ
RAI No.: MDT08PBSJ008
Sta. Name: Woodson Creek (Pond)
Client ID:
STORET ID:
Coll. Date: 7/4/2008

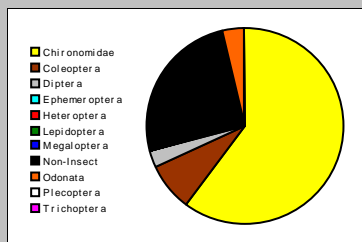
Abundance Measures

Sample Count: 110
Sample Abundance: 1,100.00 10.00% of sample used

Coll. Procedure:
Sample Notes:

Taxonomic Composition

Category	R	A	PRA
Non-Insect	2	28	25.45%
Odonata	1	4	3.64%
Ephemeroptera			
Plecoptera			
Heteroptera			
Megaloptera			
Trichoptera			
Lepidoptera			
Coleoptera	2	9	8.18%
Diptera	1	3	2.73%
Chironomidae	7	66	60.00%

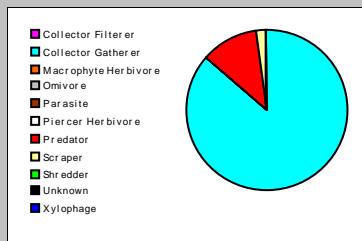


Dominant Taxa

Category	A	PRA
Chironomus	28	25.45%
Ostracoda	26	23.64%
Corvoneura	12	10.91%
Acricotopus	12	10.91%
Pseudosmittia	9	8.18%
Dytiscidae	7	6.36%
Lestes	4	3.64%
Ephydriidae	3	2.73%
Hydrophilidae	2	1.82%
Chironomidae	2	1.82%
Staenicola	1	0.91%
Psectrocladius	1	0.91%
Paratanytarsus	1	0.91%
Micropsectra	1	0.91%
Lymnaeidae	1	0.91%

Functional Composition

Category	R	A	PRA
Predator	3	13	11.82%
Parasite			
Collector Gatherer	9	95	86.36%
Collector Filterer			
Macrophyte Herbivore			
Piercer Herbivore			
Xylophage			
Scraper	1	2	1.82%
Shredder			
Omnivore			
Unknown			



Metric Values and Scores

Metric	Value	BIBI	MTP	MTV	MTM
<i>Composition</i>					
Taxa Richness	13	1	1		0
Non-Insect Percent	25.45%				
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	25.45%		3		2
Dominant Taxa (2) Percent	49.09%				
Dominant Taxa (3) Percent	60.00%	3			
Dominant Taxa (10) Percent	95.45%				
<i>Diversity</i>					
Shannon H (loge)	2.028				
Shannon H (log2)	2.926		2		
Margalef D	2.573				
Simpson D	0.162				
Evenness	0.106				
<i>Function</i>					
Predator Richness	3		1		
Predator Percent	11.82%	3			
Filterer Richness	0				
Filterer Percent	0.00%			3	
Collector Percent	86.36%		1		0
Scraper+Shredder Percent	1.82%		0		0
Scraper/Filterer	0.000				
Scraper/Scraper+Filterer	0.000				
<i>Habit</i>					
Burrower Richness	1				
Burrower Percent	25.45%				
Swimmer Richness	1				
Swimmer Percent	3.64%				
Clinger Richness	0	1			
Clinger Percent	0.00%				
<i>Characteristics</i>					
Cold Stenotherm Richness	0				
Cold Stenotherm Percent	0.00%				
Hemoglobin Bearer Richness	1				
Hemoglobin Bearer Percent	25.45%				
Air Breather Richness	2				
Air Breather Percent	8.18%				
<i>Voltinism</i>					
Univoltine Richness	3				
Semivoltine Richness	2	1			
Multivoltine Percent	83.64%		0		
<i>Tolerance</i>					
Sediment Tolerant Richness	1				
Sediment Tolerant Percent	1.82%				
Sediment Sensitive Richness	0				
Sediment Sensitive Percent	0.00%				
Metals Tolerance Index	4.323				
Pollution Sensitive Richness	0	1		0	
Pollution Tolerant Percent	34.55%	3		1	
Hilsenhoff Biotic Index	8.136		0		0
Intolerant Percent	0.00%				
Supertolerant Percent	66.36%				
CTQa	100.800				

Bioassessment Indices

BioIndex	Description	Score	Pct	Rating
BIBI	B-IBI (Karr et al.)	16	32.00%	
MTP	Montana DEQ Plains (Bukantis 1998)	8	26.67%	Moderate
MTV	Montana Revised Valleys/Foothills (Bollman 1998)	4	22.22%	Moderate
MTM	Montana DEQ Mountains (Bukantis 1998)	2	9.52%	Severe

