MONTANA DEPARTMENT OF TRANSPORTATION
WETLAND MITIGATION MONITORING REPORT: YEAR 2009

US Highway 93 Onsite:
Bouchard, Jocko Spring Creek, Mission Creek, Mud Creek, and Peterson Property

Prepared for:

MONTANA DEPARTMENT OF TRANSPORTATION
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December 2009

PBS&J Project No: 0B4308802.02.06

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MDT Project Numbers:
NH 5-2(120)20 (Bouchard, Jocko Spring Creek)
NH 5-2(122)31 (Mission Creek, Peterson)
NH-PLH 5-2(142)51 (Mud Creek)

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APPENDICES

1.0 INTRODUCTION

The US Highway 93 Onsite Wetland Mitigation Sites were developed to mitigate wetland impacts associated with eight Montana Department of Transportation (MDT) segments of the US 93 Evaro to Polson highway reconstruction project along US Highway 93. This 2009 report documents: i) the third year of monitoring at the Bouchard and Jocko Spring Creek properties; ii) the second year of monitoring at the Peterson property; and, iii) the first year of monitoring at the new Mission Creek and Mud Creek sites.

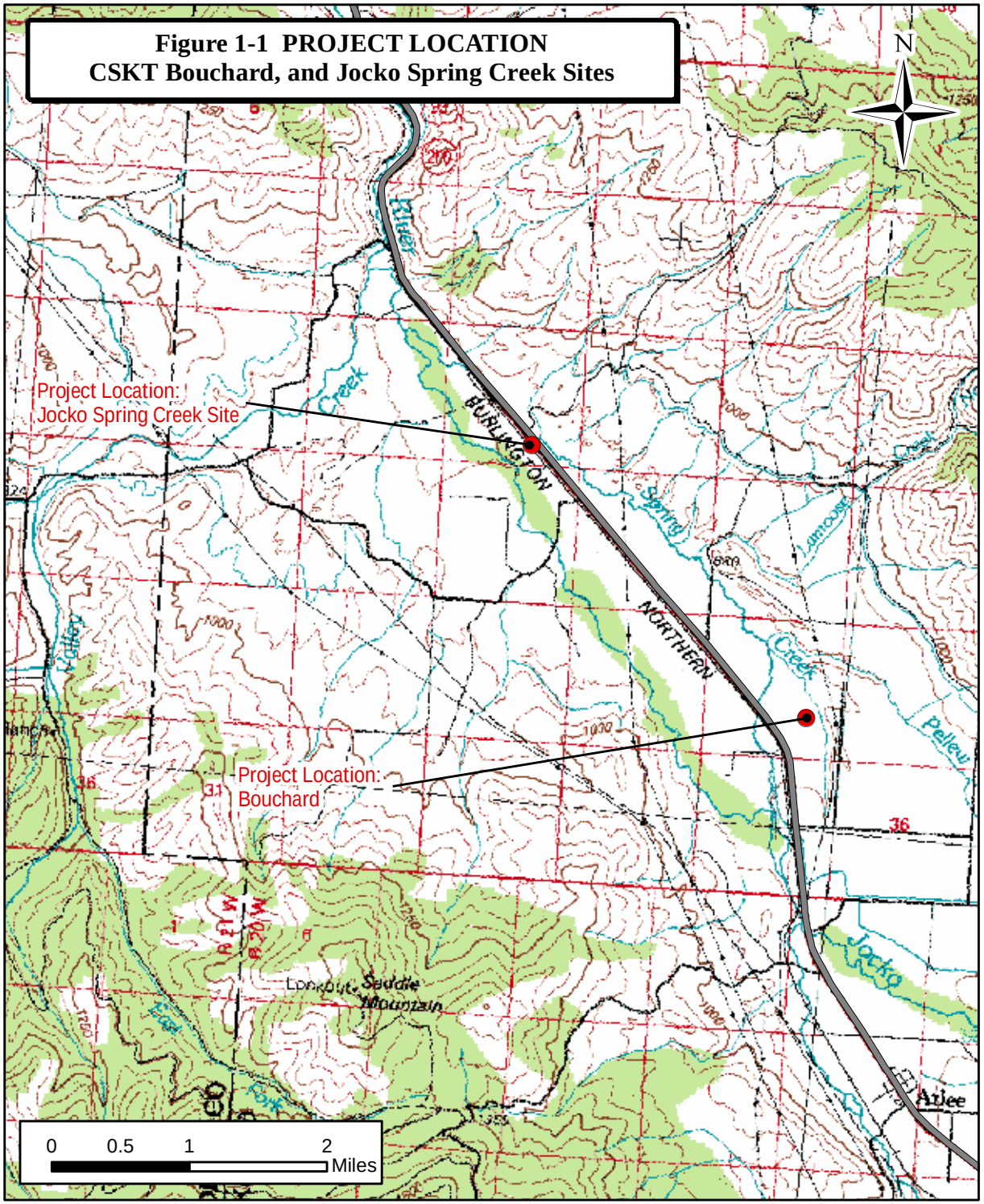
The US Highway 93 Onsite Wetland Mitigation Sites are all located in Lake County in Watershed # 3 (Lower Clark Fork). The five mitigation sites are located north of Arlee, Montana between Mileposts 20 and 50. The Bouchard and Jocko Spring Creek sites are located between Mileposts 20 and 25, along a segment identified as Project 4 - White Coyote Road-South of Ravalli (**Figure 1-1**). The Mission Creek site is located south of St. Ignatius near Milepost 32, along the segment identified as Project 6 – Medicine Tree (Old US 93)-vicinity Red Horn Road (**Figure 1-2**). The Peterson site is located north of St. Ignatius near Milepost 35, also along the segment identified as Project 6. The Mud Creek Site is located south of Pablo near Milepost 50, along a segment identified as Project 7 – Spring Creek Road to Minesinger Trail (**Figure 1-3**)

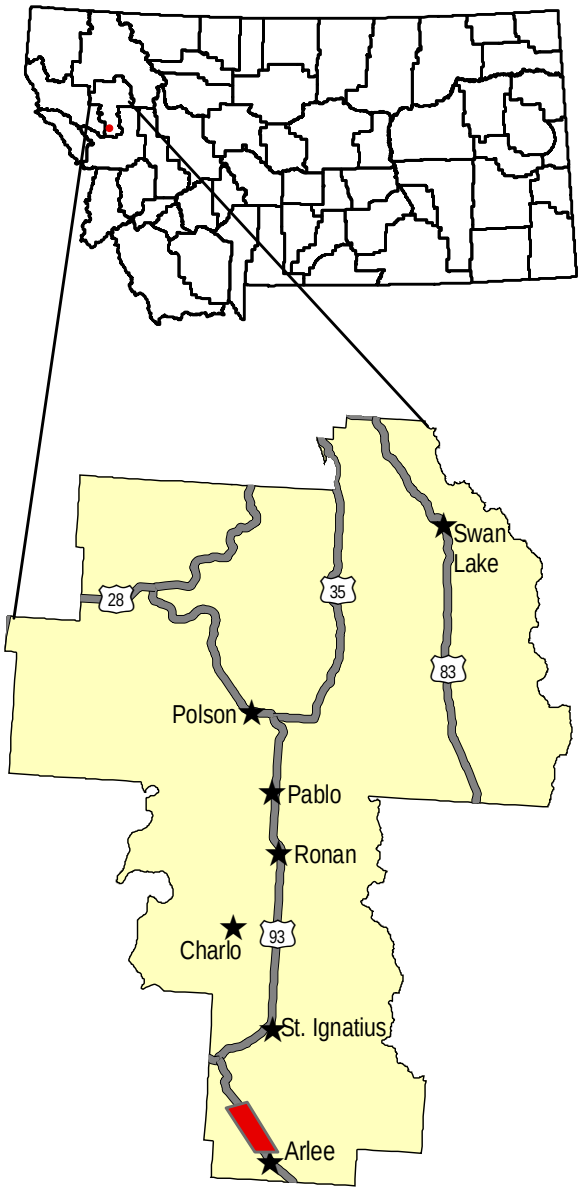
1.1 Impacts and Mitigation

Wetland impacts for the US 93 Evaro to Polson Highway reconstruction project were identified in a wetland mitigation plan prepared by Herrera Environmental Consultants (Herrera 2004). The impact totals for this report are based on information in the 2004 mitigation plan and 2007 monitoring report (Herrera 2007) and further clarification with MDT (Basting pers. comm.). The 2004 wetland mitigation plan provides wetland mitigation concepts, identifies the wetland community types targeted for establishment, and calculates the wetland mitigation credits expected to be obtained from each site. The mitigation plan specified total acres of impacts predicted for project segments 4, 6, and 7. These acres are separated into impact totals based on the Confederated Salish and Kootenai Tribes (CSKT) and the Army Corps of Engineers (Corps) regulated wetlands. Mitigation crediting systems also vary between these two agencies and are described in more detail in following sections.

Approximately 22.01 acres of impacts were calculated for the CSKT and 19.63 acres for the Corps regulated wetlands. **Table 1** shows the acreage of wetlands impacted within the three project segments. **Table 2** shows the expected mitigation credits for each project segment, wetland mitigation site, mitigation types, and expected wetland mitigation credits for both the CSKT and Corps. These expected credits are discussed in more detail in the results section for each mitigation site. Following 2008 monitoring, the Jocko River Bridge site was removed from scheduled subsequent monitoring activities and two new sites were added: Mission Creek and Mud Creek.

Figure 1-1 PROJECT LOCATION
CSKT Bouchard, and Jocko Spring Creek Sites





Project No: 0B4308802 Task: 02.06.02
Date: June 2009
Location: T16 & 17, R 20, Sec. 2, 16, & 26
Project Manager: J. Berglund
Drawn: G.Howard

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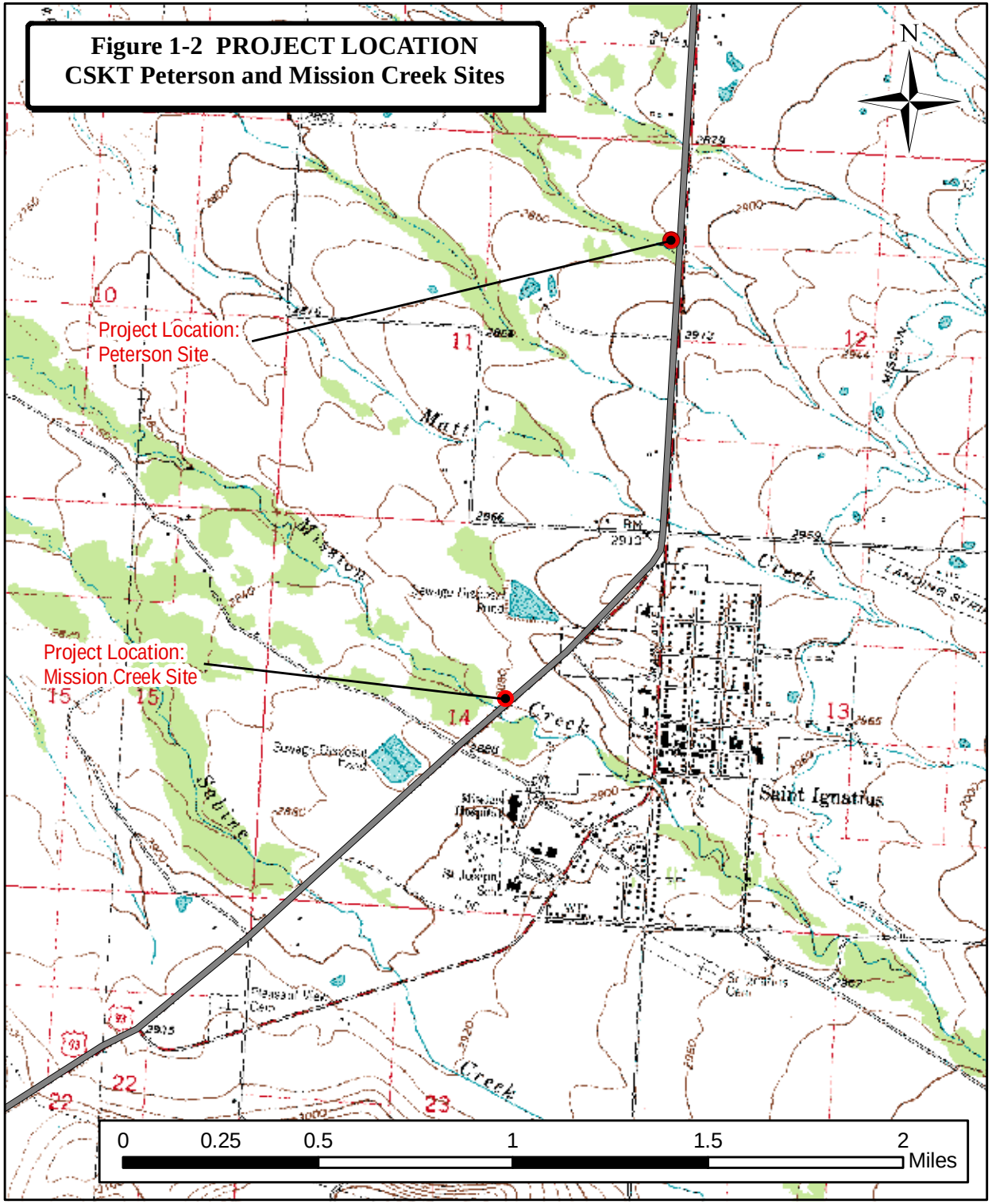
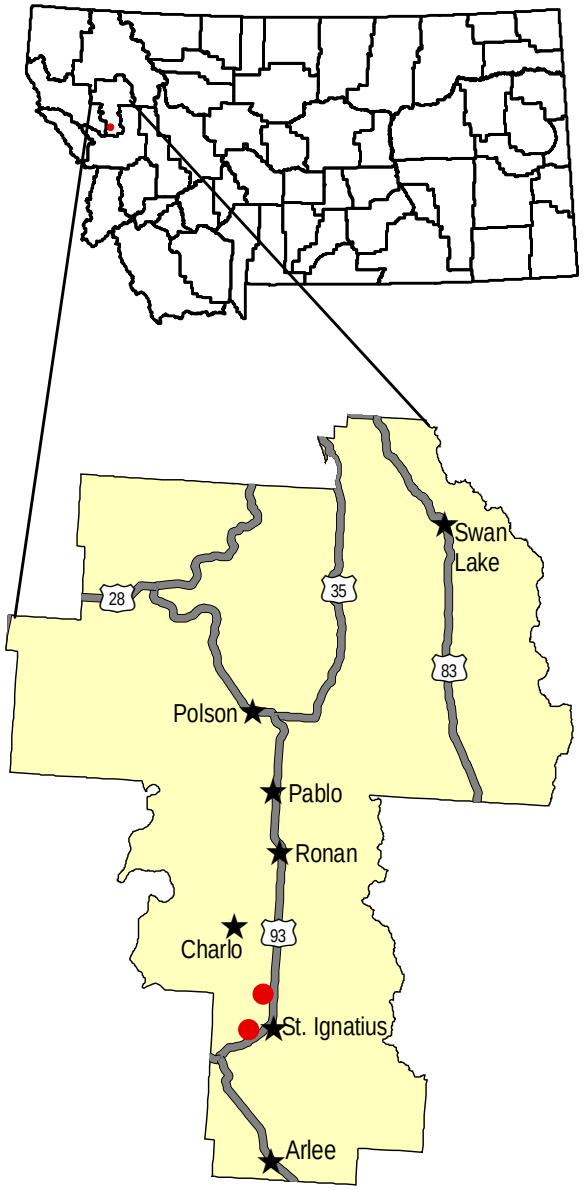
Figure 1-2 PROJECT LOCATION
CSKT Peterson and Mission Creek Sites





Project No: 0B4308802 Task: 02.06.02
Date: June 2009
Location: T19, R 20, Sec. 14 & 35
Project Manager: J. Berglund
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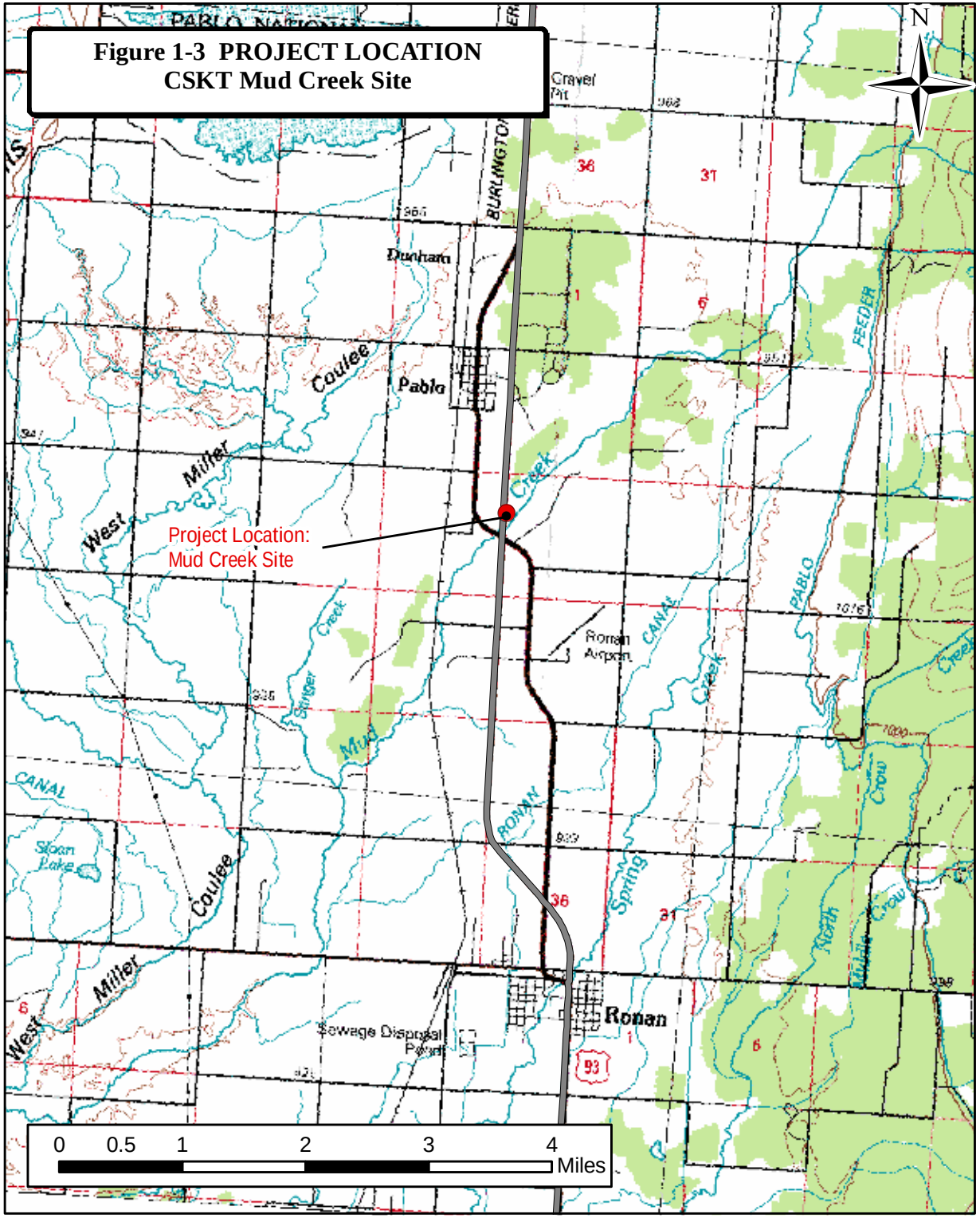
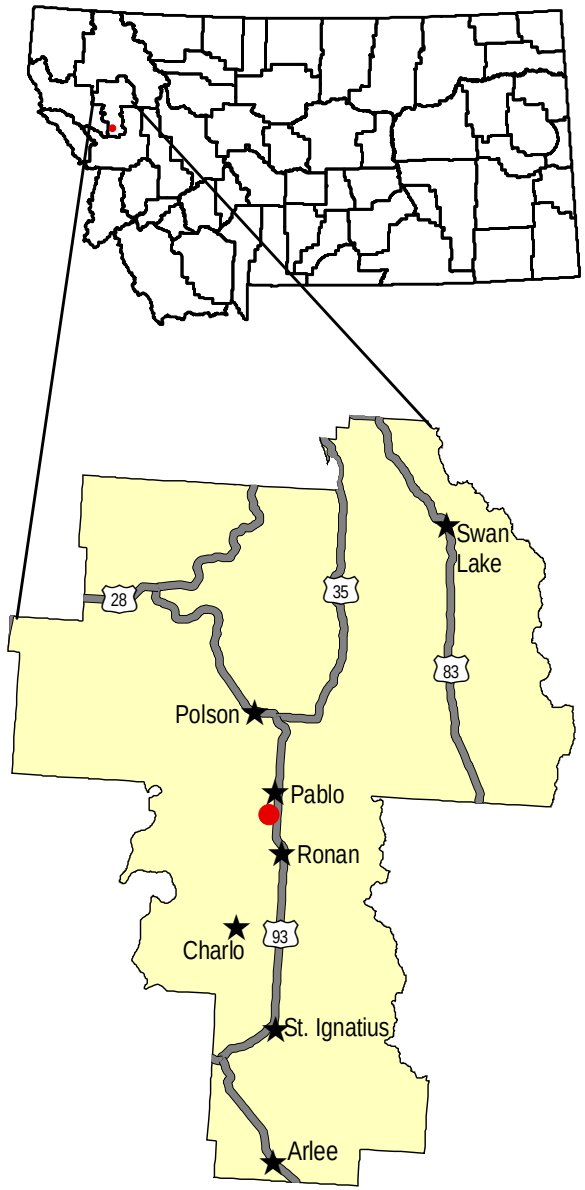
Figure 1-3 PROJECT LOCATION
CSKT Mud Creek Site





Project No: 0B4308802 Task: 02.06.02
Date: June 2009
Location: T21 R 20, Sec. 13
Project Manager: J. Berglund
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Table 1: ***Wetland impacts for project segments 4, 6, and 7 at the US 93 Evaro to Polson Highway Reconstruction Project.***

PROJECT NAME, LOCATION, AND NUMBER	WETLAND IMPACTS (acre)	
	CSKT Regulated Wetlands	Corps Regulated Wetlands
Project 4 Coyote Road – South of Ravalli MDT Project Number NH 5-2(110)20, CN 0744	3.64	2.53
Project 6 Medicine Tree (Old US 93) - Red Horn Road MDT Project Number NH 5-2(112)31, CN Q744	11.32	10.05
Project 7 Spring Creek Road to Minesinger Trail MDT Project Number NH 5-2(113)48, CN H744	7.05	7.05
TOTAL	**22.01**	**19.63**

Table 2: ***Wetland mitigation for project segments 4, 6, and 7 at the US 93 Evaro to Polson Highway Reconstruction Project.***

Project	Wetland Mitigation Site	Expected CSKT Wetland Mitigation Credits[1,2,3]		Expected COE Wetland Mitigation Credits[1,2,3]	
		Mitigation Type	Acre	Mitigation Type	Acre
Project 4 White Coyote Road – South of Ravalli	Bouchard	Creation	1.54	Creation	5.16
		Primary Restoration	1.58	Re-establishment	2.94
		Secondary Restoration	10.23	Rehabilitation	4.05
		Project Total	**13.35**	**Project Total**	**12.15**
	Jocko Spring Creek	Primary Restoration	1.17	Creation	2.17
		Secondary Restoration	0.32	Restoration	0.59[4]
				Enhancement	0.01
		Project Total	**1.49**	**Project Total**	**2.77[4]**
Project 6 Medicine Tree (Old US 93) – Red Horn Road	Mission	Primary Restoration	0.22	Re-establishment	0.15
		Project Total	**0.22**	**Project Total**	**0.15**
	Peterson	Creation	0.64	Creation	2.14
		Secondary Restoration	0.67	Rehabilitation	0.25
		Project Total	**1.31**	**Project Total**	**2.39**
Project 7 Spring Creek Road to Minesinger Trail	Mud Creek	Creation	3.22	Creation	6.18
		Secondary Restoration	0.33	Rehabilitation	0.63
		Project Total	**3.55**	**Project Total**	**6.81**

[1] Onsite Wetland Mitigation Plan, US 93 Evaro to Polson (Herrera 2004).
[2] MDT Wetland Mitigation Monitoring Report: Year 2007 (Herrera 2007).
[3] Personal communication with MDT (Basting 2008).
[4] Corrected from values presented in the 2007 US 93 mitigation monitoring report; revised figures are based on the site plan.

The CSKT crediting approach is based on the *CKST Wetlands Conservation Plan (1999)*. The CSKT crediting approach determines the final acres of credit based on an equation that calculates a weighted ratio for restoration based on two variables: mitigation types and impacted wetland classes. The CSKT uses the following mitigation types to determine ratios: preservation, restoration (primary or secondary), enhancement, and creation. The varying mitigation types have a range of ratios that are applied when calculating the final crediting ratios. **Table 3** lists the credit ratios per targeted mitigation type developed by CSKT for the highway reconstruction project. Refer to **Appendix H** – *CSKT Mitigation Ratios from Wetland Conservation Plan* (Parker 2002) for specific details on how the ratios are calculated.

Table 3: ***Mitigation credit ratio for CSKT per targeted mitigation types.***

TARGETED MITIGATION TYPE	CREDIT RATIO[1]
Creation	3.36:1
Primary restoration	1.86:1
Secondary restoration	1.86:1

[1] From MDT Wetland Mitigation Monitoring Report: Year 2007 (Herrera 2007).

The Corps crediting approach for the US Hwy 93 Onsite project is based on a crediting system developed by Herrera Environmental Consultants and approved by the Corps (Herrera 2004). The Corps crediting approach includes the following mitigation types: creation, restoration (re-establishment and rehabilitation) and enhancement. The credit ratio for creation and restoration (re-establishment) activities is 1:1. The credit ratio for restoration (rehabilitation) and enhancement is based on the measured and projected shift in wetland functions and values resulting from wetland mitigation activities. Wetland compensatory mitigation ratios specified by the Corps for rehabilitation and enhancement are based on use of the 1999 MDT Montana Wetland Assessment Method (Berglund 1999) which assigns a functional score. This mitigation concept uses baseline (pre-project) and post-project functional scores to evaluate functional lift. The ratio for rehabilitation and enhancement is calculated each year to determine an enhancement factor that is then applied to the total acres of the applicable mitigation type. The enhancement factor is part of the equation and is the inverse of the enhancement ratio. The following equation is used to determine the enhancement factor and ultimately the enhancement ratio:

$$\text{Enhancement factor} = \left[\left(F_{post} - F_{pre}\right)/ F_{pre}\right]$$

where F_{post} = projected post-mitigation project functional score; and F_{pre} = pre-project functional score.

The following formula includes the enhancement factor in the equation and is used to calculate wetland mitigation credits expressed as acres (Herrera 2004).

$$A_{credited} = A_{created} + A_{existing}\left[\left(F_{post} - F_{pre}\right)/ F_{pre}\right]$$

where $A_{credited}$ = wetland mitigation credits expressed as acres; $A_{created}$ = wetland creation acres; $A_{existing}$ = existing wetland acres to be enhanced; F_{post} = projected post-mitigation project functional score; and F_{pre} = pre-project functional score.

Mitigation crediting systems and current credits are discussed for each individual mitigation site under each **Current Credit Summary** section. The above-mentioned equation is applied to mitigation sites that include rehabilitation and enhancement activities to determine the current credit ratio and the associated credit acres.

1.2 Mitigation Sites

The US Highway 93 Onsite project includes five wetland mitigation sites located on the Flathead Indian Reservation and managed by the CSKT (**Figures 1-1, 1-2,** and **1-3**). The following

sections provide a general discussion of each wetland mitigation site including location, site topography, mitigation objectives, and targeted wetland community goals.

The sites were designed to mitigate for specific wetland functions impacted by MDT roadway projects, such as, storm water retention, roadway runoff filtration, sediment and nutrient retention, water quality, groundwater recharge, wildlife habitat, and riparian vegetation.

1.2.1 Bouchard Property

The Bouchard Property mitigation site is a 40-acre parcel located in the Project 4 segment and is adjacent to US 93 at approximately Milepost 20.5. The Bouchard Property is located in Section 26 of Township 17N and Range 20W. The site occurs east of US Highway 93, between the highway and Spring Creek. Spring Creek runs along the east side of the parcel boundary and historically provided a major source of surface water to the Bouchard property. The parcel previously included an abandoned home site, fish rearing ponds, and a system of drainage ditches and berms used to control water flow on the property. The site is near the headwaters of Jocko Spring Creek and contains a high water table that inundates a large portion of the site. Elevation is approximately 2,960 feet with slight topographic variation throughout the project site. The monitoring area boundary is illustrated on **Figure 2: Bouchard** (**Appendix A**). Mitigation plan sheets are presented in **Appendix D**.

The proposed mitigation actions included the following:

- Plug drainage ditches and remove berms adjacent to the existing fish ponds;
- Excavate topography in the southeast corner of the property to lower elevation to that of adjacent wetlands; and
- Create forested, scrub-shrub and emergent wetland vegetation types with installation of native plant species in the excavated cells.

The targeted wetland community types included forested and scrub-shrub, dominated by a smaller cover area of quaking aspen (*Populus tremuloides*) / red osier dogwood (*Cornus stolonifera*) habitat, and larger coverage of Bebbs willow (*Salix bebbiana*) and bog birch (*Betula glandulosa*) / beaked sedge (*Carex utriculata*) communities. Initial construction was completed in summer 2006, and revegetation with herbaceous plants and shrubs was completed in August-October 2006.

1.2.2 Jocko Spring Creek

The 6.5-acre Jocko Spring Creek mitigation site is located along the south side of the Montana Rail Link (MRL) grade just north of the Jocko Spring Creek highway crossing. The site occurs at approximately Milepost 23 in Section 16 of Township 17N and Range 20W. Jocko Spring Creek flows under the highway and the MRL bridge in a newly constructed channel, and then flows northwest parallel to the railroad grade before it connects to the existing channel alignment on the northwest end of the project area. The mitigation site encompasses the new channel and its floodplain. Existing flows from Jocko Spring Creek provide water for the wetland mitigation site. Elevation is approximately 3,000 feet with slight topographic variation throughout the

small project site. The monitoring area boundary is illustrated on the **Figure 2: Jocko Spring Creek** (**Appendix A**). Site plans are included in **Appendix D**.

The objectives included the following:

- Relocating Jocko Spring Creek from between the railroad and highway to a newly constructed channel west of the railroad;
- Constructing a new culvert under the railroad and in-line with the new highway bridge;
- Applying soft bioengineering treatments and installing near-bank plant material along in the new channel;
- Filling the abandoned Jocko Spring Creek channel with cobbles and gravel, topping with salvaged wetland soil, and planting;
- Creating scrub-shrub and emergent vegetation types with native wetland shrub and grass-like plantings and broadcast seeding of a wetland mix;
- Salvaging sod from the excavated channel placing along stream banks;
- Excluding grazing from the property; and
- Eliminating the existing vehicle pullout along the US Hwy 93.

The target wetland community is a palustrine scrub-shrub system supporting Bebb's willow with inclusions of emergent habitat. Initial construction of the new channel and floodplain was completed in March 2006 with prevegetated coir mats installed during April 2006. Revegetation efforts, including shrub and herbaceous plantings, were completed during August to October 2006.

1.2.3 Mission Creek

The 0.22-acre Mission Creek mitigation site occurs in the Project 6 segment just south of St. Ignatius adjacent to the highway. The site is located between Milepost 32 and 33 in Section 14 of Township 18N and Range 20W. The Mission Creek site consists of Mission Creek and adjacent floodplains along the drainage. Site hydrology is provided by perennial Mission Creek. The monitoring area boundary is illustrated on **Figure 2: Mission Creek** (**Appendix A**). Site plans are included in **Appendix D**.

The "wetland mitigation" proposal for this site involved several items under the general category of floodplain "system" re-establishment (as opposed to wetland re-establishment). This included removing the culvert and roadway fill, restoring the stream channel, and expanding the floodplain underneath the new bridge. The intent was to: i) line the stream channel with stream aggregates and install class 1 riprap and boulder clusters along the channel under the bridge; ii) use class 1 riprap, boulder clusters, and embedded brush layers in the portions of the stream channel extending upstream and downstream from the drip line of the bridge; iii) to re-establish a small floodplain underneath the bridge; iv) plant native vegetation along the floodplain both upstream and downstream of the bridge and to extend the vegetation approximately 6.6 feet under the bridge with compacted subgrade above the ordinary high water mark to allow wildlife passage; v) place gravels below the ordinary high water mark to line the newly opened channel; vi) install 50 individual brush pieces along the stream channel at about the ordinary high water mark from approximately 6.6 feet underneath the bridge extending both upstream and

downstream on both sides of the channel; and iv) remove fill on the southwest side of the new bridge abutment and revegetate the area.

Restoration of the channel and floodplain was completed in summer 2007. Revegetation efforts were completed during summer of 2008 and included riparian tree, shrub, and herbaceous plantings.

1.2.4 Mud Creek

The 2.54-acre Mud Creek mitigation site occurs in the Project 7 segment just south of Pablo. The site is located near Milepost 50 in Section 13 of Township 21N and Range 20W. The mitigation site consists of Mud Creek and adjacent wetlands dominated by emergent vegetation and remnant stands of hawthorn shrubs. Site hydrology is sourced by perennial Mud Creek that flows from the east under the newly constructed bridges along Highway 93 and through the southeast corner of the site. The monitoring area boundary is illustrated on **Figure 2: Mud Creek** (**Appendix A**). Site plans are included in **Appendix D**.

The mitigation objectives for both wetland rehabilitation and creation included the following:

- Fencing the mitigation site to prevent cattle grazing;
- Controlling invasive weedy species such as reed canarygrass;
- Performing wetland mitigation planting to increase diversity of wetland plants;
- Constructing and realigning the Mud Creek channel to provide higher surface water elevation allowing for recharge of adjacent wetlands; and
- Grading and revegetating the abandoned portion of Mud Creek located within the proposed US Highway 93 median.

The targeted wetland community is a palustrine forested and scrub-shrub system supporting black cottonwood (*Populus trichocarpa*), thin-leaf alder (*Alnus incana*), and Bebb's willow with inclusions of emergent wetland habitat. Initial construction of the new channel and floodplain was completed in summer 2007 with the installation of prevegetated coir mats along the channel. Revegetation efforts, including tree, shrub and herbaceous plantings, were completed during the late summer of 2008.

1.2.5 Peterson

The 30-acre Peterson mitigation site occurs in the Project 6 segment approximately 3 miles north of St. Ignatius and west of the highway. The site is located south of Milepost 36 in Section 2 of Township 16N and Range 20W. The Peterson site consists of a wetland draw dominated by herbaceous vegetation. Site hydrology is sourced by an unnamed perennial tributary to Post Creek. The monitoring area boundary is illustrated on **Figure 2: Peterson** (**Appendix A**). Site plans are included in **Appendix D**.

The objectives included the following:

- Constructing impoundments using twelve log crib structures and earthen berms;
- Excavating an oxbow basin along the outer fringe of existing wetland boundaries; and

- Planting shrubs and herbaceous plugs within the oxbow basin, wetland fringe, and log crib structures.

The targeted wetland community type at this site is a scrub-shrub / emergent vegetation type, supporting thinleaf alder (*Alnus incana*)/ red osier dogwood (*Cornus stolonifera*) and Nebraska sedge (*Carex nebrascensis*) / Baltic rush (*Juncus balticus*) habitat types. Revegetation work was completed in October 2006.

2.0 METHODS

2.1 Monitoring Dates and Activities

A spring kick-off visit was conducted on May 28th to review the Mission and Mud Creek sites with MDT and CSKT personnel. Monitoring activities at the four sites were conducted between July 22nd and August 16th of 2009 (mid-season). Specifically, the mitigation sites were visited as follows: Bouchard – July 22nd; Jocko Spring Creek - July 31st; Mission Creek - July 23rd, Mud Creek - July 23rd, and Peterson - August 16th. The mid-season visits were conducted to document vegetation, soil, and hydrologic conditions used to map jurisdictional wetlands. All information contained on the Wetland Mitigation Site Monitoring Form for all five sites (**Appendix B**) was collected at this time. Activities and information conducted or collected included: wetland delineation; wetland/open water aquatic habitat boundary mapping; vegetation community mapping; vegetation transect monitoring; soils data collection; hydrology data collection; bird and general wildlife use documentation; photography; macroinvertebrate sampling (Jocko Spring Creek site only); mapping using a global positioning system (GPS) unit; functional assessment; and (a non-engineering) examination of topographic features.

2.2 Hydrology

Wetland hydrology indicators were recorded during the mid-season visit using procedures outlined in the COE 1987 Wetland Delineation Manual (Environmental Laboratory 1987). Hydrology data were recorded on COE Routine Wetland Delineation Data Forms (**Appendix B**). Additional hydrologic data were recorded on the Wetland Mitigation Site Monitoring Form (**Appendix B**). No groundwater monitoring wells were installed at any of the five wetland mitigation sites. Western Regional Climate Center (WRCC) data obtained from the closest weather station to each project was used to as an indicator of current and historical precipitation patterns at each project site.

2.3 Vegetation

General dominant species-based vegetation community types were delineated onto the 2009 aerial photographs. Standardized community mapping was not used because many of these systems are geared towards climax vegetation and do not reflect annual changes.

In association with MDT and CSKT, new ten-foot wide belt transects were established at all sites during the 2008 and 2009 reconnaissance visits for Bouchard, Jocko Spring Creek, Mud, and Peterson sites. Transects were not placed at the Mission Site. The new transects replaced any

previously-located transects to better represent and capture future vegetative changes at each of the sites. These were sampled during the mid-season visit to represent the range of current vegetation conditions. Percent cover was estimated for each plant species found within each community type as follows: + (< 1 %); 1 (1-5%), 2 (6-10%); 3 (11-20%); 4 (21-50%); and 5 (>50%). The category of percent cover for dominant plants in each community type was listed on the Wetland Mitigation Site Monitoring Form (**Appendix B**).

The transect locations were marked on the aerial photographs and with a GPS unit. A photograph was taken of the transect from each start and end location.

A comprehensive plant species list has been maintained for each site. All noxious weed locations were mapped. Survival of each planted woody species was estimated.

2.4 Soils

Soils were evaluated during the mid-season site visit using the hydric soils determination procedures outlined in the COE 1987 Wetland Delineation Manual (Environmental Laboratory 1987). Soil data were recorded for each wetland determination point on the COE Routine Wetland Delineation Data Forms (**Appendix B**).

2.5 Wetland Delineation

Wetland delineations were conducted during the mid-season visits 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: Western Mountains, Valleys, and Coast Region* (COE 2008) was not required or undertaken at any of the five sites in 2009.

Wetland and upland areas within the monitoring areas 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). Information was recorded onto COE Routine Wetland Delineation Data Forms (**Appendix B**). The wetland/upland boundaries were located with a resource-grade GPS unit and by hand mapping onto each aerial photograph. The wetland/upland boundaries in combination with the wetland/open water boundaries were used to calculate the final wetland acreage.

2.6 Fish and Wildlife

Fish, mammal, reptile, and amphibian species observations and indicators of their use (i.e., vocalizations, tracks, scat, burrows, eggshells, and bones) were recorded onto the Wetland Mitigation Site Monitoring Form during each mid-season visit (**Appendix B**). Observations were recorded while conducting other required activities. Direct sampling methods, such as snap traps, live traps, and pitfall traps, were not used.

2.7 Birds

Bird observations were recorded during each mid-season visit according to the Bird Survey Protocol (**Appendix E**). No formal census plots, spot mapping, point counts, or strip transects were conducted. Bird observations were recorded incidental to other required monitoring activities, but were categorized by species, activity code, general habitat and recorded onto the Bird Survey Field Data Sheet (**Appendix B**).

2.8 Macroinvertebrates

Macroinvertebrate samples were only collected at the Jocko Spring Creek during the mid-season site visit. Collection occurred using the Macroinvertebrate Sampling Protocol (**Appendix F**). Samples were preserved as outlined in the sampling procedure and sent to Rhithron Associates, Inc. in Missoula, Montana for analysis. The macroinvertebrate sampling location was mapped with a GPS unit.

2.9 Functional Assessment

Pre-project functional assessments of all five sites used the 1999 MDT Montana Wetland Assessment Methodn (MWAM). In 2009, application of the 1999 method was continued at all five sites. The 2008 MDT MWAM version has not been used at these sites because the crediting requirement compares the functional shift between the pre- and post-project functional assessments (**Appendix B**). Field data necessary for these assessments were collected during the mid-season visits.

2.10 Photographs

The July 1, 2009 aerial photographs of each of the five sites were used for **Figures 2** and **3** (**Appendix A**). On-the-ground photographs were taken to illustrate the current land uses surrounding each site, the upland buffer, the monitored area, and the vegetation transects (**Appendix C**). Each photograph point location was mapped using a resource grade GPS unit. All photographs were taken using a digital camera.

2.11 GPS Data

During the 2009 monitoring season, point data were collected with a resource-grade GPS unit at the vegetation transect start and end locations and at all photograph locations. Wetland boundaries were recorded with a resource-grade GPS unit in 2009 (along with hand mapping onto the aerial photographs). Procedures used for GPS mapping and aerial photography referencing are included in **Appendix E**.

2.12 Maintenance Needs

Observations were made of existing structures and of erosion/sediment problems to identify maintenance needs. This did not constitute an engineering-level structural inspection, but rather a cursory examination. Current or future potential problems were documented on the monitoring forms.

3.0 RESULTS

3.1 Bouchard Property

3.1.1 Hydrology

The main source of hydrology is seasonal inundation from a high groundwater table associated with adjacent perennial Spring Creek. Spring Creek irrigation surface water previously entered the site through a series of ditches and berms. Several historic fish rearing ponds are located onsite that were previously filled with surface water from Spring Creek and were mapped as open water. Mitigation objectives included plugging and filling the ditches, and removing berms and other water-controlling features. A secondary source of hydrology is the persistent upwelling and lateral movement of groundwater through the alluvial materials across the valley floor sourced by local irrigation practices and hydrology associated with the Jocko River.

Shallow open-water areas occurred across approximately 0.39 acre or 1 % of the wetland area during the mid-season visit (**Figure 3** in **Appendix A**). Water depth in these areas was approximately 4.0 feet. Inundation from discharging groundwater was observed at this time across another 15% of the wetland area. Inundation was present within Community Types 2, 3, 5, and 7 (**Bouchard Figure 3** in **Appendix B**).

According to the Western Regional Climate Center (WRCC), mean monthly precipitation from January through July from 1896 to 2009 totaled 15.83 inches at the St Ignatius weather station (WRCC 2009). During 2009, 8.77 inches (55% of the mean) of precipitation were recorded at this station between January and July (WRCC 2009).

3.1.2 Vegetation

Eighty-one plant species were identified at the site since 2007 (**Table 4**). The majority of these species are herbaceous. The site contains a few small stands of black cottonwood (*Populus trichocarpa*) and aspen (*Populus tremuloides*) trees near or adjacent to the ponds. Eight wetland and one upland community types were identified and mapped at the mitigation site (**Bouchard Figure 3** in **Appendix A**). The eight wetland community types were Type 2: *Deschampsia/Juncus*, Type 3: *Juncus/Eleocharis,* Type 4: *Juncus/Cirsium*, Type 5: *Carex*, Type 6: *Betula/Potentilla,* Type 7: *Alnus/Glyceria,* Type 8: *Populus,* and Type 9: *Typha.* The eight wetland communities occur within wetland creation, rehabilitation, and re-establishment areas. Plant species observed within each of these communities are listed on the **Monitoring Form** (**Appendix B**).

The upland community type was Type 1: *Agropyron/Agrostis.* Plant species observed within this community are also listed on the **Monitoring Form** (**Appendix B**).

Table 4: ***2007 to 2009 vegetation species list for the Bouchard Wetland Mitigation Site.***

Scientific Name[1]	Common Name	Region 9 (Northwest) Wetland Indicator
Achillea millefolium	common yarrow	FACU
Agrostis alba	redtop	FAC+
Agropyron repens	quackgrass	FACU
Agropyron trachycaulum	slender wheatgrass	FAC
Alnus incana	alder	FACW
Alopecurus pratensis	meadow foxtail	FACW
Alyssum alyssoides	alyssum	--
Anthemis cotula	chamomile	FACU
Artemisia ludoviciana	white sagebrush	FACU-
Betula occidentalis	water birch	FACW
Bromus carinatus	mountain brome	--
Bromus tectorum	cheatgrass	--
Calamagrostis canadensis	bluejoint reedgrass	FACW+
Campanula rotundifolia	bluebell bellflower	FACU+
Carduus nutans	musk thistle	--
Carex lanuginosa	wooly sedge	OBL
Carex nebrascensis	Nebraska sedge	OBL
Carex praegracilis	clustered field sedge	FACW
Carex utriculata	beaked sedge	OBL
Carex stipata	awlfruit sedge	OBL
Carex retrorsa	retrorse sedge	FAC
Carex vesicaria	fox sedge	OBL
Centaurea maculosa	spotted knapweed	--
***Chara* spp.**	stonewort	OBL
Chenopodium album	white goosefoot	FAC
Chrysanthemum leucanthemum	ox-eye daisy	--
Cichorium intybus	chicory	--
Cirsium arvense	Canada thistle	FACU+
Cornus stolonifera	red-osier dogwood	FACW
Crataegus douglasii	Douglas hawthorn	FAC
Cynoglossum officinale	hound's tongue	FACU
Deschampsia cespitosa	tufted hairgrass	FACW
Dodecatheon spp.	shooting star	--
Eleocharis palustris	creeping spikerush	OBL
Eleocharis spp.	spike-rush	--
Epilobium ciliatum	hairy willow-herb	FACW+
Epilobium spp.	willow-herb	--
Equisetum arvense	field horsetail	FAC
Geum macrophyllum	big leafed avens	OBL
Glyceria grandis	American mannagrass	OBL
Glyceria striata	fowl mannagrass	OBL
Hordeum jubatum	fox-tail barley	FAC+
Hypericum perforatum	St. John's wort	--
Juncus balticus	Baltic rush	FACW
Juncus ensifolius	three-stamen rush	FACW
Juncus tenuis	slender rush	FAC
Juncus mertensianus	Mertens' rush	OBL
Juniperus scopulorum	Rocky Mountain juniper	--
Juncus spp.	rush	--
Lactuca serriola	prickly lettuce	FAC-
Lychnis alba	white campion	--
Mentha arvensis	field mint	FAC

Table 4 (continued): ***2007 to 2009 vegetation species list for the Bouchard Wetland Mitigation Site.***

Scientific Name[1]	Common Name	Region 9 (Northwest) Wetland Indicator
Medicago Sativa	alflafa	--
Mimulus guttatus	monkey-flower	OBL
Nepeta cataria	catnip	--
Phalaris arundinacea	Reed canarygrass	FACW
Phleum pratense	timothy	FACU
Plantago major	common plantain	FAC+
Poa palustris	fowl bluegrass	FAC
Poa pratensis	Kentucky bluegrass	FACU+
Polygonum amphibium	water smartweed	OBL
Populus tremuloides	quaking aspen	FAC+
Populus trichocarpa	cottonwood	FAC
Potentilla anserina	silverweed	OBL
Potentilla fruticosa	shrubby cinquefoil	FAC-
Ranunculus spp.	buttercup	--
Ribes spp.	currant	--
Rosa woodsii	woods rose	FACU
Rubus idaeus	wild raspberry	FACU
Rumex crispus	curly dock	FACW
Salix bebbiana	Bebb willow	FACW
Salix exigua	sandbar willow	OBL
Salix geyeriana	Geyer willow	FACW+
Salix lutea	yellow willow	OBL
Solanum dulcamara	climbing nightshade	FAC+
Solidago missouriensis	Missouri goldenrod	--
Sonchus arvensis	field sowthistle	FACU+
Symphoricarpos albus	snowberry	FACU
Typha latifolia	broad-leaf cattail	OBL
Verbascum thapsus	common mullein	--
Vicia spp.	vetch	--

[1] **Bolded** species were documented in the analysis area for the first time in 2009.

Community types 2 and 3 and the pond areas were the wettest sites. These were located in the southeast corner of the property within the wetland creation area, and were dominated by emergent vegetation and aquatic bed habitat (**Bouchard Figure 3** in **Appendix A**). The wetland creation area was planted and seeded with yarrow (*Achillea millefolium*), tufted hairgrass (*Deschampsia cespitosa*), slender wheatgrass (*Agropyron trachycaulon*), and fowl bluegrass (*Poa palustris*). Type 2 was dominated by tufted hairgrass, redtop (*Agrostis alba*), and slender rush (*Juncus tenuis*). Type 3 was located within the wetland creation area and was dominated by several species, including, dagger rush (*Juncus ensifolius*), slender rush, redtop, and spike-rush (*Eleocharis* spp.). Several small patches of cattail (*Typha latifolia*) existed within the boundaries of Type 2 and 3, but were not mapped as a separate community type.

Native containerized shrubs and herbaceous plugs were planted during the spring of 2006. Planted shrubs are arranged in patches within the created wetland to mimic natural distribution of native scrub-shrub species.

Community Types 4, 5, and 9 are dominated by mostly emergent vegetation types and occurred in the wetland rehabilitation areas. Type 4 is an existing emergent wetland that consists of

mostly wetland species, but has a small inclusion of weedy and / or aggressive species. The wetter species within Type 4 included Baltic rush, redtop, and big-leaf avens (*Geum macrophyllum*). Type 4 contained two noxious weed species: Canada thistle (*Cirsium arvense*) and hound's-tongue (*Cynoglossum officinale*). Type 5 also occured within the wetland rehabilitation area and was dominated by herbaceous wetland species including beaked sedge, fox sedge (*Carex vesicaria*), Baltic rush, fowl mannagrass (*Glyceria striata*), and woolly sedge (*Carex lanuginosa*). Type 9 occured in the wettest area and was dominated by a monoculture of cattail.

Community types 6, 7, and 8 are scrub-shrub and forested types located in the wetland rehabilitation area. Type 6 was a scrub-shrub community dominated by water birch (*Betula occidentalis*) and shrubby potentilla (*Potentilla fruticosa*) with a mixture of herbaceous species similar to Type 5. Type 6 occupied the second largest area of all the community types in the mitigation area. Type 7 was a scrub-shrub vegetation type dominated by thinleaf alder (*Alnus incana*) and containing an herbaceous layer dominated by fowl mannagrass. Type 8 was a forested vegetation type dominated by black cottonwood and quaking aspen. Black cottonwood and some quaking aspen dominate the areas surrounding the several existing ponds or shallow open waters. Type 8 areas were also found on the east side of the property along Spring Creek.

Adjacent upland vegetation communities were dominated by pasture grasses and/or aggressive invasive species. Type 1 upland areas were dominated by slender wheatgrass, yarrow, quackgrass (*Agropyron repens*), Canada thistle, and hound's-tongue.

Several noxious weeds were observed at the Bouchard property. Community types 1, 3, and 4 contained Canada thistle, hound's-tongue, and St. John's wort (*Hypericum perforatum*). The majority of the weed species were found on the west side of the parcel along the upland and wetland fringe between Types 1 and 5. Canada thistle was the most abundant weed species and had a moderate to high coverage value. Hounds tongue and St. John's wort were recorded at low to moderate levels. Two other noxious weeds, oxeye daisy (*Chrysanthemum leucanthemum*) and spotted knapweed (*Centaurea maculosa*), were recorded at low levels. Noxious weed locations in 2009 were mapped (**Bouchard Figure 3** in **Appendix A**).

Vegetation transect results were detailed in the **Monitoring Form** (**Appendix B**) and were summarized in tabular format in **Tables 5, 6,** and **7**, and graphically illustrated in **Charts 1 - 6.** The 2007 transect location was changed in 2008; therefore, no 2007 transect data are presented.

Table 5: ***Bouchard Property - Transect 1 data summary.***

Monitoring Year	2008	2009
Transect Length (feet)	526	526
# Vegetation Community Transitions along Transect	5	5
# Vegetation Communities along Transect	4	4
# Hydrophytic Vegetation Communities along Transect	3	3
Total Vegetative Species	28	28
Total Hydrophytic Species	19	18
Total Upland Species	9	10
Estimated % Total Vegetative Cover	95	96
% Transect Length Comprised of Hydrophytic Vegetation Communities	77	77
% Transect Length Comprised of Upland Vegetation Communities	33	33
% Transect Length Comprised of Unvegetated Open Water	0	0
% Transect Length Comprised of Bare Substrate	0	0

Table 6: ***Bouchard Property - Transect 2 data summary.***

Monitoring Year	2008	2009
Transect Length (feet)	313	313
# Vegetation Community Transitions along Transect	2	2
# Vegetation Communities along Transect	2	2
# Hydrophytic Vegetation Communities along Transect	2	2
Total Vegetative Species	16	18
Total Hydrophytic Species	13	15
Total Upland Species	3	3
Estimated % Total Vegetative Cover	98	98
% 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

Table 7: ***Bouchard Property - Transect 3 data summary.***

Monitoring Year	2008	2009
Transect Length (feet)	133	133
# Vegetation Community Transitions along Transect	2	2
# Vegetation Communities along Transect	2	2
# Hydrophytic Vegetation Communities along Transect	1	1
Total Vegetative Species	13	13
Total Hydrophytic Species	3	4
Total Upland Species	10	9
Estimated % Total Vegetative Cover	80	95
% Transect Length Comprised of Hydrophytic Vegetation Communities	7	7
% Transect Length Comprised of Upland Vegetation Communities	93	93
% Transect Length Comprised of Unvegetated Open Water	0	0
% Transect Length Comprised of Bare Substrate	0	0

Chart 1: ***Bouchard Property - Transect 1 maps showing vegetation types from the start (0 feet) to the end (526 feet) for each year monitored.***

Chart 2: ***Bouchard Property - length of vegetation communities within Transect 1 from 2008 to 2009.***

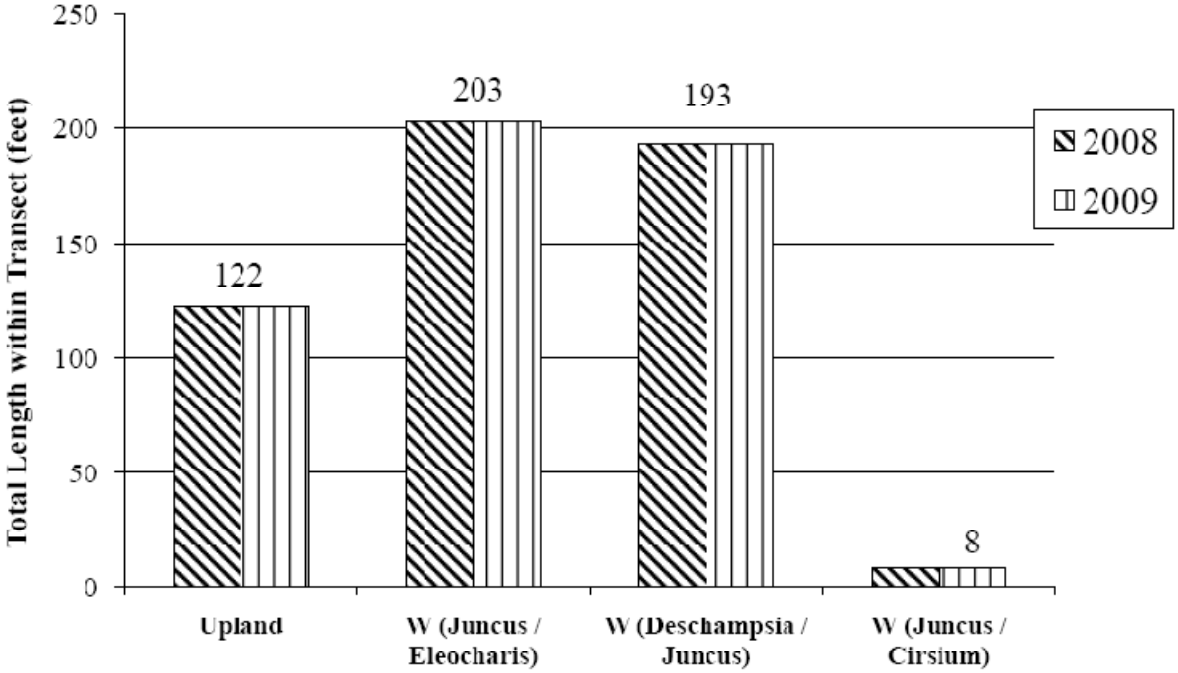


Chart 3: ***Bouchard Property - Transect 2 maps showing vegetation types from the start (0 feet) to the end (313 feet) for each year monitored.***

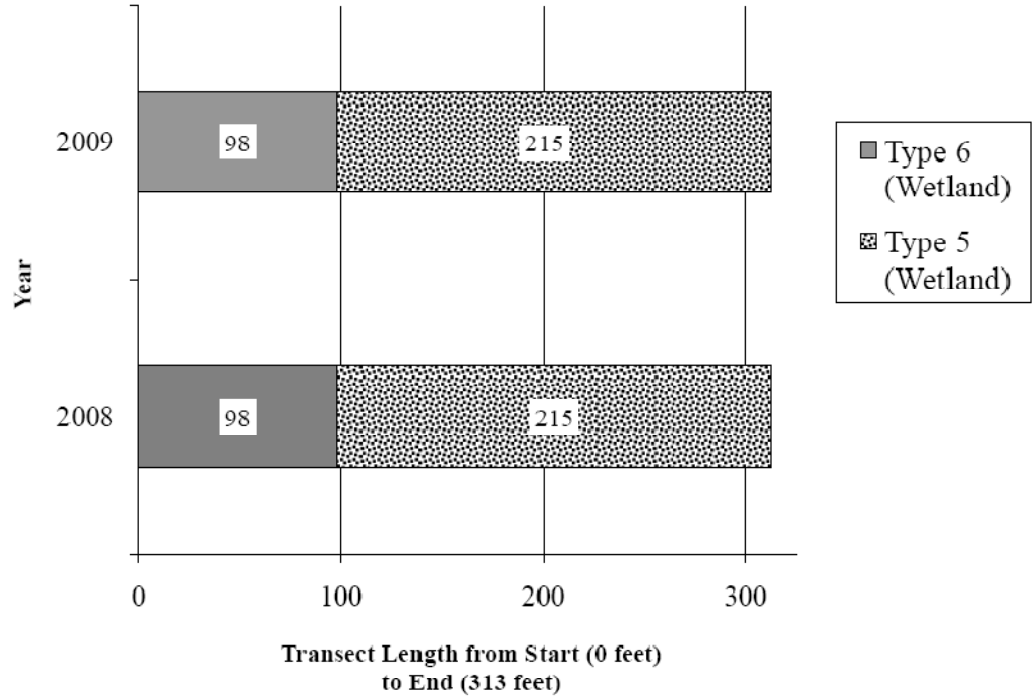


Chart 4: ***Bouchard Property - length of vegetation communities within Transect 2 from 2008 to 2009.***

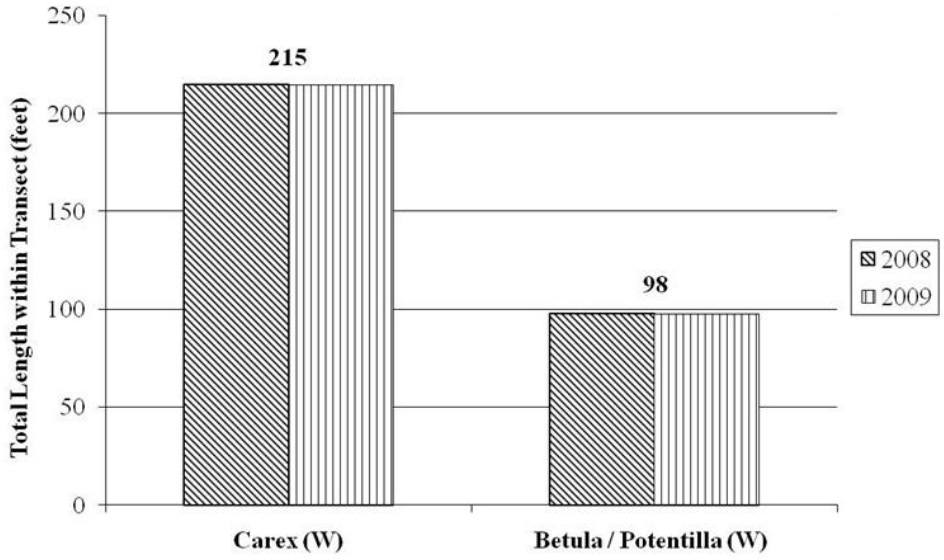


Chart 5: ***Bouchard Property - Transect 3 map showing vegetation types from the start (0 feet) to the end (133 feet) for each year monitored.***

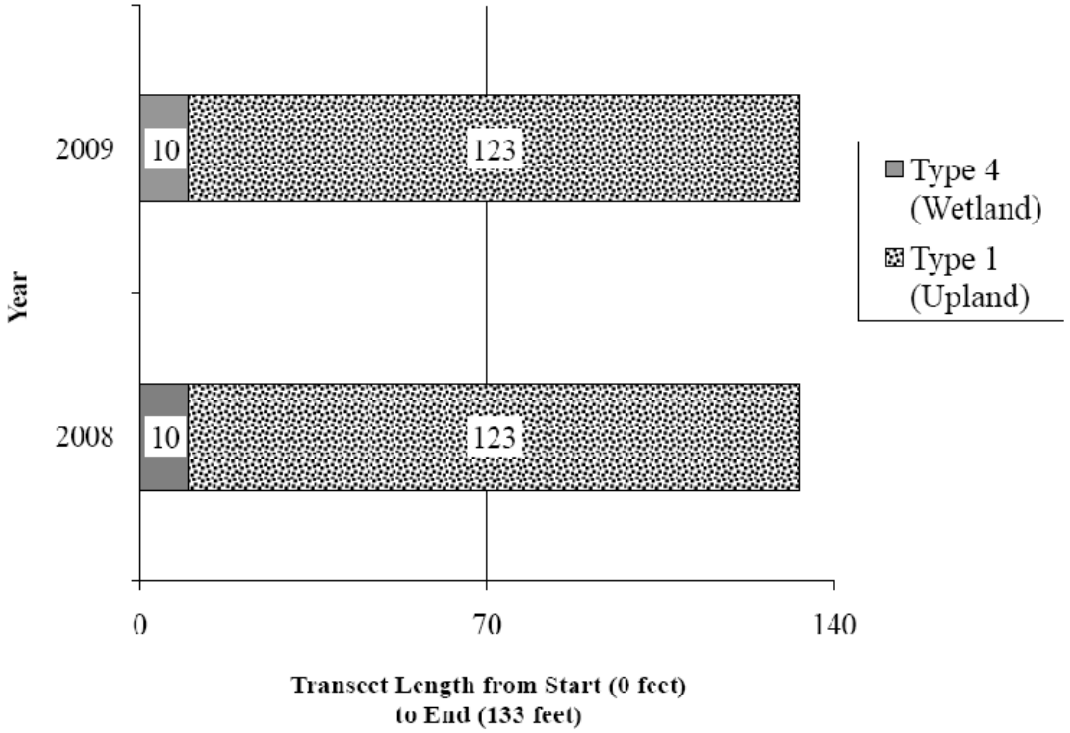
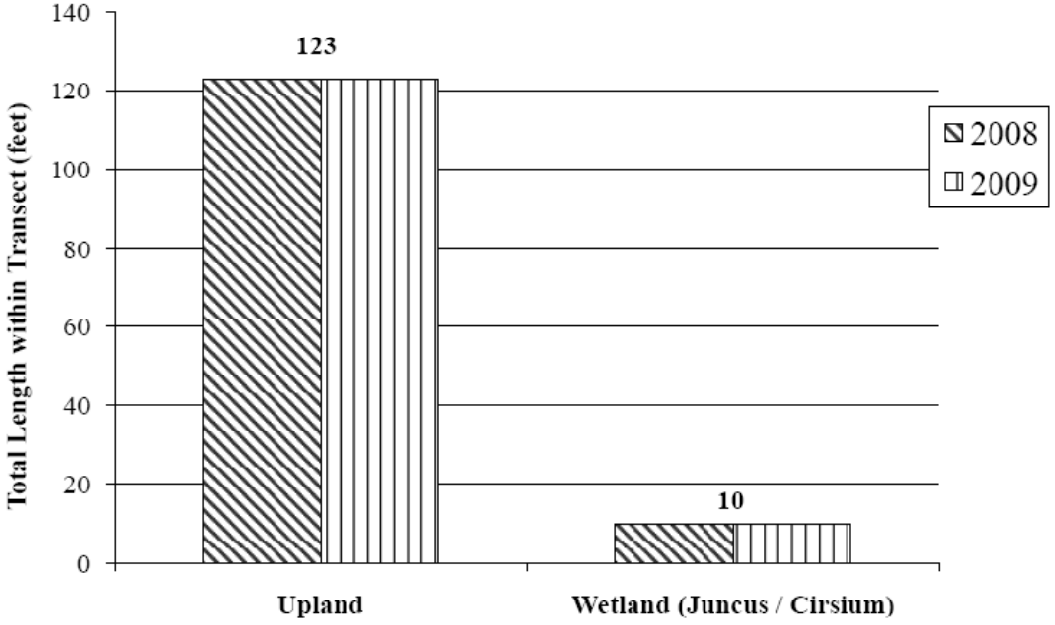


Chart 6: ***Bouchard Property - length of vegetation communities within Transect 3 from 2008 to 2009.***



3.1.3 Soils

The five soils types mapped at the Bouchard property in the Lake County Soil Survey (NRCS 2009) are:

- Borohemists, 0 to 1 percent slope
- Colake silt loam, 0 to 1 percent slope
- Colake silt loam, drained, 0 to 1 percent slope
- Jocko gravelly loam, 0 to 4 percent slope
- Lamoose loam, 0 to 2 percent slope

Four of the five soils types mapped at the Bouchard property were listed as hydric soils (NRCS 2008). These were Borohemists, Colake silt loams, and Lamoose loam. Borohemists are very poorly drained and occur on low stream terraces and floodplains. The Colake silt loam series are poorly drained and occur in swales and depressions on till plains and low stream terraces. The Lamoose series are poorly drained and occur on floodplains. The Jocko series is well drained and occurs in a very small portion of the site (NRCS 2008). Soil characteristics at each wetland determination point were compared with those of the mapped soils. The soils observed across most of the site generally matched the soil descriptions.

Wetland soils observed during monitoring and documented on the Routine Wetland Determination form were mostly loam or silt loam textured soils with very low chroma colors (1 or 2) throughout the soil profile. Redoximorphic features such as redox concentration (mottles) or depleted matrixes were not observed in any of three profiles.

3.1.4 Wetland Delineation

Wetlands were delineated and mapped (**Bouchard Figure 3** in **Appendix A**). Soils, vegetation, and hydrology are documented on the **COE Forms** (**Appendix B**). Approximately 28.53 gross wetland acres currently occur within the monitoring area (**Table 8**; **Bouchard Figure 3** in **Appendix A**). The site contains 28.14 wetland acres and 0.39 acre of shallow open water (**Table 8**).

Table 8: ***Aquatic habitats and acreages at the Bouchard Wetland Mitigation Site.***

CONDITION	2004[1] (acre)	2007[2] (acre)	2009 (acre)
Wetland Area	19.03	29.26	28.14
Open Water Area	---		0.39
Total Aquatic Habitat	**19.03**	**29.26**	**28.53**

[1]Herrera 2004, [2]Herrera 2007

Overall, the project has gained an estimated 9.50 wetland acres in comparison to 2004 baseline conditions. Prior to construction, the site contained approximately 19.03 acres of wetlands and shallow open water ponds within the current monitoring limits. The overall cumulative change in aquatic habitat at the site since construction has been approximately 28.53 - 19.03 = 9.5 acres.

Wetland size changed between the 2007 and 2008 monitoring, with a decrease of 0.73 acre. The 2007 and 2008 delineations were conducted by different firms. Slight variations in wetland mapping between the two firms most likely contributed to small differences in wetland acreages. Differences in wetland boundaries between the 2007 and 2008 wetland mapping were observed along the south side of the creation and restoration areas. During 2009 monitoring, the wetland sizes remained similar to those observed in 2008.

3.1.5 Fish and Wildlife

A comprehensive list of fish, mammals, reptiles, amphibians, and birds has been maintained for the Bouchard Property since 2007 (**Table 9)**. In 2009 four mammal, one amphibian, and ten bird species were noted at the Bouchard mitigation site (**Table 9**). Specific evidence observed, as well as activity codes pertaining to birds, was recorded onto the **Monitoring Form** and **Bird Survey Form** in **Appendix B**.

Table 9: ***Fish and wildlife species observed at the Bouchard Mitigation Site from 2007 to 2009.***

FISH	
None	
AMPHIBIAN	
Spotted Frog (*Rana luteiventris*)	
REPTILE	
None	
BIRD	
American Crow (*Corvus brachyrhynchos*)	Mourning Dove (*Zenaida macroura*)
American Finch (*Carduelis tristis*)	**Red-Winged blackbird (*Agelaius phoeniceus*)**
Black-Billed Magpie (*Pica hudsonia*)	**Red-tailed hawk (*Buteo jamaicensis*)**
Black Capped Chickadee (*Parus atricapillus*)	**Ring-necked Pheasant (*Phasianus colchicus*)**
Brown-Headed cowbird (*Molothrus ater*)	Snipe (*Gallinago gallinago*)
Common Flicker (*Colaptes auratus*)	Song Sparrow (*Melospiza melodia*)
Cordilleran flycatcher *(Empidonax occidentalis)*	**Tree Swallow (*Tachycineta bicolor*)**
Eastern Kingbird (*Tyrannus tyrannus*)	Wilson's Warbler (*Wilsonia pusilla*)
Kill Deer (*Charadrius vociferus*)	Wood Duck (*Aix sponsa*)
Mallard (*Anas platyrhynchos*)	**Yellow Warbler (*Dendroica petechia*)**
Marsh Wren (*Cistothorus palustris*)	
MAMMAL	
Coyote (*Canis latrans*)	**Meadow vole (*Microtus pennsylvanicus*)**
Deer (*Odocoileus* spp.)	**Muskrat (*Ondatra zibethicus*)**

Bolded species were observed during the 2009 monitoring.

3.1.6 Macroinvertebrates

Macroinvertebrate sampling was not conducted at the Bouchard Property.

3.1.7 Functional Assessment

The functional assessment of 2009 was compared with the baseline conditions of 2004 (**Table 10**). The completed 2009 functional assessment is included in **Appendix B**. The Bouchard Property site was assessed as one assessment area (AA-1) and rated as a Category II site in 2009. Approximately 177 functional units occur at the Bouchard Property mitigation site (**Table 10**).

Table 10: ***Summary of baseline and 2009 wetland function/value ratings and functional points at the Bouchard Wetland Mitigation Project.***

Function and Value Parameters from the MDT Montana Wetland Assessment Method	2004 Baseline (AA-1)[1]	2009 (AA-1)[1]
Listed/Proposed T&E Species Habitat	Low (0.3)	Low (0.3)
MTNHP Species Habitat	Low (0.1)	Low (0.1)
General Wildlife Habitat	High (0.8)	High (0.9)
General Fish/Aquatic Habitat	NA	NA
Flood Attenuation	NA	NA
Short and Long Term Surface Water Storage	High (0.8)	High (0.9)
Sediment/Nutrient/Toxicant Removal	NA	High (1.0)
Sediment/Shoreline Stabilization	NA	NA
Production Export/Food Chain Support	High (0.9)	High (0.9)
Groundwater Discharge/Recharge	High (1.0)	High (1.0)
Uniqueness	Mod (0.6)	Mod (0.6)
Recreation/Education Potential	Low (0.1)	Mod (0.5)
Actual Points / Possible Points	**4.6 / 8**	**6.2 / 9**
% of Possible Score Achieved	**56%**	**69%**
Overall Category	**III**	**II**
Total Acreage of Assessed Wetlands and Open Water within Easement (ac)	**19.03**	**28.53**
Total Functional Units (acreage x actual points) (fu)	**87.54**	**176.89**
Net Acreage Gain (ac)	NA	**9.5**
Net Functional Unit Gain (fu)	NA	**89.35**

[1] The baseline assessment was performed by Herrera Environmental Consultants and the 2009 assessment was completed by PBS&J; both assessments used the 1999 MDT MWAM.

3.1.8 Photographs

Representative photographs were taken in 2009 from established photo-points and transect ends (**Appendix C**).

3.1.9 Revegetation Efforts

Wetland and riparian vegetation enhancements were implemented during 2006. Wetland areas surrounding the excavated areas were broadcast seeded with a custom wetland seed mix and also planted with herbaceous and woody seedlings (**Appendix G**). Upland and wetland seed mixes were drill seeded at the different mitigation types or cells. The site was planted with native shrubs, grasses and grass-like seedlings.

Survival rates for native shrub plantings were assessed during the summer of 2009. The PBS&J botanist walked ten transects within the planting areas, visually assessed, counted, and recorded all live woody plantings by species (**Monitoring Form** in **Appendix B**). The original planting numbers as listed on the **Monitoring Form** (**Appendix B**) were referenced from the *Bouchard Wetland – Wetland Planting Summary* (**Appendix G**). Actual planting numbers and prescribed species may have varied from the original plan. Three species were found that were not listed in the original planting summary. Overall survival ratings are considered moderate to high based on visual assessment. Plant growth was vigorous and looked healthy with few discolored leaves. Browse protection was intact during the monitoring visit. In the fall MDT removed the browse control from the plantings so that the plants could thrive without this constricting netting. Planted species have reached a large enough size that they can withstand some browse from local wildlife.

3.1.10 Maintenance Needs/Recommendations

Several Category 1 noxious weeds were present (**Bouchard Figure 3** in **Appendix A**): Canada thistle, hound's-tongue, oxeye daisy, St. John's wort, and spotted knapweed. Noxious weeds should be controlled in accordance with the *Noxious Weed Management Guidelines, Species and Control Methods for US 93 Evaro to Polson Wetland Mitigation Sites* contained in the mitigation plan (Herrera 2004).

3.1.11 Current Credit Summary

As of 2009, approximately 28.53 aquatic habitat acres (28.14 acres of wetlands, 0.39 acre of shallow open water) occur on the mitigation site. Pre-project wetland delineation documented 19.03 acres of wetlands / open water. The initially-calculated net increase in aquatic habitat acres to date is approximately 28.53 – 19.03 = 9.50 acres.

To determine the current crediting acres for the Bouchard Property, the total wetland acreage was separated into the individual mitigation type zones and the appropriate credit ratios applied for both the CSKT and Corps crediting systems. The Bouchard Property mitigation types are: creation, re-establishment (Corps) / primary restoration (CSKT), and rehabilitation (Corps) / secondary restoration (CSKT).

The following equation calculates the enhancement ratio for the rehabilitation activities based on functional assessment scores (**Table 10**):

$$\text{Enhancement factor} = \left[\left(F_{post} - F_{pre}\right) / F_{pre}\right]$$

where: F_{post} = projected post-mitigation project functional score; and F_{pre} = pre-project functional score.

Enhancement factor = [(6.2 – 4.6) / 4.6]; Enhancement factor = 0.35

Enhancement Ratio = 1/ 0.35; Enhancement Ratio = 2.86

Table 11 lists the current credits based on Corps and CSKT credit ratios, including this year's calculated ratio for the rehabilitation areas at the Bouchard Property site. The Bouchard Property wetland mitigation site is progressing toward reaching the expected credits. The site currently provides slightly less than the expected creation credit acres, but is exceeding expectations in the remaining categories and as a whole, and is predicted to continue gaining in functional points and credit acreage as the wetlands continue to develop.

Table 11. ***Current credits at the Bouchard Property Wetland Mitigation Site*.**

Targeted Mitigation Type	Current Wetlands (Acre)	Credit Ratio		Current Credit (acre)		Expected Credit (acre)	
		CORPS	CSKT	CORPS	CSKT	CORPS	CSKT
Creation	4.79	1:1	3.36:1	4.79	1.43	5.16	1.54
Re-establishment / primary restoration	4.71[1]	1:1	1.86:1	4.71	2.53	2.94	1.58
Rehabilitation / secondary restoration	19.03	2.86:1	1.86:1	6.65	10.23	4.05	10.23
Total	**28.53**			**16.15**	**14.19**	**12.15**	**13.35**

[1] Includes wetlands delineated outside of targeted creation, re-establishment, and rehabilitation areas and assumed to have been re-established by project implementation.

3.2 Jocko Spring Creek

3.2.1 Hydrology

The main source of hydrology for the site comes from the perennial Jocko Spring Creek. This mitigation site occurs along the newly constructed Jocko Spring Creek channel and floodplain. A secondary source of hydrology is the persistent upwelling and lateral movement of groundwater through the alluvial materials across the Jocko Valley. The site is located adjacent to a railroad line along the toe of the slope. The site may receive additional hydrology from discharging groundwater along that boundary. Inundation was observed across approximately 80% of the created and enhanced mitigation area wetlands adjacent to the channel.

According to the WRCC, mean monthly precipitation from January through July from 1896 to 2009 totaled 15.83 inches for the St Ignatius weather station (WRCC 2009). During 2009, 8.77 inches (55% of the mean) of precipitation were recorded at this station between January and July (WRCC 2009).

3.2.2 Vegetation

Fifty-eight plant species were identified at the site since 2008 (**Table 12**). The majority of these species are herbaceous. A few small remnant shrub patches exist, mostly along the southeast side of the project boundary. In addition, a small remnant stand of black cottonwood occurs within this area on the south side of railroad grade. A large peach-leaf willow occurs on the north side of the rail line along the old channel.

At the mitigation site five wetland and three upland communities were identified and mapped (**Jocko Spring Creek Figure 3** in **Appendix A**). The five wetland community types are Type 3: *Carex/Glyceria*, Type 4: *Typha,* Type 5: *Populus*, Type 6: *Juncus/Agrostis*, and Type 7: *Salix/Juncus.* The three upland community types are Type 1: *Agropyron*, Type 2: *Symphoricarpos,* and Type 8: *Salix.* Plant species observed within each of these communities are listed on the **Monitoring Form** (**Appendix B**).

Table 12: ***2007 to 2009 vegetation species list for the Jocko Spring Creek Wetland Mitigation Site.***

Scientific Name[1]	Common Name	Region 9 (Northwest) Wetland Indicator
Achillea millefolium	common yarrow	FACU
Agrostis alba	redtop	FAC+
Agropyron repens	quackgrass	FACU
Agropyron trachycaulum	slender wheatgrass	FAC
Alnus incana	alder	FACW
Bromus tectorum	cheatgrass	--
Carex aquatilis	water sedge	OBL
Carex bebbii	Bebb sedge	OBL
Carex lanuginosa	wooly sedge	OBL
Carex nebrascensis	Nebraska sedge	OBL
Carex spp.	sedge	--
Carex stipata	sawtooth sedge	OBL

[1] **Bolded** species indicate those documented in the analysis area for the first time in 2009.

Table 12 (continued): ***2007 to 2009 vegetation species list for the Jocko Spring Creek Wetland Mitigation Site.***

Scientific Name[1]	Common Name	Region 9 (Northwest) Wetland Indicator
Carex utriculata	beaked sedge	OBL
Centaurea maculosa	spotted knapweed	--
Chrysanthemum leucanthemum	oxeye daisy	--
Cirsium arvense	Canada thistle	FACU+
Cornus stolonifera	red-osier dogwood	FACW
Crataegus douglasii	Douglas hawthorn	FAC
Cynoglossum officinale	hound's tongue	FACU
Deschampsia cespitosa	tufted hairgrass	FACW
Dipsacus sylvestris	teasel	NI
Elodea canadensis	common waterweed	OBL
Epilobium ciliatum	hairy willow-herb	FACW+
Festuca idahoensis	Idaho fescue	--
Geum macrophyllum	big leafed avens	OBL
Glyceria grandis	tall mannagrass	OBL
Impatiens ecalcarata	Impatients	FACW
Juncus ensifolius	three-stamen rush	FACW
Juncus spp.	rush	--
Lactuca serriola	prickly lettuce	FAC-
Lepidium perfoliatum	clasping pepper-grass	FACU+
Lychnis alba	white campion	--
Mentha arvensis	field mint	FAC
Mimulus guttatus	monkey-flower	OBL
Nepeta cataria	catnip	--
Phalaris arundinacea	Reed canarygrass	FACW
Phleum pretense	timothy	FACU
Poa pratensis	Kentucky bluegrass	FACU+
Polygonum amphibium	water smartweed	OBL
Polygonum spp.	smartweed	--
Populus trichocarpa	cottonwood	FAC
Prunus Americana	American plum	FACU
Rorippa nasturtium-aquaticum	white watercress	OBL
Rosa woodsii	woods rose	FACU
Rumex crispus	curly dock	FACW
Salix amygdaloides	peach-leaf willow	FACW
Salix bebbiana	Bebb willow	FACW
Salix drummondiana	Drummond willow	FACW
Salix lutea	yellow willow	OBL
Scirpus microcarpus	small-fruit bulrush	OBL
Sisymbrium altissimum	tall tumble mustard	FACU-
Solanum dulcamara	climbing nightshade	FAC+
Solidago missouriensis	Missouri goldenrod	--
Symphoricarpos albus	snowberry	FACU
Thlaspi arvense	pennycress	NI
Typha latifolia	broad-leaf cattail	OBL
Veronica Americana	American speedwell	OBL
Verbascum Thapsus	common mullein	--

[1] **Bolded** species indicate those documented in the analysis area for the first time in 2009.

Types 3 and 4 are the wettest community types and occurred as emergent wetland communities with shallow inundation (**Jocko Spring Creek Figure 3** in **Appendix A**). Type 3 was the most prevalent community type and was dominated by beaked sedge, Bebbs sedge, tall mannagrass, dagger rush, and reed canarygrass. Type 4 was dominated by cattail and had a minor amount of reed canarygrass.

Types 5, 6, and 7 were the next wettest areas, consisting of emergent and scrub-shrub vegetation types occurring in an undisturbed wetland and on the fringes of a newly constructed channel. Type 5 consisted of a small stand of forested vegetation dominated by black cottonwood with an understory of Bebbs willow and reed canarygrass. Type 6 was located adjacent to the channel and was dominated by Baltic rush and redtop. Type 7 was a remnant shrub patch dominated by an overstory of Bebbs willow and an understory of Baltic rush and redtop. Type 7 was similar to Type 6, except for the inclusion of shrub species.

Adjacent upland vegetation communities were dominated by pasture grasses, aggressive invasive plants, upland shrubs, and several large peach-leaf willows. Type 1 upland areas were currently dominated by slender wheatgrass, quackgrass, Kentucky bluegrass, Idaho fescue, cheatgrass and clasping pepper-grass. Type 2 upland areas were dominated by mostly common snowberry found in thick patches between the railroad grade and the highway, and other invasive species including Canada thistle, hound's-tongue, quackgrass and goldenrod. Type 8 was a small area dominated by several large peach-leaf willows along the north side of railroad grade located adjacent to the old Jocko Spring Creek channel.

Several noxious weeds were observed and mapped throughout the Jocko Spring Creek site (**Jocko Spring Creek Figure 3** in **Appendix A**). Types 1 and 2 contained several patches of invasive species with a moderate cover class. These were individual noxious weed locations or small patches not mapped as a community type, and included Canada thistle and hound's-tongue.

Vegetation transect results are detailed in the **Monitoring Form** (**Appendix B**) and are summarized in tabular format (**Tables 13** and **14**), and are graphically illustrated (**Charts 7** to **10**). The 2007 transect location was changed in 2008; therefore, no 2007 transect data are presented.

Table 13: ***Jocko Spring Creek - Transect 1 data summary.***

Monitoring Year	2008	2009
Transect Length (feet)	75	75
# Vegetation Community Transitions along Transect	2	2
# Vegetation Communities along Transect	2	2
# Hydrophytic Vegetation Communities along Transect	1	1
Total Vegetative Species	16	18
Total Hydrophytic Species	12	15
Total Upland Species	4	3
Estimated % Total Vegetative Cover	95	95
% Transect Length Comprised of Hydrophytic Vegetation Communities	63	63
% Transect Length Comprised of Upland Vegetation Communities	24	24
% Transect Length Comprised of Unvegetated Open Water	13	13
% Transect Length Comprised of Bare Substrate	0	0

Table 14: ***Jocko Spring Creek - Transect 2 data summary.***

Monitoring Year	2008	2009
Transect Length (feet)	208	208
# Vegetation Community Transitions along Transect	2	2
# Vegetation Communities along Transect	2	2
# Hydrophytic Vegetation Communities along Transect	1	1
Total Vegetative Species	23	25
Total Hydrophytic Species	17	19
Total Upland Species	6	6
Estimated % Total Vegetative Cover	82	92
% Transect Length Comprised of Hydrophytic Vegetation Communities	89	88
% Transect Length Comprised of Upland Vegetation Communities	6	7
% Transect Length Comprised of Unvegetated Open Water	5	5
% Transect Length Comprised of Bare Substrate	0	0

Chart 7: ***Jocko Spring Creek - Transect 1 maps showing vegetation types from the start (0 feet) to the end (75 feet) for each year monitored.***

Chart 8: ***Jocko Spring Creek - length of vegetation communities within Transect 1 from 2008 to 2009.***

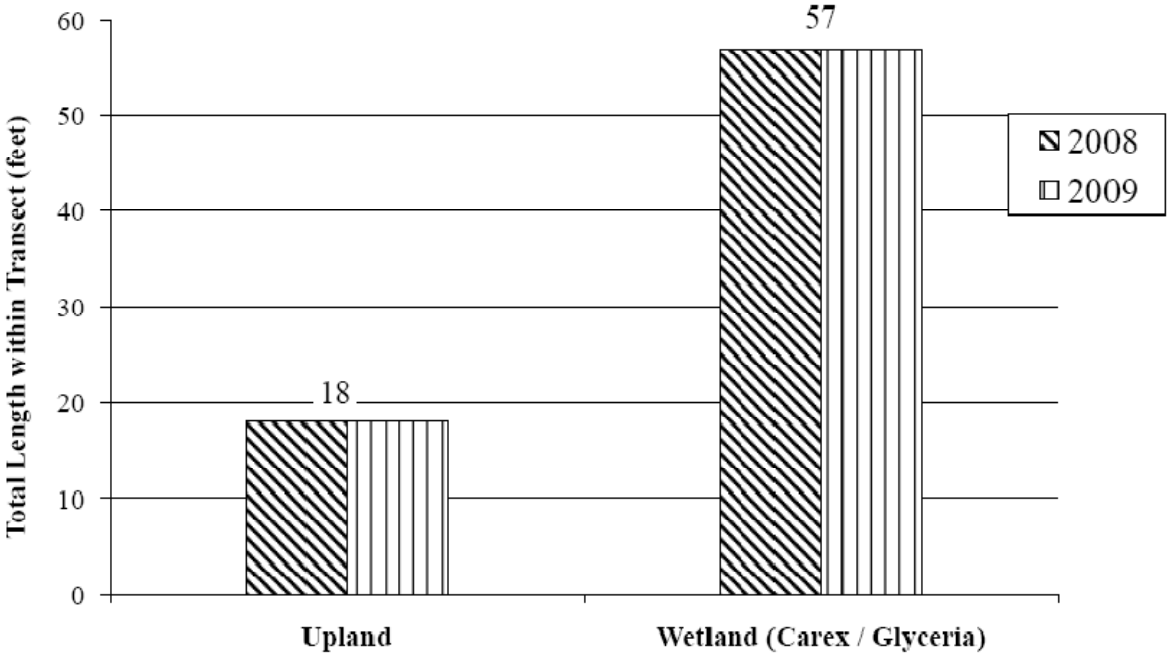


Chart 9: ***Jocko Spring Creek - Transect 2 maps showing vegetation types from the start (0 feet) to the end (208 feet) for each year monitored.***

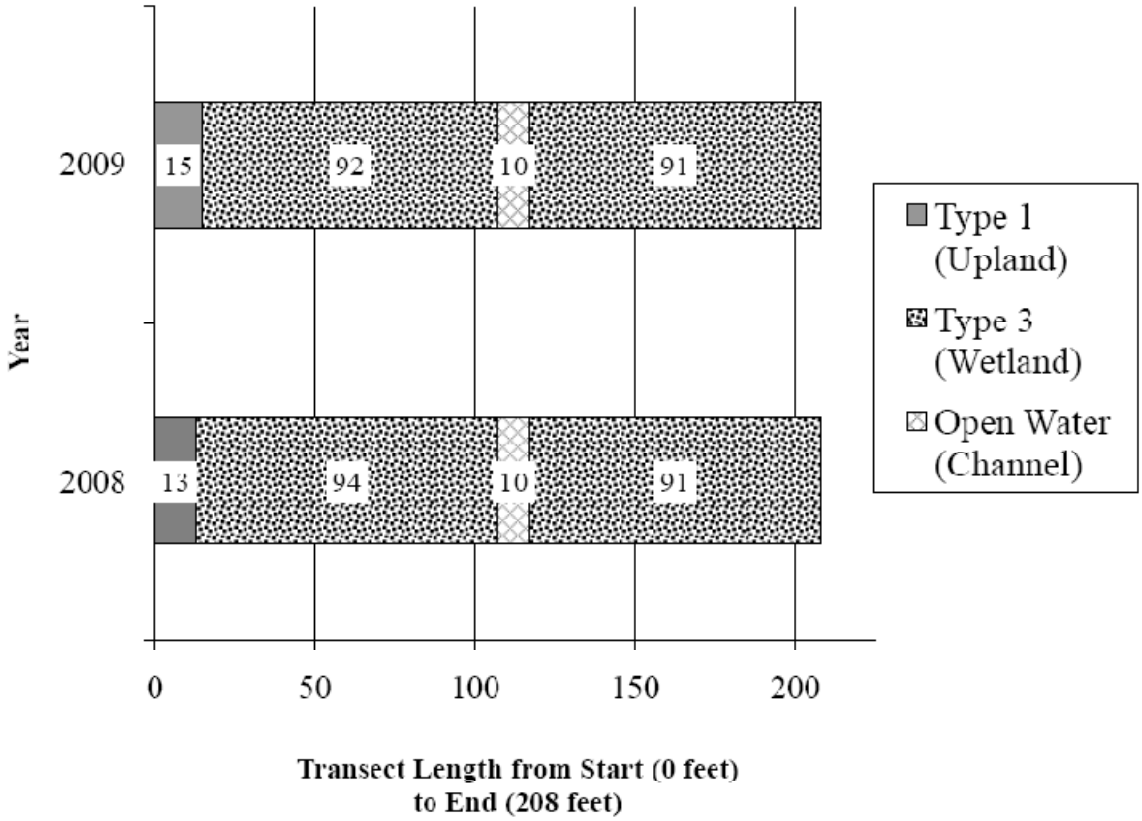
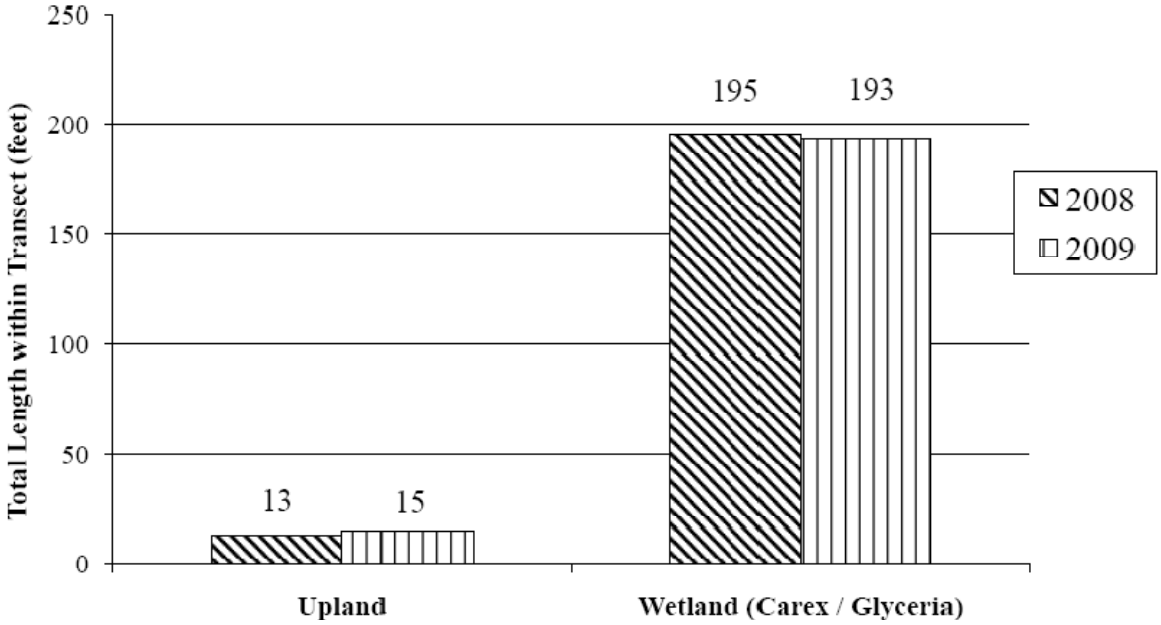


Chart 10: ***Jocko Spring Creek - length of vegetation communities within Transect 2 from 2008 to 2009.***



3.2.3 Soils

Soils at the site were mapped in the Lake County Soil Survey as Jocko gravelly loam, 0 to 4 percent slope, Ninepipe silt loam, 0 to 2 percent slope, and Xerofluvents, 0 to 2 percent slope (NRCS 2009). The Jocko gravelly loam series are somewhat excessively drained soils and are located on stream terraces. The Ninepipe and Xerofluvents soil series are associated with low stream terraces, fans drainageways, and floodplains, and are moderately drained to somewhat poorly drained. Xerofluvents have two minor inclusions: Bohnly and Belton soils. Bohnly soils are considered hydric and are poorly drained (NRCS 2008).

Wetland soils observed during monitoring and documented on the Routine Wetland Determination form were mostly loams, or silt loams with very low chroma colors (1 or 2) within several inches of the surface (**Appendix B**). Redoximorphic feature such as redox concentrations or depleted matrix were not present in profiles.

3.2.4 Wetland Delineation

Wetland boundaries were delineated and mapped (**Jocko Spring Creek Figure 3** in **Appendix A**). Approximately 2.08 aquatic habitat acres occurred within the monitoring area (**Table 15**; **Jocko Spring Creek Figure 3** in **Appendix A**).

Table 15: ***Aquatic habitats and acreages at the Jocko Spring Creek Wetland Mitigation Site.***

CONDITION	2007(acre)[2]	2004[1] (acre)	2009 (acre)
Wetland Area	1.35	2.0	1.81
Open Water Area			0.27
Total Aquatic Habitat	**1.35**	**2.0**	**2.08**

[1]Herrera 2004, [2]Herrera 2007

Pre-project wetland delineation documented 2.0 acres of wetlands, which included the degraded Jocko Spring Creek channel and wetlands along the west side of the MRL line that were enhanced as part of the mitigation activities (Herrera 2004). The net increase in aquatic habitat acres to date on the site was approximately 2.08 – 2.0 = 0.08 acre.

Wetland size increased between the 2007 and 2008 monitoring by 0.90 acre. Wetland mapping captured new wetland areas along the southeast boundary during the 2008 monitoring that were not mapped during 2007, possibly due to wetland development associated with continued surface and groundwater flows across the site. During the 2009 monitoring the wetland areas were observed to be similar in size as those mapped in 2008. Approximately 1.81 wetland acres and 0.27 open water acre (consisting of the creek) occurred within the monitoring area (**Jocko Spring Creek Figure 3** in **Appendix A**).

3.2.5 Fish and Wildlife

A comprehensive list of fish, mammals, reptiles, amphibians, and birds using the Jocko Spring Creek Site has been maintained since 2007 (**Table 16**). In 2009 three mammal and four bird species were noted at the mitigation site (**Table 16**). Specific evidence observed, as well as activity codes pertaining to birds, was recorded onto the **Monitoring Form** and **Bird Survey Form** in **Appendix B**.

Table 16: ***Fish and wildlife species observed at the Jocko Spring Creek Wetland Mitigation Site from 2007 to 2009***.

FISH	
Longnose dace (*Rhinichthys cataractae*)[1]	Mountain whitefish (*Prosopium williamsoni*)[1]
Longnose sucker (*Catostomus catostomus*)[1]	Rainbow trout (*Oncorhynchus mykiss*)[1]
Brook trout (*Salvelinus fontinalis*)[1]	Rainbow trout x westslope cutthroat trout (*Oncorhynchus clarkii X mykiss*)[1]
Brown trout (*Salmo trutta*)[1]	Slimy sculpins (*Cottus cognatus*)[1]
AMPHIBIAN	
None	
REPTILE	
Painted Turtle (*Chrysemys picta*)	

[1] Survey conducted by CSKT Fisheries Department.
[2] Observed by MDT.
Bolded species were observed during the 2009 monitoring.

Table 16 (continued): ***Fish and wildlife species observed at the Jocko Spring Creek Wetland Mitigation Site from 2007 to 2009***.

BIRD	
American Coot (*Fulica americana*)	Hooded Merganser (*Lophodytes cucullatus*)
American Crow (*Corvus brachyrhynchos*)	**Killdeer (*Charadrius vociferous*)**
American Robin (*Turdus migratorius*)[2]	Lesser Yellowlegs (*Tringa flavipes*)
American Wigeon (*Anas americana*)	Mallard (*Anas platyrhynchos*)[2]
American White Pelican (*Pelecanus erythrorhynchos*)	Mourning Dove (*Zenaida macroura*)[2]
Bald Eagle (*Haliaeetus leucocephalus*)	Northern Flicker (*Colaptes auratus*)
Belted Kingfisher (*Ceryle alcyon*)	Northern Harrier (*Circus cyaneus*)
Barn Swallow (*Hirundo rustica*)	Northern Shoveler (*Anas clypeata*)
Black-Billed Magpie (*Pica hudsonia*)[2]	Osprey (*Pandoin haliaetus*)[2]
Black Capped Chickadee (*Parus atricapillus*)[2]	Red-Tailed Hawk (*Buteo jamaicensis*)[2]
Black & White Warbler (*Mniotilta varia*)	Red-Winged blackbird
Blue-Winged Teal (*Anas discors*)	(*Agelaius phoeniceus*)[2]
Brown-Headed cowbird (*Molothrus ater*)	Ring-Billed Gull (*Larus delawarensis*)[2]
Canada Goose (*Branta canadensis*)	**Ring-necked Pheasant (*Phasianus colchicus*)**
Cinnamon Teal (*Anas cyanoptera*)	Song Sparrow (*Melospiza melodia*)
Cliff Swallow (*Petrochelidon pyrrhonota*)	Spotted Sandpiper (*Actitis macularia*)[2]
Common Raven (*Corvus corax)*[2]	**Tree Swallow (*Tachycineta bicolor*)**
Doubled Crested Cormorant (*Phalacrocorax auritus*)	Violet-Green Swallow (*Tachycineta thalassina*)
Eastern Kingbird (Tyrannus tyrannus)	Western Kingbird (*Tyrannus verticalis*)
Eurasian Wigeon (*Anas Penelope*)	Western Meadowlark (*Sturnella neglecta*)
European Starling (*Sturnus vulgaris*)	Wood Duck (*Aix sponsa*)[2]
Field Sparrow (*Spizella pusilla*)	Yellow-Headed Blackbird
Great Blue Heron (*Ardea herodias*)	(*Xanthocephalus xanthocephalus*)[2]
	Yellow Warbler (*Dendroica petechia*)[2]
MAMMAL	
Coyote (*Canis latrans*)	**Muskrat (*Ondatra zibethicus*)**
Deer (*Odocoileus* spp.)	**Raccoon (*Procyon lotor*)**
Mouse [young] (*Peromyscus* spp.)	Red Fox (*Vulpes vulpes*)

[1] Survey conducted by CSKT Fisheries Department.
[2] Observed by MDT.
Bolded species were observed during the 2009 monitoring.

3.2.6 Macroinvertebrates

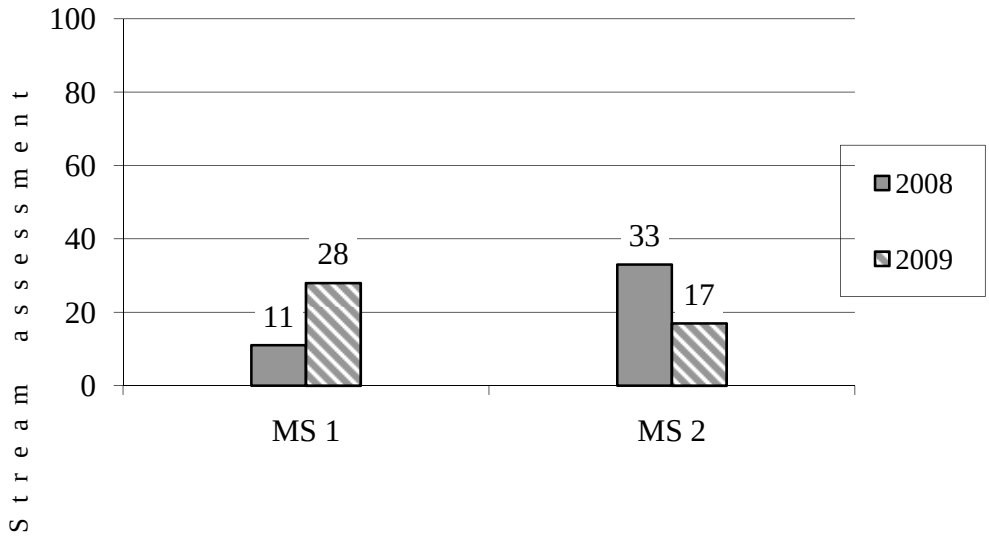
Macroinvertebrates were sampled at two locations along the newly constructed channel a the Jocko Spring Creek site (**Jocko Spring Creek Figure 2** in **Appendix A**). The complete macroinvertebrate data results are included in **Appendix F** and are summarized below, in italics, by Rhithron Associates, Inc. (Bollman 2009).

> *The sampled sites on Jocko Spring Creek supported rheophilic taxa characteristic of flowing water and cool water temperatures unlike conditions expected in wetlands. Scores indicated in the chart were derived by means of a metric battery and scoring criteria developed for lotic conditions (MVFP index: Bollman 1998) (**Chart 11**). However, the MVFP index may not adequately assess spring creek fauna, which is distinctive from that of run-off dominated stream systems.*

Jocko Spring Creek – MS 1 (downstream location). *Invertebrates were much more abundant in the 2009 sample than in the 2008 sample: this finding suggests improved conditions that favored colonization. Water quality and/or habitat improvements may account for the differences. Chironomids accounted for 49% of animals collected in 2009, with the Eukiefferiella Claripennis Group dominating. The abundance of this group along with numerous other midges with similar habits suggests the presence of filamentous algae or other floating algal masses. Mayflies were rare, and stoneflies were not collected in the sample. This pattern may be characteristic of stream reaches with large volumes of spring flow. The MVFP index, which indicated "moderate" impairment may overestimate degradation in such a case; however, the assessment score improved significantly since 2008 (**Chart 11**). Thermal preference of the sampled assemblage was estimated at 15.9C.*

Jocko Spring Creek – MS 2 (upstream location). *While the bioassessment index indicated improvement at the MS 1 site, scores for the MS 2 site worsened between 2008 and 2009 (**Chart 11**). The taxonomic composition of the fauna remained similar over the study period, but some caddisfly taxa were apparently lost, and the proportion of tolerant taxa increased in 2009. As a result of poor metric performance, the impairment at the site was classified as "severe". However, just as in the case of the MS 1 site, metric expressions in the MVFP assessment tool may not adequately assess conditions in spring creeks. The fauna was not as complex as expected for a runoff dominated system, but may have been a good representation of expectations for a spring stream. Midge taxa associated with filamentous algae were common in the sample. Thermal preference of the assemblage was calculated at 16.7ºC.*

Chart 11: ***Bioassessment scores using the MVFP index for the Jocko Spring Creek Wetland Mitigation Site.***



3.2.7 Functional Assessment

The functional assessment of 2009 was compared with the baseline conditions of 2004 (**Table 17**). The completed 2009 functional assessment is included in **Appendix B**. The Jocko Spring Creek site was assessed as one area (AA-1) rated as a Category II site. Approximately 18.1 functional units occur at the Jocko Spring Creek mitigation site as of 2009 (**Table 17**).

Despite projections, the post-project assessment considered the site to have a moderate (as opposed to low) disturbance rating due to the existing agriculture to west, adjacent railroad grade and highway influence. Functional points and ratings improved significantly for several assessed parameters over baseline conditions (**Table 17**).

Table 17: ***Summary of baseline and 2009 wetland function/value ratings and functional points at the Jocko Spring Creek Wetland Mitigation Project.***

Function and Value Parameters from the MDT Montana Wetland Assessment Method	2004 Baseline (AA-1)[1]	2009 (AA-1)[1]
Listed/Proposed T&E Species Habitat	Low (0.3)	Low (0.3)
MTNHP Species Habitat	Mod (0.6)	Mod (0.6)
General Wildlife Habitat	Mod (0.5)	Mod (0.7)
General Fish/Aquatic Habitat	High (0.9)	High (0.9)
Flood Attenuation	Low (0.2)	Low (0.1)
Short and Long Term Surface Water Storage	High (0.8)	High (0.8)
Sediment/Nutrient/Toxicant Removal	Mod (0.6)	High (0.9)
Sediment/Shoreline Stabilization	Mod (0.7)	High (1.0)
Production Export/Food Chain Support	Mod (0.7)	High (0.9)
Groundwater Discharge/Recharge	High (1)	High (1.0)
Uniqueness	Mod (0.4)	Mod (0.5)
Recreation/Education Potential	High (1.0)	High (1.0)
Actual Points / Possible Points	**7.7 / 12**	**8.7 / 12**
% of Possible Score Achieved	**64%**	**73%**
Overall Category	**III**	**II**
Total Acreage of Assessed Wetlands and Open Water within Easement (ac)	**2.00**	**2.08**
Total Functional Units (acreage x actual points) (fu)	**15.40**	**18.1**
Net Acreage Gain (ac)	NA	**0.08**
Net Functional Unit Gain (fu)	NA	**2.7**

[1] The baseline assessment was performed by Herrera Environmental Consultants and the 2009 assessment was completed by PBS&J; both assessments used the 1999 MDT MWAM.

3.2.8 Photographs

Representative photographs were taken in 2009 from established photo-points and transect ends (**Appendix C**).

3.2.9 Revegetation Efforts

Wetland and riparian vegetation seeding and plantings were implemented in 2006. These enhancements included broadcast seeding of a wetland seed mix and planting of native shrub and grass-like seedlings (**Appendix G**).

Survival rates for native shrub plantings were assessed in 2009. The PBS&J botanist walked three transects within the planting areas, visually assessed, counted, and recorded all live woody plantings by species (**Monitoring Form** in **Appendix B**). The survival transects only assessed woody species and not the grass-like species plantings. Two transects were established along the wetlands with one on both sides of wetlands near the outer edge, capturing the varying planting zones. A third survival transect was established on the north side of the railroad grade within the restored upland community.

The percentage ratings for each species' survival were not calculated due to lack of quantifiable planting numbers within the transect locations and the inherit inaccuracy with calculations based on total number of original plantings within limited transect areas. The observed plantings in all the transects looked healthy and exhibited vigorous growth for the season. A few dead species were recorded. Plantings were protected with browse control nets that offered protection from local wildlife. Plantings along the wetland fringes were flourishing and received more than adequate hydrology to sustain continued growth.

3.2.10 Maintenance Needs/Recommendations

Category 1 noxious weeds Canada thistle and hound's-tongue were present with moderate cover values (**Jocko Spring Creek Figure 3** in **Appendix A**). Noxious weeds should be controlled in accordance with the *Noxious Weed Management Guidelines, Species and Control Methods for US 93 Evaro to Polson Wetland Mitigation Sites* contained in the mitigation plan (Herrera 2004).

3.2.11 Current Credit Summary

As of 2009, approximately 1.81 acres of wetland and 0.27 acres of open water / channel occurred on the mitigation site, for a total of 2.08 acres of aquatic habitat (**Table 18**). Subtracting the original 2.0 acres of pre-project wetlands from this total yields a current net of approximately 0.08 wetland/open water acres. The site has gained approximately 2.7 functional units to date (**Table 17**).

To determine the current crediting acres for the Jocko Spring Creek, the total wetland acreage was separated into the individual mitigation type zones, acreages were calculated for each type, and credit ratios were applied for both the CSKT and Corps crediting systems. The Jocko Spring Creek mitigation types consist of creation, re-establishment (Corps) / primary restoration (CSKT), and enhancement (Corps) / secondary restoration (CSKT).

The following equation calculates the enhancement ratio for the rehabilitation activities based on functional assessment scores described in preceding **Table 17**:

Enhancement factor = $\left[\left(F_{post} - F_{pre}\right)/ F_{pre}\right]$

Enhancement factor = [(8.7 – 7.7)/ 7.7]; Enhancement factor = 0.13

Enhancement Ratio = 1/ 0.13; Enhancement Ratio = 7.69

Table 18 lists the current credits based on Corps and CSKT credit ratios, including this year's calculated ratio for the rehabilitation areas at the Jocko Spring Creek site. The Jocko Spring Creek wetland mitigation site is progressing toward reaching the expected credits. Current credit acres are below expected credit acres, but with further development of targeted wetland creation between the highway and the railroad grade, the site could reach the mitigation goals. Functional assessment scores are predicted to increase as the vegetation matures.

Table 18: ***Current credits at the Jocko Spring Creek Wetland Mitigation Site.***

Targeted Mitigation Type[1]	Current Wetland (Acre)[1]	Credit Ratio		Current Credit (acre)		Expected Credit (acre)	
		Corps	CSKT	Corps	CSKT	Corps	CSKT
Creation	0.66	1:1	3.36:1	0.66	0.19	2.17	1.17
Rehabilitation / primary restoration	0.82	1:1	1.86:1	0.82	0.44	0.59[2]	0.32
Enhancement / secondary restoration	0.05	7.69:1	--	0.01	0.0	0.01	0.0
Assumed pre-existing wetland (based on the site plan) occurring outside of Mitigation Type boundaries	0.55	--	--	--	--	--	--
TOTAL	**2.08**			**1.49**	**0.63**	**2.77[2]**	**1.49**

[1] Target mitigation type zone boundaries were derived from the site plan.
[2] Corrected from values presented in the 2007 monitoring report. The revised figures are based on the site plan (**Appendix D**).

3.3 Mission Creek

3.3.1 Hydrology

The main source of hydrology comes from the perennial Mission Creek. This creek is sourced from the Mission Reservoir and groundwater along the drainage way. This mitigation site occurs along the Mission Creek channel and restored floodplain where Highway 93 crosses at the newly constructed bridge.

According to the WRCC, mean monthly precipitation from January through July from 1896 to 2009 totaled 15.83 inches for the St Ignatius weather station (WRCC 2009). During 2009, 8.77 inches (55% of the mean) of precipitation were recorded at this station between January and July (WRCC 2009).

3.3.2 Vegetation

Forty-eight plant species were identified at the site (**Table 19**). The majority of these species are herbaceous. One wetland and one upland community type were identified and mapped at the mitigation site (**Mission Creek Figure 3** in **Appendix A**). The wetland community type is Type 2: *Carex*, and the upland community type is Type 1: *Elymus*. Plant species observed within each of these communities are listed on the **Monitoring Form** (**Appendix B**).

Type 2 is the wettest community type and occurred as emergent wetland community along the edge of the stream channel that receives annual inundation (**Mission Creek Figure 3** in **Appendix A**). Type 2 is dominated by Nebraska sedge, fowl mannagrass, small-fruit bulrush and hardstem bulrush and sandbar willow.

Type 1 areas were mostly located within the floodplain of Mission Creek and received annual inundation. The ordinary high water mark runs across portions of the site designated as Type 1 areas. These areas were part of the restored stream channel floodplain and have been planted with riparian / wetland species. Type 1 upland areas were dominated by blue wildrye, black cottonwood, thin-leaf alder, red-osier dogwood, and woods rose.

Several noxious weeds were observed and mapped throughout the Mission Creek site (**Mission Creek Figure 3** in **Appendix A**). Types 1 and 2 contained several patches of invasive species with a moderate cover class. These were individual noxious weed locations or small patches not mapped as a community type, and included Canada thistle and hound's-tongue.

Table 19: ***2009 vegetation species list for the Mission Creek Wetland Mitigation Site.***

Scientific Name	Common Name	Region 9 (Northwest) Wetland Indicator
Achillea millefolium	common yarrow	FACU
Agrostis alba	redtop	FAC+
Agropyron smithii	western wheatgrass	FACU
Alnus incana	alder	FACW
Amelanchier alnifolia	serviceberry	FACU
Betula occidentalis	water birch	FACW
Carex nebrascensis	Nebraska sedge	OBL
Carex retrorsa	retrorse sedge	FAC
Carex stipata	awlfruit sedge	OBL
Carex utriculata	beaked sedge	OBL
Chrysanthemum leucanthemum	oxeye daisy	--
Cirsium arvense	Canada thistle	FACU+
Cirsium vulgare	bull thistle	FACU
Cornus stolonifera	red-osier dogwood	FACW
Crataegus douglasii	Douglas hawthorn	FAC
Crataegus douglasii	tufted hairgrass	FACW
Elymus glaucus	blue-wildrye	FACU
Epilobium ciliatum	hairy willow-herb	FACW+
Galium spp.	bedstraw	--
Geum macrophyllum	big leafed avens	OBL
Glyceria striata	tall mannagrass	OBL
Hypericum perforatum	St. John wort	--
Impatiens ecalcarata	impatients	FACW
Iris pseudacorus	yellow-flag iris	OBL
Juncus ensifolius	three-stamen rush	FACW
Medicago Sativa	yellow clover	--
Nepeta cataria	catnip	--
Phalaris arundinacea	reed canarygrass	FACW
Poa pratensis	Kentucky bluegrass	FACU
Populus trichocarpa	cottonwood	FAC
Potentilla gracilis	slender cinquefoil	--
Prunus virginiana	chokecherry	FACU
Ranunculus aquatilis	whitewater buttercup	OBL
Rosa woodsii	woods rose	FACU
Rubus idaeus	common raspberry	FACU
Rumex crispus	curly dock	FACW
Salix bebbiana	Bebb willow	FACW
Salix exigua	sandbar willow	OBL
Salix lutea	yellow willow	OBL
Scirpus acutus	hardstem bulrush	OBL
Scirpus microcarpus	small-fruit bulrush	OBL
Symphoricarpos albus	snowberry	FACU
Taraxacum officinale	common dandelion	FACU
Tragopogon dubius	goatsbeard	--
Trifolium pratense	red clover	FACU
Urtica dioica	stinging nettle	FAC
Verbascum thapsus	common mullein	--
Xanthium strumarium	cocklebur	FAC

Vegetation transects were not established at the Mission Creek Site.

3.3.3 Soils

Soil at the site is mapped in the Lake County Soil Survey as Lamoose loam, 0 to 2 percent slopes, which is listed as a hydric soil for Lake County (NRCS 2009 and 2008). The Lamoose loam series are associated with floodplain landforms and have a drainage class of poorly drained (NRCS 2009).

Wetland soils observed during monitoring and documented on the Routine Wetland Determination form were mostly loams, or silt loams with very low chroma colors (1 or 2) within several inches of the surface. Redoximorphic feature such as redox concentrations or depleted matrix were not present in profiles.

3.3.4 Wetland Delineation

Wetland boundaries were delineated and mapped (**Mission Creek Figure 3** in **Appendix A**). Approximately 0.02 wetland acres occur within the monitoring area (**Table 20**; **Mission Creek Figure 3** in **Appendix A**). Consistent with the proposed plan, the acreage of Mission Creek itself was not included in wetland or floodplain totals.

Table 20: ***Habitats and acreages at the Mission Creek Wetland Mitigation Site.***

CONDITION	2009 (acre)
Wetland	0.02
Non-Wetland Floodplain Area - Re-establishment / Enhancement	0.20
Total	**0.22**

A pre-project wetland delineation was not available for the Mission Creek site. The total wetland habitat at the site equates to approximately 0.02 acre (**Table 20**). The non-wetland floodplain re-establishment / enhancement areas totaled 0.2 acre (**Table 20**).

3.3.5 Wildlife

A list of fish, mammals, reptiles, amphibians, and birds found at the Mission Creek Site was developed in 2009 (**Table 21**). One mammal and three bird species were noted at the mitigation site during the 2009 site visit (**Table 21**). Specific evidence observed, as well as activity codes pertaining to birds, was recorded onto the **Monitoring Form** and **Bird Survey Form** in **Appendix B**. The removal of the existing metal pipe (culvert) and construction of an open span bridge has allowed wildlife to travel freely under the highway corridor. A significant increase in wildlife passage is expected along this drainage way.

3.3.6 Macroinvertebrates

Macroinvertebrate sampling was not conducted at the Mission Creek site.

Table 21: ***Fish and wildlife species observed at the Mission Creek Wetland Mitigation Site in 2009***.

FISH None	
AMPHIBIAN None	
REPTILE None	
BIRD Great horned owl (*Bubo virginianus*) Cliff swallow (*Petrochelidon pyrrhonota*)	Red-winged blackbird (*Agelaius phoeniceus*)
MAMMAL Deer (*Odocoileus* spp.)	

3.3.7 Functional Assessment

The functional assessment of 2009 was compared with the baseline conditions of 2004 (**Table 10**). The completed 2009 functional assessment is included in **Appendix B**. The Mission Creek site was assessed as one area (AA-1) and rated as a Category I site, as it was during the baseline assessment. The AA encompasses portions of the up- and down-stream areas of existing forested, scrub-shrub, and emergent wetlands located on either side of restoration zones. These areas were included in the pre-project evaluation and also included in the 2009 evaluation for consistency with pre- and post-project comparison. Approximately 8 functional units occur at the Mission Creek mitigation site as of 2009 (**Table 22**).

The post-project assessment considered the site to have a moderate disturbance rating due to the existing agriculture and highway influence. Most of the assessed parameters rated moderate to high in 2009 (**Table 22**). Overall, the 2009 functional assessment was similar to the 2004 baseline conditions (**Table 22**).

3.3.8 Photographs

Representative photographs were taken in 2009 from established photo-points and transect ends (**Appendix C**).

Table 22: ***Summary of baseline and 2009 wetland function/value ratings and functional points at the Mission Creek Wetland Mitigation Project.***

Function and Value Parameters from the MDT Montana Wetland Assessment Method	2004 Baseline (AA-1)[1]	2009 (AA-1)[2]
Listed/Proposed T&E Species Habitat	High (1.0)	High (1.0)
MTNHP Species Habitat	Mod (0.7)	Mod (0.7)
General Wildlife Habitat	High (0.9)	High (0.9)
General Fish/Aquatic Habitat	High (0.9)	High (0.9)
Flood Attenuation	Mod (0.7)	Mod (0.7)
Short and Long Term Surface Water Storage	High (0.8)	High (0.8)
Sediment/Nutrient/Toxicant Removal	High (0.9)	High (0.9)
Sediment/Shoreline Stabilization	High (1.0)	High (1.0)
Production Export/Food Chain Support	High (1.0)	High (1.0)
Groundwater Discharge/Recharge	High (1.0)	High (1.0)
Uniqueness	Mod (0.5)	Mod (0.5)
Recreation/Education Potential	High (1.0)	High (1.0)
Actual Points / Possible Points	**10.4 / 12**	**10.4 / 12**
% of Possible Score Achieved	**87%**	**87%**
Overall Category	**I**	**I**
Total Acreage of Assessed Wetlands and Open Water within Easement (ac)	Unknown	**0.77**[2]
Total Functional Units (acreage x actual points) (fu)	Unknown	**8.00**
Net Acreage Gain (ac)	NA	Unknown
Net Functional Unit Gain (fu)	NA	Unknown

[1] The baseline assessment was performed by Herrera Environmental Consultants and the 2009 assessment was completed by PBS&J; both assessments used the 1999 MDT MWAM.

[2] Includes 0.02 acre of wetland and approximately 0.75 acre of Mission Creek within monitoring limits.

3.3.9 Revegetation Efforts

Wetland and riparian vegetation seeding and plantings were implemented in 2008 (**Appendix G**). These enhancements included broadcast seeding of a wetland seed mix and planting of native shrub and grass-like seedlings. Survival rates for native shrub plantings were assessed in 2009. The PBS&J botanist walked several transects within the planting areas and record all living woody plantings by species. The survival transects only assessed woody species and not the grass-like species plantings. Three areas had transects established including the southwest, southeast and northeast zones of the re-establishment areas. The channel and bridge features separated the site into four individual zones.

Survival data is detailed in the **Monitoring Form** and includes general qualitative descriptions of each species within each planting area (**Appendix B**). The percentage ratings for each species' survival were not calculated due to lack of quantifiable planting numbers within the transect locations and the inherit inaccuracy with calculations based on total number of original plantings within limited transect areas. The observed plantings along all transects looked healthy and exhibited vigorous growth for the season. Few dead individuals were recorded. Plantings along the wetland fringes were flourishing and received more than adequate hydrology to sustain continued growth.

3.3.10 Maintenance Needs/Recommendations

Category 1 noxious weeds Canada thistle and hound's-tongue were present at moderate cover values (**Mission Creek Figure 3** in **Appendix A**). Noxious weeds should be controlled in accordance with the *Noxious Weed Management Guidelines, Species and Control Methods for US 93 Evaro to Polson Wetland Mitigation Sites* that can be found in the mitigation plan (Herrera 2004).

3.3.11 Current Credit Summary

As of 2009, the total wetland habitat at the site equates to approximately 0.02 acre, and the non-wetland floodplain re-establishment / enhancement areas totaled 0.2 acre, which comes to a grand total of 0.22acre (**Table 23**). To determine the current crediting acres for the Mission Creek site, the total wetland and non-wetland floodplain "re-establishment" acreage was subjected to agreed-upon credit ratios for both the CSKT and Corps crediting systems. The Mission Creek mitigation types consist of re-establishment (Corps) / primary restoration (CSKT).

Table 23 lists the current credits based on Corps and CSKT credit ratios for the re-establishment areas at the Mission Creek site. The Mission Creek wetland mitigation site has reached the expected credits for the proposed Corps credits. The current credits are slightly below the expected CSKT credits by 0.04 acre.

Table 23: ***Current credits at the Mission Creek Mitigation Site.***

Targeted Mitigation Type[1]	2009 (acre)[1]	Credit Ratio		Current Credit (acre)		Expected Credit (acre)	
		Corps	CSKT	Corps	CSKT	Corps	CSKT
Rehabilitation / primary restoration areas (wetland and non-wetland per site plan)	0.22	1:1	1.86:1	0.22	0.11	0.22[1]	0.15
TOTAL	**0.22**			**0.22**	**0.11**	**0.22**	**0.15**

[1] Target mitigation type zone boundaries were derived from the site plan.

3.4 Mud Creek

3.4.1 Hydrology

The main source of hydrology at the Mud Creek site comes from the perennial Mud Creek. This mitigation site occurs on the west side of the highway within an existing depressional wetland that has shallow groundwater and overbank flow from the restored Mud Creek. The site receives seasonal flooding during spring runoff and sustained flows during the summer from irrigation return and groundwater sources. Inundation was present throughout all of Community Types 5 and 8 (**Mud Creek Figure 3** in **Appendix A**).

According to the WRCC, mean monthly precipitation from January through July from 1896 to 2009 totaled 15.83 inches for the St Ignatius weather station (WRCC 2009). During 2009, 8.77 inches (55% of the mean) of precipitation were recorded at this station between January and July (WRCC 2009).

3.4.2 Vegetation

Sixty-eight plant species were identified at the site in 2009 (**Table 24**). The majority of these species are herbaceous. The site has a small area of existing riparian shrub species. Seven wetland and one upland community types were identified and mapped at the mitigation site (**Mud Creek Figure 3** in **Appendix A**). The seven wetland community types were Type 1: *Juncus*, Type 2: *Phalaris*, Type 3: *Scirpus*; Type 4: *Juncus / Carex*, Type 5: *Carex*, Type 6: *Crataegus* / *Phalaris*, and Type 8: *Elodea*. The upland community type was Type 7: *Phalaris / Melilotus.* Plant species observed within each of these communities are listed on the **Monitoring Form** (**Appendix B**).

Table 24: ***2009 vegetation species list for the Mud Creek Wetland Mitigation Site.***

Scientific Name	Common Name	Region 9 (Northwest) Wetland Indicator
Achillea millefolium	common yarrow	FACU
Agrostis alba	redtop	FAC+
Agropyron repens	quackgrass	FACU
Agropyron smithii	western wheatgrass	FACU
Agropyron spp.	wheatgrass	--
Agropyron trachycaulum	slender wheatgrass	FAC
Alnus incana	alder	FACW
Bidens cernua	nodding beggar-ticks	FACW+
Bromus inermis	smooth brome	--
Bromus japonicus	Japanese brome	FACU
Bromus tectorum	cheatgrass	--
Cardaria draba	whitetop	--
Carex bebbii	Bebb sedge	--
Carex nebrascensis	Nebraska sedge	OBL
Carduus nutans	musk thistle	--
Carex spp.	sedge	--
Carex stipata	awlfruit sedge	OBL
Carex utriculata	beaked sedge	OBL
Chrysanthemum leucanthemum	oxeye daisy	--

Scientific Name	Common Name	Region 9 (Northwest) Wetland Indicator
Cirsium arvense	Canada thistle	FACU+
Cirsium vulgare	bull thistle	FACU
Cornus stolonifera	red-osier dogwood	FACW
Cynoglossum officinale	hound's-tongue	--
Dactylis glomerata	orchardgrass	FACU
Descurainia sophia	flixweed	--
Dipsacus sylvestris	teasel	NI
Dianthus spp.	pink	--
Eleocharis palustris	creeping spikerush	OBL
Elodea spp.	common waterweed	OBL
Epilobium ciliatum	hairy willow-herb	FACW+
Erodium cicutarium	redstem stork's bill	--
Festuca arundinacea	Kentucky fescue	FACU-
Festuca spp.	Fescue	--
Glyceria grandis	American mannagrass	OBL
Impatiens ecalcarata	impatients	FACW
Iris pseudacorus	yellow iris	OBL
Juncus balticus	Baltic rush	OBL
Juncus ensifolius	three-stamen rush	FACW
Juncus spp.	rush	--
Lactuca serriola	prickly lettuce	FAC-
Lemna minor	common duckweed	OBL
Lepidium campestre	field pepperweed	--
Lepidium perfoliatum	clasping pepper-grass	FACU+
Lychnis alba	white campion	--
Malva neglecta	common mallow	--
Medicago Sativa	alflafa	--
Melilotus officinalis	yellow sweetclover	FACU
Nepeta cataria	catnip	--
Oenanthe spp.	primrose	--
Phalaris arundinacea	reed canarygrass	FACW
Poa pratensis	Kentucky bluegrass	FACU+
Poa spp.	bluegrass	--
Polygonum bistortoides	American bisort	FACW+
Polygonum spp.	smartweed	--
Potentilla recta	sulphur cinquefoil	--
Rorippa nasturtium-aquaticum	white watercress	OBL
Rosa woodsii	woods rose	FACU
Rumex crispus	curly dock	FACW
Salix bebbiana	Bebb willow	FACW
Salix drummondiana	Drummond willow	FACW
Scirpus microcarpus	small-fruit bulrush	OBL
Solanum dulcamara	nightshade	FAC
Sonchus arvensis	field sowthistle	FACU+
Thlaspi arvense	pennycress	NI
Tragopogon dubius	yellow salsify	--
Trifolium pratense	red clover	FACU
Trifolium spp.	clover	--
Typha latifolia	broad-leaf cattail	OBL

Community types 5 and 8 are the wettest and occurred as emergent types along the Mud Creek floodplain; these community types were inundated throughout most the growing season.

Community type 8 consisted of aquatic vegetation in the Mud Creek channel and was inundated with perennial surface waters (**Mud Creek Figure 3** in **Appendix A**). Type 1 was dominated by Baltic rush with a small inclusion of redtop and reed canarygrass. Type 2 was dominated by reed canarygrass with a small inclusion of sawtooth sedge, mannagrass, and redtop. Type 3 was dominated by a slightly wetter species mix including small-fruit bulrush, sedge, fowl mannagrass, and big-leaf avens. Types 3 and 4 are located within an area of existing wetlands. Type 4 was dominated by Nebraska sedge, Baltic rush, sawtooth sedge and other sedges and rushes. Type 6 was the driest wetland area and was dominated by remnant riparian shrubs (i.e., Douglas hawthorn) and emergent vegetation (i.e., reed canarygrass). Type 6 occurred in both wetland and upland areas within the mitigation site.

Adjacent upland vegetation communities were dominated by aggressive invasive species. Type 7 is an upland area dominated by reed canarygrass, white clover, yellow clover, tumble mustard, and smooth brome.

Several noxious weeds were observed throughout the Mud Creek site. Type 7 had a moderate amount of invasive species located throughout. Noxious weed locations observed during the 2009 field visit were mapped (**Mud Creek Figure 3** in **Appendix A**). These were individual noxious weed locations or small patches not mapped as a community type, and included Canada thistle, St. John's wort, oxeye daisy, and yellow iris.

Vegetation transect results were detailed in the **Monitoring Form** (**Appendix B**) and were summarized in tabular format in **Table 25**, and graphically illustrated in **Charts 12-13.**

Table 25: ***Mud Creek - Transect 1 data summary.***

Monitoring Year	**2009**
Transect Length (feet)	494
# Vegetation Community Transitions along Transect	6
# Vegetation Communities along Transect	5
# Hydrophytic Vegetation Communities along Transect	5
Total Vegetative Species	29
Total Hydrophytic Species	22
Total Upland Species	7
Estimated % Total Vegetative Cover	96
% Transect Length Comprised of Hydrophytic Vegetation Communities	100
% Transect Length Comprised of Upland Vegetation Communities	0
% Transect Length Comprised of Unvegetated Open Water	0
% Transect Length Comprised of Bare Substrate	0

Chart 12: ***Mud Creek - Transect 1 map showing vegetation types from the start (0 feet) to the end (494 feet) for 2009.***

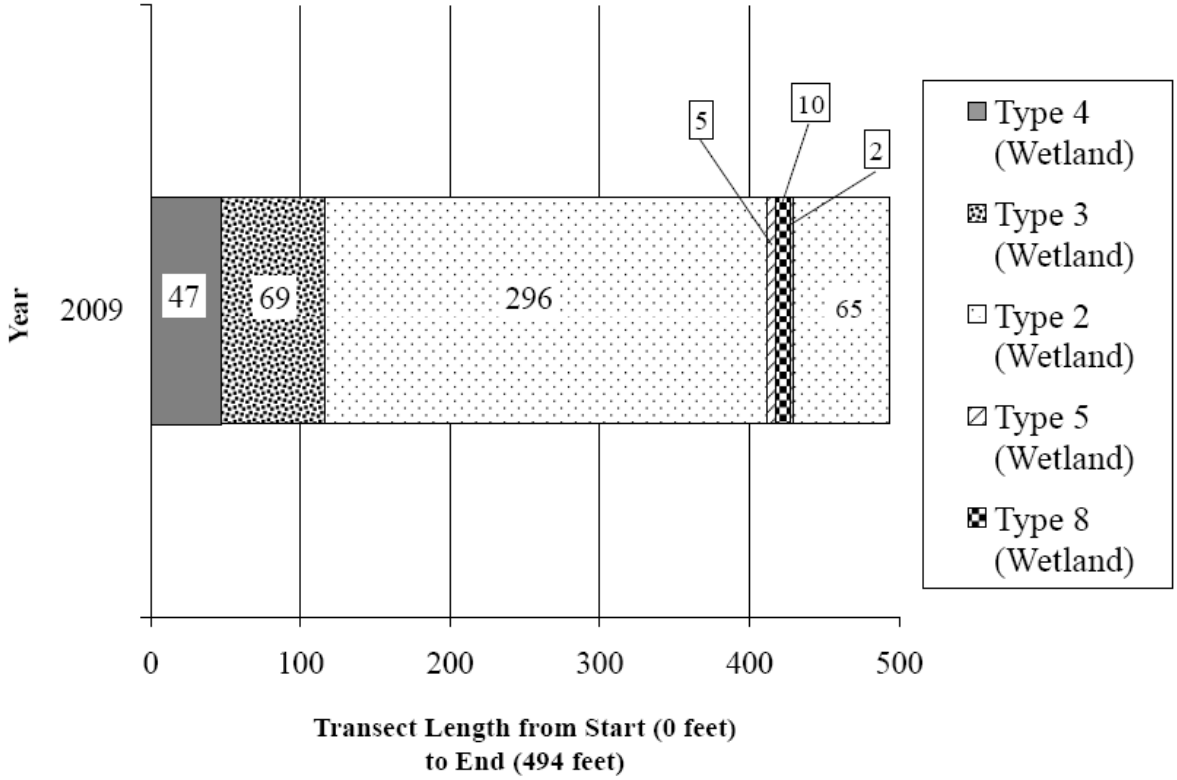
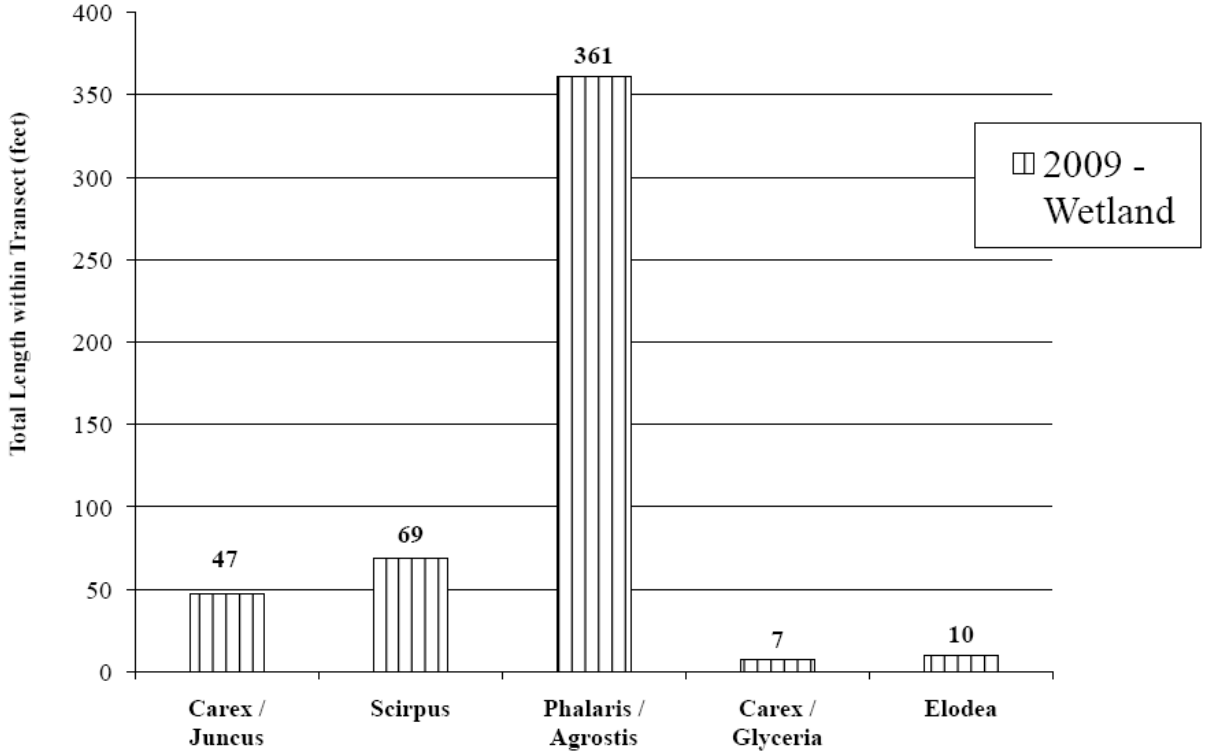


Chart 13: ***Mud Creek - length of vegetation communities within Transect 1 for 2009.***



3.4.3 Soils

Soils at the Mud Creek site are mapped in the Lake County Soil Survey as Borohemists, 0 to 1 percent slopes (NRCS 2009). The Borohemists series was listed as hydric and is very poorly drained and associated with floodplain type landforms.

Wetland soils observed during monitoring and documented on the Routine Wetland Determination form were mostly loams and muck with very low chroma colors (1 or 2) within 12 inches of the surface. Redoximorphic features were not present in soil profiles.

3.4.4 Wetland Delineation

Wetlands were delineated and their boundaries were mapped in 2009 (**Mud Creek Figure 3** in **Appendix A**). Approximately 2.02 wetland acres currently occur within the monitoring area (**Table 26**; **Mud Creek Figure 3** in **Appendix A**).

A pre-construction wetland delineation was not available. The site currently contains 2.02 acres of aquatic habitat (**Mud Creek Figure 3** in **Appendix A**).

Table 26: ***Aquatic habitats and acreages at the Mud Creek Wetland Mitigation Site.***

CONDITION	2009 (acre)
Wetland Area	2.02
Total Aquatic Habitat Area	**2.02**

3.4.5 Fish and Wildlife

A list has been made of the fish, mammal, reptile amphibian, and bird species observed in 2009 at the Mud Creek Site (**Table 27**). Specific evidence observed, as well as activity codes pertaining to birds, was recorded onto the **Monitoring Form** and **Bird Survey Form** in **Appendix B**. Two mammals and three bird species were noted at the mitigation site during the 2009 site visits (**Table 27**).

Table 27: ***Fish and wildlife species observed at the Mud Creek Wetland Mitigation Site in 2009.***

FISH None	
AMPHIBIAN None	
REPTILE None	
BIRD **American Robin (*Turdus migratorius*)** Black-billed magpie (*Pica hudsonia*) Cliff swallow (*Petrochelidon pyrrhonota*) **Common Snipe (*Gallinago gallinago*)**	 **European Starling (*Sturnus vulgaris*)** **Red-winged Blackbird (*Agelaius phoeniceus*)** Tree swallow (*Tachycineta bicolor*)
MAMMAL Deer (*Odocoileus* sp.) **Feral cat (*Felis* sp.)**	 **Raccoon (*Procyon lotor*)** Red Fox (*Vulpes velox*)

Bolded species were observed by MDT and CSKT staff.

3.4.6 Macroinvertebrates

Macroinvertebrate sampling was not conducted at the Mud Creek Site.

3.4.7 Functional Assessment

The functional assessment of 2009 was compared with the baseline conditions of 2004 (**Table 28**). The completed 2009 functional assessment is included in **Appendix B**. The Mud Creek site was assessed as one area (AA-1), which rated as a Category III site. Approximately15.76 functional units occurred at the Mud Creek mitigation site in 2009 (**Table 28**).

3.4.8 Photographs

Representative photographs were taken in 2009 from established photo-points and transect ends (**Appendix C**).

Table 28: ***Summary of baseline and 2009 wetland function/value ratings and functional points at the Mud Creek Wetland Mitigation Project.***

Function and Value Parameters from the MDT Montana Wetland Assessment Method	2004 Baseline (AA-1)[1]	2009 (AA-1)[2]
Listed/Proposed T&E Species Habitat	Low (0.3)	Low (0.3)
MTNHP Species Habitat	Low (0.1)	Low (0.1)
General Wildlife Habitat	Mod (0.5)	Mod (0.7)
General Fish/Aquatic Habitat	Low (0.3)	Mod (0.7)
Flood Attenuation	Low (0.4)	Mod (0.4)
Short and Long Term Surface Water Storage	High (0.8)	High (0.8)
Sediment/Nutrient/Toxicant Removal	Mod (0.6)	High (0.9)
Sediment/Shoreline Stabilization	Mod (0.7)	High (1.0)
Production Export/Food Chain Support	High (0.9)	High (0.9)
Groundwater Discharge/Recharge	High (1.0)	High (1.0)
Uniqueness	Mod(0.4)	Mod (0.5)
Recreation/Education Potential	Low (0.1)	Mod (0.5)
Actual Points / Possible Points	**6.1 / 12**	**7.8 / 12**
% of Possible Score Achieved	**50%**	**65%**
Overall Category	**III**	**III**
Total Acreage of Assessed Wetlands and Open Water within Easement (ac)	Unknown	**2.02**
Total Functional Units (acreage x actual points) (fu)	Unknown	**15.76**
Net Acreage Gain (ac)	NA	Unknown
Net Functional Unit Gain (fu)	NA	Unknown

[1] The baseline assessment was performed by Herrera Environmental Consultants and the 2009 assessment was completed by PBS&J; both assessments used the 1999 MDT MWAM.

3.4.9 Revegetation Efforts

Wetland and riparian vegetation enhancements were implemented in 2008 (**Appendix G**). These enhancements included planting of native containerized trees, shrubs, and grass-like seedlings. Plants were installed along the restored banks and adjacent floodplain of Mud Creek.

Shrub and tree planting survival data were collected along one 2-meter wide belt transect. The transect was established along the north side of Mud Creek and followed the channel sinuosity. Species survival was based on visual estimates and counts for each live species. The original planting numbers in **Appendix G** were referenced from the *Mud Creek Wetland Mitigation Planting Summary*. Actual planting numbers and prescribed species may vary from the original plan. Post- design changes for planting prescriptions may have been adjusted during the construction phase due to availability of seedlings. Overall, survival ratings were considered moderate to high based on the 2009 visual assessment. Plant growth was vigorous and looked healthy and few discolored leaves were found.

3.4.10 Maintenance Needs/Recommendations

Three Category 1 noxious weeds were present at low to high cover values: Canada thistle, oxeye daisy, and hound's-tongue (**Figure 3**, **Appendix A**). A Category 2 noxious weed, yellowflag iris, was also present within the mitigation site. Noxious weeds should be controlled in accordance with the *Noxious Weed Management Guidelines, Species and Control Methods for*

US 93 Evaro to Polson Wetland Mitigation Sites that can be found in the mitigation plan (Herrera 2004).

3.4.11 Current Credit Summary

As of 2009, approximately 2.02 acres of wetland occur on the mitigation site. The channel was included in the wetland totals. Additional acreage may form with additional time and continued increase in hydrology levels. The site scores approximately 15.15 functional units as of 2009.

To determine the current crediting acres for the Mud Creek site, the total wetland acreage was separated into the individual mitigation type zones, acreages were calculated for each type, and credit ratios were applied for both the CSKT and Corps crediting systems. The Mud Creek site mitigation types consisted of creation and rehabilitation (Corps) / secondary restoration (CSKT).

The following equation calculates the enhancement ratio for the rehabilitation activities based on functional assessment scores described in preceding **Table 28**:

Enhancement factor = $[(F_{post} - F_{pre})/ F_{pre}]$

Enhancement factor = [(7.5 – 6.1) / 6.1]; Enhancement factor = 0.23

Enhancement Ratio = 1/ 0.23; Enhancement Ratio = 4.35

Table 29 lists the current credits based on Corps and CSKT credit ratios, including this year's calculated ratio for the rehabilitation areas at the Mud Creek site. Current credits are well below the expected credits, due to apparent discrepancy in the original acreage calculation in the mitigation plan. The mitigation plan proposed a total of 6.81 acres, but in actuality, following construction, the total area of the site is 2.54 acres, including 0.52 acres of uplands. Construction plans were followed as specified in the plan and existing conditions at the site are similar to the proposed design plan. This discrepancy of 4.8 acres of wetlands leaves the site well below expected credits. The site is predicted to continue gaining functional points as the wetlands continue to develop.

Table 29: ***Current credits at the Mud Creek Wetland Mitigation Site.***

Targeted Mitigation Type	Current Wetland (acre)	Credit Ratio		Current Credit (acre)		Expected Credit (acre)	
		Corps	CSKT	Corps	CSKT	Corps	CSKT
Creation	1.49	1:1	3.36:1	1.49	0.44	6.18	3.22
Rehabilitation / secondary restoration	0.53	4.35:1	1.86:1	0.12	0.28	0.63	0.33
TOTAL	**2.02**	**--**	**--**	**1.61**	**0.72**	**6.81**	**3.55**

3.5 Peterson

3.5.1 Hydrology

The main source of hydrology at the Peterson site comes from an unnamed perennial tributary of Post Creek. This mitigation site occurs within a long wetland swale that runs east to west. The site receives seasonal flooding during spring runoff and sustained flows during the summer from irrigation return. As part of the mitigation activities, twelve log crib structures were installed to create shallow inundation behind the structures. The site exhibited shallow inundation of varying extents behind these impoundments during the monitoring visit. Each crib structure was designed to allow surface flow to spill through a designated overflow. Inundation was present throughout all of Community Types 2, 3, and 4 (**Peterson Figure 3** in **Appendix A**).

According to the WRCC, mean monthly precipitation from January through July from 1896 to 2009 totaled 15.83 inches for the St Ignatius weather station (WRCC 2009). During 2009, 8.77 inches (55% of the mean) of precipitation were recorded at this station between January and July (WRCC 2009).

3.5.2 Vegetation

Sixty-seven plant species were identified at the site (**Table 30**). The majority of these species are herbaceous. The site has no woody vegetation, except for the plantings installed as part of the mitigation efforts to enhance scrub-shrub habitat. Three wetland and one upland community types were identified and mapped at the mitigation site (**Peterson Figure 3** in **Appendix A**). The three wetland community types were Type 2: *Phalaris*, Type 3: *Phalaris /Typha,* and Type 4: *Carex/Poa.* The upland community type was Type 1: *Agropyron.* Plant species observed within each of these communities are listed on the **Monitoring Form** (**Appendix B**).

Table 30: ***2008 to 2009 vegetation species list for the CSKT Peterson Wetland Mitigation Site.***

Scientific Name[1]	Common Name	Region 9 (Northwest) Wetland Indicator
Achillea millefolium	common yarrow	FACU
Agrostis alba	redtop	FAC+
Agropyron repens	quackgrass	FACU
Agropyron smithii	western wheatgrass	FACU
Agropyron spp.	wheatgrass	--
Agropyron trachycaulum	slender wheatgrass	FAC
Alnus incana	alder	FACW
Bidens cernua	nodding beggar-ticks	FACW+
Bromus inermis	smooth brome	--
Bromus japonicus	Japanese brome	FACU
Bromus tectorum	cheatgrass	--
Cardaria draba	whitetop	--
Carex bebbii	Bebb sedge	--
Carex nebrascensis	Nebraska sedge	OBL
Carduus nutans	musk thistle	--
Carex spp.	sedge	--
Carex stipata	awlfruit sedge	OBL
Carex utriculata	beaked sedge	OBL

Bolded species were observed for the first time in 2009.

Table 30 (continued): ***2008 to 2009 vegetation species list for the CSKT Peterson Wetland Mitigation Site.***

Scientific Name[1]	Common Name	Region 9 (Northwest) Wetland Indicator
Chrysanthemum leucanthemum	oxeye daisy	--
Cirsium arvense	Canada thistle	FACU+
Cirsium vulgare	bull thistle	FACU
Cornus stolonifera	red-osier dogwood	FACW
Cynoglossum officinale	hound's-tongue	--
Dactylis glomerata	orchardgrass	FACU
Descurainia sophia	flixweed	--
Dipsacus sylvestris	teasel	NI
Dianthus spp.	pink	--
Eleocharis palustris	creeping spikerush	OBL
Elodea spp.	common waterweed	OBL
Epilobium ciliatum	hairy willow-herb	FACW+
Erodium cicutarium	redstem stork's bill	--
Festuca arundinacea	Kentucky fescue	FACU-
Festuca spp.	fescue	--
Glyceria grandis	American mannagrass	OBL
Impatiens ecalcarata	impatients	FACW
Iris pseudacorus	yellow iris	OBL
Juncus balticus	Baltic rush	OBL
Juncus ensifolius	three-stamen rush	FACW
Juncus spp.	rush	--
Lactuca serriola	prickly lettuce	FAC-
Lemna minor	common duckweed	OBL
Lepidium campestre	field pepperweed	--
Lepidium perfoliatum	clasping pepper-grass	FACU+
Lychnis alba	white campion	--
Malva neglecta	common mallow	--
Medicago Sativa	alflafa	--
Melilotus officinalis	yellow sweetclover	FACU
Nepeta cataria	catnip	--
Oenanthe spp.	primrose	--
Phalaris arundinacea	reed canarygrass	FACW
Poa pratensis	Kentucky bluegrass	FACU+
Poa spp.	bluegrass	--
Polygonum bistortoides	American bisort	FACW+
Polygonum spp.	smartweed	--
Potentilla recta	sulphur cinquefoil	--
Rorippa nasturtium-aquaticum	white watercress	OBL
Rosa woodsii	woods rose	FACU
Rumex crispus	curly dock	FACW
Salix bebbiana	Bebb willow	FACW
Salix drummondiana	Drummond willow	FACW
Scirpus microcarpus	small-fruit bulrush	OBL
Solanum dulcamara	nightshade	FAC
Sonchus arvensis	field sowthistle	FACU+
Thlaspi arvense	pennycress	NI
Tragopogon dubius	yellow salsify	--
Trifolium pratense	red clover	FACU
Trifolium spp.	clover	--
Typha latifolia	broad-leaf cattail	OBL

Bolded species were observed for the first time in 2009.

Community types 2 and 3 were the wettest and occurred as aquatic bed/emergent wetlands in the shallow water impounded behind the log crib structures (**Peterson Figure 3** in **Appendix A**). Type 2 was dominated by a monoculture of reed canarygrass with a small inclusion of teasel. Type 3 was dominated by a slightly better diversity and included cattail, reed canarygrass, beaked sedge, tall mannagrass, and rush (*Juncus* spp.). Reed canarygrass and cattail had the highest cover values for this community type and were inundated with shallow water. Type 4 is dominated by slightly drier species mix and occurred in the transition zone between the wettest inundated areas and the dry outer fringes of the wetland. Type 4 was dominated by Nebraska sedge and fowl bluegrass, with small amounts of reed canarygrass, teasel, and common plantain.

Adjacent upland vegetation communities were dominated by pasture grasses and/or aggressive invasive species. Type 1 was upland and was dominated by pasture grasses (i.e., quackgrass, Kentucky bluegrass, clasping pepperweed, field pepperweed, teasel, tumble mustard, sulfur cinquefoil, and whitetop).

Several noxious weeds were observed throughout the Peterson site. Type 1 had a moderate amount of invasive species located throughout it. Noxious weed locations observed during the 2009 field visit were mapped (**Peterson Figure 3** in **Appendix A**). These were individual noxious weed locations or small patches not mapped as a community type, and included Canada thistle, yellow iris, and whitetop (*Cardaria draba*). Several other noxious weed species were recorded only at the community level and therefore were not mapped.

Vegetation transect results are detailed in the **Monitoring Form** (**Appendix B**) and are summarized in tabular format (**Tables 31** and **32**), and are graphically illustrated (**Charts 14** to **17**).

Table 31: ***CSKT Peterson - Transect 1 data summary.***

Monitoring Year	2008	2009
Transect Length (feet)	144	144
# Vegetation Community Transitions along Transect	3	3
# Vegetation Communities along Transect	2	2
# Hydrophytic Vegetation Communities along Transect	1	1
Total Vegetative Species	19	24
Total Hydrophytic Species	9	14
Total Upland Species	10	10
Estimated % Total Vegetative Cover	100	87
% Transect Length Comprised of Hydrophytic Vegetation Communities	45	45
% Transect Length Comprised of Upland Vegetation Communities	55	55
% Transect Length Comprised of Unvegetated Open Water	0	0
% Transect Length Comprised of Bare Substrate	0	0

Table 32: ***CSKT Peterson - Transect 2 data summary.***

Monitoring Year	2008	2009
Transect Length (feet)	325	325
# Vegetation Community Transitions along Transect	3	3
# Vegetation Communities along Transect	3	3
# Hydrophytic Vegetation Communities along Transect	2	2
Total Vegetative Species	21	23
Total Hydrophytic Species	11	11
Total Upland Species	10	12
Estimated % Total Vegetative Cover	93	85
% Transect Length Comprised of Hydrophytic Vegetation Communities	90	90
% Transect Length Comprised of Upland Vegetation Communities	10	10
% Transect Length Comprised of Unvegetated Open Water	0	0
% Transect Length Comprised of Bare Substrate	0	0

Chart 14: ***CSKT Peterson - Transect 1 maps showing vegetation types from the start (0 feet) to the end (144 feet) for each year monitored.***

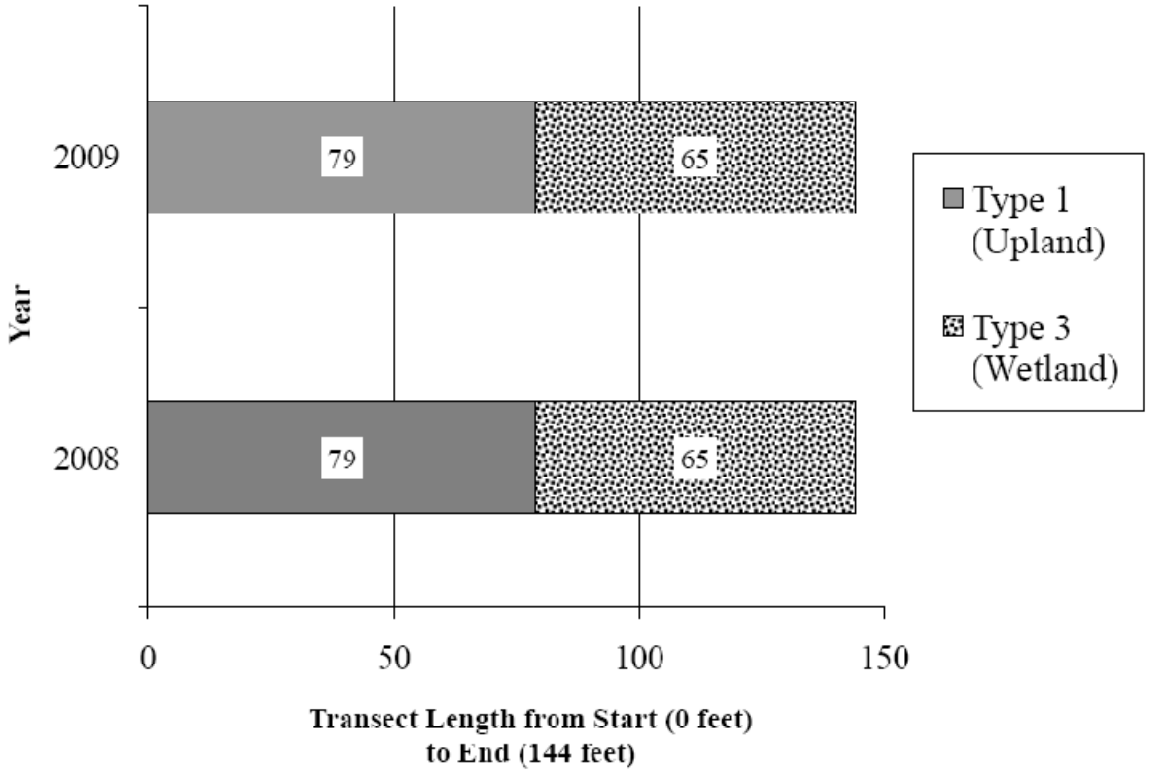


Chart 15: ***CSKT Peterson - length of vegetation communities within Transect 1 from 2008 to 2009.***

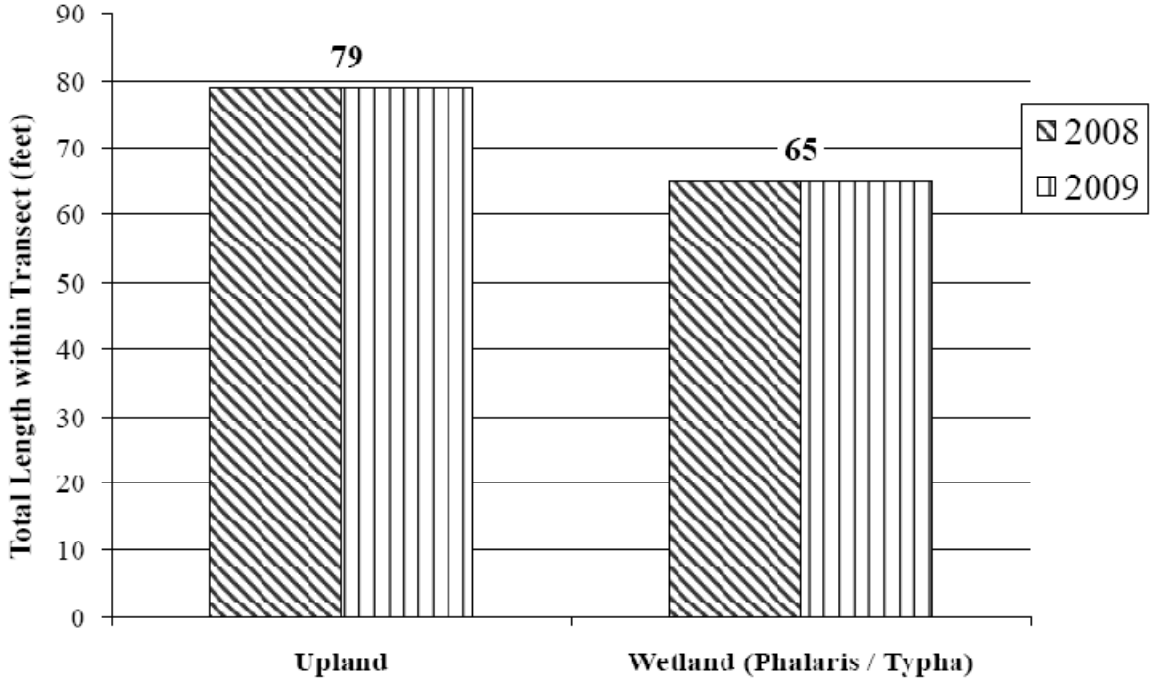


Chart 16: ***CSKT Peterson - Transect 2 map showing vegetation types from the start (0 feet) to the end (325 feet) for each year monitored.***

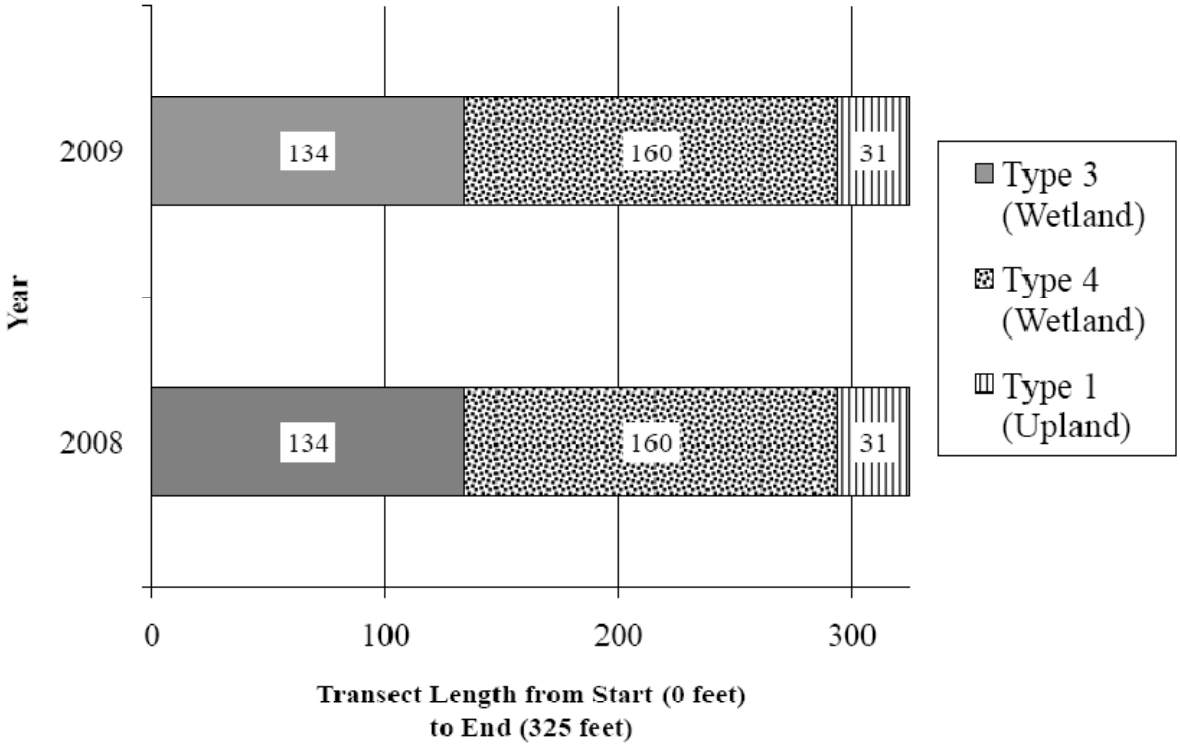
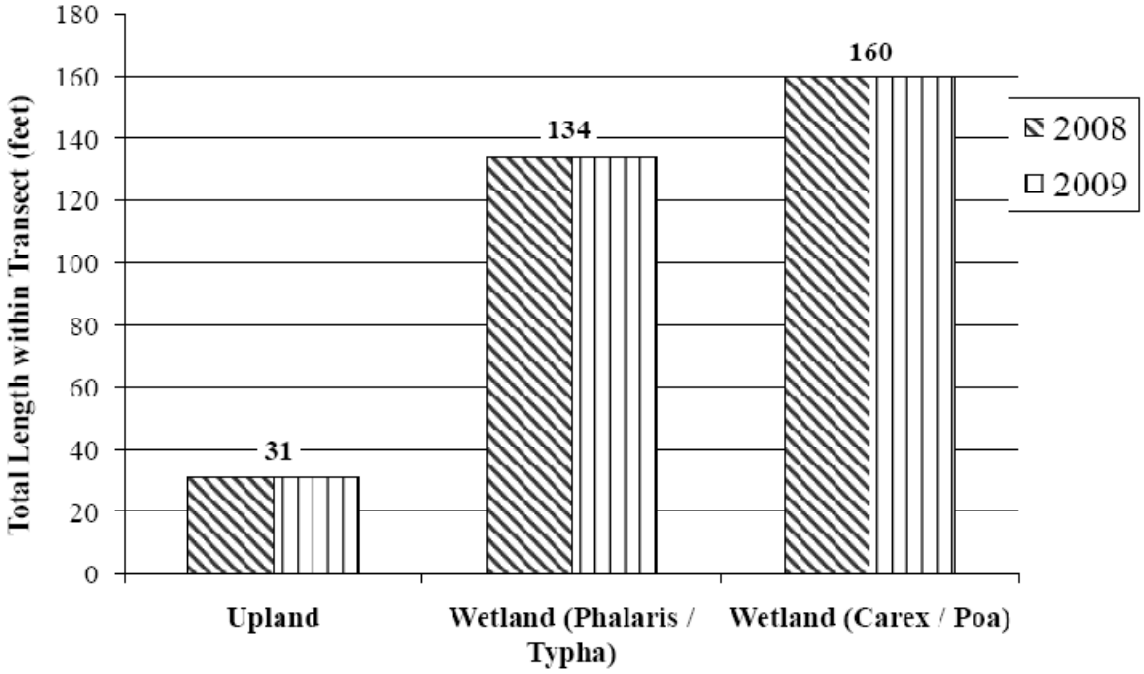


Chart 17: ***CSKT Peterson - length of vegetation communities within Transect 2 from 2008 to 2009.***



3.5.3 Soils

Soils at the Peterson site are mapped in the Lake County Soil Survey as Colake silt loam, 0 to 1 percent slopes, Ronan silty clay loam, 4 to 8 percent slopes, Ronan silty clay loam, 2 to 4 percent slopes, and Post silty clay loam, 2 to 4 percent slopes (NRCS 2009). The Colake series was listed as hydric and is poorly drained. Colake series are associated with till plain type landforms and parent material consisting of calcareous alluvium. The Colake series polygon boundary at the Peterson site coincides with the long shallow topographic wetland swale that comprises the mitigation site. The remaining three soil series were located in the areas outside the wetland swale and were not considered hydric. The two Ronan silty clay loam series and the Post silty clay loam series are all well drained soils and are associated with lake plains and moraines.

Wetland soils observed during monitoring and documented on the Routine Wetland Determination form were mostly loams and silt loams with very low chroma colors (1 or 2) within 2 inches of the surface (**COE Forms** in **Appendix B**). Redoximorphic features were not present in soil profiles.

3.5.4 Wetland Delineation

Wetlands were delineated and their boundaries mapped (**Peterson Figure 3** in **Appendix A**). Approximately 3.71 wetland acres occurred within the monitoring area in 2009 (**Table 33**; **Peterson Figure 3** in **Appendix A**). A pre-construction wetland delineation was not available.

Table 33: ***Wetland acreages at the CSKT Peterson Wetland Mitigation Site.***

CONDITION	2009 (acre)[1]
Wetland Area	3.71
Total Aquatic Habitat Area	**3.71**

[1] Similar acreage as observed in 2008.

3.5.5 Fish and Wildlife

A comprehensive list of fish, mammals, reptiles, amphibians, and birds using the Peterson Site has been maintained since 2008 (**Table 34**). Several mammal and bird species were noted at the mitigation site during 2009 (**Table 34**). Specific evidence observed, as well as activity codes pertaining to birds, was recorded onto the **Monitoring Form** and **Bird Survey Form** in **Appendix B**.

3.5.6 Macroinvertebrates

Macroinvertebrate sampling was not conducted at the Peterson Site.

Table 34: ***Fish and wildlife species observed at the Peterson Wetland Mitigation Site from 2008 to 2009.***

FISH	
Unidentified spp.*	
AMPHIBIAN	
Spotted Frog (*Rana luteiventris*)*	
REPTILE	
None	
BIRD	
American Kestrel (*Falco sparverius*)*	**Red-Winged blackbird (*Agelaius phoeniceus*)**
American Robin (*Turdus migratorius*)*	**Ring-necked Pheasant (*Phasianus colchicus*)**
Barn Swallow (*Hirundo rustica*)	**Sora (*Porzana Carolina*)***
Canada Goose (*Branta canadensis*)	Vesper Sparrow (*Pooecetes gramineus*)
Marsh Wren (*Cistothorus palustris*)*	**Western Bluebird (*Sialia mexicana*)***
Mourning Dove (*Zenaida macroura*)	**Western Meadowlark (*Sturnella neglecta*)***
MAMMAL	
Black Bear (*Ursus americanus*)	Raccoon (*Procyon lotor*)
Deer (*Odocoileus* spp.)	**Voles (*Microtus* spp.)**
Muskrat (*Ondatra zibethicus*)	

Bolded species were observed during the 2009 monitoring.
*Observed by MDT staff

3.5.7 Functional Assessment

The functional assessment of 2009 was compared with the baseline conditions of 2004 (**Table 35**). The completed 2009 functional assessment is included in **Appendix B**. The Peterson site was assessed as one area (AA-1), which rated as a Category III site in 2009. Approximately 25.23 functional units occurred at the Peterson mitigation site in 2009 (**Table 35**).

3.5.8 Photographs

Representative photographs were taken in 2009 from established photo-points and transect ends (**Appendix C**).

Table 35: ***Summary of baseline and 2009 wetland function/value ratings and functional points at the Peterson Wetland Mitigation Project.***

Function and Value Parameters from the MDT Montana Wetland Assessment Method	2004 Baseline (AA-1)[1]	2009 (AA-1)[2]
Listed/Proposed T&E Species Habitat	Low (0.3)	Low (0.3)
MTNHP Species Habitat	Low (0.1)	Low (0.1)
General Wildlife Habitat	Low (0.5)	Mod (0.7)
General Fish/Aquatic Habitat	Low (0.1)	NA
Flood Attenuation	Low (0.2)	Mod (0.4)
Short and Long Term Surface Water Storage	Mod (0.4)	High (0.8)
Sediment/Nutrient/Toxicant Removal	High (0.9)	High (0.9)
Sediment/Shoreline Stabilization	High (0.7)	High (1.0)
Production Export/Food Chain Support	High (0.8)	High (0.8)
Groundwater Discharge/Recharge	High (1.0)	High (1.0)
Uniqueness	Low (0.2)	Low (0.3)
Recreation/Education Potential	Low (0.1)	Mod (0.5)
Actual Points / Possible Points	**5.3 / 12**	**6.8 / 11**
% of Possible Score Achieved	**44%**	**61%**
Overall Category	**III**	**III**
Total Acreage of Assessed Wetlands and Open Water within Easement (ac)	**1.26**	**3.71**
Total Functional Units (acreage x actual points) (fu)	**6.68**	**25.23**
Net Acreage Gain (ac)	NA	**2.45**
Net Functional Unit Gain (fu)	NA	**18.43**

[1] The baseline assessment was performed by Herrera Environmental Consultants and the 2009 assessment was completed by PBS&J; both assessments used the 1999 MDT MWAM.

3.5.9 Revegetation Efforts

Wetland and riparian vegetation enhancements were implemented in 2007 (**Appendix G**). These enhancements included planting of native containerized and cutting shrubs and grass-like seedlings. Plants were installed along the constructed log crib structures, excavated oxbow depressions, fringe of the wetlands, and disturbed areas.

Shrub planting survival data were collected along several 2-meter wide belt transects of varying lengths. Transects were established along the edges of the wetland draw encompassing creation and enhancement mitigation areas. One transect was placed along a log crib structure. Species

survival was based on visual estimates and counts for each live species. The original planting numbers in **Appendix G** were referenced from *Peterson Tract Wetland Mitigation Site –Planting Summary*. Actual planting numbers and prescribed species may vary from the original plan. Three species were found that were not listed in the original planting summary. Post- design changes for planting prescriptions may have been adjusted during the construction phase due to availability of seedlings. Overall, survival ratings were considered moderate to high based on the 2009 visual assessment. Plant growth was vigorous and looked healthy with few discolored leaves. Browse protection was intact and properly functioning.

3.5.10 Maintenance Needs/Recommendations

Four Category 1 noxious weeds were present at low to high cover values: Canada thistle, oxeye daisy, sulfur cinquefoil, and whitetop (**Figure 3**, **Appendix A**). A Category 3 noxious weed, yellowflag iris, was also present within the mitigation site. Noxious weeds should be controlled in accordance with the *Noxious Weed Management Guidelines, Species and Control Methods for US 93 Evaro to Polson Wetland Mitigation Sites* that can be found in the mitigation plan (Herrera 2004).

Log crib structures were assessed for general functionality and were generally considered to be operational, with shallow inundation observed behind the impoundments. However, undercutting and substantive leakage between logs was observed at many of the structures. Subsequent to monitoring, MDT installed additional straw bales and rock at the structures to facilitate sediment entrapment, vegetation establishment, and sealing.

3.5.11 Current Credit Summary

As of 2009, approximately 3.71 acres of wetland occur on the mitigation site. The channel was included in the wetland totals. Additional acreage may form with additional time and continued increase in hydrology levels. The site scores approximately 25.23 functional units as of 2009.

To determine the current crediting acres for the Peterson site, the total wetland acreage was separated into the individual mitigation type zones, acreages were calculated for each type, and credit ratios were applied for both the CSKT and Corps crediting systems. The Peterson site mitigation types consisted of creation and rehabilitation (Corps) / secondary restoration (CSKT).

The following equation calculates the enhancement ratio for the rehabilitation activities based on functional assessment scores described in preceding **Table 35**:

Enhancement factor = $[(F_{post} - F_{pre})/ F_{pre}]$

Enhancement factor = [(6.8 – 5.3) / 5.3]; Enhancement factor = 0.28

Enhancement Ratio = 1/ 0.28; Enhancement Ratio = 3.57

Table 36 lists the current credits based on Corps and CSKT credit ratios, including this year's calculated ratio for the rehabilitation areas at the Peterson site. Current credits have exceeded the expected credits, assuming that wetlands delineated outside of the targeted creation and rehabilitation areas were created by project implementation. The site is predicted to continue gaining functional points as the wetlands continue to develop.

Table 36: ***Current credits at the CSKT Peterson Property Wetland Mitigation Site.***

Targeted Mitigation Type	Current Wetland (acre)	Credit Ratio		Current Credit (acre)		Expected Credit (acre)	
		Corps	CSKT	Corps	CSKT	Corps	CSKT
Creation	2.46[1]	1:1	3.36:1	2.46	0.73	2.14	0.64
Rehabilitation / secondary restoration	1.25	3.57:1	1.86:1	0.35	0.67	0.25	0.67
TOTAL	**3.71**	**--**	**--**	**2.81**	**1.40**	**2.39**	**1.31**

[1] Includes wetlands delineated outside of targeted creation and rehabilitation areas and assumed to have been created by project implementation.

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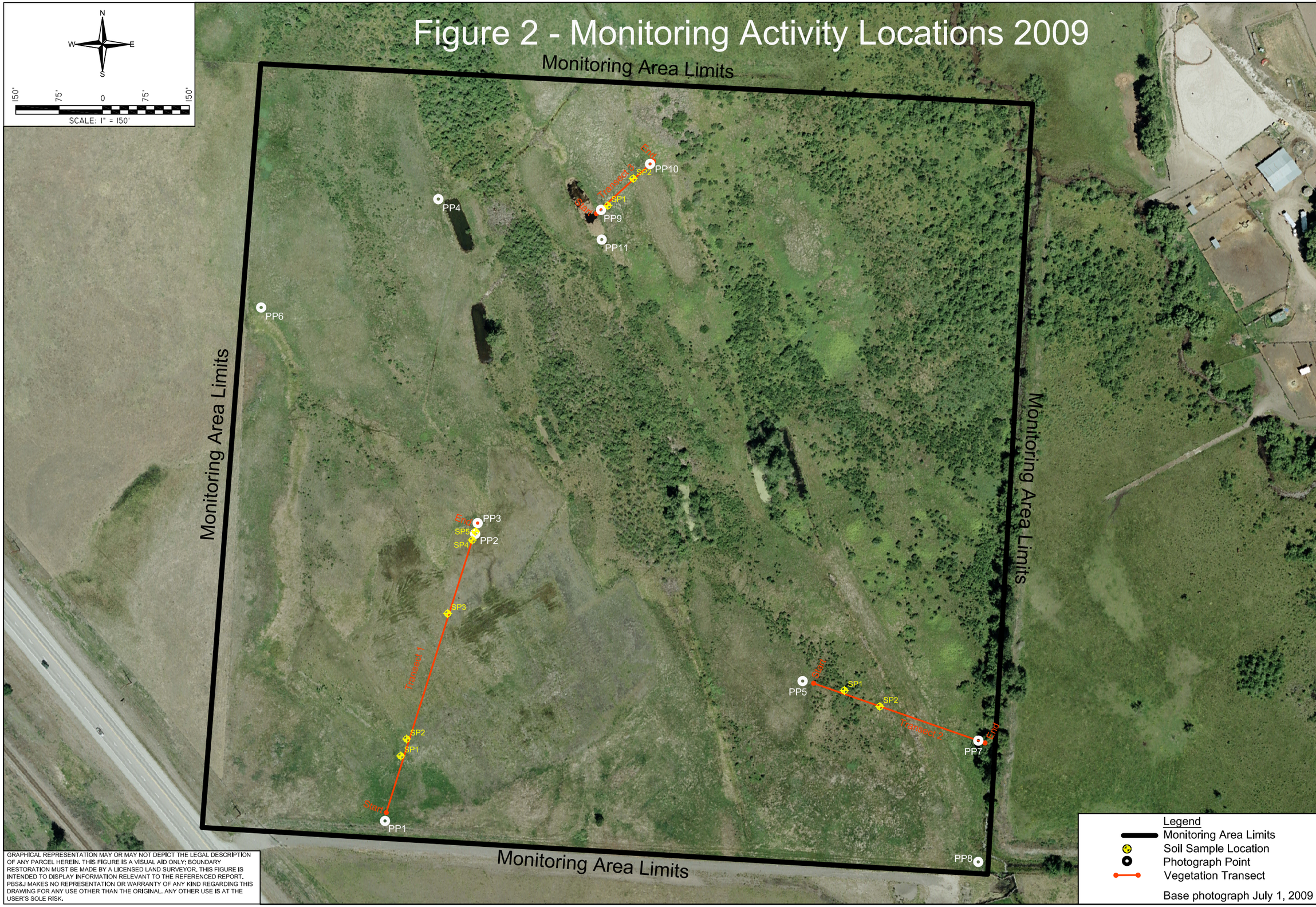
Appendix A

FIGURES 2 & 3

US Highway 93 Onsite: Bouchard, Jocko Spring Creek, Mission Creek, Mud Creek, and Peterson Property

Figure 2 - Monitoring Activity Locations 2009



Legend
- Monitoring Area Limits
- Soil Sample Location
- Photograph Point
- Vegetation Transect

Base photograph July 1, 2009

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PROJECT NAME
MDT BOUCHARD WETLAND MITIGATION

DRAWING TITLE
MONITORING ACTIVITY LOCATIONS 2009

DRAWN: JR
PROJ MGR: J. BERGLUND
CHECKED: GH | APPVD: JB

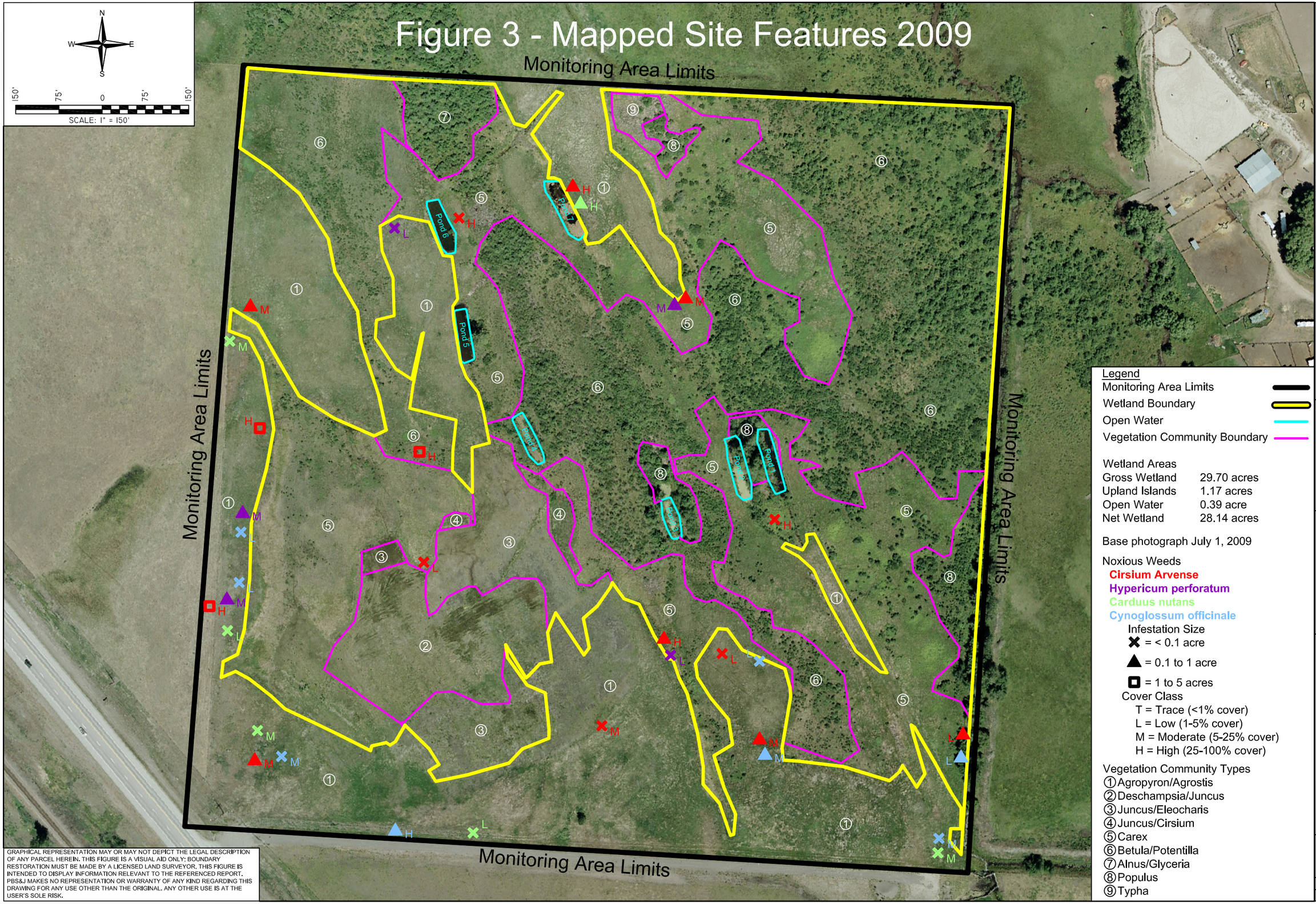
PROJ NO: 0B4308802 02.06
LOCATION: ARLEE, MT
SCALE: NOTED
FILE NAME: BASE 2009.dwg

PBSJ
1120 Cedar
Missoula, MT 59802

FIGURE
2 OF -

REV -
Oct/30/2009

Figure 3 - Mapped Site Features 2009



Legend

- Monitoring Area Limits
- Wetland Boundary
- Open Water
- Vegetation Community Boundary

Wetland Areas

Gross Wetland	29.70 acres
Upland Islands	1.17 acres
Open Water	0.39 acre
Net Wetland	28.14 acres

Base photograph July 1, 2009

Noxious Weeds

- **Cirsium Arvense**
- **Hypericum perforatum**
- Carduus nutans
- Cynoglossum officinale

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)

Vegetation Community Types

① Agropyron/Agrostis
② Deschampsia/Juncus
③ Juncus/Eleocharis
④ Juncus/Cirsium
⑤ Carex
⑥ Betula/Potentilla
⑦ Alnus/Glyceria
⑧ Populus
⑨ Typha

PROJECT NAME: MDT BOUCHARD WETLAND MITIGATION

DRAWING TITLE: MAPPED SITE FEATURES 2009

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FIGURE 3 OF .

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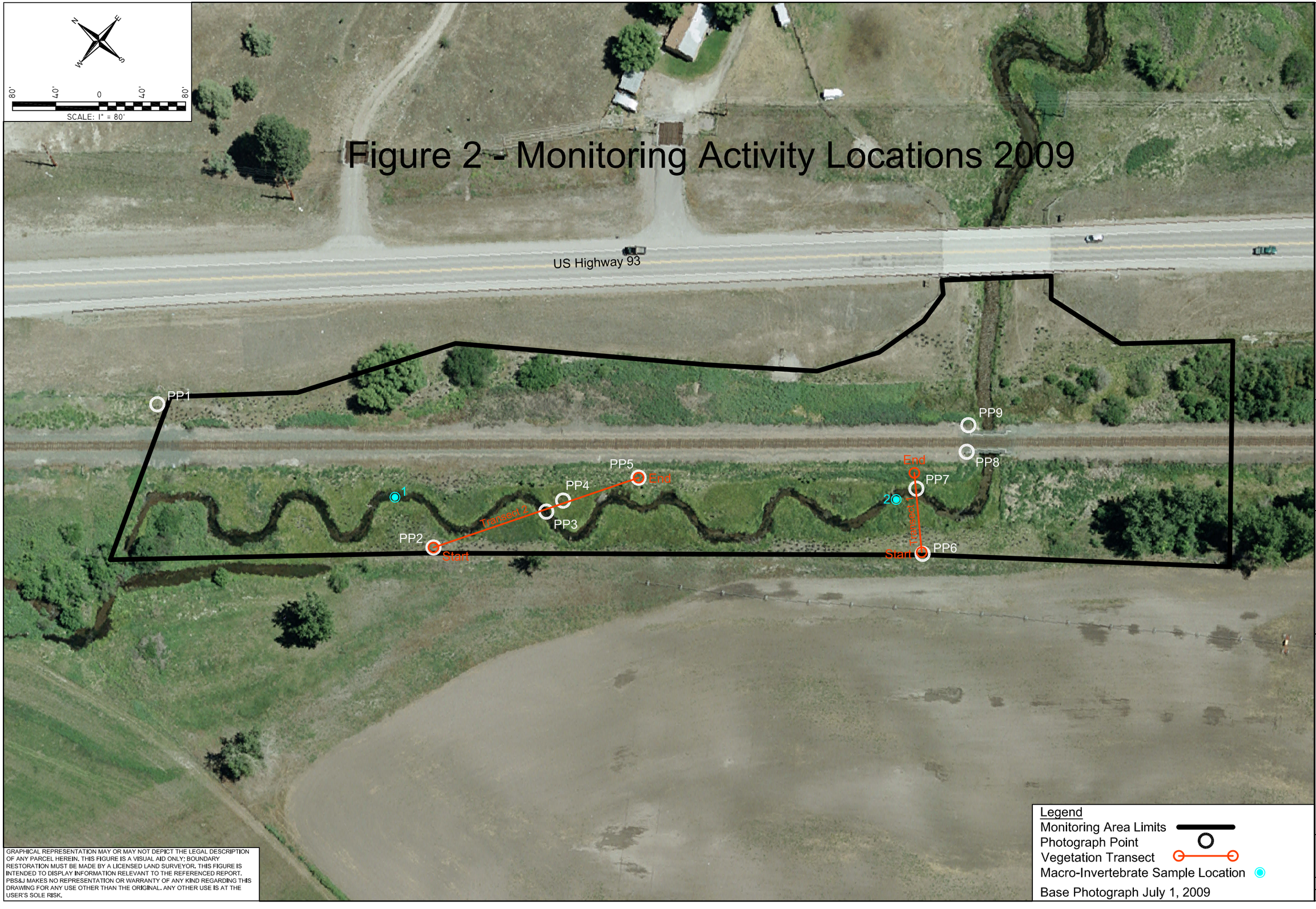
Nov/04/2009

Figure 2 - Monitoring Activity Locations 2009



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PROJ NO: 0B4308802 02.06 | LOCATION: RAVALLI, MT | SCALE: NOTED | FILE NAME: BASE 2009.dwg

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1120 Cedar
Missoula, MT 59802

FIGURE
2 OF .

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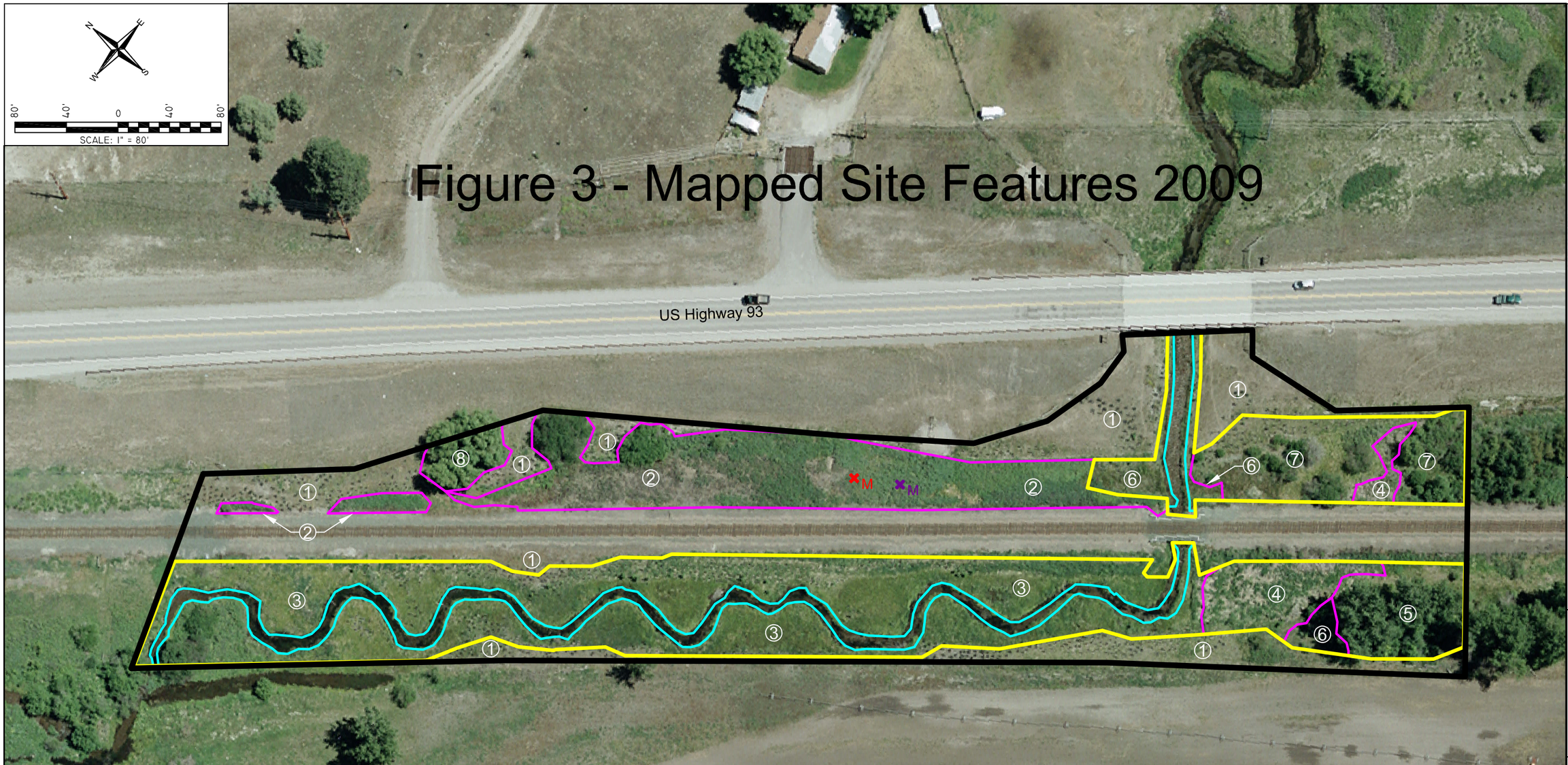
Dec/10/2009

Figure 3 - Mapped Site Features 2009



Legend

Monitoring Area Limits
Wetland Boundary
Open Water
Vegetation Community Boundary

Base Photograph July 1, 2009

Gross Wetland Area	2.08 acres
Open Water	0.27 acre
Net Wetland	1.81 acres

Noxious Weeds
Cirsium arvense
Cynoglossum officinale
Infestation Size
✖ = <0.1 acre
Cover Class
M = Moderate (5-25% cover)

Vegetation Types
① Agropyron
② Symphoricarpos
③ Carex/Glyceria
④ Typha
⑤ Populus
⑥ Juncus/Agrostis
⑦ Salix/Juncus
⑧ Salix

PROJECT NAME
MDT JOCKO SPRING CREEK WETLAND MITIGATION
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FIGURE 3 OF
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Figure 2 - Monitoring Activity Locations 2009

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FIGURE
2 OF
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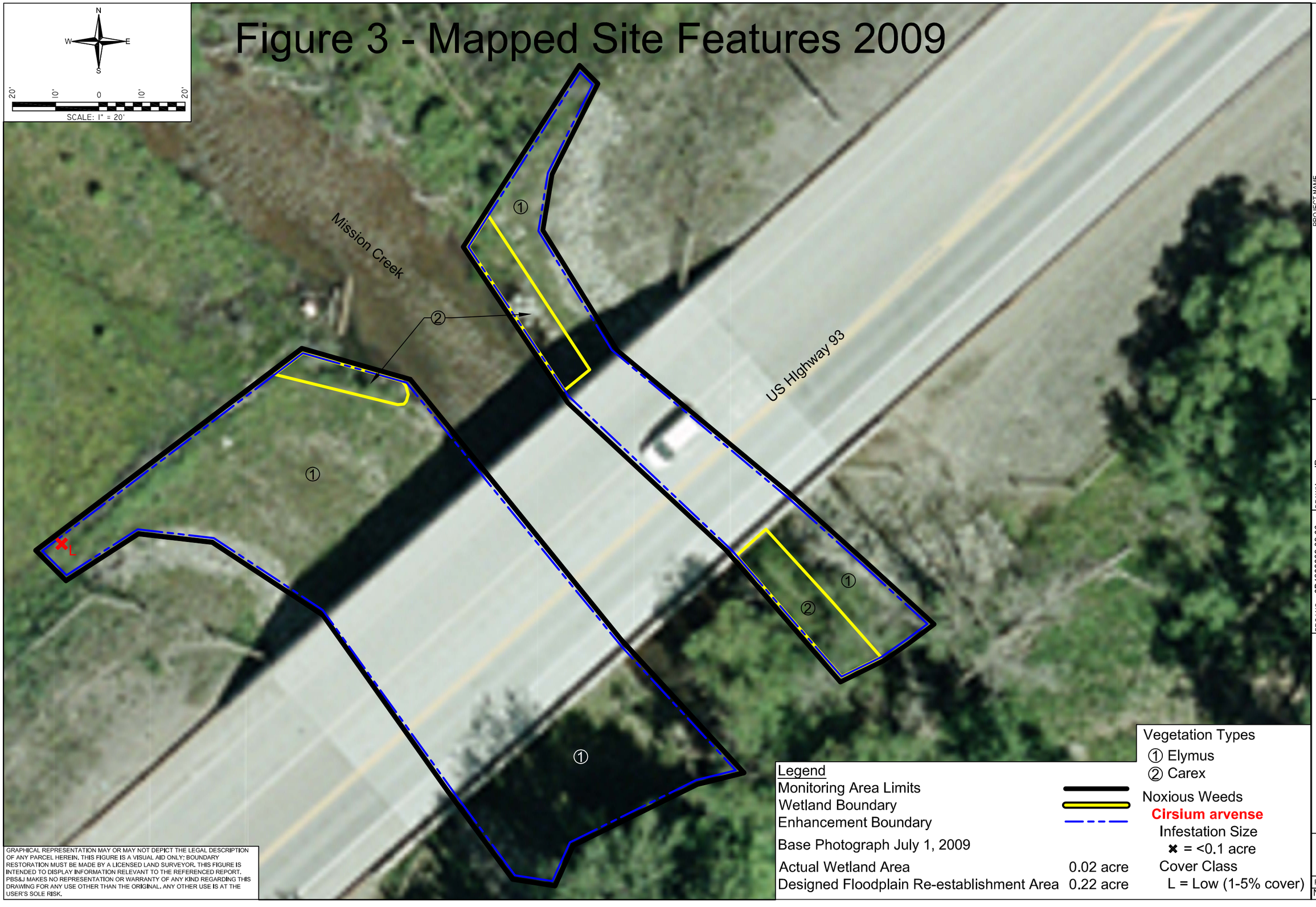
Nov/13/2009

Figure 3 - Mapped Site Features 2009



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PROJ NO: 0B4308802 02.06
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SCALE: NOTED
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1120 Cedar
Missoula, MT 59802
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FIGURE
3 OF
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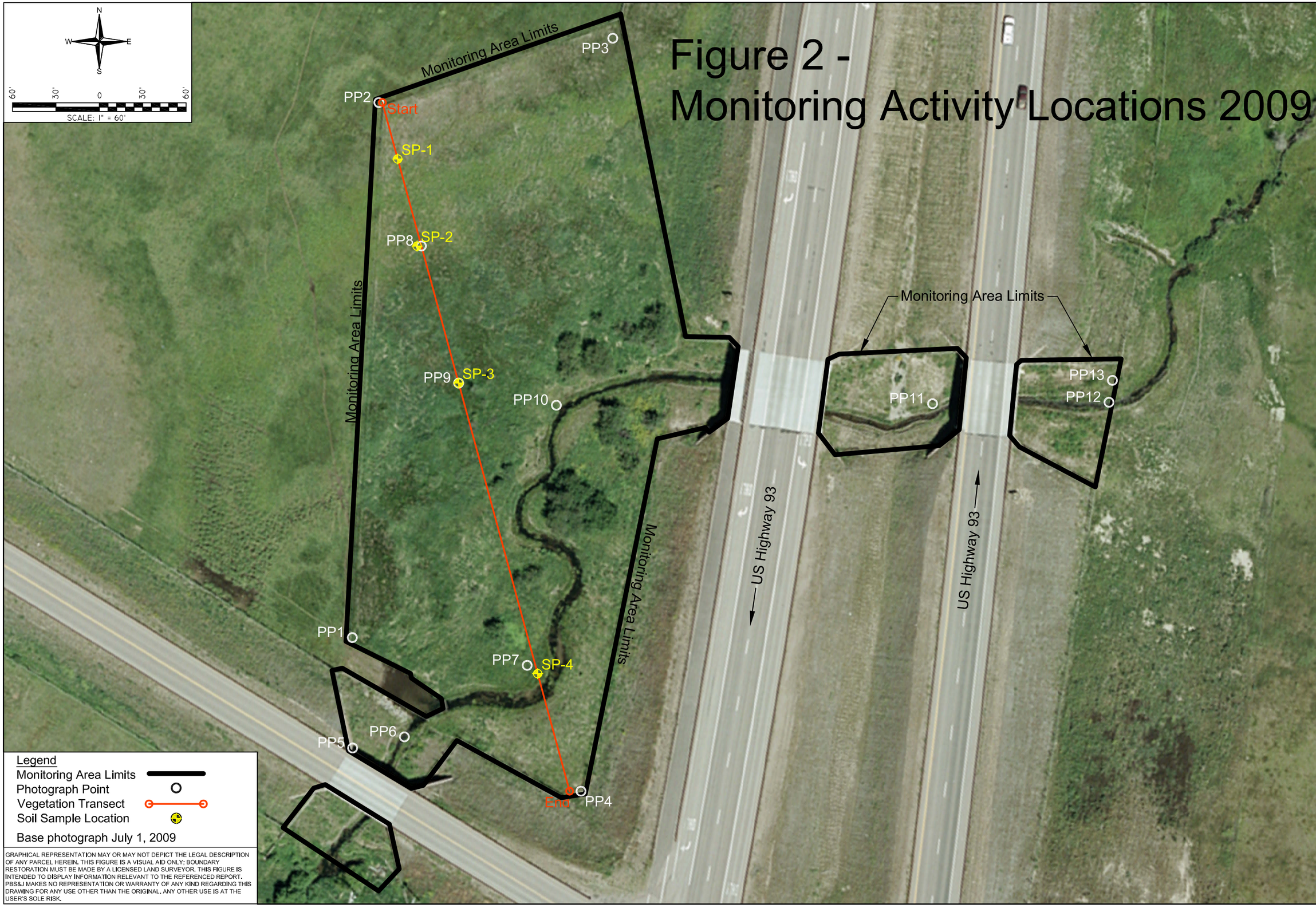
Nov/23/2009

Figure 2 - Monitoring Activity Locations 2009



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CHECKED: GH | APPVD: JB

PROJ NO: 0B4308802 02.06
LOCATION: RONAN, MT
SCALE: NOTED
FILE NAME: BASE 2009.dwg

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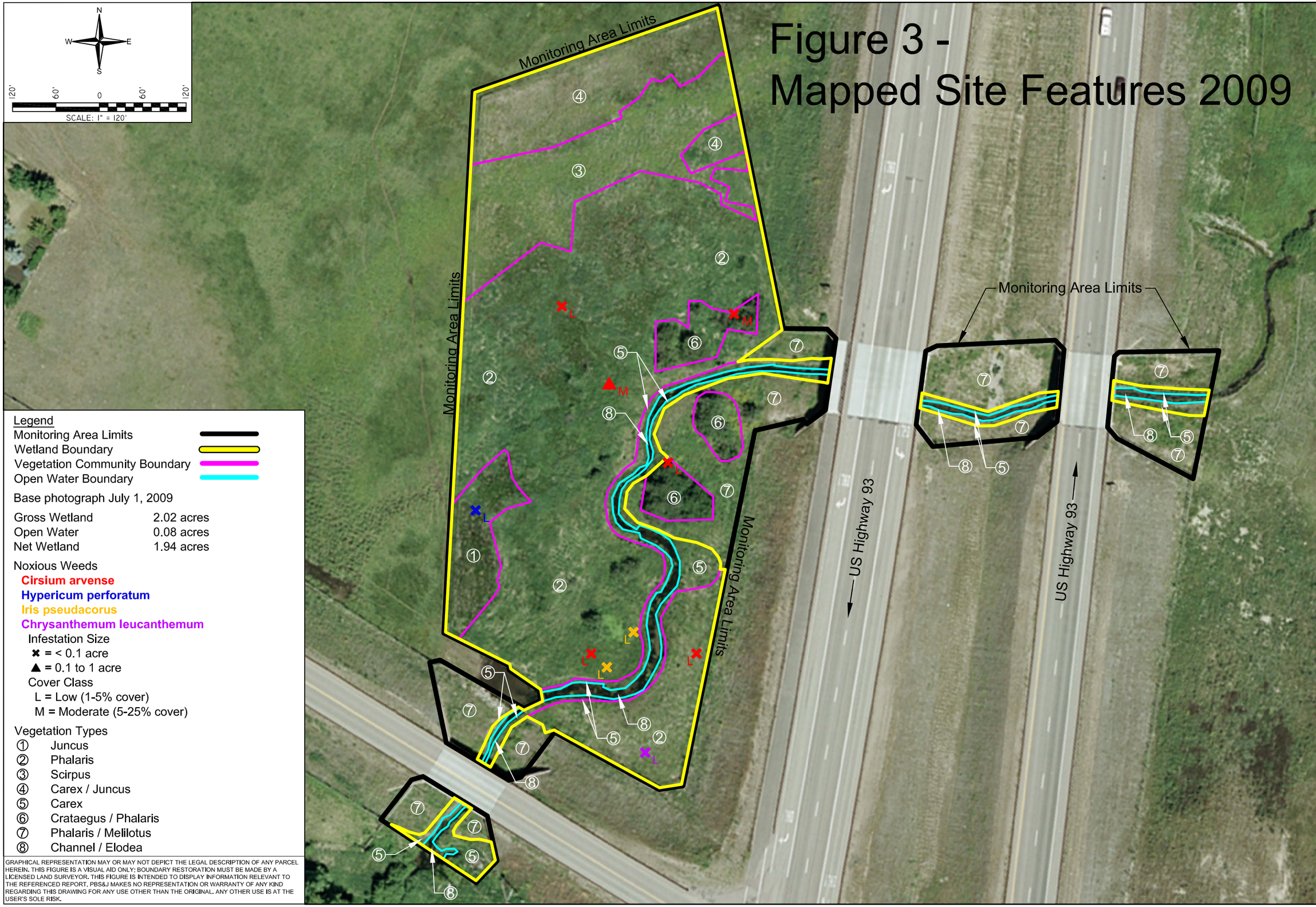
Nov/23/2009

Figure 3 - Mapped Site Features 2009



Legend

- Monitoring Area Limits
- Wetland Boundary
- Vegetation Community Boundary
- Open Water Boundary

Base photograph July 1, 2009

Gross Wetland	2.02 acres
Open Water	0.08 acres
Net Wetland	1.94 acres

Noxious Weeds

- **Cirsium arvense**
- **Hypericum perforatum**
- **Iris pseudacorus**
- **Chrysanthemum leucanthemum**

Infestation Size

- ✖ = < 0.1 acre
- ▲ = 0.1 to 1 acre

Cover Class

- L = Low (1-5% cover)
- M = Moderate (5-25% cover)

Vegetation Types

① Juncus
② Phalaris
③ Scirpus
④ Carex / Juncus
⑤ Carex
⑥ Crataegus / Phalaris
⑦ Phalaris / Melilotus
⑧ Channel / Elodea

PROJECT NAME: MDT MUD CREEK WETLAND MITIGATION
DRAWING TITLE: MAPPED SITE FEATURES 2009

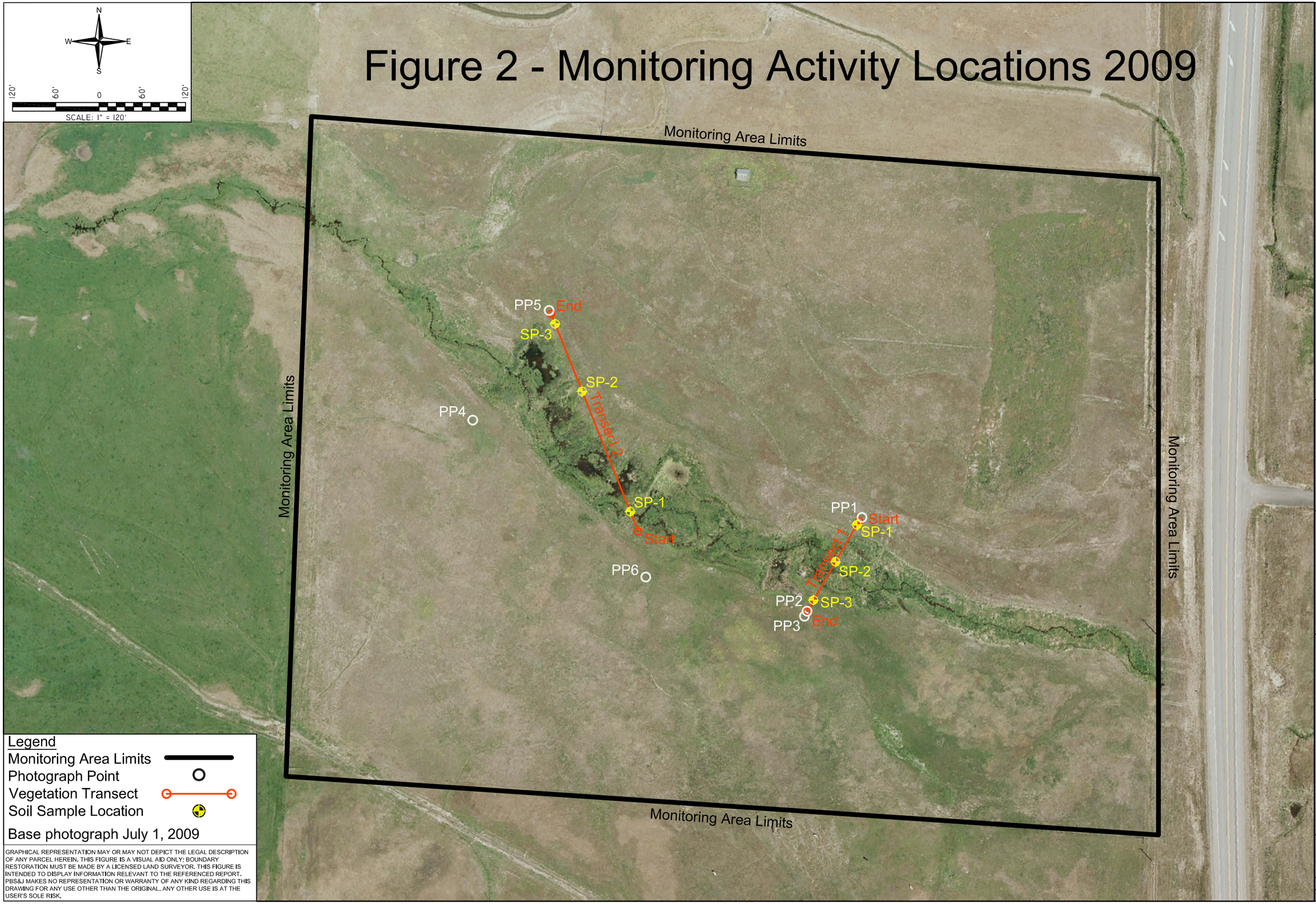
DRAWN: JR
PROJ MGR: J. BERGLUND
CHECKED: GH | APPVD: JB

PROJ NO: 0B4308802 02.06
LOCATION: RONAN, MT
SCALE: NOTED
FILE NAME: BASE 2009.dwg

PBSJ
1120 Cedar
Missoula, MT 59802

FIGURE 3 OF
REV -
Nov/23/2009

Figure 2 - Monitoring Activity Locations 2009



Legend

- Monitoring Area Limits
- Photograph Point
- Vegetation Transect
- Soil Sample Location

Base photograph July 1, 2009

PROJECT NAME: MDT PETERSON WETLAND MITIGATION

DRAWING TITLE: MONITORING ACTIVITY LOCATIONS 2009

PROJ NO:	0B4308802 02.06
LOCATION:	ST. IGNATIUS, MT
SCALE:	NOTED
FILE NAME:	BASE 2009.dwg
DRAWN:	JR
PROJ MGR:	J. BERGLUND
CHECKED:	GH
APPVD:	JB

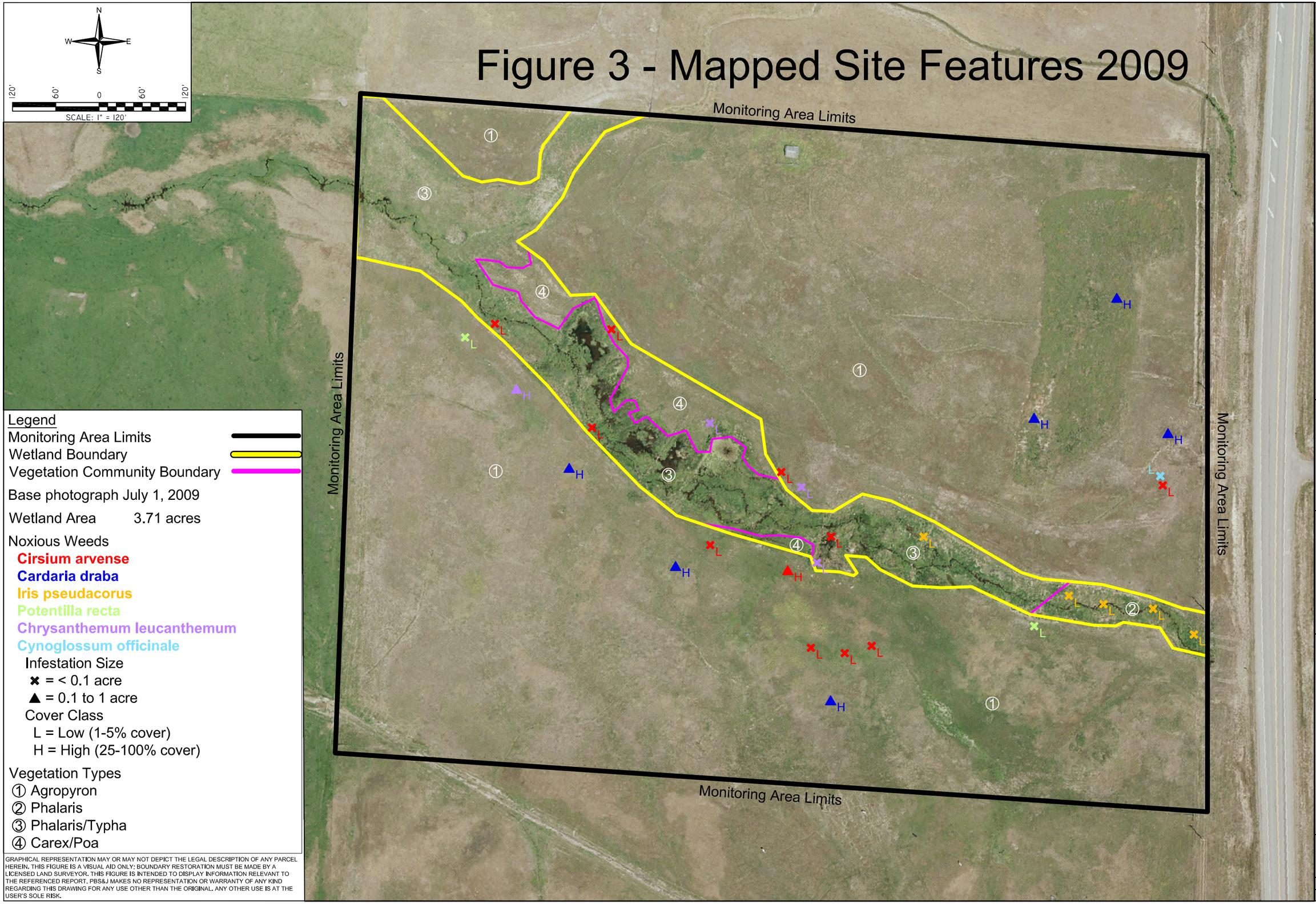
PBSJ
1120 Cedar
Missoula, MT 59802

FIGURE 2 OF .

REV -

Oct/30/2009

Figure 3 - Mapped Site Features 2009



Legend

Monitoring Area Limits

Wetland Boundary

Vegetation Community Boundary

Base photograph July 1, 2009

Wetland Area 3.71 acres

Noxious Weeds

- **Cirsium arvense**
- **Cardaria draba**
- **Iris pseudacorus**
- **Potentilla recta**
- **Chrysanthemum leucanthemum**
- **Cynoglossum officinale**

Infestation Size

- ✖ = < 0.1 acre
- ▲ = 0.1 to 1 acre

Cover Class

- L = Low (1-5% cover)
- H = High (25-100% cover)

Vegetation Types

① Agropyron
② Phalaris
③ Phalaris/Typha
④ Carex/Poa

PROJECT NAME
MDT PETERSON WETLAND MITIGATION

DRAWING TITLE
MAPPED SITE FEATURES 2009

DRAWN: JR
PROJ MGR: J. BERGLUND
CHECKED: GH | APPVD: JB

PROJ NO: 0B4308802 02.06
LOCATION: ST. IGNATIUS, MT
SCALE: NOTED
FILE NAME: BASE 2009.dwg

PBSJ
1120 Cedar
Missoula, MT 59802

FIGURE
3 OF .
REV -
Oct/30/2009

Appendix B

2009 WETLAND MITIGATION SITE MONITORING FORMS
2009 BIRD SURVEY FORMS
2009 COE WETLAND DELINEATION FORMS
2009 MDT FUNCTIONAL ASSESSMENT FORMS

US Highway 93 Onsite: Bouchard, Jocko Spring Creek, Mission Creek, Mud Creek, and Peterson Property

Bouchard Property

PBS&J / MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name: **Bouchard** Project Number: **4308802**
Assessment Date: **July 22, 2009** Person(s) conducting the assessment: **G. Howard**
Location: **Arlee** MDT District: **Missoula** Milepost: _____
Legal Description: T **17N** R **20W** Section **26**
Weather Conditions: _____ Time of Day: _____
Initial Evaluation Date: **July 29, 2008** Monitoring Year: **3** # Visits in Year: **1**
Size of evaluation area: **40 acres** Land use surrounding wetland: **Agriculture and residential**

HYDROLOGY

Surface Water Source: **groundwater (Spring Creek)**
Inundation: **Present** Average Depth: **0.5 feet** Range of Depths: **0.5 - 4ft/**
Percent of assessment area under inundation: **25%**
Depth at emergent vegetation-open water boundary: _____ **feet**
If assessment area is not inundated then are the soils saturated within 12 inches of surface: _
Other evidence of hydrology on the site (ex. – drift lines, erosion, stained vegetation, etc.):

_____

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

Well Number	Depth	Well Number	Depth	Well Number	Depth

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

COMMENTS / PROBLEMS:
The mitigation site consists of a 40-acre parcel dominated by emergent, scrub-shrub and forested vegetation types. Site does not receive any direct surface water. Site is influenced by groundwater. Several small ponds exist that are also sourced by groundwater. These areas were previously sourced by irrigation water from the spring creek that is located adjacent to the southeast corner of the parcel. The values specified for the range of depths includes both constructed shallow depression and existing small ponds. The constructed shallow depression has an average depth of approximately 6 inches. Site conditions are similar to those observed in 2008 with an increase in inundation in the created wetland zones.

VEGETATION COMMUNITIES

Community Number: **1** Community Title (main spp): **Agropyron / Agrostis**

Dominant Species	% Cover	Dominant Species	% Cover
AGRTRA	4 = 21-50%	LYNALB	+ = < 1%
ACHMIL	2 = 6-10%	CARNUT	1 = 1-5%
AGRREP	2 = 6-10%		
AGRALB	3 = 11-20%		
CIRARV	2 = 6-10%		
CYNOFF	1 = 1-5%		

Comments / Problems: **Upland plant community surrounding wetland areas. Several noxious weeds present and location illustrated on Figure 3. Weedy fringe around wetlands.**

Community Number: **2** Community Title (main spp): **Deschampsia / Juncus**

Dominant Species	% Cover	Dominant Species	% Cover
DESCES	5 = > 50%	CARSTI	+ = < 1%
AGRALB	2 = 6-10%	CORSTO (P)	1 = 1-5%
ALOPRA	+ = < 1%	ALNINC (P)	1 = 1-5%
JUNENS	+ = < 1%	SALBEB (P)	1 = 1-5%
JUNTEN	2 = 6-10%		
CARPRA	1 = 1-5%		

Comments / Problems: **Vegetation community located within the wetland creation areas. Type 2 dominated by herbaecous species.**

Community Number: **3** Community Title (main spp): **Juncus / Eleocharis**

Dominant Species	% Cover	Dominant Species	% Cover
AGRALB	2 = 6-10%	ALOPRA	+ = < 1%
JUNENS	4 = 21-50%	CORSTO (P)	+ = < 1%
JUNTEN	3 = 11-20%	ELESPP	3 = 11-20%
AGRTRA	+ = < 1%		
ACHMIL	1 = 1-5%		
CIRARV	1 = 1-5%		

Comments / Problems: **Vegetation community located within the wetland creation areas. Type 2 dominated by herbaecous species.**

Community Number: **4** Community Title (main spp): **Juncus / Cirsium**

Dominant Species	% Cover	Dominant Species	% Cover
JUNBAL	4 = 21-50%	HYPPER	+ = < 1%
AGRALB	3 = 11-20%	SOLDUL	2 = 6-10%
CIRARV	3 = 11-20%		
CYNOFF	1 = 1-5%		
GEUMAC	2 = 6-10%		
SONARV	1 = 1-5%		

Comments / Problems: **Existing wetland areas with high cover value of weedy species. One noxious weed species present.**

VEGETATION COMMUNITIES (continued)

Community Number: **5** Community Title (main spp): **Carex**

Dominant Species	% Cover	Dominant Species	% Cover
CARUTR	4 = 21-50%	JUNBAL	2 = 6-10%
CARVES	3 = 11-20%	GLYSTR	1 = 1-5%
SOLSPP	1 = 1-5%	CARLAN	1 = 1-5%
SALBEB	2 = 6-10%	CARNEB	2 = 6-10%
CORSTO	1 = 1-5%	GEUMAC	1 = 1-5%
BETOCC	1 = 1-5%		

Comments / Problems: **Unaltered wetland area dominated by emergent vegetation.**

Community Number: **6** Community Title (main spp): **Betula / Potentilla**

Dominant Species	% Cover	Dominant Species	% Cover
BETOCC	5 = > 50%		
POTFRU	3 = 11-20%		
SALBEB	2 = 6-10%		
CARNEB	1 = 1-5%		
JUNBAL	4 = 21-50%		
HYPSPP	2 = 6-10%		

Comments / Problems: **Existing wetlands dominated by scrub-shrub and emergent veegtation types.**

Community Number: **7** Community Title (main spp): **Alnus / Glyceria**

Dominant Species	% Cover	Dominant Species	% Cover
ALNINC	5 = > 50%	GEUMAC	1 = 1-5%
CORSTO	2 = 6-10%	CARUTR	2 = 6-10%
CARVES	2 = 6-10%		
GLYGRA	3 = 11-20%		
SOLDAL	+ = < 1%		
BETOCC	2 = 6-10%		

Comments / Problems: **Existing wetlands dominated by scrub-shrub and emergent vegetation types.**

Community Number: **8** Community Title (main spp): **Populus**

Dominant Species	% Cover	Dominant Species	% Cover
POPTRI	5 = > 50%		
POPTRE	3 = 11-20%		

Comments / Problems: **Small forested stands surrounding and near the shallow open-water ponds.**

VEGETATION COMMUNITIES (continued)

Community Number: **9** Community Title (main spp): **Typha**

Dominant Species	% Cover	Dominant Species	% Cover
TYPLAT	5 = > 50%		

Comments / Problems: **Area dominated by a monoculture of cattails.**

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

Dominant Species	% Cover	Dominant Species	% Cover

Comments / Problems: _____

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

Dominant Species	% Cover	Dominant Species	% Cover

Comments / Problems: _____

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

Dominant Species	% Cover	Dominant Species	% Cover

Comments / Problems: _____

Additional Activities Checklist:

☒ Record and map vegetative communities on aerial photograph.

COMPREHENSIVE VEGETATION LIST

Plant Species	Vegetation Community Number (s)	Plant Species	Vegetation Community Number (s)
Achillea millefolium	1,3,	*Hordeum jubatum*	1
Agrostis alba	1,2,3,4	*Hypericum perforatum*	1,3
Agropyron repens	1	*Juncus balticus*	4,5,6
Agropyron trachycaulum	1	*Juncus ensifolius*	2,3
Alnus incana	7	*Juncus mertensianus*	2,3
Alopecurus pratensis	2,3	*Juncus tenuis*	2,3
Alyssum alyssoides	1	*Juniperus scopulorum*	1
Anthemis cotula	1	*Juncus spp.*	2,3
Artemisia ludoviciana	1	*Lactuca serriola*	1
Betula occidentalis	5,6	*Lychnis alba*	1
Bromus carinatus	1	*Mentha arvensis*	5,6
Bromus tectorum	1	*Medicago sativa*	1
Calamagrostis canadensis	5,6,7	*Mimulus guttatus*	5,6,7
Campanula rotundifolia	5	*Nepeta cataria*	5
Carduus nutans	1,4	*Phalaris arundinacea*	2,3,5
Carex lanuginose	5	*Phleum pratense*	1
Carex nebrascensis	2,3,5,6,7,	*Plantago major*	1
Carex praegracilis	5	*Poa palustris*	2,3
Carex utriculata	5,6,7	*Poa pratensis*	1
Carex stipata	5,6	*Polygonum amphibium*	2,3
Carex retrorsa	5,6,7	*Populus tremuloides*	8
Carex vesicaria	5,6	*Populus trichocarpa*	8
Centaurea maculosa	1	*Potentilla anserina*	5,6
Chara spp.	Pond	*Potentilla fruticosa*	5,6
Chenopodium album	1	*Ranunculus spp.*	5,6
Chrysanthemum leucanthemum	1	*Ribes spp.*	6
Cichorium intybus	1	*Rosa woodsii*	1,6
Cirsium arvense	1,4	*Rubus idaeus*	1,6
Cornus stolonifera	2,3,6	*Rumex crispus*	1,2,3
Crataegus douglasii	2,3	*Salix bebbiana*	2,3,6,7
Cynoglossum officinale	1,4	*Salix exigua*	2,3,6
Deschampsia cespitosa	2,3	*Salix geyeriana*	2,3,6
Dodecatheon spp.	5,6	*Salix lutea*	2,3,6
Eleocharis palustris	2,3	*Solanum dulcamara*	5,6
Eleocharis spp.	2,3	*Solidago missouriensis*	1,4,5,6
Epilobium ciliatum	2,3,4,5	*Sonchus arvensis*	1,4,5
Epilobium spp.	2,3,4,5	*Symphoricarpos albus*	1,6
Equisetum arvense	2,3,5	*Typha latifolia*	2,3,9
Geum macrophyllum	2,3,5,6,7	*Verbascum thapsus*	1
Glyceria grandis	5,7	*Vicia spp.*	1
Glyceria striata	5,7		

Comments / Problems: Two new species identified in 2009 including *Chara* spp. and *Juncus mertensianus.*

PLANTED WOODY VEGETATION SURVIVAL

Plant Species	Number Originally Planted	Number Observed	Mortality Causes
ALNINC	--	99	Plantings looked healthy with vigorous growth for the season with few discolored leaves. Browse protection were intact and properly functioning. Water birch and red-osier dogwood species had the highest counts within transects.
BETOCC	817	120	
CORSTO	408	97	
CRADOU	--	7	
RIBHUD	245	21	
ROSWOO	--	3	
SALSPP	408	58	
SYMALB	--	9	

Comments / Problems: Shrub planting survival data was collected along ten (240 feet long) 2 meter wide belt transects that totaled approximately 0.35 acres (15,600 sq. ft.). Transects were randomly established across the wetland creation area perpendicular to southern boundary. Transects were walked from south to north across this mitigation type. During the 2009 monitoring, species survival was based on visual estimates and counts for each live species. The original plantings numbers as listed above were referenced from Bouchard Wetland – Wetland Planting Summary (**Appendix G**). Actual planting numbers and prescribed species may vary from the original plan. Three species were found that were not listed in the original planting summary. Post design changes for planting prescriptions were adjusted during the construction phase due to availability of seedlings. Overall survival ratings are considered moderate to high based on visual assessment. Plant growth was vigorous and looked healthy with few discolored leaves. Browse protection were intact and properly functioning.

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
Coyotes		☐	☒	☐	
Deer		☐	☒	☐	
Meadow vole	2	☐	☐	☐	
Spotted frog	4	☐	☐	☐	
Muskrat		☐	☒	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	

Additional Activities Checklist:
NA 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 (°)
PP1	1.0	View looking north.	0
PP1	1.1	View looking north.	0
PP2	1.0	View looking north.	0
PP3	1.0	View looking west.	270
PP3	1.0	View looking southeast to southwest.	180
PP4	1.1	View looking southeast.	135
PP5	1.0	View looking east.	90
PP5	1.1	View looking north.	0
PP5	1.2	View looking east.	90
PP6	1.0	View looking southeast.	135
PP7	1.0	View looking east.	90
PP7	1.1	View looking west.	270
PP7	1.2	View looking west.	270
PP8	1.0	View looking north.	0
PP8	1.1	View looking east.	90
PP9	1.0	View looking southwest.	225
PP9	1.1	View looking southeast.	135
PP9	1.2	View looking northeast.	45
PP9	1.3	View looking northwest.	315
PP10	1.0	View looking southeast.	135
PP10	1.1	View looking northeast.	45
PP11	1.0	View looking northwest.	315

Comments / Problems: **Refer to photopage for a decription of each photo point.**

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: **FA completed using 1999 MDT Montana Wetland Assessment Method. Mitigation credit system requires direct comparison between pre-and post-project using the 1999 methods to show a functional shift.**

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? **No**
If yes, are the structures working properly and in good working order? **NA**
If no, describe the problems below.

Comments / Problems: _____

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Bouchard** Date: **07/22/2009** Examiner: **G. Howard**
Transect Number: **1** Approximate Transect Length: **526 feet** Compass Direction from Start: **0˚** Note: _____

Vegetation Type A: **C.T.1 - Agropyron / Agrostis (Upland)**	
Length of transect in this type: 122 feet	
Plant Species	**Cover**
AGRTRA	3 = 11-20%
AGRREP	2 = 6-10%
AGRALB	2 = 6-10%
ACHMIL	4 = 21-50%
CIRARV	2 = 6-10%
CYNOFF	1 = 1-5%
RUMCRI	+ = < 1%
Total Vegetative Cover:	100%

Vegetation Type B: **C.T. 3 - Juncus / Eleocharis (Wetland)**	
Length of transect in this type: 43 feet	
Plant Species	**Cover**
JUNTEN	2 = 6-10%
JUNENS	2 = 6-10%
AGRALB	4 = 21-50%
AGRTRA	2 = 6-10%
ACHMIL	2 = 6-10%
CIRARV	1 = 1-5%
EQUARV	2 = 6-10%
GLYSTR	1 = 1-5%
PLAMAJ	+ = < 1%
ALOPRA	+ = < 1%
MEDSAT	+ = < 1%
Total Vegetative Cover:	95%

Vegetation Type C: **C.T. 2 - Deschampsia / Juncus (Wetland)-**	
Length of transect in this type: 193 feet	
Plant Species	**Cover**
DESCES	5 = > 50%
CARNEB	2 = 6-10%
CARLAN	+ = < 1%
EQUARV	1 = 1-5%
JUNTEN	2 = 6-10%
ALNINC	+ = < 1%
SALBEB	+ = < 1%
ELEPAL	2 = 6-10%
AGRALB	1 = 1-5%
CARPRA	+ = < 1%
CARSTI	+ = < 1%
JUNBAL	+ = < 1%
Total Vegetative Cover:	95%

Vegetation Type D: **C.T. 3 - Juncus / Eleocharis (Wetland)**	
Length of transect in this type: 160 feet	
Plant Species	**Cover**
JUNENS	3 = 11-20%
JUNTEN	4 = 21-50%
TYPLAT	1 = 1-5%
DESCES	+ = < 1%
AGRALB	+ = < 1%
ELEPAL	3 = 11-20%
Total Vegetative Cover:	95%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Bouchard** Date: **07/22/2009** Examiner: **G. Howard**
Transect Number: **1** Approximate Transect Length: **526 feet** Compass Direction from Start: **0˚** Note: _____

Vegetation Type E: **C.T. 4 - Juncus / Cirsium (Wetland)**	
Length of transect in this type: 8 feet	
Plant Species	**Cover**
AGRALB	4 = 21-50%
JUNBAL	4 = 21-50%
CIRARV	2 = 6-10%
SONARV	2 = 6-10%
CYNOFF	+ = < 1%
SOLDUL	2 = 6-10%
GEUMAC	+ = < 1%
CIRVUL	+ = < 1%
Total Vegetative Cover:	95%

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

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

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

Site: **Bouchard** Date: **07/22/2009** Examiner: **G. Howard**
Transect Number: **2** Approximate Transect Length: **313 feet** Compass Direction from Start: **90˚** Note: _____

Vegetation Type E: **C.T. 6 - Betula / Potentilla (Wetlands)**	
Length of transect in this type: 98 feet	
Plant Species	**Cover**
BETOCC	3 = 11-20%
SALBEB	4 = 21-50%
JUNBAL	2 = 6-10%
CIRARV	1 = 1-5%
SOLSPP	2 = 6-10%
CARUTR	2 = 6-10%
AGRALB	2 = 6-10%
CIRVUL	+ = < 1%
GEUMAC	2 = 6-10%
MENARV	+ = < 1%
Total Vegetative Cover:	100%

Vegetation Type F: **C.T. 5 - Carex (Wetland)**	
Length of transect in this type: 215 feet	
Plant Species	**Cover**
CARUTR	4 = 21-50%
AGRALB	2 = 6-10%
TYPLAT	1 = 1-5%
JUNBAL	3 = 11-20%
GLYGRA	1 = 1-5%
GLYSTR	2 = 6-10%
JUNTEN	1 = 1-5%
CARLAN	1 = 1-5%
CARSTI	1 = 1-5%
ALOPRA	2 = 6-10%
CIRARV	1 = 1-5%
JUNENS	+ = < 1%
Total Vegetative Cover:	95%

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

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

MDT WETLAND MONITORING – VEGETATION TRANSECT
MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Bouchard** Date: **07/22/2009** Examiner: **G. Howard**
Transect Number: **3** Approximate Transect Length: **133 feet** Compass Direction from Start: **45˚** Note: _____

Vegetation Type I: **C.T. 4 - Juncus / Cirsium (Wetland)**	
Length of transect in this type: 10 feet	
Plant Species	**Cover**
CARNUT	3 = 11-20%
AGRREP	4 = 21-50%
CIRARV	4 = 21-50%
GEUMAC	1 = 1-5%
VERTHA	+ = < 1%
CYNOFF	2 = 6-10%
ACHMIL	+ = < 1%
BROTEC	1 = 1-5%
TYPLAT	+ = < 1%
Total Vegetative Cover:	95%

Vegetation Type J: **C.T. 1 - Agropyron (Upland)**	
Length of transect in this type: 123 feet	
Plant Species	**Cover**
ALOPRA	3 = 11-20%
AGRREP	4 = 21-50%
POAPRA	2 = 6-10%
JUNBAL	3 = 11-20%
CIRARV	2 = 6-10%
SONARV	1 = 1-5%
GEUMAC	+ = < 1%
	3 = 11-20%
Total Vegetative Cover:	95%

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

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

MDT WETLAND MONITORING – VEGETATION TRANSECT

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

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

Establish transects perpendicular to the shoreline (or saturated perimeter). The transect should begin in the upland area. Permanently mark this location with a standard metal fencepost. Extend the imaginary transect line towards the center of the wetland, ending at the 3 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: **Bouchard** Date: **7/22/09**
Survey Time: **12** to **4**

Bird Species	#	Behavior	Habitat	Bird Species	#	Behavior	Habitat
Tree Swallow	5	FO	WM				
Red-winged blackbirds	2	L	SS				
Brown-headed cowbirds	1	L	WM				
Yellow warbler	2	FO	SS				
Magpie	1	FO	WM				
American Crow	1	L	WM				
Pheasant	1	N	WM				
Mallard	2	L	OW				
Red tailed hawk	1	L FO	FO SS				
Killdeer	2	N	WM				

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: Warm temperatures and clear.

Notes: _____

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

Project/Site:	Bouchard Property	**Project No:** B4308802	**Date:** 22-Jul-2009
Applicant/Owner:	Montana Department of Transportation		**County:** Lake
Investigators:	G. Howard		**State:** Montana
			Plot ID: T1 - SP1

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

VEGETATION **(USFWS Region No. 9)**

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
Agropyron trachycaulum	Herb	FAC	*Achillea millefolium*	Herb	FACU
Wheatgrass,Slender			Yarrow,Common		
Agropyron repens	Herb	FACU	*Cirsium arvense*	Herb	FACU+
Quackgrass			Thistle,Creeping		
Agrostis alba	Herb	FACW	*Rumex crispus*	Herb	FACW
Redtop			Dock,Curly		

Percent of Dominant Species that are OBL, FACW or FAC: 2/5 = 40.00%
(excluding FAC-) 3/6 = 50.00%
FAC Neutral: 2/5 = 40.00%
Numeric Index: 19/6 = 3.17

Remarks:
Area considered upland vegetation dominated by several wheatgrasses.

HYDROLOGY

NO **Recorded Data(Describe in Remarks):**
N/A **Stream, Lake or Tide Gauge**
N/A **Aerial Photographs**
N/A **Other**
YES **No Recorded Data**

Field Observations

Depth of Surface Water: N/A *(in.)*
Depth to Free Water in Pit: N/A *(in.)*
Depth to Saturated Soil: N/A *(in.)*

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 Wetlands**
Secondary Indicators
NO **Oxidized Root Channels in Upper 12 Inches**
NO **Water-Stained Leaves**
YES **Local Soil Survey Data**
NO **FAC-Neutral Test**
NO **Other(Explain in Remarks)**

Remarks:
No hydrology indicators.

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

Project/Site:	Bouchard Property	**Project No:** B4308802	**Date:** 22-Jul-2009
Applicant/Owner:	Montana Department of Transportation		**County:** Lake
Investigators:	G. Howard		**State:** Montana
			Plot ID: T1 - SP1

SOILS

Map Unit Name (Series and Phase): Lamoose loam, 0 to 2 percent slope
Map Symbol: 93 **Drainage Class:** poorly drained **Mapped Hydric Inclusion?**
Taxonomy (Subgroup): **Field Observations Confirm Mapped Type?** (Yes) No
Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
0-10+	A	10YR2/1	N/A	N/A	N/A	Loam

Hydric Soil Indicators:

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

Remarks:
Hydric soil indicator not present.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes (No)	Is the Sampling Point within the Wetland? Yes (No)
Wetland Hydrology Present?	Yes (No)	
Hydric Soils Present?	Yes (No)	

Remarks:
Sampling point is considered within an upland area.

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

Project/Site: Bouchard Property	**Project No:** B4308802	**Date:** 22-Jul-2009
Applicant/Owner: Montana Department of Transportation		**County:** Lake
Investigators: G. Howard		**State:** Montana
		Plot ID: T1 - SP2

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

VEGETATION **(USFWS Region No. 9)**

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
Juncus tenuis	Herb	FAC	*Achillea millefolium*	Herb	FACU
Rush,Slender			Yarrow,Common		
Juncus ensifolius	Herb	FACW	*Equisetum arvense*	Herb	FAC
Rush,Three-Stamen			Horsetail,Field		
Agrostis alba	Herb	FACW	*Glyceria striata*	Herb	OBL
Redtop			Grass,Fowl Manna		
Agropyron trachycaulum	Herb	FAC			
Wheatgrass,Slender					

Percent of Dominant Species that are OBL, FACW or FAC: **(excluding FAC-)** 6/7 = 85.71%

FAC Neutral: 3/4 = 75.00%

Numeric Index: 18/7 = 2.57

Remarks:
Area dominated by hydrophytic vegetation.

HYDROLOGY

NO **Recorded Data(Describe in Remarks):**
- N/A **Stream, Lake or Tide Gauge**
- N/A **Aerial Photographs**
- N/A **Other**

YES **No Recorded Data**

Field Observations

Depth of Surface Water:	N/A *(in.)*
Depth to Free Water in Pit:	N/A *(in.)*
Depth to Saturated Soil:	= 0 *(in.)*

Wetland Hydrology Indicators

Primary Indicators
- NO **Inundated**
- YES **Saturated in Upper 12 Inches**
- NO **Water Marks**
- NO **Drift Lines**
- NO **Sediment Deposits**
- NO **Drainage Patterns in Wetlands**

Secondary Indicators
- NO **Oxidized Root Channels in Upper 12 Inches**
- NO **Water-Stained Leaves**
- NO **Local Soil Survey Data**
- YES **FAC-Neutral Test**
- NO **Other(Explain in Remarks)**

Remarks:
Hydrology indicator present with soils saturated to the ground surface.

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

Project/Site: Bouchard Property	**Project No:** B4308802	**Date:** 22-Jul-2009
Applicant/Owner: Montana Department of Transportation		**County:** Lake
Investigators: G. Howard		**State:** Montana
		Plot ID: T1 - SP2

SOILS

Map Unit Name (Series and Phase): Lamoose loam, 0 to 2 percent slope
Map Symbol: 93 **Drainage Class:** poorly drained **Mapped Hydric Inclusion?**
Taxonomy (Subgroup): **Field Observations Confirm Mapped Type?** Yes (No)
Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
0-10+	A	10YR2/1	N/A	N/A	N/A	Loam

Hydric Soil Indicators:

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

Remarks:
Hydric soils present with low-chroma colors.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No	Is the Sampling Point within the Wetland? (Yes) No	
Wetland Hydrology Present? (Yes) No		
Hydric Soils Present? (Yes) No		

Remarks:
Sampling point considered within a wetland area. Site dominated by emergent vegetation type.

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

Project/Site:	Bouchard Property	**Project No:** B4308802	**Date:** 22-Jul-2009
Applicant/Owner:	Montana Department of Transportation		**County:** Lake
Investigators:	G. Howard		**State:** Montana
			Plot ID: T1 - SP3

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

VEGETATION **(USFWS Region No. 9)**

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
Deschampsia cespitosa	Herb	FACW	*Juncus tenuis*	Herb	FAC
Hairgrass,Tufted			Rush,Slender		
Carex nebrascensis	Herb	OBL	*Eleocharis palustris*	Herb	OBL
Sedge,Nebraska			Spikerush,Creeping		
Equisetum arvense	Herb	FAC			
Horsetail,Field					

Percent of Dominant Species that are OBL, FACW or FAC:	**FAC Neutral:** 3/3 = 100.00%
(excluding FAC-) 5/5 = 100.00%	**Numeric Index:** 10/5 = 2.00

Remarks:
Area dominated by hydrophytic vegetation.

HYDROLOGY

NO **Recorded Data(Describe in Remarks):**
- N/A **Stream, Lake or Tide Gauge**
- N/A **Aerial Photographs**
- N/A **Other**

YES **No Recorded Data**

Field Observations

Depth of Surface Water:	N/A *(in.)*
Depth to Free Water in Pit:	N/A *(in.)*
Depth to Saturated Soil:	= 0 *(in.)*

Wetland Hydrology Indicators

Primary Indicators
- NO **Inundated**
- YES **Saturated in Upper 12 Inches**
- NO **Water Marks**
- NO **Drift Lines**
- NO **Sediment Deposits**
- NO **Drainage Patterns in Wetlands**

Secondary Indicators
- NO **Oxidized Root Channels in Upper 12 Inches**
- NO **Water-Stained Leaves**
- NO **Local Soil Survey Data**
- YES **FAC-Neutral Test**
- NO **Other(Explain in Remarks)**

Remarks:
Hydric soil indicators present with soils saturated to the ground surface.

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

Project/Site:	Bouchard Property	**Project No:** B4308802	**Date:** 22-Jul-2009
Applicant/Owner:	Montana Department of Transportation		**County:** Lake
Investigators:	G. Howard		**State:** Montana
			Plot ID: T1 - SP3

SOILS

Map Unit Name (Series and Phase): Lamoose loam, 0 to 2 percent slope
Map Symbol: 93 **Drainage Class:** poorly drained **Mapped Hydric Inclusion?**
Taxonomy (Subgroup): **Field Observations Confirm Mapped Type?** Yes (No)
Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
0-10+	A	10YR2/1	N/A	N/A	N/A	Loam

Hydric Soil Indicators:

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

Remarks:
Hydric soil indicator present with low-chroma colors.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes) No	Is the Sampling Point within the Wetland? (Yes) No
Wetland Hydrology Present?	(Yes) No	
Hydric Soils Present?	(Yes) No	

Remarks:
Sampling point considered within a wetland area.

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

Project/Site: Bouchard Property	**Project No:** B4308802	**Date:** 22-Jul-2009
Applicant/Owner: Montana Department of Transportation		**County:** Lake
Investigators: G. Howard		**State:** Montana
		Plot ID: T1 - SP4

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

VEGETATION **(USFWS Region No. 9)**

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
Juncus ensifolius	Herb	FACW	*Deschampsia cespitosa*	Herb	FACW
Rush,Three-Stamen			Hairgrass,Tufted		
Juncus tenuis	Herb	FAC	*Agrostis alba*	Herb	FACW
Rush,Slender			Redtop		
Typha latifolia	Herb	OBL			
Cattail,Broad-Leaf					

Percent of Dominant Species that are OBL, FACW or FAC:	**FAC Neutral:** 4/4 = 100.00%
(excluding FAC-) 5/5 = 100.00%	**Numeric Index:** 10/5 = 2.00

Remarks:
Area dominated by hydrophytic vegetation.

HYDROLOGY

NO **Recorded Data(Describe in Remarks):**
- N/A **Stream, Lake or Tide Gauge**
- N/A **Aerial Photographs**
- N/A **Other**

YES **No Recorded Data**

Field Observations

Depth of Surface Water:	N/A *(in.)*
Depth to Free Water in Pit:	N/A *(in.)*
Depth to Saturated Soil:	= 0 *(in.)*

Wetland Hydrology Indicators

Primary Indicators
- NO **Inundated**
- YES **Saturated in Upper 12 Inches**
- NO **Water Marks**
- NO **Drift Lines**
- NO **Sediment Deposits**
- NO **Drainage Patterns in Wetlands**

Secondary Indicators
- NO **Oxidized Root Channels in Upper 12 Inches**
- NO **Water-Stained Leaves**
- NO **Local Soil Survey Data**
- YES **FAC-Neutral Test**
- NO **Other(Explain in Remarks)**

Remarks:
Hydrology indicator present with soils saturated to ground surface.

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

Project/Site: Bouchard Property	**Project No:** B4308802	**Date:** 22-Jul-2009
Applicant/Owner: Montana Department of Transportation		**County:** Lake
Investigators: G. Howard		**State:** Montana
		Plot ID: T1 - SP4

SOILS

Map Unit Name (Series and Phase): Lamoose loam, 0 to 2 percent slope
Map Symbol: 93 **Drainage Class:** poorly drained **Mapped Hydric Inclusion?**
Taxonomy (Subgroup): **Field Observations Confirm Mapped Type?** Yes (No)
Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
0-8	A	10YR2/1	N/A	N/A	N/A	Clay loam
8-10	B	2.5Y3/1	N/A	N/A	N/A	Clay loam
10+	A	10YR2/1	N/A	N/A	N/A	Loam

Hydric Soil Indicators:

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

Remarks:
Hydric soil indicator present with low-chroma colors.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes) No	Is the Sampling Point within the Wetland? (Yes) No
Wetland Hydrology Present?	(Yes) No	
Hydric Soils Present?	(Yes) No	

Remarks:
Sampling point considered within a wetland area.

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

Project/Site:	Bouchard Property	**Project No:** B4308802	**Date:** 22-Jul-2009
Applicant/Owner:	Montana Department of Transportation		**County:** Lake
Investigators:	G. Howard		**State:** Montana
			Plot ID: T1 - SP5

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

VEGETATION **(USFWS Region No. 9)**

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
Agrostis alba	Herb	FACW	*Cirsium arvense*	Herb	FACU+
Redtop			Thistle,Creeping		
Juncus balticus	Herb	OBL	*Sonchus arvensis*	Herb	FACU+
Rush,Baltic			Sowthistle,Field		
Glyceria striata	Herb	OBL	*Solanum dulcamara*	Herb	FAC
Grass,Fowl Manna			Nightshade,Climbing		

Percent of Dominant Species that are OBL, FACW or FAC:	**FAC Neutral:** 3/5 = 60.00%
(excluding FAC-) 4/6 = 66.67%	**Numeric Index:** 15/6 = 2.50

Remarks:
Area dominated by hydrophytic vegetation.

HYDROLOGY

NO **Recorded Data(Describe in Remarks):**
- N/A **Stream, Lake or Tide Gauge**
- N/A **Aerial Photographs**
- N/A **Other**

YES **No Recorded Data**

Field Observations

Depth of Surface Water:	N/A *(in.)*
Depth to Free Water in Pit:	N/A *(in.)*
Depth to Saturated Soil:	= 8 *(in.)*

Wetland Hydrology Indicators

Primary Indicators
- NO **Inundated**
- YES **Saturated in Upper 12 Inches**
- NO **Water Marks**
- NO **Drift Lines**
- NO **Sediment Deposits**
- NO **Drainage Patterns in Wetlands**

Secondary Indicators
- NO **Oxidized Root Channels in Upper 12 Inches**
- NO **Water-Stained Leaves**
- NO **Local Soil Survey Data**
- YES **FAC-Neutral Test**
- NO **Other(Explain in Remarks)**

Remarks:
Hydrology indicator present with soils saturated within the upper 12 of the profile.

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

Project/Site:	Bouchard Property	**Project No:** B4308802	**Date:** 22-Jul-2009
Applicant/Owner:	Montana Department of Transportation		**County:** Lake
Investigators:	G. Howard		**State:** Montana
			Plot ID: T1 - SP5

SOILS

Map Unit Name (Series and Phase): Lamoose loam, 0 to 2 percent slope
Map Symbol: 93 **Drainage Class:** poorly drained **Mapped Hydric Inclusion?**
Taxonomy (Subgroup): **Field Observations Confirm Mapped Type?** Yes (No)
Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
0-6	A/B	10YR3/3	N/A	N/A	N/A	Loam
6-10+	A	10YR2/1	N/A	N/A	N/A	Clay loam

Hydric Soil Indicators:

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

Remarks:
Hydric soil indicator present with low-chroma colors.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes)	No	Is the Sampling Point within the Wetland? (Yes) No
Wetland Hydrology Present?	(Yes)	No	
Hydric Soils Present?	(Yes)	No	

Remarks:
Sampling point considered within a wetland area. Exisitng wetlands adjacent to created wetland areas.

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

Project/Site:	Bouchard Property	**Project No:** B4308802	**Date:** 22-Jul-2009
Applicant/Owner:	Montana Department of Transportation		**County:** Lake
Investigators:	G. Howard		**State:** Montana
			Plot ID: T2 - SP1

Do Normal Circumstances exist on the site?	(Yes) No	**Community ID:** EM / SS
Is the site significantly disturbed (Atypical Situation:)?	Yes (No)	**Transect ID:** 1
Is the area a potential Problem Area?	Yes (No)	**Field Location:**
(If needed, explain on the reverse side)		Transect # 2

VEGETATION **(USFWS Region No. 9)**

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
Betula occidentalis	Shrub	FACW	*Carex utriculata*	Herb	OBL
Birch,Spring			beaked sedge		
Salix bebbiana	Shrub	FACW	*Agrostis alba*	Herb	FACW
Willow,Bebb			Redtop		
Juncus balticus	Herb	OBL	*Geum macrophyllum*	Herb	FACW+
Rush,Baltic			Avens,Large-Leaf		

Percent of Dominant Species that are OBL, FACW or FAC: 6/6 = 100.00%
(excluding FAC-) 6/6 = 100.00%

FAC Neutral: 6/6 = 100.00%
Numeric Index: 10/6 = 1.67

Remarks:
Area dominated by hydrophytic vegetation.

HYDROLOGY

NO **Recorded Data(Describe in Remarks):**
N/A **Stream, Lake or Tide Gauge**
N/A **Aerial Photographs**
N/A **Other**

YES **No Recorded Data**

Field Observations

Depth of Surface Water: N/A *(in.)*
Depth to Free Water in Pit: N/A *(in.)*
Depth to Saturated Soil: = 0 *(in.)*

Wetland Hydrology Indicators
Primary Indicators
NO **Inundated**
YES **Saturated in Upper 12 Inches**
NO **Water Marks**
NO **Drift Lines**
NO **Sediment Deposits**
NO **Drainage Patterns in Wetlands**
Secondary Indicators
NO **Oxidized Root Channels in Upper 12 Inches**
NO **Water-Stained Leaves**
NO **Local Soil Survey Data**
YES **FAC-Neutral Test**
NO **Other(Explain in Remarks)**

Remarks:
Hydrology indicator present with soils saturated to the ground surface.

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

Project/Site:	Bouchard Property	**Project No:** B4308802	**Date:** 22-Jul-2009
Applicant/Owner:	Montana Department of Transportation		**County:** Lake
Investigators:	G. Howard		**State:** Montana
			Plot ID: T2 - SP1

SOILS

Map Unit Name (Series and Phase): Borohemists, 0 to 1 percent slopes
Map Symbol: 19 **Drainage Class:** very poorly drained **Mapped Hydric Inclusion?**
Taxonomy (Subgroup): **Field Observations Confirm Mapped Type?** Yes (No)
Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
0-10+	A	10YR2/1	N/A	N/A	N/A	Loam

Hydric Soil Indicators:

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

Remarks:
Hydric soils indicators present with low-chroma colors. Area also mapped as a Hydric Soil.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes) No	Is the Sampling Point within the Wetland? (Yes) No
Wetland Hydrology Present?	(Yes) No	
Hydric Soils Present?	(Yes) No	

Remarks:
Sampling point considered within a wetland area.

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

Project/Site:	Bouchard Property	**Project No:** B4308802	**Date:** 22-Jul-2009
Applicant/Owner:	Montana Department of Transportation		**County:** Lake
Investigators:	G. Howard		**State:** Montana
			Plot ID: T2 - SP2

Do Normal Circumstances exist on the site?	(Yes) No	**Community ID:** EM
Is the site significantly disturbed (Atypical Situation:)?	Yes (No)	**Transect ID:** 1
Is the area a potential Problem Area?	Yes (No)	**Field Location:**
(If needed, explain on the reverse side)		Transect # 2

VEGETATION **(USFWS Region No. 9)**

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
Carex utriculata	Herb	OBL	*Glyceria maxima*	Herb	OBL
beaked sedge			Meadowgrass,Reed		
Agrostis alba	Herb	FACW	*Juncus tenuis*	Herb	FAC
Redtop			Rush,Slender		
Typha latifolia	Herb	OBL	*Alopecurus pratensis*	Herb	FACW
Cattail,Broad-Leaf			Foxtail,Meadow		
Juncus balticus	Herb	OBL			
Rush,Baltic					

Percent of Dominant Species that are OBL, FACW or FAC: **FAC Neutral:** 6/6 = 100.00%
(excluding FAC-) 7/7 = 100.00% **Numeric Index:** 11/7 = 1.57

Remarks:
Area dominated by hydrophytic vegetation.

HYDROLOGY

NO **Recorded Data(Describe in Remarks):**
N/A **Stream, Lake or Tide Gauge**
N/A **Aerial Photographs**
N/A **Other**

YES **No Recorded Data**

Field Observations

Depth of Surface Water: N/A *(in.)*
Depth to Free Water in Pit: N/A *(in.)*
Depth to Saturated Soil: = 0 *(in.)*

Wetland Hydrology Indicators
Primary Indicators
NO **Inundated**
YES **Saturated in Upper 12 Inches**
NO **Water Marks**
NO **Drift Lines**
NO **Sediment Deposits**
NO **Drainage Patterns in Wetlands**
Secondary Indicators
NO **Oxidized Root Channels in Upper 12 Inches**
NO **Water-Stained Leaves**
NO **Local Soil Survey Data**
YES **FAC-Neutral Test**
NO **Other(Explain in Remarks)**

Remarks:
Hydrology indicator present with low-chroma colors.

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

Project/Site:	Bouchard Property	**Project No:** B4308802	**Date:** 22-Jul-2009
Applicant/Owner:	Montana Department of Transportation		**County:** Lake
Investigators:	G. Howard		**State:** Montana
			Plot ID: T2 - SP2

SOILS

Map Unit Name (Series and Phase): Borohemists, 0 to 1 percent slopes
Map Symbol: 19 **Drainage Class:** very poorly drained **Mapped Hydric Inclusion?**
Taxonomy (Subgroup): **Field Observations Confirm Mapped Type?** Yes (No)
Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
0-10+	A	10YR2/1	N/A	N/A	N/A	Loam

Hydric Soil Indicators:

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

Remarks:
Hydric soil indicators present with low-chroma colors. Area also mapped as Hydric Soil.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes) No	Is the Sampling Point within the Wetland? (Yes) No
Wetland Hydrology Present?	(Yes) No	
Hydric Soils Present?	(Yes) No	

Remarks:
Sampling point considered within a wetland area.

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

Project/Site:	Bouchard Property	**Project No:** B4308802	**Date:** 22-Jul-2009
Applicant/Owner:	Montana Department of Transportation		**County:** Lake
Investigators:	G. Howard		**State:** Montana
			Plot ID: T3 - SP1

Do Normal Circumstances exist on the site?	(Yes) No	**Community ID:** EM
Is the site significantly disturbed (Atypical Situation:)?	Yes (No)	**Transect ID:** 1
Is the area a potential Problem Area?	Yes (No)	**Field Location:**
(If needed, explain on the reverse side)		Transect # 3

VEGETATION **(USFWS Region No. 9)**

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
Carduus nutans	Herb	NI	*Geum macrophyllum*	Herb	FACW+
Musk thistle			Avens,Large-Leaf		
Agropyron repens	Herb	FACU	*Typha latifolia*	Herb	OBL
Quackgrass			Cattail,Broad-Leaf		
Cirsium arvense	Herb	FACU+	*Juncus balticus*	Herb	OBL
Thistle,Creeping			Rush,Baltic		

Percent of Dominant Species that are OBL, FACW or FAC:	**FAC Neutral:** 3/5 = 60.00%
(excluding FAC-) 3/5 = 60.00%	**Numeric Index:** 12/5 = 2.40

Remarks:
Hydrophytic vegtation marginal, area considered wetland. Weedy fringe around shallow ponds.

HYDROLOGY

NO **Recorded Data(Describe in Remarks):**	**Wetland Hydrology Indicators**
N/A **Stream, Lake or Tide Gauge**	**Primary Indicators**
N/A **Aerial Photographs**	NO **Inundated**
N/A **Other**	YES **Saturated in Upper 12 Inches**
YES **No Recorded Data**	NO **Water Marks**
	NO **Drift Lines**
Field Observations	NO **Sediment Deposits**
	NO **Drainage Patterns in Wetlands**
Depth of Surface Water: N/A *(in.)*	**Secondary Indicators**
	NO **Oxidized Root Channels in Upper 12 Inches**
Depth to Free Water in Pit: N/A *(in.)*	NO **Water-Stained Leaves**
	NO **Local Soil Survey Data**
Depth to Saturated Soil: = 10 *(in.)*	YES **FAC-Neutral Test**
	NO **Other(Explain in Remarks)**

Remarks:
Hydrology indicators present with saturated soils.

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

Project/Site:	Bouchard Property	**Project No:** B4308802	**Date:** 22-Jul-2009
Applicant/Owner:	Montana Department of Transportation		**County:** Lake
Investigators:	G. Howard		**State:** Montana
			Plot ID: T3 - SP1

SOILS

Map Unit Name (Series and Phase): Borohemists, 0 to 1 percent slopes
Map Symbol: 19 **Drainage Class:** very poorly drained **Mapped Hydric Inclusion?**
Taxonomy (Subgroup): **Field Observations Confirm Mapped Type?** Yes (No)
Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
0-10	A	10YR2/1	N/A	N/A	N/A	Loam

Hydric Soil Indicators:

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

Remarks:
Hydric soil indicators present with low-chroma colors and area mapped as a Hydric Soil.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes) No	Is the Sampling Point within the Wetland? (Yes) No
Wetland Hydrology Present?	(Yes) No	
Hydric Soils Present?	(Yes) No	

Remarks:
Sampling point considered with a wetland area. Vegetation marginal, high abundance of weedy species around fringe of pond.

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

Project/Site:	Bouchard Property	**Project No:** B4308802	**Date:** 30-Jul-2009
Applicant/Owner:	Montana Department of Transportation		**County:** Lake
Investigators:	G. Howard		**State:** Montana
			Plot ID: T3 - SP2

Do Normal Circumstances exist on the site?	(Yes) No	**Community ID:** EM
Is the site significantly disturbed (Atypical Situation:)?	Yes (No)	**Transect ID:** 1
Is the area a potential Problem Area?	Yes (No)	**Field Location:**
(If needed, explain on the reverse side)		Transect # 3

VEGETATION **(USFWS Region No. 9)**

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
Agropyron repens	Herb	FACU	*Sonchus arvensis*	Herb	FACU+
Quackgrass			Sowthistle,Field		
Poa pratensis	Herb	FACU+	*Alopecurus pratensis*	Herb	FACW
Bluegrass,Kentucky			Foxtail,Meadow		
Cirsium arvense	Herb	FACU+	*Juncus balticus*	Herb	OBL
Thistle,Creeping			Rush,Baltic		

Percent of Dominant Species that are OBL, FACW or FAC: 2/6 = 33.33%
(excluding FAC-) 2/6 = 33.33%

FAC Neutral: 2/6 = 33.33%
Numeric Index: 19/6 = 3.17

Remarks:
Area dominated by upland species.

HYDROLOGY

NO **Recorded Data(Describe in Remarks):**
N/A **Stream, Lake or Tide Gauge**
N/A **Aerial Photographs**
N/A **Other**

YES **No Recorded Data**

Field Observations

Depth of Surface Water: N/A *(in.)*
Depth to Free Water in Pit: N/A *(in.)*
Depth to Saturated Soil: N/A *(in.)*

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 Wetlands**
Secondary Indicators
NO **Oxidized Root Channels in Upper 12 Inches**
NO **Water-Stained Leaves**
NO **Local Soil Survey Data**
NO **FAC-Neutral Test**
NO **Other(Explain in Remarks)**

Remarks:
No hydrology indicators.

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

Project/Site:	Bouchard Property	**Project No:** B4308802	**Date:** 30-Jul-2009
Applicant/Owner:	Montana Department of Transportation		**County:** Lake
Investigators:	G. Howard		**State:** Montana
			Plot ID: T3 - SP2

SOILS

Map Unit Name (Series and Phase): Borohemists, 0 to 1 percent slopes
Map Symbol: 19 **Drainage Class:** very poorly drained **Mapped Hydric Inclusion?**
Taxonomy (Subgroup): **Field Observations Confirm Mapped Type?** Yes (No)
Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
0-10+	A	10YR2/2	N/A	N/A	N/A	Loam

Hydric Soil Indicators:

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

Remarks:
Area mapped as Hydric Soil - no other indicators present.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes (No)	Is the Sampling Point within the Wetland? Yes (No)
Wetland Hydrology Present?	Yes (No)	
Hydric Soils Present?	Yes (No)	

Remarks:
sampling point considered within a upland area.

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

1. Project Name: Bouchard **2. Project #:** 4308802 **Control #:** _____

3. Evaluation Date: 7/22/2009 **4. Evaluator(s):** G. Howard **5. Wetland / Site #(s):** AA-1

6. Wetland Location(s) i. T: 17 N **R:** 20 W **S:** 26 **T:** __ N **R:** __ E **S:** _____

ii. Approx. Stationing / Mileposts: _____

iii. Watershed: Flathead **GPS Reference No. (if applies):** _____

Other Location Information: _____

7. A. Evaluating Agency MDT

B. Purpose of Evaluation:

- ☐ Wetlands potentially affected by MDT project
- ☐ Mitigation wetlands; pre-construction
- ☒ Mitigation wetlands; post-construction
- ☐ Other

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

9. Assessment Area (total acres): _____ (visually estimated)
28.53 (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	None	Aquatic Bed	Seasonally Flooded	Excavated	5
Slope	Palustrine	None	Emergent Wetland	Seasonally Flooded	Excavated	50
Slope	Palustrine	None	Scrub-Shrub Wetland	Seasonally Flooded	---	40
Slope	Palustrine	None	Forested Wetland	Seasonally Flooded	---	5
---	---	---	---	---	---	

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

Comments: _____

11. ESTIMATED RELATIVE ABUNDANCE (of similarly classified sites within the same Major Montana Watershed Basin)
Common **Comments:** _____

12. GENERAL CONDITION OF AA

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

	Predominant Conditions Adjacent (within 500 Feet) To AA		
Conditions Within 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.) Adjacent parcels grazed and farmed.

ii. Prominent weedy, alien, & introduced species: Cirsium arvense, Cynoglossum officinale, Centaurea maculosa, and Hypericum perforatum.

iii. Briefly describe AA and surrounding land use / habitat: AA is located within sloped and depressional wetlands consisting of emergent, aquatic bed, scrub-shrub and forested habitat types. Site hydrology is sourced by groundwater from nearby Jocko Spring Creek.

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	High	---	---

Comments: _____

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	Grizzly Bear, Canada Lynx
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	---	---	---	---	---	.3 (L)	---

If documented, list the source (e.g., observations, records, etc.)**:** Montana Natural Heritage Program.

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	_____
Incidental habitat **(list species)**	☐ D ☒ S	Bald Eagle, Townsend's Big-eared Bat, Western Toad
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 (L)	---

If documented, list the source (e.g., observations, records, etc.)**:** Montana Natural Heritage Program.

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)	☒High								☐Moderate								☐Low			
Class Cover Distribution (all vegetated classes)	☐Even				☒Uneven				☐Even				☐Uneven				☐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)	--	--	--	--	--	E	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Moderate disturbance at AA (see #12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
High disturbance at AA (see #12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

iii. **Rating** (Using 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)			
	☒ Exceptional	☐ High	☐ Moderate	☐ Low
Substantial	--	--	--	--
Moderate	.9 (H)	--	--	--
Low	--	--	--	--

Comments: _____

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, 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 pick the exceptional (E), high (H), moderate (M), or low (L) quality rating.

Duration of Surface Water in AA	☐ Permanent/Perennial			☐ Seasonal / Intermittent			☐ 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 pick 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)			
	☐ Exceptional	☐ High	☐ Moderate	☐ 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 flooded from in-channel or overbank flow, 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	☐ ≥ 10 acres			☐ <10, >2 acres			☐ ≤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, 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.	☒ >5 acre feet			☐ <5, >1 acre feet			☐ ≤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**	--	.9 (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 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	☒ ≥ 70%		☐ < 70%		☐ ≥ 70%		☐ < 70%	
Evidence of flooding or ponding in AA	☒ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No
AA contains **no or restricted outlet**	1 (H)	--	--	--	--	--	--	--
AA contains **unrestricted outlet**	--	--	--	--	--	--	--	--

Comments: _____

14H. SEDIMENT/SHORELINE STABILIZATION ☒ **NA** (proceed to 14I)

Applies only if AA occurs on or within the banks or 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, 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		
	☐Permanent / Perennial	☐Seasonal / Intermittent	☐Temporary / Ephemeral
≥ 65 %	--	--	--
35-64 %	--	--	--
< 35 %	--	--	--

Comments: _____

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT

i. **Rating** (Working from top to bottom, use the matrix below to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function.
A = acreage of vegetated component in the AA. **B** = structural diversity rating from #13. **C** = Yes (Y) or No (N) as to whether or not the AA contains a surface or subsurface outlet; **P/P** = permanent/perennial; **S/I** = seasonal/intermittent; **T/E/A**= temporary/ephemeral/absent.

A	☒ Vegetated component >5 acres						☐ Vegetated component 1-5 acres						☐ Vegetated component <1 acre					
B	☒ High		☐ Moderate		☐ Low		☐ High		☐ Moderate		☐ Low		☐ High		☐ Moderate		☐ Low	
C	☒Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N
P/P	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S/I	.9H	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
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: _____

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	☐rare	☐common	☐abundant	☐rare	☒common	☐abundant	☐rare	☐common	☐abundant
Low disturbance at AA (#12i)	--	--	--	--	.6M	--	--	--	--
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)		
	☐ Low	☒ Moderate	☐ High
Public ownership	--	.5(M)	--
Private ownership	--	--	--

Comments: _____

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	0.30	1	
B. MT Natural Heritage Program Species Habitat	Low	0.10	1	
C. General Wildlife Habitat	High	0.90	1	
D. General Fish/Aquatic Habitat	NA		--	
E. Flood Attenuation	NA		--	
F. Short and Long Term Surface Water Storage	High	0.90	1	
G. Sediment/Nutrient/Toxicant Removal	High	1.00	1	
H. Sediment/Shoreline Stabilization	NA		--	
I. Production Export/Food Chain Support	High	0.90	1	
J. Groundwater Discharge/Recharge	High	1.00	1	
K. Uniqueness	Mod	0.60	1	
L. Recreation/Education Potential	Mod	0.5	1	
	Totals:	**6.20**	**9.00**	
		Percent of Total Possible Points:	**69%** (Actual / Possible) x 100 [rd to nearest whole #]	

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

Jocko Spring Creek

PBS&J / MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name: **Jocko Spring Creek** Project Number: **4300881**
Assessment Date: **July 31, 2009** Person(s) conducting the assessment: **G. Howard**
Location: **Arlee** MDT District: **Missoula** Milepost: ____
Legal Description: T **17N** R **20W** Section **16**
Weather Conditions: **Sunny, Temps in low 80's** Time of Day: **12-4**
Initial Evaluation Date: **August 11, 2008** Monitoring Year: **3** # Visits in Year: **1**
Size of evaluation area: **3 acres** Land use surrounding wetland: **highway, railroad, agriculture**

HYDROLOGY

Surface Water Source: **Jocko Spring Creek**
Inundation: **Present** Average Depth: **0.3 feet** Range of Depths: **0 -0.5**
Percent of assessment area under inundation: **60%**
Depth at emergent vegetation-open water boundary: **2 feet**
If assessment area is not inundated then are the soils saturated within 12 inches of surface: _
Other evidence of hydrology on the site (ex. – drift lines, erosion, stained vegetation, etc.):

____

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

Well Number	Depth	Well Number	Depth	Well Number	Depth

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

COMMENTS / PROBLEMS:
Mitigation site consists of the constructed Jocko Spring Creek channel, adjacent wetlands, and upland vegetation restoration areas. The wetland areas of the mitigation site are dominated by emergent vegetation and small area of remnant scrub-shrub and forested areas. Hydrology source is the perennial Jocko Spring Creek. Wetlands inundated from overbank flow of the creek onto the adjacent wetland pads and high groundwater. Site conditions are similar to those observed during 2008.

VEGETATION COMMUNITIES

Community Number: **1** Community Title (main spp): **Agropyron (Upland)**

Dominant Species	% Cover	Dominant Species	% Cover
AGRTRA	4 = 21-50%	POAPRA	3 = 11-20%
AGRREP	2 = 6-10%	BROTEC	2 = 6-10%
LEPPER	2 = 6-10%	SISALT	+ = < 1%
FESIDA	2 = 6-10%	VERTHA	2 = 6-10%
PHAARU	1 = 1-5%	PHLPRA	1 = 1-5%
Plantings	1 = 1-5%		

Comments / Problems: **Upland on North side of railroad grade.**

Community Number: **2** Community Title (main spp): **Symphoricarpos**

Dominant Species	% Cover	Dominant Species	% Cover
SYMALB	5 = > 50%	SOLSPP	2 = 6-10%
DISSYL	2 = 6-10%	SISALT	1 = 1-5%
CIRARV	1 = 1-5%		
CYNOFF	1 = 1-5%		
AGRREP	2 = 6-10%		
BROTEC	1 = 1-5%		

Comments / Problems: **Thick snowberry (Symphoricarpos albus) patch adjacent to railroad grade.**

Community Number: **3** Community Title (main spp): **Carex / Glyceria**

Dominant Species	% Cover	Dominant Species	% Cover
CARUTR	4 = 21-50%	AGRALB	2 = 6-10%
CARBEB	2 = 6-10%	DISSYL	1 = 1-5%
PHAARU	2 = 6-10%	GLYGRA	3 = 11-20%
TYPLAT	2 = 6-10%	MENARV	1 = 1-5%
JUNSPP	2 = 6-10%		
JUNENS	2 = 6-10%		

Comments / Problems: **Wetland areas adajcent to the creek and throughout the topographic basin of the new channel.**

Community Number: **4** Community Title (main spp): **Typha**

Dominant Species	% Cover	Dominant Species	% Cover
TYPLAT	5 = > 50%		
PHAARU	2 = 6-10%		

Comments / Problems: **Existing wetland dominated by a monoculture of cattail with a minor inclusion of reed canarygrass.**

VEGETATION COMMUNITIES (continued)

Community Number: **5** Community Title (main spp): **Populus**

Dominant Species	% Cover	Dominant Species	% Cover
POPTRI	5 = > 50%		
SALBEB	2 = 6-10%		
PHAARU	2 = 6-10%		

Comments / Problems: **Small stand of black cottonwood located on the south side of mitigation project.**

Community Number: **6** Community Title (main spp): **Juncus / Agrostis**

Dominant Species	% Cover	Dominant Species	% Cover
JUNBAL	4 = 21-50%	CARUTR	2 = 6-10%
AGRALB	4 = 21-50%		
VERTHA	2 = 6-10%		
DISSYL	1 = 1-5%		
SOLSPP	2 = 6-10%		

Comments / Problems: **Emergent wetlands along the channel above the banks.**

Community Number: **7** Community Title (main spp): **Salix / Juncus**

Dominant Species	% Cover	Dominant Species	% Cover
SALBEB	4 = 21-50%	CARUTR	1 = 1-5%
JUNBAL	4 = 21-50%		
AGRALB	2 = 6-10%		
PHAARU	1 = 1-5%		
VERTHA	+ = < 1%		

Comments / Problems: **Existing emergent and scrub-shrub vegetation types on the south.**

Community Number: **8** Community Title (main spp): **Salix**

Dominant Species	% Cover	Dominant Species	% Cover
SALAMY	5 = > 50%		

Comments / Problems: **Large willow trees along the old channel that was removed.**

COMPREHENSIVE VEGETATION LIST

Plant Species	Vegetation Community Number (s)	Plant Species	Vegetation Community Number (s)
Achillea millefolium	1	*Mentha arvensis*	3
Agrostis alba	3	*Mimulus guttatus*	3
Agropyron repens	1	*Nepeta cataria*	3
Agropyron trachycaulum	1	*Phalaris arundinacea*	3,4,5,7
Alnus incana	3	*Phleum pratense*	1
Bromus tectorum	1	*Poa pratensis*	1
Carex aquatilis	3	*Polygonum amphibium*	3
Carex bebbii	3	*Polygonum spp.*	3
Carex lanuginose	3	*Populus trichocarpa*	5
Carex nebrascensis	3	*Prunus americana*	1
Carex spp.	3	*Rorippa nasturtium-aquaticum*	3
Carex stipata	3	*Rosa woodsii*	1
Carex utriculata	3,6,7	*Rumex crispus*	3
Centaurea maculosa	1,2	*Salix amygdaloides*	8
Chrysanthemum leucanthemum	1,2	*Salix bebbiana*	7
Cirsium arvense	2	*Salix drummondiana*	3
Cornus stolonifera	3	*Salix lutea*	3
Crataegus douglasii	3	*Scirpus microcarpus*	3
Cynoglossum officinale	1,2	*Sisymbrium altissimum*	1,2
Deschampsia cespitosa	3	*Solanum dulcamara*	1,2,3
Dipsacus sylvestris	2,3	*Solidago missouriensis*	2
Elodea canadensis	Channel	*Symphoricarpos albus*	2
Epilobium ciliatum	3	*Thlaspi arvense*	1,2
Festuca idahoensis	1,2	*Typha latifolia*	3,4
Geum macrophyllum	3	*Veronica americana*	3
Glyceria grandis	3	*Verbascum thapsus*	1,2
Impatiens ecalcarata	3		
Juncus ensifolius	3		
Juncus spp.	3		
Lactuca serriola	1		
Lepidium perfoliatum	1,2		
Lychnis alba	1,2		

Comments / Problems: <u>One new species was identified for 2009: *Elodea canadensis*.</u>

PLANTED WOODY VEGETATION SURVIVAL

Plant Species	Number Originally Planted	Number Observed	Mortality Causes
ALNINC	605	48	Plantings looked healthy with vigorous growth for the season with few discolored leaves. Browse protection were intact and properly functioning within the wetlands area. Browse protection was removed for the upland planting area on the north side of the railroad tracks. Bebb willow and common snowberry had the highest counts. Plantings located within the wetland areas and along the fringe were inundated – plants receiving adequate hydrology.
CRADOU	388	11	
CORSTO	106	39	
POPTRI		2	
PRUAME	323	30	
RHAALN	42	4	
ROSWOO	85	11	
SALBEB	386	92	
SALLUT	193	16	
SAMRAC		3	
SYMALB	234	50	

Comments / Problems: Shrub planting survival data was collected along three (lengths varied) 2 meter wide belt transects that totaled approximately 0.15 acres (6,000 sq. ft.). Transects were established along the edges of the created and enhanced wetland mitigation areas on the south-side of railroad grade. Another transect was placed along the upland restoration area on the north side of railroad grade. During the 2009 monitoring, species survival was based on visual estimates and counts for each live species. The original plantings numbers as listed above were referenced from Wetland Plant Summary – Spring Creek Wetlands (**Appendix G**). Actual planting numbers and prescribed species may vary from the original plan. Post design changes for planting prescriptions were adjusted during the construction phase due to availability of seedlings. Overall survival ratings are considered high based on visual assessment. Plant growth was vigorous and looked healthy with few discolored leaves. Browse protection were intact and properly functioning within the wetland planting zones. Wetland planting sites were inundated and plantings receiving adequate hydrology. The browse protection was removed from the upland planting areas.

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
Raccoon		☐	☒	☐	
Muskrat		☐	☐	☒	
Deer		☒	☒	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	

Additional Activities Checklist:
Yes Macroinvertebrate Sampling (if required)

Comments / Problems: Macroinvertebrate sampling conducted at two locations.

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 (°)
PP1	1.0	View looking southeast.	135
PP2	1.0	View looking southeast.	135
PP2	1.1	View looking northwest.	315
PP2	1.2	View looking southeast.	135
PP2	1.3	View looking north.	0
PP2	1.4	View looking southwest.	225
PP3	1.0	View looking east.	90
PP3	1.1	View looking east.	90
PP3	1.2	View looking west.	270
PP4	1.0	View looking east.	90
PP4	1.1	View looking east.	90
PP4	1.2	View looking west.	270
PP5	1.0	View looking west.	270
PP5	1.1	View looking southeast.	135
PP5	1.2	View looking west.	270
PP6	1.0	View looking northeast.	45
PP6	1.1	View looking northwest.	315
PP7	1.0	View looking southwest.	225
PP7	1.1	View looking northeast.	45
PP7	1.2	View looking west.	270
PP7	1.3	View looking west.	270
PP7	1.4	View looking southeast.	135
PP8	1.0	View looking northwest.	315
PP8	1.1	View looking west.	270
PP8	1.2	View looking southeast.	135
PP9	1.0	View looking north.	0
PP9	1.1	View looking east.	90

Comments / Problems: **Refer to photopage for a more detailed description of the photo points.**

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.
- **NA** 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: **FA completed using the 1999 MDT MWAM. Mitigation crediting system requires a pre- and post-project functional assessment that requires a direct comparison using the 1999 methods for functional shift.**

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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? **NA**
If yes, are the structures working properly and in good working order? **NA**
If no, describe the problems below.

Comments / Problems: _____

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Jocko Spring Creek** Date: **7/31/09** Examiner: **G. Howard**
Transect Number: **1** Approximate Transect Length: **75 feet** Compass Direction from Start: **45˚** Note: _____

Vegetation Type A: **C.T. 1 - Agropyron (Upland)**	
Length of transect in this type: 18 feet	
Plant Species	**Cover**
AGRREP	5 = > 50%
AGRALB	4 = 21-50%
VERTHA	+ = < 1%
ROSWOO	+ = < 1%
PHAARU	2 = 6-10%
Total Vegetative Cover:	90%

Vegetation Type B: **C.T. 3 - Carex / Glyceria (Wetland)**	
Length of transect in this type: 34 feet	
Plant Species	**Cover**
CARUTR	3 = 11-20%
PHAARU	4 = 21-50%
TYPLAT	2 = 6-10%
DISSYL	+ = < 1%
GLYGRA	+ = < 1%
JUNENS	+ = < 1%
AGRALB	1 = 1-5%
POLAMB	1 = 1-5%
EPICIL	+ = < 1%
CARSTI	+ = < 1%
CARNEB	2 = 6-10%
Total Vegetative Cover:	100%

Vegetation Type C: **Channel**	
Length of transect in this type: 10 feet	
Plant Species	**Cover**
ELOCAN	2 = 6-10%
Total Vegetative Cover:	10%

Vegetation Type D: **C.T. 3 - Carex / Glyceria**	
Length of transect in this type: 13 feet	
Plant Species	**Cover**
CARUTR	3 = 11-20%
PHAARU	5 = > 50%
CARSTI	+ = < 1%
CORSTO (P)	+ = < 1%
TYPLAT	2 = 6-10%
SALBEB	+ = < 1%
CARBEB	2 = 6-10%
CARNEB	1 = 1-5%
Total Vegetative Cover:	95%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Jocko Spring Creek** Date: **July 31, 2009** Examiner: **G. Howard**
Transect Number: **2** Approximate Transect Length: **208 feet** Compass Direction from Start: **90˚** Note: _____

Vegetation Type E: **C.T. 1 - Agropyron (Upland)**	
Length of transect in this type: 15 feet	
Plant Species	**Cover**
AGRREP	5 = > 50%
VERTHA	1 = 1-5%
BROTEC	1 = 1-5%
ACHMIL	+ = < 1%
SYMALB	1 = 1-5%
LYNALB	+ = < 1%
POAPRA	1 = 1-5%
SALBEB - plantings	1 = 1-5%
Total Vegetative Cover:	90%

Vegetation Type F: **C.T. 3 - Carex / Glyceria (Wetland)**	
Length of transect in this type: 92 feet	
Plant Species	**Cover**
PHAARU	2 = 6-10%
AGRALB	1 = 1-5%
CARNEB	1 = 1-5%
CARUTR	4 = 21-50%
RUMCRI	1 = 1-5%
SALBEB (P)	+ = < 1%
SALDRU (P)	+ = < 1%
JUNSPP	3 = 11-20%
TYPLAT	1 = 1-5%
CARSTI	3 = 11-20%
DISSYL	1 = 1-5%
Total Vegetative Cover:	90%

Vegetation Type G: **Channel**	
Length of transect in this type: 10 feet	
Plant Species	**Cover**
ELOSPP	4 = 21-50%
EPICIL	+ = < 1%
Total Vegetative Cover:	40%

Vegetation Type H: **C.T. 3 - Carex / Glyceria (Wetland)**	
Length of transect in this type: 91 feet	
Plant Species	**Cover**
CARUTR	4 = 21-50%
TYPLAT	+ = < 1%
AGRALB	1 = 1-5%
DISSYL	2 = 6-10%
CARBEB	2 = 6-10%
CARSTI	1 = 1-5%
PHAARU	1 = 1-5%
ALNINC (P)	1 = 1-5%
GLYGRA	3 = 11-20%
CORSTO (P)	1 = 1-5%
JUNSPP	2 = 6-10%
MENARV	2 = 6-10%
Total Vegetative Cover:	95%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: _____ Date: _____ Examiner: _____
Transect Number: _____ Approximate Transect Length: _____**feet** Compass Direction from Start: ___˚ Note: _____

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

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

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

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

MDT WETLAND MONITORING – VEGETATION TRANSECT

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

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

Establish transects perpendicular to the shoreline (or saturated perimeter). The transect should begin in the upland area. Permanently mark this location with a standard metal fencepost. Extend the imaginary transect line towards the center of the wetland, ending at the 3 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: **Jocko Spring Creek** Date: **7/31/09**
Survey Time: **12** to **4**

Bird Species	#	Behavior	Habitat	Bird Species	#	Behavior	Habitat
Pheasant	1	L	UP				
Tree swallows	5	FO	SS				
Killdeer	2	N	WM				
European Starling	1	L	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: Warm and clear.

Notes: Little bird activity observed during monitoring.

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

Project/Site: Jocko Spring Creek **Project No:** 4308802
Applicant/Owner: Montana Department of Transportation
Investigators: G. Howard

Date: 31-Jul-2009
County: Lake
State: Montana
Plot ID: T1 - SP1

Do Normal Circumstances exist on the site? (Yes) No
Is the site significantly disturbed (Atypical Situation:)? Yes (No)
Is the area a potential Problem Area? Yes (No)
(If needed, explain on the reverse side)

Community ID: EM
Transect ID: 1
Field Location:
Transect # 1

VEGETATION **(USFWS Region No. 9)**

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
Agropyron repens	Herb	FACU	*Phalaris arundinacea*	Herb	FACW
Quackgrass			Grass,Reed Canary		
Agrostis alba	Herb	FACW	*Achillea millefolium*	Herb	NI
Redtop			yarrow		
Rosa woodsii	Herb	FACU			
Rose,Woods					

Percent of Dominant Species that are OBL, FACW or FAC: 2/4 = 50.00%
(excluding FAC-) 2/4 = 50.00%

FAC Neutral: 2/4 = 50.00%
Numeric Index: 12/4 = 3.00

Remarks:
Area considered within an upland.

HYDROLOGY

NO **Recorded Data(Describe in Remarks):**
N/A **Stream, Lake or Tide Gauge**
N/A **Aerial Photographs**
N/A **Other**

YES **No Recorded Data**

Field Observations

Depth of Surface Water: N/A *(in.)*
Depth to Free Water in Pit: N/A *(in.)*
Depth to Saturated Soil: N/A *(in.)*

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 Wetlands**
Secondary Indicators
NO **Oxidized Root Channels in Upper 12 Inches**
NO **Water-Stained Leaves**
NO **Local Soil Survey Data**
NO **FAC-Neutral Test**
NO **Other(Explain in Remarks)**

Remarks:
No hydrology indicators present.

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

Project/Site: Jocko Spring Creek **Project No:** 4308802
Applicant/Owner: Montana Department of Transportation
Investigators: G. Howard

Date: 31-Jul-2009
County: Lake
State: Montana
Plot ID: T1 - SP1

SOILS

Map Unit Name (Series and Phase): Jocko gravelly loam, 0 to 4 % slope
Map Symbol: 81 **Drainage Class:** somewhat excessively drained **Mapped Hydric Inclusion?**
Taxonomy (Subgroup): **Field Observations Confirm Mapped Type?** Yes (No)
Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
0-10+	A	N/A	N/A	N/A	N/A	Sandy loam

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

Remarks:
No hydric soils indicators.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes (No)
Wetland Hydrology Present? Yes (No)
Hydric Soils Present? Yes (No)

Is the Sampling Point within the Wetland? Yes (No)

Remarks:
Sampling point considered within an upland area.

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

Project/Site:	Jocko Spring Creek	**Project No:** 4308802	**Date:** 31-Jul-2009
Applicant/Owner:	Montana Department of Transportation		**County:** Lake
Investigators:	G. Howard		**State:** Montana
			Plot ID: T1 - SP2

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

VEGETATION **(USFWS Region No. 9)**

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
Carex utriculata	Herb	OBL	*Glyceria maxima*	Herb	OBL
beaked sedge			Meadowgrass,Reed		
Phalaris arundinacea	Herb	FACW	*Juncus ensifolius*	Herb	FACW
Grass,Reed Canary			Rush,Three-Stamen		
Typha latifolia	Herb	OBL	*Agrostis alba*	Herb	FACW
Cattail,Broad-Leaf			Redtop		
Dipsacus sylvestris	Herb	NI	*Polygonum amphibium*	Herb	OBL
Teasel			Smartweed,Water		

Percent of Dominant Species that are OBL, FACW or FAC: 7/7 = 100.00%
(excluding FAC-) 7/7 = 100.00%

FAC Neutral: 7/7 = 100.00%
Numeric Index: 10/7 = 1.43

Remarks:
Area dominated by hydrophytic vegetation.

HYDROLOGY

NO **Recorded Data(Describe in Remarks):**
N/A **Stream, Lake or Tide Gauge**
N/A **Aerial Photographs**
N/A **Other**

YES **No Recorded Data**

Field Observations

Depth of Surface Water: = 3 *(in.)*
Depth to Free Water in Pit: N/A *(in.)*
Depth to Saturated Soil: N/A *(in.)*

Wetland Hydrology Indicators
Primary Indicators
YES **Inundated**
YES **Saturated in Upper 12 Inches**
NO **Water Marks**
NO **Drift Lines**
NO **Sediment Deposits**
NO **Drainage Patterns in Wetlands**
Secondary Indicators
NO **Oxidized Root Channels in Upper 12 Inches**
NO **Water-Stained Leaves**
NO **Local Soil Survey Data**
YES **FAC-Neutral Test**
NO **Other(Explain in Remarks)**

Remarks:
Hydrology indicator present with shallow inundation and soils saturated to ground surface.

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

Project/Site:	Jocko Spring Creek	**Project No:** 4308802	**Date:** 31-Jul-2009
Applicant/Owner:	Montana Department of Transportation		**County:** Lake
Investigators:	G. Howard		**State:** Montana
			Plot ID: T1 - SP2

SOILS

Map Unit Name (Series and Phase): Jocko gravelly loam, 0 to 4 % slope
Map Symbol: 81 **Drainage Class:** somewhat excessively drained **Mapped Hydric Inclusion?**
Taxonomy (Subgroup): **Field Observations Confirm Mapped Type?** Yes (No)
Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
0-10+	A	10YR2/1	N/A	N/A	N/A	Sandy loam

Hydric Soil Indicators:

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

Remarks:
Hydric soil indicator present with low-chroma colors.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes) No	Is the Sampling Point within the Wetland? (Yes) No
Wetland Hydrology Present?	(Yes) No	
Hydric Soils Present?	(Yes) No	

Remarks:
Sampling point considered within a wetland area.

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

Project/Site:	Jocko Spring Creek	**Project No:** 4308802	**Date:** 31-Jul-2009
Applicant/Owner:	Montana Department of Transportation		**County:** Lake
Investigators:	G. Howard		**State:** Montana
			Plot ID: T1 - SP3

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

VEGETATION **(USFWS Region No. 9)**

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
Carex utriculata	Herb	OBL	*Carex stipata*	Herb	OBL
beaked sedge			saw-beak sedge		
Phalaris arundinacea	Herb	FACW	*Typha latifolia*	Herb	OBL
Grass,Reed Canary			Cattail,Broad-Leaf		

Percent of Dominant Species that are OBL, FACW or FAC:	**FAC Neutral:** 4/4 = 100.00%
(excluding FAC-) 4/4 = 100.00%	**Numeric Index:** 5/4 = 1.25

Remarks:
Area dominated by hydrophytic vegetation.

HYDROLOGY

NO **Recorded Data(Describe in Remarks):**
- N/A **Stream, Lake or Tide Gauge**
- N/A **Aerial Photographs**
- N/A **Other**

YES **No Recorded Data**

Field Observations

Depth of Surface Water:	N/A *(in.)*
Depth to Free Water in Pit:	N/A *(in.)*
Depth to Saturated Soil:	= 0 *(in.)*

Wetland Hydrology Indicators

Primary Indicators
- NO **Inundated**
- YES **Saturated in Upper 12 Inches**
- NO **Water Marks**
- NO **Drift Lines**
- NO **Sediment Deposits**
- NO **Drainage Patterns in Wetlands**

Secondary Indicators
- NO **Oxidized Root Channels in Upper 12 Inches**
- NO **Water-Stained Leaves**
- NO **Local Soil Survey Data**
- YES **FAC-Neutral Test**
- NO **Other(Explain in Remarks)**

Remarks:
Hydrology indicator present with soils saturated to the ground surface.

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

Project/Site:	Jocko Spring Creek	**Project No:** 4308802	**Date:** 31-Jul-2009
Applicant/Owner:	Montana Department of Transportation		**County:** Lake
Investigators:	G. Howard		**State:** Montana
			Plot ID: T1 - SP3

SOILS

Map Unit Name (Series and Phase): Jocko gravelly loam, 0 to 4 % slope
Map Symbol: 81 **Drainage Class:** somewhat excessively drained **Mapped Hydric Inclusion?**
Taxonomy (Subgroup): **Field Observations Confirm Mapped Type?** Yes (No)
Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
0-10+	A	10YR2/1	N/A	N/A	N/A	Sandy loam

Hydric Soil Indicators:

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

Remarks:
Hydric soil indicators present with low-chroma colors.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes) No	Is the Sampling Point within the Wetland? (Yes) No
Wetland Hydrology Present?	(Yes) No	
Hydric Soils Present?	(Yes) No	

Remarks:
Sampling point considered within a wetland area.

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

Project/Site: Jocko Spring Creek	**Project No:** 4308802	**Date:** 31-Jul-2009
Applicant/Owner: Montana Department of Transportation		**County:** Lake
Investigators: G. Howard		**State:** Montana
		Plot ID: T2 - SP1

Do Normal Circumstances exist on the site?	(Yes) No	**Community ID:** EM
Is the site significantly disturbed (Atypical Situation:)?	Yes (No)	**Transect ID:** 1
Is the area a potential Problem Area?	Yes (No)	**Field Location:**
(If needed, explain on the reverse side)		Transect # 2

VEGETATION **(USFWS Region No. 9)**

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
Agropyron repens	Herb	FACU	*Symphoricarpos albus*	Herb	FACU
Quackgrass			Snowberry		
Achillea millefolium	Herb	FACU			
Yarrow,Common					

Percent of Dominant Species that are OBL, FACW or FAC: 0/3 = 0.00%
(excluding FAC-) 0/3 = 0.00%

FAC Neutral: 0/3 = 0.00%
Numeric Index: 12/3 = 4.00

Remarks:
Area considered within an upland area.

HYDROLOGY

NO **Recorded Data(Describe in Remarks):**
- N/A **Stream, Lake or Tide Gauge**
- N/A **Aerial Photographs**
- N/A **Other**

YES **No Recorded Data**

Field Observations

Depth of Surface Water:	N/A *(in.)*
Depth to Free Water in Pit:	N/A *(in.)*
Depth to Saturated Soil:	N/A *(in.)*

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 Wetlands**

Secondary Indicators
- NO **Oxidized Root Channels in Upper 12 Inches**
- NO **Water-Stained Leaves**
- NO **Local Soil Survey Data**
- NO **FAC-Neutral Test**
- NO **Other(Explain in Remarks)**

Remarks:
No hydrology indicators.

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

Project/Site: Jocko Spring Creek	**Project No:** 4308802	**Date:** 31-Jul-2009
Applicant/Owner: Montana Department of Transportation		**County:** Lake
Investigators: G. Howard		**State:** Montana
		Plot ID: T2 - SP1

SOILS

Map Unit Name (Series and Phase): Jocko gravelly loam, 0 to 4 % slope
Map Symbol: 81 **Drainage Class:** somewhat excessively drained **Mapped Hydric Inclusion?**
Taxonomy (Subgroup): **Field Observations Confirm Mapped Type?** Yes (No)
Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
0-10	A	10YR2/1	N/A	N/A	N/A	Loam

Hydric Soil Indicators:

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

Remarks:
Hydric soil indicator present with low-chroma colors.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes (No)	Is the Sampling Point within the Wetland? Yes (No)
Wetland Hydrology Present?	Yes (No)	
Hydric Soils Present?	(Yes) No	

Remarks:
Sampling point considered within a upland area. Hydric soil likely remnant.

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

Project/Site: Jocko Spring Creek	**Project No:** 4308802	**Date:** 31-Jul-2009
Applicant/Owner: Montana Department of Transportation		**County:** Lake
Investigators: G. Howard		**State:** Montana
		Plot ID: T2 - SP2

Do Normal Circumstances exist on the site? (Yes) No	**Community ID:** EM
Is the site significantly disturbed (Atypical Situation:)? Yes (No)	**Transect ID:** 1
Is the area a potential Problem Area? Yes (No)	**Field Location:**
(If needed, explain on the reverse side)	Transect # 2

VEGETATION **(USFWS Region No. 9)**

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
Phalaris arundinacea	Herb	FACW	*Carex aquatilis*	Herb	OBL
Grass,Reed Canary			Sedge,Water		
Agrostis alba	Herb	FACW	*Juncus effusus*	Herb	FACW+
Redtop			Rush,Soft		
Carex nebrascensis	Herb	OBL	*Agrostis alba*	Herb	FACW
Sedge,Nebraska			Redtop		
Carex utriculata	Herb	OBL	*Polygonum amphibium*	Herb	OBL
beaked sedge			Smartweed,Water		

Percent of Dominant Species that are OBL, FACW or FAC:	**FAC Neutral:** 8/8 = 100.00%
(excluding FAC-) 8/8 = 100.00%	**Numeric Index:** 12/8 = 1.50

Remarks:
Area dominanted by hydrophytic vegetation.

HYDROLOGY

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

Remarks:
Hydrology indicators present with soils saturated to ground surface.

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

Project/Site: Jocko Spring Creek	**Project No:** 4308802	**Date:** 31-Jul-2009
Applicant/Owner: Montana Department of Transportation		**County:** Lake
Investigators: G. Howard		**State:** Montana
		Plot ID: T2 - SP2

SOILS

Map Unit Name (Series and Phase): Jocko gravelly loam, 0 to 4 % slope
Map Symbol: 81 **Drainage Class:** somewhat excessively drained **Mapped Hydric Inclusion?**
Taxonomy (Subgroup): **Field Observations Confirm Mapped Type?** Yes (No)
Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
0-10+	A	10YR2/1	N/A	N/A	N/A	Loam

Hydric Soil Indicators:

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

Remarks:
Hydric soils indicator present with low-chroma colors.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No	Is the Sampling Point within the Wetland? (Yes) No
Wetland Hydrology Present? (Yes) No	
Hydric Soils Present? (Yes) No	

Remarks:
Sampling point considered within a wetland area.

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

Project/Site:	Jocko Spring Creek	**Project No:** 4308802	**Date:** 31-Jul-2009
Applicant/Owner:	Montana Department of Transportation		**County:** Lake
Investigators:	G. Howard		**State:** Montana
			Plot ID: T2 - SP3

Do Normal Circumstances exist on the site?	(Yes) No	**Community ID:** EM
Is the site significantly disturbed (Atypical Situation:)?	Yes (No)	**Transect ID:** 1
Is the area a potential Problem Area?	Yes (No)	**Field Location:**
(If needed, explain on the reverse side)		Transect # 2

VEGETATION **(USFWS Region No. 9)**

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
Carex utriculata	Herb	OBL	*Carex stipata*	Herb	OBL
beaked sedge			saw-beak sedge		
Typha latifolia	Herb	OBL	*Phalaris arundinacea*	Herb	FACW
Cattail,Broad-Leaf			Grass,Reed Canary		
Agrostis alba	Herb	FACW	*Glyceria maxima*	Herb	OBL
Redtop			Meadowgrass,Reed		
Dipsacus sylvestris	Herb	NI	*Juncus effusus*	Herb	FACW+
Teasel			Rush,Soft		
Carex bebbii	Herb	OBL	*Mentha arvensis*	Herb	FAC
Sedge,Bebb's			Mint,Field		

Percent of Dominant Species that are OBL, FACW or FAC:	**FAC Neutral:** 8/8 = 100.00%
(excluding FAC-) 9/9 = 100.00%	**Numeric Index:** 14/9 = 1.56

Remarks:
Area dominated by hydrophytic vegetation.

HYDROLOGY

NO **Recorded Data(Describe in Remarks):**
- N/A **Stream, Lake or Tide Gauge**
- N/A **Aerial Photographs**
- N/A **Other**

YES **No Recorded Data**

Field Observations

Depth of Surface Water:	= 6 *(in.)*
Depth to Free Water in Pit:	N/A *(in.)*
Depth to Saturated Soil:	N/A *(in.)*

Wetland Hydrology Indicators

Primary Indicators
- YES **Inundated**
- YES **Saturated in Upper 12 Inches**
- NO **Water Marks**
- NO **Drift Lines**
- NO **Sediment Deposits**
- NO **Drainage Patterns in Wetlands**

Secondary Indicators
- NO **Oxidized Root Channels in Upper 12 Inches**
- NO **Water-Stained Leaves**
- NO **Local Soil Survey Data**
- YES **FAC-Neutral Test**
- NO **Other(Explain in Remarks)**

Remarks:
hydrology indicator present with shallow inundation and soils saturated to ground surface.

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

Project/Site:	Jocko Spring Creek	**Project No:** 4308802	**Date:** 31-Jul-2009
Applicant/Owner:	Montana Department of Transportation		**County:** Lake
Investigators:	G. Howard		**State:** Montana
			Plot ID: T2 - SP3

SOILS

Map Unit Name (Series and Phase): Jocko gravelly loam, 0 to 4 % slope
Map Symbol: 81 **Drainage Class:** somewhat excessively drained **Mapped Hydric Inclusion?**
Taxonomy (Subgroup): **Field Observations Confirm Mapped Type?** Yes (No)
Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
0-10+	A	10YR2/1	N/A	N/A	N/A	Loam

Hydric Soil Indicators:

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

Remarks:
Hydric soil indicator present with low-chroma colors.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes) No	Is the Sampling Point within the Wetland? (Yes) No
Wetland Hydrology Present?	(Yes) No	
Hydric Soils Present?	(Yes) No	

Remarks:
Sampling point considered within a wetland area.

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

1. Project Name: Jocko Spring Creek **2. Project #:** 4308802 **Control #:** _____

3. Evaluation Date: 7/31/2009 **4. Evaluator(s):** G. Howard **5. Wetland / Site #(s):** AA-1

6. Wetland Location(s) i. T: 17 N **R:** 20 W **S:** 16 **T:** __ N **R:** __ E **S:** _____

ii. Approx. Stationing / Mileposts: _____

iii. Watershed: Flathead **GPS Reference No. (if applies):** _____

Other Location Information: _____

7. A. Evaluating Agency MDT

B. Purpose of Evaluation:

- ☐ Wetlands potentially affected by MDT project
- ☐ Mitigation wetlands; pre-construction
- ☒ Mitigation wetlands; post-construction
- ☐ Other

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

9. Assessment Area (total acres): _____ (visually estimated)
2.08 (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
Riverine	Palustrine	None	Rock Bottom	Permanently Flooded	Excavated	10
Riverine	Palustrine	None	Emergent Wetland	Permanently Flooded	---	75
Riverine	Palustrine	None	Scrub-Shrub Wetland	Seasonally Flooded	---	10
Depression	Palustrine	None	Forested Wetland	Seasonally Flooded	---	5
---	---	---	---	---	---	

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

Comments: _____

11. ESTIMATED RELATIVE ABUNDANCE (of similarly classified sites within the same Major Montana Watershed Basin)
Common **Comments:** _____

12. GENERAL CONDITION OF AA

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

	Predominant Conditions Adjacent (within 500 Feet) To AA		
Conditions Within 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.	---	---	---
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.	---	moderate disturbance	---
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.) Adjacent parcels grazed and farmed.

ii. Prominent weedy, alien, & introduced species: Cirsium arvense and Cynoglossum officinale.

iii. Briefly describe AA and surrounding land use / habitat: AA is along the re-constructed Jocko Spring Creek a perennial stream. Surrounding land uses include Highway 93, agriculture, and residential.

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	High	---	---

Comments: _____

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	Bull trout
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	---	---	---	---	---	.3 (L)	---

If documented, list the source (e.g., observations, records, etc.)**:** Montana Natural Heritage Program.

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	Westslope Cutthroat
Incidental habitat **(list species)**	☐ D	☒ S	Bald Eagle
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.)**:** Montana Natural Heritage Program.

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)	☒High								☐Moderate								☐Low			
Class Cover Distribution (all vegetated classes)	☐Even				☒Uneven				☐Even				☐Uneven				☐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** (Using 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)			
	☐ Exceptional	☒ High	☐ Moderate	☐ Low
Substantial	--	--	--	--
Moderate	--	.7 (M)	--	--
Low	--	--	--	--

Comments: _____

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, 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 pick the exceptional (E), high (H), moderate (M), or low (L) quality rating.

Duration of Surface Water in AA	☒Permanent/Perennial			☐Seasonal / Intermittent			☐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.	H	--	--	--	--	--	--	--	--

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 pick 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)			
	☐ Exceptional	☒ High	☐ Moderate	☐ Low
Native game fish	--	.9 (H)	--	--
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 flooded from in-channel or overbank flow, 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	☐ ≥ 10 acres			☐ <10, >2 acres			☒ ≤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**	--	--	--	--	--	--	--	--	.1 (L)

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, 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.	☐ >5 acre feet			☒ <5, >1 acre feet			☐ ≤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 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	☒ ≥ 70%		☐ < 70%		☐ ≥ 70%		☐ < 70%	
Evidence of flooding or ponding in AA	☒ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No
AA contains **no or restricted outlet**	--	--	--	--	--	--	--	--
AA contains **unrestricted outlet**	.9 (H)	--	--	--	--	--	--	--

Comments: _____

14H. SEDIMENT/SHORELINE STABILIZATION ☐ **NA** (proceed to 14I)

Applies only if AA occurs on or within the banks or 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, 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		
	☒Permanent / Perennial	☐Seasonal / Intermittent	☐Temporary / Ephemeral
≥ 65 %	1 (H)	--	--
35-64 %	--	--	--
< 35 %	--	--	--

Comments: _____

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT

i. **Rating** (Working from top to bottom, use the matrix below to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function.
A = acreage of vegetated component in the AA. **B** = structural diversity rating from #13. **C** = Yes (Y) or No (N) as to whether or not the AA contains a surface or subsurface outlet; **P/P** = permanent/perennial; **S/I** = seasonal/intermittent; **T/E/A**= temporary/ephemeral/absent.

A	☐ Vegetated component >5 acres						☒ Vegetated component 1-5 acres						☐ Vegetated component <1 acre					
B	☐ High		☐ Moderate		☐ Low		☒ High		☐ Moderate		☐ Low		☐ High		☐ Moderate		☐ Low	
C	☐Y	☐N	☐Y	☐N	☐Y	☐N	☒Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐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: _____

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	☐rare	☐common	☐abundant	☐rare	☒common	☐abundant	☐rare	☐common	☐abundant
Low disturbance at AA (#12i)	--	--	--	--	--	--	--	--	--
Moderate disturbance at AA (#12i)	--	--	--	--	.5M	--	--	--	--
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)		
	☐ Low	☐ Moderate	☐ High
Public ownership	--	--	--
Private ownership	--	--	--

Comments: _____

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	0.30	1	
B. MT Natural Heritage Program Species Habitat	Mod	0.60	1	
C. General Wildlife Habitat	Mod	0.70	1	
D. General Fish/Aquatic Habitat	High	0.90	1	
E. Flood Attenuation	low	0.10	1	
F. Short and Long Term Surface Water Storage	High	0.80	1	
G. Sediment/Nutrient/Toxicant Removal	High	0.90	1	
H. Sediment/Shoreline Stabilization	High	1.00	1	
I. Production Export/Food Chain Support	High	0.9	1	
J. Groundwater Discharge/Recharge	High	1.00	1	
K. Uniqueness	Mod	0.50	1	
L. Recreation/Education Potential	High	1.00	1	
	Totals:	**8.70**	**12.00**	
		Percent of Total Possible Points:	**73%** (Actual / Possible) x 100 [rd to nearest whole #]	

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

Mission Creek

PBS&J / MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name: **Mission Creek** Project Number: **B4300882**
Assessment Date: **July 23, 2009** Person(s) conducting the assessment: **G. Howard**
Location: **St. Ignatius** MDT District: **Missoula** Milepost: _____
Legal Description: T **16N** R **20W** Section **2**
Weather Conditions: **Sunny, Temps in low 80's** Time of Day: **12-4**
Initial Evaluation Date: **July 23, 2009** Monitoring Year: **1** # Visits in Year: **2**
Size of evaluation area: **> 1 acres** Land use surrounding wetland: **Agriculture**

HYDROLOGY

Surface Water Source: **Mission Creek**
Inundation: **Absent** Average Depth: _____ **feet** Range of Depths: _____
Percent of assessment area under inundation: ___ **%**
Depth at emergent vegetation-open water boundary: _____ **feet**
If assessment area is not inundated then are the soils saturated within 12 inches of surface: _
Other evidence of hydrology on the site (ex. – drift lines, erosion, stained vegetation, etc.):
Ordinary high water mark

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

Well Number	Depth	Well Number	Depth	Well Number	Depth

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

COMMENTS / PROBLEMS:
Mitigation site consists of restored channel and re-established floodplain along Mission Creek. Mitigation efforts included the removal of the stream from 8 foot elliptical pipe, channel restoration, and vegetation enhancements within the restored floodplain. Woody plants installed within the floodplain are thriving and have new growth. Several noxious weed species identified including Canada Thistle (*Cirsium arvense*), oxeye daisy (*Chrysanthemum leucanthemum*) and yellow flag iris (*Iris pseudacorus*).

VEGETATION COMMUNITIES

Community Number: **1** Community Title (main spp): Elymus

Dominant Species	% Cover	Dominant Species	% Cover
ELYGLA	4 = 21-50%	SALBEB	+ = < 1%
ALNINC	2 = 6-10%	SYMALB	+ = < 1%
POPTRI	1 = 1-5%	CIRARV	+ = < 1%
TAROFF	1 = 1-5%	CRADOU	+ = < 1%
ROSWOO	+ = < 1%		
CORSTO	+ = < 1%		

Comments / Problems: **Small area located within the floodplain of Mission Creek and dominated by emergent vegetation. Site planted with wetland / riparain woody species.**

Community Number: **2** Community Title (main spp): Carex

Dominant Species	% Cover	Dominant Species	% Cover
CARNEB	5 = > 50%		
SALEXI	3 = 11-20%		
GLYSTR	2 = 6-10%		
EPICIL	1 = 1-5%		
SCIACU	1 = 1-5%		
SCIMIC	1 = 1-5%		

Comments / Problems: **Wetland area dominated by emergent vegetation located adjacent to channel banks.**

Community Number: Community Title (main spp):

Dominant Species	% Cover	Dominant Species	% Cover

Comments / Problems:

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

Dominant Species	% Cover	Dominant Species	% Cover

Comments / Problems: _____

VEGETATION COMMUNITIES (continued)

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

Dominant Species	% Cover	Dominant Species	% Cover

Comments / Problems: _____

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

Dominant Species	% Cover	Dominant Species	% Cover

Comments / Problems: _____

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

Dominant Species	% Cover	Dominant Species	% Cover

Comments / Problems:

Community Number: ___ Community Title (main spp):

Dominant Species	% Cover	Dominant Species	% Cover

Comments / Problems: _____

COMPREHENSIVE VEGETATION LIST

Plant Species	Vegetation Community Number (s)	Plant Species	Vegetation Community Number (s)
Achillea millefolium	1	*Rosa woodsii*	1
Agrostis alba	1,2	*Rubus idaeus*	1
Agropyron smithii	1	*Rumex crispus*	1,2
Alnus incana	1,2	*Salix bebbiana*	1,2
Amelanchier alnifolia	1	*Salix exigua*	1,2
Betula occidentalis	1,2	*Salix lutea*	1,2
Carex nebrascensis	2	*Scirpus acutus*	2
Carex retrorsa	2	*Scirpus microcarpus*	2
Carex stipata	2	*Symphoricarpos albus*	1
Carex utriculata	2	*Taraxacum officinale*	1
Chrysanthemum leucanthemum	1	*Tragopogon dubius*	1
Cirsium arvense	1	*Trifolium pratense*	1
Cirsium vulgare	1	*Urtica dioica*	2
Cornus stolonifera	1,2	*Verbascum thapsus*	1
Crataegus douglasii	1	*Xanthium strumarium*	1
Crataegus douglasii	1,2		
Elymus glaucus	1		
Epilobium ciliatum	1,2		
Galium spp.	1		
Geum macrophyllum	1,2		
Glyceria striata	2		
Hypericum perforatum	1		
Impatiens ecalcarata	2		
Iris pseudacorus	2		
Juncus ensifolius	2		
Medicago Sativa	1		
Nepeta cataria	1		
Phalaris arundinacea	1,2		
Poa pratensis	1		
Populus trichocarpa	1,2		
Potentilla gracilis	1		
Prunus virginiana	1		
Ranunculus aquatilis	Channel		

Comments / Problems: None

PLANTED WOODY VEGETATION SURVIVAL

Plant Species	Number Originally Planted	Number Observed	Mortality Causes
ALNINC		22	Plantings looked healthy with vigorous growth for the season with few discolored leaves. Thin-leaf alder and black cottonwood species had the highest counts along transect. Plantings were heavy browsed due to no browse protection. Many of the planted species had died back and re-sprouted new growth.
AMEALN		10	
BETOCC		1	
CORSTO		8	
CRADOU		18	
POPTRE		2	
POPTRI		47	
PRUVIR		13	
ROSWOO		16	
RUBIDA		2	
SALBEB		19	
SALEXI		10	
SALLUT		3	
SYMALB		9	

Comments / Problems: Shrub / tree planting survival data was collected along three separate areas at Mission Creek site. These included the southwest, southeast and northeast areas of the re-establishment zones. Zones were separated by channel and the new bridge. Each zone was established with several small transects. During the 2009 monitoring, species survival was based on visual estimates and counts for each live species. The original plantings numbers were referenced from Summary and Construction Notes. (**Appendix G**). Actual planting numbers and prescribed species may vary from the original plan. Overall survival ratings are considered high based on visual assessment.

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
Deer		☒	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	

Additional Activities Checklist:
NA 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 (°)
PP1	1.0	View looking southwest	225
PP1	1.1	View looking west.	270
PP2	1.1	View looking southwest.	225
PP2	1.1	View looking east.	90
PP3	1.0	View looking north.	0
PP4	1.0	View looking north.	0
PP5	1.0	View looking south.	180
PP5	1.1	View looking north.	0

Comments / Problems: **Refer to the photopage for a more specific description of the photo points.**

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: **FA completed using the 1999 MDT Montana Wetland Assessment Method. Mitigation crediting system requires a direct comparison between pre- and post-project functional assessment to evalaute mitigation site progress with a functional shift.**

MAINTENANCE

Were man-made nesting structure installed at this site? **NA**
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? **NA**
If yes, are the structures working properly and in good working order? **NA**
If no, describe the problems below.

Comments / Problems: _____

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: Mission Creek Date: No Transect Examiner: _____
Transect Number: _____ Approximate Transect Length: **0 feet** Compass Direction from Start: **0˚** Note: _____

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

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

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

Vegetation Type D: **C.T. 5 -** _____	
Length of transect in this type: feet	
Plant Species	**Cover**
Total Vegetative Cover:	%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: Mission Creek Date: No Transect Examiner: _____
Transect Number: _____ Approximate Transect Length: _____**feet** Compass Direction from Start: **0˚** Note: _____

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

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

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

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

MDT WETLAND MONITORING – VEGETATION TRANSECT

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

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

Establish transects perpendicular to the shoreline (or saturated perimeter). The transect should begin in the upland area. Permanently mark this location with a standard metal fencepost. Extend the imaginary transect line towards the center of the wetland, ending at the 3 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: No vegetation transects established at the site.

BIRD SURVEY – FIELD DATA SHEET

Site: **Mission Creek** Date: **7/23/09**
Survey Time: **10** to **2**

Bird Species	#	Behavior	Habitat	Bird Species	#	Behavior	Habitat
Great horned owl	1	FO	FO				
Cliff swallow	2	N					
Red winged blackbird	2	L	WM				

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: _____

Notes: _____

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

Project/Site:	Mission Creek	**Project No:** 4308802	**Date:** 23-Jul-2009
Applicant/Owner:	Montana Department of Transportation		**County:** Lake
Investigators:	G. Howard		**State:** Montana
			Plot ID: SP1

Do Normal Circumstances exist on the site?	(Yes) No	**Community ID:** EM
Is the site significantly disturbed (Atypical Situation:)?	Yes (No)	**Transect ID:**
Is the area a potential Problem Area?	Yes (No)	**Field Location:**
(If needed, explain on the reverse side)		Along Mission Creek streambanks

VEGETATION **(USFWS Region No. 9)**

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
Carex nebrascensis	Herb	OBL	*Scirpus acutus*	Herb	OBL
Sedge,Nebraska			Bulrush,Hard-Stem		
Glyceria striata	Herb	OBL	*Scirpus microcarpus*	Herb	OBL
Grass,Fowl Manna			Bulrush,Small-Fruit		

Percent of Dominant Species that are OBL, FACW or FAC: **(excluding FAC-)** 4/4 = 100.00%

FAC Neutral: 4/4 = 100.00%

Numeric Index: 4/4 = 1.00

Remarks:
Area dominated by hydrophytic vegetation.

HYDROLOGY

NO **Recorded Data(Describe in Remarks):**
- N/A **Stream, Lake or Tide Gauge**
- N/A **Aerial Photographs**
- N/A **Other**

YES **No Recorded Data**

Field Observations

Depth of Surface Water:	N/A *(in.)*
Depth to Free Water in Pit:	N/A *(in.)*
Depth to Saturated Soil:	= 0 *(in.)*

Wetland Hydrology Indicators

Primary Indicators
- NO **Inundated**
- YES **Saturated in Upper 12 Inches**
- NO **Water Marks**
- NO **Drift Lines**
- NO **Sediment Deposits**
- NO **Drainage Patterns in Wetlands**

Secondary Indicators
- NO **Oxidized Root Channels in Upper 12 Inches**
- NO **Water-Stained Leaves**
- NO **Local Soil Survey Data**
- YES **FAC-Neutral Test**
- NO **Other(Explain in Remarks)**

Remarks:
Hydrology indicator present with soils saturated to ground surface.

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

Project/Site:	Mission Creek	**Project No:** 4308802	**Date:** 23-Jul-2009
Applicant/Owner:	Montana Department of Transportation		**County:** Lake
Investigators:	G. Howard		**State:** Montana
			Plot ID: SP1

SOILS

Map Unit Name (Series and Phase): Lamoose loam, 0 to 2 percent slope
Map Symbol: 93 **Drainage Class:** poorly drained **Mapped Hydric Inclusion?**
Taxonomy (Subgroup): **Field Observations Confirm Mapped Type?** Yes (No)
Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
0-10	A	10YR2/1	N/A	N/A	N/A	Loam

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

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes) No	Is the Sampling Point within the Wetland? (Yes) No
Wetland Hydrology Present?	(Yes) No	
Hydric Soils Present?	(Yes) No	

Remarks:
Sampling points considered within a wetland area. Area dominated by emergent vegetation along the banks of Mission Creek.

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

1. Project Name: Mission Creek **2. Project #:** _____ **Control #:** _____

3. Evaluation Date: 7/23/2009 **4. Evaluator(s):** G. Howard **5. Wetland / Site #(s):** AA-1

6. Wetland Location(s) i. T: 18 N **R:** 20 W **S:** 14 **T:** __ N **R:** __ E **S:** _____

ii. Approx. Stationing / Mileposts: _____

iii. Watershed: Flathead **GPS Reference No. (if applies):** _____

Other Location Information: _____

7. A. Evaluating Agency MDT

B. Purpose of Evaluation:

- ☐ Wetlands potentially affected by MDT project
- ☐ Mitigation wetlands; pre-construction
- ☒ Mitigation wetlands; post-construction
- ☐ Other

8. Wetland Size (total acres): ≥10 (visually estimated)
_____ (measured, e.g. GPS)

9. Assessment Area (total acres): ≥10 (visually estimated)
_____ (measured, e.g. GPS)

Comments: AA consistent w/ baseline AA for comparison. Actual wetlands on site = 0.02 ac

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
Riverine	Palustrine	Lower Perennial	Streambed	Permanently Flooded	---	10
Riverine	Palustrine	None	Emergent Wetland	Intermittently Exposed	---	20
Riverine	Palustrine	None	Scrub-Shrub Wetland	Intermittently Exposed	---	10
Riverine	Palustrine	None	Forested Wetland	Intermittently Exposed	---	60
---	---	---	---	---	---	

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

Comments: _____

11. ESTIMATED RELATIVE ABUNDANCE (of similarly classified sites within the same Major Montana Watershed Basin)
Common **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.	---	---	---
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.	---	moderate disturbance	---
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.) Adjacent parcels grazed.

ii. Prominent weedy, alien, & introduced species: Cirsium arvense, Chrysanthemum leucanthemum, Iris pseudacorus.

iii. Briefly describe AA and surrounding land use / habitat: AA is located along Mission Creek corridor and adjacent wetlands. Surrounding land uses include Highway 93, agriculture, and residential.

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	High	---	---

Comments: Forested and scrub-shrub classes associated with Mission Creek corridor up - and down-stream from the Emergent vegetation classes.

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	Bull trout
Secondary habitat **(list species)**	☐ D ☐ S	_____
Incidental habitat **(list species)**	☐ D ☒ S	Grizzly bear
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	1 (H)	---	---	---	---	---	---

If documented, list the source (e.g., observations, records, etc.)**:** Montana Natural Heritage Program.

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	West slope cutthroat
Incidental habitat **(list species)**	☐ D ☒ S	Bald eagle
No usable habitat	☐ D ☐ S	_____

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

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

If documented, list the source (e.g., observations, records, etc.)**:** Montana Natural Heritage Program.

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)	☒High								☐Moderate								☐Low			
Class Cover Distribution (all vegetated classes)	☐Even				☒Uneven				☐Even				☐Uneven				☐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** (Using 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)			
	☐ Exceptional	☒ High	☐ Moderate	☐ Low
Substantial	--	.9 (H)	--	--
Moderate	--	--	--	--
Low	--	--	--	--

Comments: High wildlife use levels within Mission Creek Corridor.

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, 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 pick the exceptional (E), high (H), moderate (M), or low (L) quality rating.

Duration of Surface Water in AA	☒Permanent/Perennial			☐Seasonal / Intermittent			☐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.	H	--	--	--	--	--	--	--	--
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 pick 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)			
	☐ Exceptional	☒ High	☐ Moderate	☐ Low
Native game fish	--	.9 (H)	--	--
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 flooded from in-channel or overbank flow, 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	☐ ≥ 10 acres			☒ <10, >2 acres			☐ ≤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**	--	--	--	--	.7 (H)	--	--	--	--
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, 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.	☐ >5 acre feet			☒ <5, >1 acre feet			☐ ≤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 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	☒ ≥ 70%		☐ < 70%		☐ ≥ 70%		☐ < 70%	
Evidence of flooding or ponding in AA	☒ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No
AA contains **no or restricted outlet**	--	--	--	--	--	--	--	--
AA contains **unrestricted outlet**	.9 (H)	--	--	--	--	--	--	--

Comments: _____

14H. SEDIMENT/SHORELINE STABILIZATION ☐ **NA** (proceed to 14I)

Applies only if AA occurs on or within the banks or 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, 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		
	☒Permanent / Perennial	☐Seasonal / Intermittent	☐Temporary / Ephemeral
≥ 65 %	1 (H)	--	--
35-64 %	--	--	--
< 35 %	--	--	--

Comments: _____

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT

i. **Rating** (Working from top to bottom, use the matrix below to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function.
A = acreage of vegetated component in the AA. **B** = structural diversity rating from #13. **C** = Yes (Y) or No (N) as to whether or not the AA contains a surface or subsurface outlet; **P/P** = permanent/perennial; **S/I** = seasonal/intermittent; **T/E/A**= temporary/ephemeral/absent.

A	☒ Vegetated component >5 acres						☐ Vegetated component 1-5 acres						☐ Vegetated component <1 acre					
B	☒ High		☐ Moderate		☐ Low		☐ High		☐ Moderate		☐ Low		☐ High		☐ Moderate		☐ Low	
C	☒Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N
P/P	1H	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
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: _____

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	☐rare	☐common	☐abundant	☐rare	☒common	☐abundant	☐rare	☐common	☐abundant
Low disturbance at AA (#12i)	--	--	--	--	--	--	--	--	--
Moderate disturbance at AA (#12i)	--	--	--	--	.5M	--	--	--	--
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)		
	☐ Low	☐ Moderate	☐ High
Public ownership	--	--	--
Private ownership	--	--	--

Comments: _____

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	High	1.00	1	
B. MT Natural Heritage Program Species Habitat	Mod	0.70	1	
C. General Wildlife Habitat	High	0.90	1	
D. General Fish/Aquatic Habitat	High	0.90	1	
E. Flood Attenuation	Mod	0.70	1	
F. Short and Long Term Surface Water Storage	High	0.80	1	
G. Sediment/Nutrient/Toxicant Removal	High	0.90	1	
H. Sediment/Shoreline Stabilization	High	1.00	1	
I. Production Export/Food Chain Support	High	1.00	1	
J. Groundwater Discharge/Recharge	High	1.00	1	
K. Uniqueness	Mod	0.5	1	
L. Recreation/Education Potential	High	1.00	1	
	Totals:	**10.4**	**12.00**	
	Percent of Total Possible Points:		**87%** (Actual / Possible) x 100 [rd to nearest whole #]	

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

Mud Creek

PBS&J / MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name: **Mud Creek** Project Number: **B4300882**
Assessment Date: **July 23, 2009** Person(s) conducting the assessment: **G. Howard**
Location: **Pablo** MDT District: **Missoula** Milepost: ____
Legal Description: T **21N** R **20W** Section **13**
Weather Conditions: **Sunny, Temps in low 80's** Time of Day: **12-4**
Initial Evaluation Date: **July 23, 2009** Monitoring Year: **1** # Visits in Year: **2**
Size of evaluation area: **2.5 acres** Land use surrounding wetland: **Agriculture and residential**

HYDROLOGY

Surface Water Source: **Mud Creek**
Inundation: **Present** Average Depth: **1.5 feet** Range of Depths: **0-3 ft.**
Percent of assessment area under inundation: **20%**
Depth at emergent vegetation-open water boundary: ____ **feet**
If assessment area is not inundated then are the soils saturated within 12 inches of surface: _
Other evidence of hydrology on the site (ex. – drift lines, erosion, stained vegetation, etc.):

____

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

Well Number	Depth	Well Number	Depth	Well Number	Depth

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

COMMENTS / PROBLEMS:
Mitigation site consists of emergent wetlands, restored Mud Creek, riparian areas and uplands. Mitigation efforts included vegetation enhancements and Mud Creek restoration. The emergent portions of mitigation area are thriving with the removal of grazing and increased hydrology. Areas adjacent and along the banks of Mud Creek planted with woody vegetation. The vegetated soils lifts and wetland sod matting used in creek restoration are thriving and well established with dense emergent vegetation cover along most of the creek banks. Several noxious weed species indentified including Canada Thistle (*Cirsium arvense*) and oxeye daisy (*Chrysanthemum leucanthemum*).

VEGETATION COMMUNITIES

Community Number: **1** Community Title (main spp): **Juncus**

Dominant Species	% Cover	Dominant Species	% Cover
JUNBAL	5 = > 50%	POAPRA	2 = 6-10%
AGRALB	3 = 11-20%	GEUMAC	+ = < 1%
PHLPRA	+ = < 1%	EPICIL	+ = < 1%
PHAARU	1 = 1-5%		
CARSPP	+ = < 1%		
FESARU	+ = < 1%		

Comments / Problems: **Small wetland area dominated by emergent vegetation.**

Community Number: **2** Community Title (main spp): **Phalaris**

Dominant Species	% Cover	Dominant Species	% Cover
PHAARU	4 = 21-50%		
CARSTI	2 = 6-10%		
GLYSPP	1 = 1-5%		
AGRALB	2 = 6-10%		

Comments / Problems: **Wetland area dominated by emergent vegetation.**

Community Number: **3** Community Title (main spp): **Scirpus**

Dominant Species	% Cover	Dominant Species	% Cover
SCIMIC	5 = > 50%	POPTRE	+ = < 1%
CARSPP	1 = 1-5%	CIRVUL	+ = < 1%
GEUMAC	1 = 1-5%	GLYSTR	1 = 1-5%
EPICIL	+ = < 1%		
PHAARU	+ = < 1%		

Comments / Problems: **Wetland area dominated by emergent vegetation type.**

Community Number: **4** Community Title (main spp): **Juncus / Carex**

Dominant Species	% Cover	Dominant Species	% Cover
JUNSPP	3 = 11-20%	GEUMAC	1 = 1-5%
CARSPP	3 = 11-20%	JUNBAL	3 = 11-20%
CARSTI	2 = 6-10%	AGRALB	1 = 1-5%
CARSPP2	2 = 6-10%	EPICIL	+ = < 1%
CARNEB	3 = 11-20%		

Comments / Problems: **Wetland area dominated by emergent vegetation type.**

VEGETATION COMMUNITIES (continued)

Community Number: **5** Community Title (main spp): **Carex**

Dominant Species	% Cover	Dominant Species	% Cover
CARUTR	5 = > 50%	IMPECA	+ = < 1%
GLYGRA	2 = 6-10%	ALNINC - PLANTED	1 = 1-5%
AGRALB	2 = 6-10%	JUNENS	1 = 1-5%
CARSTI	2 = 6-10%	JUNSPP	1 = 1-5%
MYOSPP	1 = 1-5%	POPTRI	+ = < 1%
PHAARU	2 = 6-10%		

Comments / Problems: **Wetland areas dominated by emergent vegetation along the reconstructed banks of Mud Creek. Woody plants planted along the stream corridor.**

Community Number: **6** Community Title (main spp): **Crataegus / Phalaris**

Dominant Species	% Cover	Dominant Species	% Cover
CRADOU	5 = > 50%		
PHAARU	4 = 21-50%		
LYSAME	1 = 1-5%		
EPICIL	1 = 1-5%		
CIRARV	2 = 6-10%		
SOLDRU	2 = 6-10%		

Comments / Problems: **Wetland area dominated by scrub-shrub and emergent vegetation types.**

Community Number: **7** Community Title (main spp): **Phalaris / Melilotus**

Dominant Species	% Cover	Dominant Species	% Cover
PHAARU	4 = 21-50%	SOLDRU	1 = 1-5%
TRIREP	3 = 11-20%	CIRVUL	+ = < 1%
MELOFF	3 = 11-20%	AGRREP	+ = < 1%
SISALT	1 = 1-5%		
BROINE	2 = 6-10%		
VERTHA	1 = 1-5%		

Comments / Problems: **Upland areas between and underneath the new bridges along the Mud Creek reconstruction. Dry slopes outside the creeks floodplain margin.**

Community Number: **8** Community Title (main spp): **Channel - Surface Waters**

Dominant Species	% Cover	Dominant Species	% Cover
AQUATIC VEG	5 = > 50%		
RANAQU	1 = 1-5%		
VERAME	2 = 6-10%		
RORAQU	2 = 6-10%		

Comments / Problems: **Aquatic vegetation within the reconstructed channel.**

COMPREHENSIVE VEGETATION LIST

Plant Species	Vegetation Community Number (s)	Plant Species	Vegetation Community Number (s)
Achillea millefolium	2	*Juncus spp.*	3,4
Agrostis alba	1,2,3,4,5,6	*Lactuca serriola*	1,2
Agropyron repens	2	*Lepidium perfoliatum*	7
Agropyron smithii	2	*Lychnis alba*	1,2
Alnus incana	2,5	*Lysichiton americanus*	6
Artemisia ludoviciana	2	*Medicago Sativa*	2
Bromus carinatus	7	*Melilotus officinalis*	7
Bromus tectorum	7	*Mimulus guttatus*	4
Carex nebrascensis	4	*Phalaris arundinacea*	1,2,3,4,5,6
Carex stipata	3	*Plantago lanceolata*	3,4
Carex utriculata	5	*Plantago major*	7
Centaurea maculosa	7	*Poa pratensis*	1,2,4
Chenopodium album	2	*Polygonum douglasii*	7
Chrysanthemum leucanthemum	7	*Polygonum spp.*	3
Cirsium arvense	1,2,3,4,5,6	*Populus tremuloides*	3
Cirsium vulgare	2,3	*Potentilla gracilis*	2
Conyza canadensis	7	*Rosa woodsii*	7
Cornus stolonifera	2	*Rumex crispus*	2
Crataegus douglasii	2,6	*Salix bebbiana*	2
Crataegus douglasii	2,3	*Salix lutea*	2
Descurainia sophia	2	*Scirpus acutus*	3
Eleocharis palustris	3	*Scirpus microcarpus*	3
Epilobium ciliatum	1,2,3,4,5,6	*Sisymbrium altissimum*	1,2
Equisetum arvense	7	*Solanum dulcamara*	1,2,6
Festuca arundinacea	1	*Sonchus arvensis*	2
Geum macrophyllum	1,2,3,4	*Thlaspi arvense*	7
Glyceria striata	3	*Trifolium pratense*	2
Hordeum jubatum	7	*Trifolium repens*	7
Hypericum perforatum	1	*Typha latifolia*	3
Impatiens ecalcarata	2	*Verbascum thapsus*	2
Iris pseudacorus	2	*Viola spp.*	3
Juncus balticus	1,2,4	*Xanthium strumarium*	2
Juncus ensifolius	4		

Comments / Problems:

PLANTED WOODY VEGETATION SURVIVAL

Plant Species	Number Originally Planted	Number Observed	Mortality Causes
ALNINC	85	28	Plantings looked healthy with vigorous growth for the season with few discolored leaves. Thin-leaf alder and black cottonwood species had the highest counts along transect.
CORSTO	32	6	
CRADOU	10	5	
POPTRE	0	3	
POPTRI	83	28	
ROSWOO	31	8	
SALAMY	0	1	
SALBEB	56	10	
SALEXI	--	14	
SALLUT	54	4	

Comments / Problems: Shrub / tree planting survival data were collected along one (428 ft long) 2 meter wide belt transect that totaled approximately 0.06 acres (2,808 sq. ft.). Transect was established along the reconstructed creek and floodplain margins. During the 2009 monitoring, species survival was based on visual estimates and counts for each live species. The original plantings numbers as listed above were referenced from Wetland Mitigation Planting Details and Schedule (**Appendix G**). Actual planting numbers and prescribed species may vary from the original plan. Post design changes for planting prescriptions may have been adjusted during the construction phase due to availability of seedlings. Overall survival ratings are considered high based on visual assessment.

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
Fox	1	☐	☐	☐	
Deer		☒	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	

Additional Activities Checklist:
NA 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 (°)
PP1	1.0	View looking east.	0
PP1	1.1	View looking northeast	45
PP2	1.0	View looking east.	90
PP2	1.1	View looking southeast.	135
PP3	1.0	View looking southwest.	225
PP4	1.0	View looking northwest.	315
PP5	1.0	View looking north.	0
PP6	1.0	View looking south.	180
PP6	1.1	View looking northeast.	45
PP7	1.0	View looking southeast.	135
PP8	1.0	View looking northwest.	315
PP8	1.1	View looking southeast.	135
PP9	1.0	View looking south.	180
PP9	1.1	View looking northwest.	315
PP10	1.0	View looking east.	90
PP11	1.0	View looking east.	90
PP12	1.0	View looking southwest.	225
PP13	1.0	View looking east.	90

Comments / Problems: **Refer to the photopage for a more specific description of the photo points.**

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: **FA completed using the 1999 MDT Montana Wetland Assessment Method. Mitigation crediting system requires a direct comparison between pre- and post-project functional assessment to evalaute mitigation site progress with a functional shift.**

MAINTENANCE

Were man-made nesting structure installed at this site? **NA**
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? **NA**
If yes, are the structures working properly and in good working order? **NA**
If no, describe the problems below.

Comments / Problems: _____

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Mud Creek** Date: **July 23, 2009** Examiner: **G. Howard**
Transect Number: **1** Approximate Transect Length: **494 feet** Compass Direction from Start: **315˚** Note: _____

Vegetation Type A: **C.T. 4 - Carex / Juncus (Wetland)**	
Length of transect in this type: 47 feet	
Plant Species	**Cover**
CARSPP1	4 = 21-50%
CARSTI	3 = 11-20%
JUNBAL	1 = 1-5%
EPICIL	+ = < 1%
PHAARU	1 = 1-5%
CARSPP2	3 = 11-20%
JUNENS	+ = < 1%
Total Vegetative Cover:	95%

Vegetation Type B: **C.T. 3 - Scirpus (Wetland)**	
Length of transect in this type:69 feet	
Plant Species	**Cover**
SCIMIC	5 = > 50%
CARPRA	+ = < 1%
GEUMAC	2 = 6-10%
PHAARU	1 = 1-5%
CIRARV	+ = < 1%
GLYSTR	1 = 1-5%
Total Vegetative Cover:	100%

Vegetation Type C: **C.T. 2 - Phalaris / Agrostis (Wetland)**	
Length of transect in this type: 296 feet	
Plant Species	**Cover**
PHAARU	4 = 21-50%
AGRALB	4 = 21-50%
POAPRA	2 = 6-10%
CRADOU	1 = 1-5%
CORSTO	+ = < 1%
CARNEB	2 = 6-10%
JUNBAL	2 = 6-10%
CIRARV	2 = 6-10%
PHLPRA	1 = 1-5%
Total Vegetative Cover:	100%

Vegetation Type D: **C.T. 5 - Carex / Glyceria (Wetland)**	
Length of transect in this type: 5 feet	
Plant Species	**Cover**
CARUTR	5 = > 50%
GLYGRA	1 = 1-5%
CARSTI	1 = 1-5%
JUNENS	+ = < 1%
Total Vegetative Cover:	95%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Mud Creek** Date: **July 23, 2009** Examiner: **G. Howard**
Transect Number: **1** Approximate Transect Length: **494 feet** Compass Direction from Start: **315˚** Note: _____

Vegetation Type A: **C.T. 8 - Channel / Elodea (Wetland)**	
Length of transect in this type: 10 feet	
Plant Species	**Cover**
RORAQU	1 = 1-5%
ELOSPP	5 = > 50%
VERAME	2 = 6-10%
Total Vegetative Cover:	95%

Vegetation Type B: **C.T. 5 - Carex / Glyceria (Wetland)**	
Length of transect in this type: 2 feet	
Plant Species	**Cover**
CARSTI	3 = 11-20%
CARUTR	1 = 1-5%
AGRALB	1 = 1-5%
CARNEB	3 = 11-20%
CARPRA	3 = 11-20%
EPICIL	1 = 1-5%
JUNSPP	4 = 21-50%
Total Vegetative Cover:	95%

Vegetation Type C: **C.T. 2 - Phalaris / Agrostis (Wetland)**	
Length of transect in this type: 65 feet	
Plant Species	**Cover**
PHAARU	4 = 21-50%
DESCES	2 = 6-10%
AGRALB	4 = 21-50%
SONARV	2 = 6-10%
FESARU	3 = 11-20%
ROSWOO	+ = < 1%
CHRLEU	+ = < 1%
Total Vegetative Cover:	95%

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

MDT WETLAND MONITORING – VEGETATION TRANSECT

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

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

Establish transects perpendicular to the shoreline (or saturated perimeter). The transect should begin in the upland area. Permanently mark this location with a standard metal fencepost. Extend the imaginary transect line towards the center of the wetland, ending at the 3 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: **Mud Creek** Date: **7/23/09**
Survey Time: **10** to **2**

Bird Species	#	Behavior	Habitat	Bird Species	#	Behavior	Habitat
American Robin	2	L	FO				
Black-Billed Magpie	1	FO	SS				
Common Raven	2	FO	SS				
Red -Winged blackbird	3	L	WM				

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: _____

Notes: _____

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

Project/Site:	Mud Creek	**Project No:**	**Date:** 23-Jul-2009
Applicant/Owner:	Montana Department of Transportation		**County:** Lake
Investigators:	G. Howard		**State:** Montana
			Plot ID: T1-SP4

Do Normal Circumstances exist on the site?	(Yes) No	**Community ID:** EM
Is the site significantly disturbed (Atypical Situation:)?	Yes (No)	**Transect ID:** 1
Is the area a potential Problem Area?	Yes (No)	**Field Location:**
(If needed, explain on the reverse side)		SE corner - CT 5 along Mud Cr.

VEGETATION **(USFWS Region No. 9)**

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
Carex utriculata	Herb	OBL	*Glyceria maxima*	Herb	OBL
beaked sedge			Meadowgrass,Reed		
Carex stipata	Herb	OBL	*Juncus ensifolius*	Herb	FACW
saw-beak sedge			Rush,Three-Stamen		

Percent of Dominant Species that are OBL, FACW or FAC:	**FAC Neutral:** 4/4 = 100.00%
(excluding FAC-) 4/4 = 100.00%	**Numeric Index:** 5/4 = 1.25

Remarks:
Area dominated by hydrophytic vegetation.

HYDROLOGY

NO **Recorded Data(Describe in Remarks):**
- N/A **Stream, Lake or Tide Gauge**
- N/A **Aerial Photographs**
- N/A **Other**

YES **No Recorded Data**

Field Observations

Depth of Surface Water:	N/A *(in.)*
Depth to Free Water in Pit:	N/A *(in.)*
Depth to Saturated Soil:	= 0 *(in.)*

Wetland Hydrology Indicators

Primary Indicators
- NO **Inundated**
- YES **Saturated in Upper 12 Inches**
- NO **Water Marks**
- NO **Drift Lines**
- NO **Sediment Deposits**
- YES **Drainage Patterns in Wetlands**

Secondary Indicators
- NO **Oxidized Root Channels in Upper 12 Inches**
- NO **Water-Stained Leaves**
- NO **Local Soil Survey Data**
- YES **FAC-Neutral Test**
- NO **Other(Explain in Remarks)**

Remarks:
Hydrology indicator present with soils saturated to ground surface. Sampling point located within the floodplain of Mud Creek.

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

Project/Site:	Mud Creek	**Project No:**	**Date:** 23-Jul-2009
Applicant/Owner:	Montana Department of Transportation		**County:** Lake
Investigators:	G. Howard		**State:** Montana
			Plot ID: T1-SP4

SOILS

Map Unit Name (Series and Phase): Borohemists, 0 to 1 percent slopes
Map Symbol: 19 **Drainage Class:** very poorly drained **Mapped Hydric Inclusion?**
Taxonomy (Subgroup): **Field Observations Confirm Mapped Type?** Yes (No)
Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
0-12	A	10YR2/1	N/A	N/A	N/A	Loam

Hydric Soil Indicators:

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

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes) No	Is the Sampling Point within the Wetland? (Yes) No
Wetland Hydrology Present?	(Yes) No	
Hydric Soils Present?	(Yes) No	

Remarks:
Sampling point considered within a wetland area. Sampling point located within an emergent vegetation type.

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

Project/Site:	Mud Creek	**Project No:**	**Date:** 23-Jul-2009
Applicant/Owner:	Montana Department of Transportation		**County:** Lake
Investigators:	G. Howard		**State:** Montana
			Plot ID: T1-SP2

Do Normal Circumstances exist on the site?	(Yes) No	**Community ID:** EM
Is the site significantly disturbed (Atypical Situation:)?	Yes (No)	**Transect ID:** 1
Is the area a potential Problem Area?	Yes (No)	**Field Location:**
(If needed, explain on the reverse side)		NE corner - CT 3

VEGETATION **(USFWS Region No. 9)**

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
Scirpus microcarpus	Herb	OBL	*Glyceria striata*	Herb	OBL
Bulrush,Small-Fruit			Grass,Fowl Manna		
Carex praegracilis	Herb	FACW			
Sedge,Clustered Field					

Percent of Dominant Species that are OBL, FACW or FAC: 3/3 = 100.00%
(excluding FAC-) 3/3 = 100.00%

FAC Neutral: 3/3 = 100.00%
Numeric Index: 4/3 = 1.33

Remarks:
Area dominated by hydrophytic vegetation.

HYDROLOGY

NO **Recorded Data(Describe in Remarks):**
N/A **Stream, Lake or Tide Gauge**
N/A **Aerial Photographs**
N/A **Other**
YES **No Recorded Data**

Field Observations

Depth of Surface Water:	N/A *(in.)*
Depth to Free Water in Pit:	N/A *(in.)*
Depth to Saturated Soil:	= 0 *(in.)*

Wetland Hydrology Indicators
Primary Indicators
NO **Inundated**
YES **Saturated in Upper 12 Inches**
NO **Water Marks**
NO **Drift Lines**
NO **Sediment Deposits**
NO **Drainage Patterns in Wetlands**
Secondary Indicators
NO **Oxidized Root Channels in Upper 12 Inches**
NO **Water-Stained Leaves**
NO **Local Soil Survey Data**
YES **FAC-Neutral Test**
NO **Other(Explain in Remarks)**

Remarks:
Hydrology indicator present with soils saturated to the ground surface.

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

Project/Site:	Mud Creek	**Project No:**	**Date:** 23-Jul-2009
Applicant/Owner:	Montana Department of Transportation		**County:** Lake
Investigators:	G. Howard		**State:** Montana
			Plot ID: T1-SP2

SOILS

Map Unit Name (Series and Phase): Borohemists, 0 to 1 percent slopes
Map Symbol: 19 **Drainage Class:** very poorly drained **Mapped Hydric Inclusion?**
Taxonomy (Subgroup): **Field Observations Confirm Mapped Type?** Yes (No)
Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
0-12	A	10YR2/1	N/A	N/A	N/A	Mucky mineral

Hydric Soil Indicators:

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

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes) No	Is the Sampling Point within the Wetland? (Yes) No
Wetland Hydrology Present?	(Yes) No	
Hydric Soils Present?	(Yes) No	

Remarks:
Sampling point considered within a wetland area. Sampling point located within an emergent vegetation type.

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

Project/Site:	Mud Creek	**Project No:**	**Date:** 23-Jul-2009
Applicant/Owner:	Montana Department of Transportation		**County:** Lake
Investigators:	G. Howard		**State:** Montana
			Plot ID: T1-SP3

Do Normal Circumstances exist on the site?	(Yes) No	**Community ID:** EM
Is the site significantly disturbed (Atypical Situation:)?	Yes (No)	**Transect ID:** 1
Is the area a potential Problem Area?	Yes (No)	**Field Location:**
(If needed, explain on the reverse side)		Southeast of SP2

VEGETATION **(USFWS Region No. 9)**

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
Phalaris arundinacea	Herb	FACW	*Crataegus douglasii*	Shrub	FAC
Grass,Reed Canary			Hawthorn,Douglas'		
Agrostis alba	Herb	FACW	*Carex nebrascensis*	Herb	OBL
Redtop			Sedge,Nebraska		
Poa pratensis	Herb	FACU+			
Bluegrass,Kentucky					

Percent of Dominant Species that are OBL, FACW or FAC: **FAC Neutral:** 3/4 = 75.00%
(excluding FAC-) 4/5 = 80.00% **Numeric Index:** 12/5 = 2.40

Remarks:
Area dominated by hydrophytic vegetation.

HYDROLOGY

NO **Recorded Data(Describe in Remarks):**
N/A **Stream, Lake or Tide Gauge**
N/A **Aerial Photographs**
N/A **Other**

YES **No Recorded Data**

Field Observations

Depth of Surface Water: N/A *(in.)*
Depth to Free Water in Pit: N/A *(in.)*
Depth to Saturated Soil: = 8 *(in.)*

Wetland Hydrology Indicators
Primary Indicators
NO **Inundated**
YES **Saturated in Upper 12 Inches**
NO **Water Marks**
NO **Drift Lines**
NO **Sediment Deposits**
NO **Drainage Patterns in Wetlands**
Secondary Indicators
NO **Oxidized Root Channels in Upper 12 Inches**
NO **Water-Stained Leaves**
NO **Local Soil Survey Data**
YES **FAC-Neutral Test**
NO **Other(Explain in Remarks)**

Remarks:
Hydrology indicator present with soils saturated to 8 inch depth.

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

Project/Site:	Mud Creek	**Project No:**	**Date:** 23-Jul-2009
Applicant/Owner:	Montana Department of Transportation		**County:** Lake
Investigators:	G. Howard		**State:** Montana
			Plot ID: T1-SP3

SOILS

Map Unit Name (Series and Phase): Borohemists, 0 to 1 percent slopes
Map Symbol: 19 **Drainage Class:** very poorly drained **Mapped Hydric Inclusion?**
Taxonomy (Subgroup): **Field Observations Confirm Mapped Type?** Yes (No)
Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
0-12	A	10YR2/1	N/A	N/A	N/A	Loam

Hydric Soil Indicators:

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

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes) No	Is the Sampling Point within the Wetland? (Yes) No
Wetland Hydrology Present?	(Yes) No	
Hydric Soils Present?	(Yes) No	

Remarks:
Sampling point considered within a wetland area. Sampling point located within an emergent vegetation type.

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

Project/Site:	Mud Creek	**Project No:**	**Date:** 23-Jul-2009
Applicant/Owner:	Montana Department of Transportation		**County:** Lake
Investigators:	G. Howard		**State:** Montana
			Plot ID: T1-SP4

Do Normal Circumstances exist on the site?	(Yes) No	**Community ID:** EM
Is the site significantly disturbed (Atypical Situation:)?	Yes (No)	**Transect ID:** 1
Is the area a potential Problem Area?	Yes (No)	**Field Location:**
(If needed, explain on the reverse side)		SE corner - CT 5 along Mud Cr.

VEGETATION **(USFWS Region No. 9)**

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
Carex utriculata	Herb	OBL	*Glyceria maxima*	Herb	OBL
beaked sedge			Meadowgrass,Reed		
Carex stipata	Herb	OBL	*Juncus ensifolius*	Herb	FACW
saw-beak sedge			Rush,Three-Stamen		

Percent of Dominant Species that are OBL, FACW or FAC:	**FAC Neutral:** 4/4 = 100.00%
(excluding FAC-) 4/4 = 100.00%	**Numeric Index:** 5/4 = 1.25

Remarks:
Area dominated by hydrophytic vegetation.

HYDROLOGY

NO **Recorded Data(Describe in Remarks):**
- N/A **Stream, Lake or Tide Gauge**
- N/A **Aerial Photographs**
- N/A **Other**

YES **No Recorded Data**

Field Observations

Depth of Surface Water:	N/A *(in.)*
Depth to Free Water in Pit:	N/A *(in.)*
Depth to Saturated Soil:	= 0 *(in.)*

Wetland Hydrology Indicators

Primary Indicators
- NO **Inundated**
- YES **Saturated in Upper 12 Inches**
- NO **Water Marks**
- NO **Drift Lines**
- NO **Sediment Deposits**
- YES **Drainage Patterns in Wetlands**

Secondary Indicators
- NO **Oxidized Root Channels in Upper 12 Inches**
- NO **Water-Stained Leaves**
- NO **Local Soil Survey Data**
- YES **FAC-Neutral Test**
- NO **Other(Explain in Remarks)**

Remarks:
Hydrology indicator present with soils saturated to ground surface. Sampling point located within the floodplain of Mud Creek.

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

Project/Site:	Mud Creek	**Project No:**	**Date:** 23-Jul-2009
Applicant/Owner:	Montana Department of Transportation		**County:** Lake
Investigators:	G. Howard		**State:** Montana
			Plot ID: T1-SP4

SOILS

Map Unit Name (Series and Phase): Borohemists, 0 to 1 percent slopes
Map Symbol: 19 **Drainage Class:** very poorly drained **Mapped Hydric Inclusion?**
Taxonomy (Subgroup): **Field Observations Confirm Mapped Type?** Yes (No)
Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
0-12	A	10YR2/1	N/A	N/A	N/A	Loam

Hydric Soil Indicators:

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

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes) No	Is the Sampling Point within the Wetland? (Yes) No
Wetland Hydrology Present?	(Yes) No	
Hydric Soils Present?	(Yes) No	

Remarks:
Sampling point considered within a wetland area. Sampling point located within an emergent vegetation type.

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

1. Project Name: Mud C reek **2. Project #:** _____ **Control #:** _____

3. Evaluation Date: 7/23/2009 **4. Evaluator(s):** G. Howard **5. Wetland / Site #(s):** AA-1

6. Wetland Location(s) i. T: 21 N **R:** 20 W **S:** 13 **T:** __ N **R:** __ E **S:** _____

ii. Approx. Stationing / Mileposts: _____

iii. Watershed: Flathead **GPS Reference No. (if applies):** _____

Other Location Information: _____

7. A. Evaluating Agency MDT

8. Wetland Size (total acres): _____ (visually estimated)
2.02 (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)
2.02 (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
Riverine	Palustrine	None	Aquatic Bed	Permanently Flooded	---	5
Riverine	Palustrine	None	Emergent Wetland	Permanently Flooded	---	10
Riverine	Riverine	Lower Perennial	Rock Bottom	Permanently Flooded	---	5
Depression	Palustrine	None	Emergent Wetland	Seasonally Flooded	---	75
Depression	Palustrine	None	Scrub-Shrub Wetland	Seasonally Flooded	---	5

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

Comments: _____

11. ESTIMATED RELATIVE ABUNDANCE (of similarly classified sites within the same Major Montana Watershed Basin)
Common **Comments:** _____

12. GENERAL CONDITION OF AA

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

	Predominant Conditions Adjacent (within 500 Feet) To AA		
Conditions Within 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.	---	---	---
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.	---	moderate disturbance	---
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.) Adjacent parcels grazed and farmed.

ii. Prominent weedy, alien, & introduced species: Centaurea maculosa, Cirsium arvense, Chrysanthemum leucanthemum, Cynoglossum officinale, and Iris pseudacorus.

iii. Briefly describe AA and surrounding land use / habitat: AA is located along Mud Creek corridor and adjacent depressional wetlands. Surrounding land uses include Highway 93, agriculture, and residential.

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	High	---	---

Comments: Emergent, scrub-shrub, and aquatic bed vegetation classes.

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	Grizzly bear
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	---	---	---	---	---	.3 (L)	---

If documented, list the source (e.g., observations, records, etc.)**:** Montana Natural Heritage Program.

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	_____
Incidental habitat **(list species)**	☐ D ☒ S	Bobolink
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 (L)	---

If documented, list the source (e.g., observations, records, etc.)**:** Montana Natural Heritage Program.

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)	☒High								☐Moderate								☐Low			
Class Cover Distribution (all vegetated classes)	☐Even				☒Uneven				☐Even				☐Uneven				☐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** (Using 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)			
	☐ Exceptional	☒ High	☐ Moderate	☐ Low
Substantial	--	--	--	--
Moderate	--	.7 (M)	--	--
Low	--	--	--	--

Comments: _____

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, 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 pick the exceptional (E), high (H), moderate (M), or low (L) quality rating.

Duration of Surface Water in AA	☒Permanent/Perennial			☐Seasonal / Intermittent			☐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 pick 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)			
	☐ Exceptional	☐ High	☒ Moderate	☐ Low
Native game fish	--	--	.7 (M)	--
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 flooded from in-channel or overbank flow, 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	☐ ≥ 10 acres			☒ <10, >2 acres			☐ ≤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**	--	--	--	--	--	.4 (M)	--	--	--

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, 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.	☐ >5 acre feet			☒ <5, >1 acre feet			☐ ≤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 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	☒ ≥ 70%		☐ < 70%		☐ ≥ 70%		☐ < 70%	
Evidence of flooding or ponding in AA	☒ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No
AA contains **no or restricted outlet**	--	--	--	--	--	--	--	--
AA contains **unrestricted outlet**	.9 (H)	--	--	--	--	--	--	--

Comments: _____

14H. SEDIMENT/SHORELINE STABILIZATION ☐ **NA** (proceed to 14I)

Applies only if AA occurs on or within the banks or 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, 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		
	☒Permanent / Perennial	☐Seasonal / Intermittent	☐Temporary / Ephemeral
≥ 65 %	1 (H)	--	--
35-64 %	--	--	--
< 35 %	--	--	--

Comments: _____

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT

i. **Rating** (Working from top to bottom, use the matrix below to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function.
A = acreage of vegetated component in the AA. **B** = structural diversity rating from #13. **C** = Yes (Y) or No (N) as to whether or not the AA contains a surface or subsurface outlet; **P/P** = permanent/perennial; **S/I** = seasonal/intermittent; **T/E/A**= temporary/ephemeral/absent.

A	☐ Vegetated component >5 acres						☒ Vegetated component 1-5 acres						☐ Vegetated component <1 acre					
B	☐ High		☐ Moderate		☐ Low		☒ High		☐ Moderate		☐ Low		☐ High		☐ Moderate		☐ Low	
C	☐Y	☐N	☐Y	☐N	☐Y	☐N	☒Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐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: _____

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	☐rare	☐common	☐abundant	☐rare	☒common	☐abundant	☐rare	☐common	☐abundant
Low disturbance at AA (#12i)	--	--	--	--	--	--	--	--	--
Moderate disturbance at AA (#12i)	--	--	--	--	.5M	--	--	--	--
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)		
	☐ Low	☒ Moderate	☐ High
Public ownership	--	.5(M)	--
Private ownership	--	--	--

Comments: _____

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	0.30	1	
B. MT Natural Heritage Program Species Habitat	Low	0.10	1	
C. General Wildlife Habitat	Mod	0.70	1	
D. General Fish/Aquatic Habitat	Mod	0.70	1	
E. Flood Attenuation	Mod	0.40	1	
F. Short and Long Term Surface Water Storage	High	0.80	1	
G. Sediment/Nutrient/Toxicant Removal	High	0.90	1	
H. Sediment/Shoreline Stabilization	High	1.00	1	
I. Production Export/Food Chain Support	High	0.90	1	
J. Groundwater Discharge/Recharge	High	1.00	1	
K. Uniqueness	Mod	0.5	1	
L. Recreation/Education Potential	Mod	0.5	1	
	Totals:	**7.8**	**12.00**	
	Percent of Total Possible Points:		**65%** (Actual / Possible) x 100 [rd to nearest whole #]	

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

Peterson Property

PBS&J / MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name: **Peterson** Project Number: **B4308802**
Assessment Date: **August 16, 2009** Person(s) conducting the assessment: **G. Howard**
Location: **St. Ignatius** MDT District: **Missoula** Milepost: _____
Legal Description: T **19N** R **20W** Section **35**
Weather Conditions: **Clear & temps in low 90's** Time of Day: **12-4**
Initial Evaluation Date: **August 15, 2008** Monitoring Year: **2** # Visits in Year: **2**
Size of evaluation area: **5-6 acres** Land use surrounding wetland: **Agriculture & residences**

HYDROLOGY

Surface Water Source: **Unnamed perennial creek**
Inundation: **Present** Average Depth: **0.5. feet** Range of Depths: **0-1 ft.**
Percent of assessment area under inundation: **%**
Depth at emergent vegetation-open water boundary: **feet**
If assessment area is not inundated then are the soils saturated within 12 inches of surface:
Other evidence of hydrology on the site (ex. – drift lines, erosion, stained vegetation, etc.):

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

Well Number	Depth	Well Number	Depth	Well Number	Depth

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

COMMENTS / PROBLEMS:
Mitigation site consists of a long draw running east to west with hydrology source from unnamed drainage or tributary to Post Creek. Site dominated by emergent vegetation. Mitigation efforts implemented include the construction of log crib structures to impound water, and shrub and herbaceous plug plantings. Wetland areas inundated with shallow water. Site conditions similar to those observed in 2008. Additional observations for 2009 include a decrease in biomass cover for reed canarygrass (Phalaris arundinacea) and notes for crib structures. Reed canarygrass seemed under-developed with much less stem /leaf material as compared to previous years observation. This may be due to increased hydrology and extended spring / summer flooding. Crib structure near transect 2 has water draining over the dike on the north side of structure.

VEGETATION COMMUNITIES

Community Number: **1** Community Title (main spp): **Agroyron - Upland**

Dominant Species	% Cover	Dominant Species	% Cover
AGRREP		POTREC	
POLBIS		SISALY	
POAPRA			
LEPPER			
DISSYL			
BROTEC			

Comments / Problems: **Upland plant community on either sides of the wetland**

Community Number: **2** Community Title (main spp): **Phalaris**

Dominant Species	% Cover	Dominant Species	% Cover
PHAARU	5 = > 50%		
DISSYL	1 = 1-5%		

Comments / Problems: **Wetland community type dominanted by a monoculture of reed canarygrass.**

Community Number: **3** Community Title (main spp): **Phalaris / Typha**

Dominant Species	% Cover	Dominant Species	% Cover
PHAARU	4 = 21-50%	SCIMIC	1 = 1-5%
TYPLAT	4 = 21-50%	RORAQU	1 = 1-5%
JUNSPP	2 = 6-10%	DISSYL	1 = 1-5%
CARUTR	2 = 6-10%	IRIPSE	+ = < 1%
GLYGRA	2 = 6-10%		
IMPECA	1 = 1-5%		

Comments / Problems: **Wetland communtiy type dominated by a variety of species.**

Community Number: **4** Community Title (main spp): **Carex / Poa**

Dominant Species	% Cover	Dominant Species	% Cover
CARNEB	5 = > 50%		
POAPAL	4 = 21-50%		
PHAARU	1 = 1-5%		
DISSYL	1 = 1-5%		
POLBIS	1 = 1-5%		

Comments / Problems: **Wetland community type located near the vegetation transition between the wetland and upland boundary.**

COMPREHENSIVE VEGETATION LIST

Plant Species	Vegetation Community Number (s)	Plant Species	Vegetation Community Number (s)
Achillea millefolium	1	*Iris pseudacorus*	3,4
Agrostis alba	1,2	*Juncus balticus*	3,4
Agropyron repens	1	*Juncus ensifolius*	3,4
Agropyron smithii	1	*Juncus spp.*	3,4
Agropyron spp.	1	*Lactuca serriola*	1
Agropyron trachycaulum	1	*Lemna minor*	3
Alnus incana	3,4	*Lepidium campestre*	1
Bidens cernua	3,4	*Lepidium perfoliatum*	1
Bromus inermis	1	*Lychnis alba*	1
Bromus japonicus	1	*Malva neglecta*	1
Bromus tectorum	1	*Medicago Sativa*	1
Cardaria draba	1	*Melilotus officinalis*	1
Carex bebbii	3,4	*Nepeta cataria*	3
Carex nebrascensis	3,4	*Oenanthe spp.*	3
Carduus nutans	1	*Phalaris arundinacea*	2,3,3
Carex spp.	3,4	*Plantago lanceolata*	1
Carex stipata	3,4	*Poa pratensis*	4
Carex utriculata	3,4	*Poa spp.*	4
Chrysanthemum leucanthemum	1,4	*Polygonum bistortoides*	3,4
Cirsium arvense	1	*Polygonum spp.*	3
Cirsium vulgare	1	*Potentilla recta*	2
Cornus stolonifera	3,4	*Rorippa nasturtium-aquaticum*	3
Cynoglossum officinale	1	*Rosa woodsii*	1
Dactylis glomerata	1	*Rumex crispus*	3
Descurainia sophia	1	*Salix bebbiana*	1,3
Dianthus spp.	1	*Salix drummondiana*	1,3
Dipsacus sylvestris	1	*Scirpus microcarpus*	3
Elodea spp.	3, 4	*Solanum dulcamara*	3
Eleocharis palustris	3,4	*Sonchus arvensis*	1
Epilobium ciliatum	3,4	*Thlaspi arvense*	1
Erodium cicutarium	1	*Tragopogon dubius*	1
Festuca arundinacea	1	*Trifolium pratense*	1
Festuca spp.	1	*Trifolium spp.*	1
Glyceria grandis	3,4	*Typha latifolia*	3
Impatiens ecalcarata	3,4		

Comments / Problems: Four new species indentified during 2009 including *Cynoglossum officinale*, *Dianthus spp.*, *Elodea spp.*, *and Solanum dulcamara.*

PLANTED WOODY VEGETATION SURVIVAL

Plant Species	Number Originally Planted	Number Observed	Mortality Causes
ALNINC	1,163	27	Plantings looked healthy with moderate to vigorous growth for the season with few discolored leaves. Browse protection were intact and properly functioning. Some of the planted seedlings were installed higher than recommended. The base of the main caliper (stem) and associated roots were sticking out of the ground instead of flush with the ground. Thinleaf alder and woods rose had the highest counts.
CORSTO	226	14	
CRADOU	75	8	
PRUAME	226	9	
RHAALN	207	0	
ROSWOO	450	47	
SASLBEB	394	6	
SALEXI	--	6	
SALLUT	375	3	
SAMCER	19	0	
SYMALB	56	3	

Comments / Problems: Shrub planting survival data were collected along several (lengths varied) 2 meter wide belt transects that totaled approximately 0.17 acres (7,500 sq. ft.). Transects were established along the edges of the wetland draw encompassing creation and enhancement mitigation areas. One transect was placed along a log crib structure. During the 2009 monitoring, species survival was based on visual estimates and counts for each live species. The original plantings numbers as listed above were referenced from Peterson Tract Wetland Mitigation Site –Planting Summary (**Appendix G**). Actual planting numbers and prescribed species may vary from the original plan. One species (*Salix exigua*) was found that was not listed in the original planting summary. Post design changes for planting prescriptions may have been adjusted during the construction phase due to availability of seedlings. Overall survival ratings are considered moderate to high based on visual assessment. Plant growth was vigorous and looked healthy with few discolored leaves. Browse protection were intact and properly functioning.

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
Deer		☐	☒	☐	
Muskrat		☐	☒	☐	
Raccoon		☒	☐	☐	
Crayfish	1	☐	☐	☐	
Voles	5	☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	

Additional Activities Checklist:
NA 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 (°)
PP1	1	View looking SW along Transect 1.	215
PP1	1.1	View looking SE to NW along Transect 1.	135
PP2	2	View looking NE along Transect 1.	45
PP2	2.1	View looking NW to SE along Transect 1.	315
PP2	2.2	View looking SE along wetland / upland boundary.	135
PP3	3	View looking NE along Transect 1.	45
PP4	4	View looking E across wetland swale.	90
PP4	4.1	View looking N across wetland swale.	0
PP4	4.2	View looking N to S across wetland swale.	0
PP5	5	View looking SE along Transect 2 end.	135
PP6	6	View looking NW along Transect 2 start	315

Comments / Problems: **Refer to Photo Page.**

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.
- **NA** 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: **Functional Assessment completed in 2008 using the 1999 MDT Montana Wetland Assessment Method. The mitigation credit system requires a pre-and post-project functional assessment using the 1999 methods for a direct comparision of scores to show functional shift at the mtigation site that determines enhancement ratio to be applied.**

MAINTENANCE

Were man-made nesting structure installed at this site? **NA**
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? **Yes**
If no, describe the problems below.

Comments / Problems: **General inspection of log crib structures. Log cribs generally working correctly with indunation above the crib and surface flow through crib spill over. However, undercutting and substantive leakage between logs was observed, and during 2009, surface water was draining over top of the crib dike near Transect 2**.

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Peterson** Date: **August 16, 2009** Examiner: **G. Howard**
Transect Number: **1** Approximate Transect Length**: 144 feet** Compass Direction from Start: **0˚** Note: **Rock to Rock**

Vegetation Type A: **C.T.1 - Agropyron (Upland)**	
Length of transect in this type: 35 feet	
Plant Species	**Cover**
DISSYL	3 = 11-20%
PLALAN	1 = 1-5%
POAPRA	3 = 11-20%
CIRARV	+ = < 1%
PHAARU	3 = 11-20%
BROTEC	1 = 1-5%
DESSOP	+ = < 1%
CIRVUL	+ = < 1%
Total Vegetative Cover:	90%

Vegetation Type B: **C.T. 3 - Phalaris / Typha (Wetlands)**	
Length of transect in this type: 65 feet	
Plant Species	**Cover**
TYPLAT	2 = 6-10%
JUNBAL	4 = 21-50%
PHAARU	4 = 21-50%
CARUTR	2 = 6-10%
RORAQU	1 = 1-5%
POLSPP	2 = 6-10%
CARSPI	+ = < 1%
IMPECA	1 = 1-5%
EPICIL	1 = 1-5%
DISSYL	1 = 1-5%
IRIPSE	+ = < 1%
Total Vegetative Cover:	110%

Vegetation Type C: **C.T.1 - Agropyron (Upland)**	
Length of transect in this type: 44 feet	
Plant Species	**Cover**
PLALAN	2 = 6-10%
AGRREP	2 = 6-10%
DESSOP	1 = 1-5%
DISSYL	1 = 1-5%
POAPRA	3 = 11-20%
PHAARU	1 = 1-5%
ROSWOO (Planted)	+ = < 1%
DACGLO	+ = < 1%
THLARV	+ = < 1%
GEUMAC	+ = < 1%
ALNINC	+ = < 1%
CORSTO	+ = < 1%
Total Vegetative Cover:	60%

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

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Peterson** Date: **August 16, 2009** Examiner: **G. Howard**
Transect Number: **2** Approximate Transect Length: **325 feet** Compass Direction from Start: **0˚** Note: _____

Vegetation Type E: **C.T. 3 - Phalaris / Typha (Wetlands)**	
Length of transect in this type: 134 feet	
Plant Species	**Cover**
PHAARU	4 = 21-50%
CARNEB	3 = 11-20%
DISSYL	2 = 6-10%
LEPPER	1 = 1-5%
SCIMIC	2 = 6-10%
GLYGRA	1 = 1-5%
CIRARV	+ = < 1%
JUNSPP	+ = < 1%
EPICIL	+ = < 1%
TYPLAT	3 = 11-20%
IMPECA	1 = 1-5%
Total Vegetative Cover:	100%

Vegetation Type F: **C.T. 4 - Carex / Poa (Wetland)**	
Length of transect in this type: 160 feet	
Plant Species	**Cover**
POAPAL	4 = 21-50%
POLBIS	4 = 21-50%
DISSYL	2 = 6-10%
ALNINC	1 = 1-5%
ROSWOO	1 = 1-5%
LEPPER	1 = 1-5%
CARNEB	2 = 6-10%
JUNBAL	2 = 6-10%
Total Vegetative Cover:	95%

Vegetation Type G: **C.T.1 - Agropyron (Upland)**	
Length of transect in this type: 31 feet	
Plant Species	**Cover**
LEPPER	1 = 1-5%
OENSPP	+ = < 1%
POLBIS	2 = 6-10%
BROTEC	2 = 6-10%
LACSER	2 = 6-10%
POTREC	+ = < 1%
THLARV	+ = < 1%
POASPP	1 = 1-5%
SISALT	1 = 1-5%
Total Vegetative Cover:	60%

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

MDT WETLAND MONITORING – VEGETATION TRANSECT

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

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: **Peterson** Date: **8/16/09**
Survey Time: **12** to **4:30**

Bird Species	#	Behavior	Habitat	Bird Species	#	Behavior	Habitat
Pheasant	2	N	WM				
Red- winged Blackbird	15	L	WM				

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: **Sunny, temps in high 80's.**

Notes: _____

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

Project/Site:	Peterson	**Project No:** B4308802	**Date:** 16-Aug-2009
Applicant/Owner:	Montana Department of Transportation		**County:** Lake
Investigators:	G. Howard		**State:** Montana
			Plot ID: T1 - SP1

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

VEGETATION **(USFWS Region No. 9)**

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
Dipsacus sylvestris	Herb	NI	*Lepidium perfoliatum*	Herb	FACU+
Teasel			Pepper-Grass,Clasping		
Poa pratensis	Herb	FACU+	*Plantago lanceolata*	Herb	FACU+
Bluegrass,Kentucky			Plantain,English		
Phalaris arundinacea	Herb	FACW			
Grass,Reed Canary					

Percent of Dominant Species that are OBL, FACW or FAC:	**FAC Neutral:** 1/4 = 25.00%
(excluding FAC-) 1/4 = 25.00%	**Numeric Index:** 14/4 = 3.50

Remarks:
Area is considered upland.

HYDROLOGY

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

Remarks:
No hydrology indicators.

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

Project/Site:	Peterson	**Project No:** B4308802	**Date:** 16-Aug-2009
Applicant/Owner:	Montana Department of Transportation		**County:** Lake
Investigators:	G. Howard		**State:** Montana
			Plot ID: T1 - SP1

SOILS

Map Unit Name (Series and Phase): Colake silt loam, 0 to 1 percent slopes
Map Symbol: 22 **Drainage Class:** poorly drained **Mapped Hydric Inclusion?**
Taxonomy (Subgroup): **Field Observations Confirm Mapped Type?** Yes (No)
Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
0-10+	A	10YR2/1	N/A	N/A	N/A	Loam

Hydric Soil Indicators:

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

Remarks:
HYydric soil indicator present with low-chroma colors. Sampling point within an area mapped as a Hydric soils.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes (No)	Is the Sampling Point within the Wetland? Yes (No)
Wetland Hydrology Present?	Yes (No)	
Hydric Soils Present?	(Yes) No	

Remarks:
Sampling area considered within an upland. Hydric soils likely remnant.

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

Project/Site:	Peterson	**Project No:** B4308802	**Date:** 16-Aug-2009
Applicant/Owner:	Montana Department of Transportation		**County:** Lake
Investigators:	G. Howard		**State:** Montana
			Plot ID: T1 - SP2

Do Normal Circumstances exist on the site?	(Yes) No	**Community ID:** EM
Is the site significantly disturbed (Atypical Situation:)?	Yes (No)	**Transect ID:** 1
Is the area a potential Problem Area?	Yes (No)	**Field Location:**
(If needed, explain on the reverse side)		Transect # 2.

VEGETATION **(USFWS Region No. 9)**

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
Typha latifolia	Herb	OBL	*Impatiens ecalcarata*	Herb	FACW
Cattail,Broad-Leaf			Touch-Me-Not,Spurless		
Phalaris arundinacea	Herb	FACW	*Epilobium ciliatum*	Herb	FACW-
Grass,Reed Canary			Willow-Herb,Hairy		
Carex utriculata	Herb	OBL	*Dipsacus sylvestris*	Herb	NI
beaked sedge			Teasel		
Nasturtium officinale	Herb	OBL			
Water-Cress,True					

Percent of Dominant Species that are OBL, FACW or FAC: 6/6 = 100.00%
(excluding FAC-) 6/6 = 100.00%

FAC Neutral: 6/6 = 100.00%
Numeric Index: 9/6 = 1.50

Remarks:
Area dominated by hydrophytic vegetation.

HYDROLOGY

NO **Recorded Data(Describe in Remarks):**
N/A **Stream, Lake or Tide Gauge**
N/A **Aerial Photographs**
N/A **Other**

YES **No Recorded Data**

Field Observations

Depth of Surface Water: = 6 *(in.)*
Depth to Free Water in Pit: N/A *(in.)*
Depth to Saturated Soil: N/A *(in.)*

Wetland Hydrology Indicators
Primary Indicators
YES **Inundated**
YES **Saturated in Upper 12 Inches**
NO **Water Marks**
NO **Drift Lines**
NO **Sediment Deposits**
NO **Drainage Patterns in Wetlands**
Secondary Indicators
NO **Oxidized Root Channels in Upper 12 Inches**
NO **Water-Stained Leaves**
NO **Local Soil Survey Data**
YES **FAC-Neutral Test**
NO **Other(Explain in Remarks)**

Remarks:
Hydrology indicator present with shallow inundation.

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

Project/Site:	Peterson	**Project No:** B4308802	**Date:** 16-Aug-2009
Applicant/Owner:	Montana Department of Transportation		**County:** Lake
Investigators:	G. Howard		**State:** Montana
			Plot ID: T1 - SP2

SOILS

Map Unit Name (Series and Phase): Colake silt loam, 0 to 1 percent slopes
Map Symbol: 22 **Drainage Class:** poorly drained **Mapped Hydric Inclusion?**
Taxonomy (Subgroup): **Field Observations Confirm Mapped Type?** Yes (No)
Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
0-10+	A	10YR2/1	N/A	N/A	N/A	Loam

Hydric Soil Indicators:

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

Remarks:
Hydric soil indicator present with low-chroma colors.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes) No	Is the Sampling Point within the Wetland? (Yes) No
Wetland Hydrology Present?	(Yes) No	
Hydric Soils Present?	(Yes) No	

Remarks:
Sampling point considered within a wetland area.

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

Project/Site: Peterson **Project No:** B4308802
Applicant/Owner: Montana Department of Transportation
Investigators: G. Howard

Date: 16-Aug-2009
County: Lake
State: Montana
Plot ID: T1 - SP3

Do Normal Circumstances exist on the site? (Yes) No
Is the site significantly disturbed (Atypical Situation:)? Yes (No)
Is the area a potential Problem Area? Yes (No)
(If needed, explain on the reverse side)

Community ID: EM
Transect ID: 1
Field Location:
Transect # 1.

VEGETATION **(USFWS Region No. 9)**

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
Polygonum bistortoides	Herb	FACW+	*Dipsacus sylvestris*	Herb	NI
Bistort,American			Teasel		
Agropyron repens	Herb	FACU	*Poa pratensis*	Herb	FACU+
Quackgrass			Bluegrass,Kentucky		
Lepidium perfoliatum	Herb	FACU+	*Phalaris arundinacea*	Herb	FACW
Pepper-Grass,Clasping			Grass,Reed Canary		

Percent of Dominant Species that are OBL, FACW or FAC: 2/5 = 40.00%
(excluding FAC-) 2/5 = 40.00%

FAC Neutral: 2/5 = 40.00%
Numeric Index: 16/5 = 3.20

Remarks:
Area considered within an upland.

HYDROLOGY

NO **Recorded Data(Describe in Remarks):**
N/A **Stream, Lake or Tide Gauge**
N/A **Aerial Photographs**
N/A **Other**

YES **No Recorded Data**

Field Observations

Depth of Surface Water: N/A *(in.)*
Depth to Free Water in Pit: N/A *(in.)*
Depth to Saturated Soil: N/A *(in.)*

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 Wetlands**
Secondary Indicators
NO **Oxidized Root Channels in Upper 12 Inches**
NO **Water-Stained Leaves**
NO **Local Soil Survey Data**
NO **FAC-Neutral Test**
NO **Other(Explain in Remarks)**

Remarks:
No hydrology indicators present.

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

Project/Site: Peterson **Project No:** B4308802
Applicant/Owner: Montana Department of Transportation
Investigators: G. Howard

Date: 16-Aug-2009
County: Lake
State: Montana
Plot ID: T1 - SP3

SOILS

Map Unit Name (Series and Phase): Colake silt loam, 0 to 1 percent slopes
Map Symbol: 22 **Drainage Class:** poorly drained **Mapped Hydric Inclusion?**
Taxonomy (Subgroup): **Field Observations Confirm Mapped Type?** Yes (No)
Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
0-10+	A	10YR2/1	N/A	N/A	N/A	Loam

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

Remarks:
Hydric soil indicator present with low-chroma colors. Sampling point also within an area mapped as a Hydric soil.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes (No)
Wetland Hydrology Present? Yes (No)
Hydric Soils Present? (Yes) No

Is the Sampling Point within the Wetland? Yes (No)

Remarks:
Sampling point within an upland area. Hydric soils likely remnant.

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

Project/Site:	Peterson	**Project No:** B4308802	**Date:** 16-Aug-2009
Applicant/Owner:	Montana Department of Transportation		**County:** Lake
Investigators:	G. Howard		**State:** Montana
			Plot ID: T2 - SP1

Do Normal Circumstances exist on the site?	(Yes) No	**Community ID:** EM
Is the site significantly disturbed (Atypical Situation:)?	Yes (No)	**Transect ID:** 1
Is the area a potential Problem Area?	Yes (No)	**Field Location:**
(If needed, explain on the reverse side)		Transect # 2

VEGETATION **(USFWS Region No. 9)**

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
Phalaris arundinacea	Herb	FACW	*Scirpus acutus*	Herb	OBL
Grass,Reed Canary			Bulrush,Hard-Stem		
Carex nebrascensis	Herb	OBL	*Glyceria maxima*	Herb	OBL
Sedge,Nebraska			Meadowgrass,Reed		
Dipsacus sylvestris	Herb	NI			
Teasel					

Percent of Dominant Species that are OBL, FACW or FAC: **(excluding FAC-)** 4/4 = 100.00%

FAC Neutral: 4/4 = 100.00%

Numeric Index: 5/4 = 1.25

Remarks:
Area dominated by hydrophytic vegetation.

HYDROLOGY

NO **Recorded Data(Describe in Remarks):**
- N/A **Stream, Lake or Tide Gauge**
- N/A **Aerial Photographs**
- N/A **Other**

YES **No Recorded Data**

Field Observations

Depth of Surface Water:	= 6 *(in.)*
Depth to Free Water in Pit:	N/A *(in.)*
Depth to Saturated Soil:	N/A *(in.)*

Wetland Hydrology Indicators

Primary Indicators
- YES **Inundated**
- YES **Saturated in Upper 12 Inches**
- NO **Water Marks**
- NO **Drift Lines**
- NO **Sediment Deposits**
- NO **Drainage Patterns in Wetlands**

Secondary Indicators
- NO **Oxidized Root Channels in Upper 12 Inches**
- NO **Water-Stained Leaves**
- NO **Local Soil Survey Data**
- YES **FAC-Neutral Test**
- NO **Other(Explain in Remarks)**

Remarks:
Hydrology indicators present with minor inundation and saturated soils.

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

Project/Site:	Peterson	**Project No:** B4308802	**Date:** 16-Aug-2009
Applicant/Owner:	Montana Department of Transportation		**County:** Lake
Investigators:	G. Howard		**State:** Montana
			Plot ID: T2 - SP1

SOILS

Map Unit Name (Series and Phase): Colake silt loam, 0 to 1 percent slopes
Map Symbol: 22 **Drainage Class:** poorly drained **Mapped Hydric Inclusion?**
Taxonomy (Subgroup): **Field Observations Confirm Mapped Type?** Yes (No)
Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
0-10	A	10YR2/1	N/A	N/A	N/A	Loam

Hydric Soil Indicators:

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

Remarks:
Sampling area located within a mapped Hydric soils. Hydric soil indicators present with low-chroma colors.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes) No	Is the Sampling Point within the Wetland? (Yes) No
Wetland Hydrology Present?	(Yes) No	
Hydric Soils Present?	(Yes) No	

Remarks:
Sampling point considered within a wetland.

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

Project/Site:	Peterson	**Project No:** B4308802	**Date:** 16-Aug-2009
Applicant/Owner:	Montana Department of Transportation		**County:** Lake
Investigators:	G. Howard		**State:** Montana
			Plot ID: T2 - SP2

Do Normal Circumstances exist on the site?	(Yes) No	**Community ID:** EM
Is the site significantly disturbed (Atypical Situation:)?	Yes (No)	**Transect ID:** 1
Is the area a potential Problem Area?	Yes (No)	**Field Location:**
(If needed, explain on the reverse side)		Transect # 2

VEGETATION **(USFWS Region No. 9)**

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
Poa palustris	Herb	FAC	*Lepidium perfoliatum*	Herb	FACU+
Bluegrass,Fowl			Pepper-Grass,Clasping		
Polygonum bistortoides	Herb	FACW+	*Carex nebrascensis*	Herb	OBL
Bistort,American			Sedge,Nebraska		
Dipsacus sylvestris	Herb	NI	*Juncus balticus*	Herb	OBL
Teasel			Rush,Baltic		

Percent of Dominant Species that are OBL, FACW or FAC: **FAC Neutral:** 3/4 = 75.00%
(excluding FAC-) 4/5 = 80.00% **Numeric Index:** 11/5 = 2.20

Remarks:
Area dominated by hydrophytic vegetation.

HYDROLOGY

NO **Recorded Data(Describe in Remarks):**
N/A **Stream, Lake or Tide Gauge**
N/A **Aerial Photographs**
N/A **Other**

YES **No Recorded Data**

Field Observations

Depth of Surface Water: N/A *(in.)*
Depth to Free Water in Pit: N/A *(in.)*
Depth to Saturated Soil: = 0 *(in.)*

Wetland Hydrology Indicators
Primary Indicators
NO **Inundated**
YES **Saturated in Upper 12 Inches**
NO **Water Marks**
NO **Drift Lines**
NO **Sediment Deposits**
NO **Drainage Patterns in Wetlands**
Secondary Indicators
NO **Oxidized Root Channels in Upper 12 Inches**
NO **Water-Stained Leaves**
NO **Local Soil Survey Data**
YES **FAC-Neutral Test**
NO **Other(Explain in Remarks)**

Remarks:
Hydrology indicator present with soils saturated to the ground surface.

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

Project/Site:	Peterson	**Project No:** B4308802	**Date:** 16-Aug-2009
Applicant/Owner:	Montana Department of Transportation		**County:** Lake
Investigators:	G. Howard		**State:** Montana
			Plot ID: T2 - SP2

SOILS

Map Unit Name (Series and Phase): Colake silt loam, 0 to 1 percent slopes
Map Symbol: 22 **Drainage Class:** poorly drained **Mapped Hydric Inclusion?**
Taxonomy (Subgroup): **Field Observations Confirm Mapped Type?** Yes (No)
Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
0-10+	A	10YR2/1	N/A	N/A	N/A	Loam

Hydric Soil Indicators:

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

Remarks:
Hydric soils indicator present with low-chroma colors.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes) No	Is the Sampling Point within the Wetland? (Yes) No
Wetland Hydrology Present?	(Yes) No	
Hydric Soils Present?	(Yes) No	

Remarks:
Sampling point considered within a wetland area.

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

Project/Site:	Peterson	**Project No:** B4308802	**Date:** 16-Aug-2009
Applicant/Owner:	Montana Department of Transportation		**County:** Lake
Investigators:	G. Howard		**State:** Montana
			Plot ID: T2 - SP3

Do Normal Circumstances exist on the site?	(Yes) No	**Community ID:** EM
Is the site significantly disturbed (Atypical Situation:)?	Yes (No)	**Transect ID:** 1
Is the area a potential Problem Area?	Yes (No)	**Field Location:**
(If needed, explain on the reverse side)		Transect # 2

VEGETATION **(USFWS Region No. 9)**

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
Lepidium perfoliatum	Herb	FACU+	*Lactuca serriola*	Herb	FAC-
Pepper-Grass,Clasping			Lettuce,Prickly		
Polygonum bistortoides	Herb	FACW+	*Poa pratensis*	Herb	FACU+
Bistort,American			Bluegrass,Kentucky		

Percent of Dominant Species that are OBL, FACW or FAC: **FAC Neutral:** 1/3 = 33.33%
(excluding FAC-) 1/4 = 25.00% **Numeric Index:** 13/4 = 3.25

Remarks:
Area not dominated by hydrophytic vegetation.

HYDROLOGY

NO **Recorded Data(Describe in Remarks):**
N/A **Stream, Lake or Tide Gauge**
N/A **Aerial Photographs**
N/A **Other**

YES **No Recorded Data**

Field Observations

Depth of Surface Water: N/A *(in.)*
Depth to Free Water in Pit: N/A *(in.)*
Depth to Saturated Soil: N/A *(in.)*

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 Wetlands**
Secondary Indicators
NO **Oxidized Root Channels in Upper 12 Inches**
NO **Water-Stained Leaves**
NO **Local Soil Survey Data**
NO **FAC-Neutral Test**
NO **Other(Explain in Remarks)**

Remarks:
No hydrology indicators.

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

Project/Site:	Peterson	**Project No:** B4308802	**Date:** 16-Aug-2009
Applicant/Owner:	Montana Department of Transportation		**County:** Lake
Investigators:	G. Howard		**State:** Montana
			Plot ID: T2 - SP3

SOILS

Map Unit Name (Series and Phase): Colake silt loam, 0 to 1 percent slopes
Map Symbol: 22 **Drainage Class:** poorly drained **Mapped Hydric Inclusion?**
Taxonomy (Subgroup): **Field Observations Confirm Mapped Type?** Yes (No)
Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
0-10+	A	10YR2/1	N/A	N/A	N/A	Loam

Hydric Soil Indicators:

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

Remarks:
Hydric soil indicator present with low-chroma colors. Sampling point within area mapped as a Hydric Soils.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes (No)	Is the Sampling Point within the Wetland? Yes (No)
Wetland Hydrology Present?	Yes (No)	
Hydric Soils Present?	(Yes) No	

Remarks:
Sampling point within an upland area. Hydric soil likely remnant.

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

1. Project Name: Peterson **2. Project #:** **Control #:** _____

3. Evaluation Date: 8/16/2009 **4. Evaluator(s):** G. Howard **5. Wetland / Site #(s):** AA-1

6. Wetland Location(s) i. T: 19 N **R:** 20 W **S:** 35 **T:** __ N **R:** __ E **S:** _____

ii. Approx. Stationing / Mileposts: _____

iii. Watershed: Flathead **GPS Reference No. (if applies):** _____

Other Location Information: _____

7. A. Evaluating Agency MDT

8. Wetland Size (total acres): _____ (visually estimated)
3.71 (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)
3.71 (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
Riverine	Palustrine	None	Aquatic Bed	Permanently Flooded	Impounded	10
Riverine	Palustrine	None	Emergent Wetland	Permanently Flooded	Impounded	80
Riverine	Riverine	Lower Perennial	Rock Bottom	Permanently Flooded	Impounded	5
Depression	Palustrine	None	Emergent Wetland	Seasonally Flooded	---	5
---	---	---	---	---	---	

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

Comments: _____

11. ESTIMATED RELATIVE ABUNDANCE (of similarly classified sites within the same Major Montana Watershed Basin)
Common **Comments:** _____

12. GENERAL CONDITION OF AA

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

	Predominant Conditions Adjacent (within 500 Feet) To AA		
Conditions Within 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.	---	---	---
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.	---	moderate disturbance	---
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.) Adjacent parcels grazed and farmed.

ii. Prominent weedy, alien, & introduced species: Cardaria draba, Cirsium arvense, Chrysanthemum leucanthemum, Cynoglossum officinale, Iris pseudacorus, and Potentilla recta

iii. Briefly describe AA and surrounding land use / habitat: AA is located within a long wetland swale that drains toward the west and has hydrology from an unnamed perennial stream. Surrounding land uses include Highway 93, agriculture, and residential.

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: _____

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	Grizzly bear
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	---	---	---	---	---	.3 (L)	---

If documented, list the source (e.g., observations, records, etc.)**:** Montana Natural Heritage Program.

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	_____
Incidental habitat **(list species)**	☐ D	☒ S	Black tern, Bald Eagle,
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 (L)	---

If documented, list the source (e.g., observations, records, etc.)**:** Montana Natural Heritage Program.

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)	☐High								☒Moderate								☐Low			
Class Cover Distribution (all vegetated classes)	☐Even				☐Uneven				☐Even				☒Uneven				☐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** (Using 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)			
	☐ Exceptional	☒ High	☐ Moderate	☐ Low
Substantial	--	--	--	--
Moderate	--	.7 (M)	--	--
Low	--	--	--	--

Comments: _____

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, 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 pick the exceptional (E), high (H), moderate (M), or low (L) quality rating.

Duration of Surface Water in AA	☐ Permanent/Perennial			☐ Seasonal / Intermittent			☐ 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 pick 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)			
	☐ Exceptional	☐ High	☐ Moderate	☐ 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 flooded from in-channel or overbank flow, 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	☐ ≥ 10 acres			☒ <10, >2 acres			☐ ≤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**	--	--	--	--	--	.4 (M)	--	--	--

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, 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.	☐ >5 acre feet			☒ <5, >1 acre feet			☐ ≤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 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	☒ ≥ 70%		☐ < 70%		☐ ≥ 70%		☐ < 70%	
Evidence of flooding or ponding in AA	☒ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No	☐ Yes	☐ No
AA contains **no or restricted outlet**	--	--	--	--	--	--	--	--
AA contains **unrestricted outlet**	.9 (H)	--	--	--	--	--	--	--

Comments: _____

14H. SEDIMENT/SHORELINE STABILIZATION ☐ **NA** (proceed to 14I)

Applies only if AA occurs on or within the banks or 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, 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		
	☒Permanent / Perennial	☐Seasonal / Intermittent	☐Temporary / Ephemeral
≥ 65 %	1 (H)	--	--
35-64 %	--	--	--
< 35 %	--	--	--

Comments: _____

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT

i. **Rating** (Working from top to bottom, use the matrix below to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function.
A = acreage of vegetated component in the AA. **B** = structural diversity rating from #13. **C** = Yes (Y) or No (N) as to whether or not the AA contains a surface or subsurface outlet; **P/P** = permanent/perennial; **S/I** = seasonal/intermittent; **T/E/A**= temporary/ephemeral/absent.

A	☐ Vegetated component >5 acres						☒ Vegetated component 1-5 acres						☐ Vegetated component <1 acre					
B	☐ High		☐ Moderate		☐ Low		☐ High		☒ Moderate		☐ Low		☐ High		☐ Moderate		☐ Low	
C	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☒Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N	☐Y	☐N
P/P	--	--	--	--	--	--	--	--	.8H	--	--	--	--	--	--	--	--	--
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: _____

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	☐rare	☐common	☐abundant	☐rare	☐common	☐abundant	☐rare	☒common	☐abundant
Low disturbance at AA (#12i)	--	--	--	--	--	--	--	--	--
Moderate disturbance at AA (#12i)	--	--	--	--	--	--	--	.3L	--
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)		
	☐ Low	☒ Moderate	☐ High
Public ownership	--	.5(M)	--
Private ownership	--	--	--

Comments: _____

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	0.30	1	
B. MT Natural Heritage Program Species Habitat	Low	0.10	1	
C. General Wildlife Habitat	Mod	0.70	1	
D. General Fish/Aquatic Habitat	NA		--	
E. Flood Attenuation	Mod	0.40	1	
F. Short and Long Term Surface Water Storage	High	0.80	1	
G. Sediment/Nutrient/Toxicant Removal	High	0.90	1	
H. Sediment/Shoreline Stabilization	High	1.00	1	
I. Production Export/Food Chain Support	High	0.80	1	
J. Groundwater Discharge/Recharge	High	1.00	1	
K. Uniqueness	Low	0.30	1	
L. Recreation/Education Potential	Mod	0.5	1	
	Totals:	**6.8**	**11.00**	
		Percent of Total Possible Points:	**61%** (Actual / Possible) x 100 [rd to nearest whole #]	

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

Appendix C

2009 REPRESENTATIVE PHOTOGRAPHS

US Highway 93 Onsite: Bouchard, Jocko Spring Creek, Mission Creek, Mud Creek, and Peterson Property

BOUCHARD PROPERTY MITIGATION SITE 2009

Photo Point No. 1: View facing north along vegetation Transect # 1. Upland vegetation transitioning into created wetlands (Type 2).

Photo Point No. 2: View facing north towards the end of Transect # 1.

Photo Point No. 5: View facing east along Transect # 2 at scrub-shrub and emergent wetlands.

Photo Point No. 7: View facing east at the end of Transect # 2 and eastern side of parcel.

Photo Point No. 7: View facing west along Transect # 2 at emergent and scrub-shrub vegetation types with the wetland.

Photo Point No. 9: View facing southwest at the start of Transect # 3. Shallow open-water located in background and weedy vegetation around the fringe.

Photo Point No. 9: View facing northwest along the fringe of the ponds. Area dominated by weedy / aggressive species.

Photo Point No. 9: View facing northeast along Transcect # 3. Area dominated by emergent vegetation type.

Photo Point No. 9: View facing southeast along the weedy fringe of ponds. Area dominated by musk thistle a weedy species.

Photo Point No. 11: View facing northwest across the shallow open-water pond.

Photo Point No. 3: View facing west across the transition between the wetland creation (Type 2 and 3) and the existing rehabilitation areas (Type 5).

Photo Point No. 3: Panoramic view facing south across the wetland creation areas (Type 2, and 3).

Photo Point No. 4: View facing south along a shallow open-water pond and adjacent emergent vegetation types. Community Type 6 in the background with areas dominated by scrub-shrub vegetation types.

Photo Point No.5: View facing north across wetland transition between emergent (Type 5) and scrub-shrub (Type 6) vegetation types.

Photo Point No. 6: View facing southeast along another wetland transition zone between upland (Type 1) and emergent vegetation type (Type 5). Wetland areas considered mitigation type wetland rehabilitation.

Photo Point No. 8: View facing north from the southeast corner of the parcel. Spring creek runs adjacent to parcel along boundary. This area was previously an inlet to the Bouchard Property for irrigation waters. Inlet plugged and ditches filled as part of the mitigation efforts.

JOCKO SPRING CREEK MITIGATION SITE 2009

Photo Point No. 1: View looking southeast along the route of the old Jocko Spring Creek channel. Old channel filled and site planted with upland / riparian species.

Photo Point No. 2: View looking southeast at the start of Transect # 1.

Photo Point No. 2: View looking northwest at mitigation boundary. Vegetation transition between upland and wetland areas.

Photo Point No. 2: View looking southwest at adjacent parcel. Site dominated by weedy species.

Photo Point No. 3: View looking southeast along Transect # 2 where it crosses the channel. Wetlands dominated by emergent vegetation.

Photo Point No.3: View looking northwest along Transect # 2. Area dominated by emergent vegetation type.

JOCKO SPRING CREEK MITIGATION SITE 2009

Photo Point No. 4: View looking southeast along Transect # 2 from the other side of the channel.

Photo Point No. 4: View looking northwest across channel back towards the start of the Transect # 2.

Photo Point No. 5: View looking south across mitigation site.

Photo Point No. 5: View looking northwest along Transect # 2 from the end point.

Photo Point No. 6: View looking northeast along Transect # 1. Area dominated by emergent vegetation type and shrub plantings.

Photo Point No. 6: View looking north along the mitigation boundary. Shrub plantings seen in the foreground.

Photo Point No. 7: View looking southwest along Transect # 1 towards starting point and across channel.

Photo Point No. 7: View looking northeast at Transect # 1 ending point.

Photo Point No. 7: View looking southeast along channel towards southeast end of the project site.

Photo Point No. 2: View looking northwest across mitigation site. View showing transition between upland and emergent wetland areas. Shrub planting throughout the area.

Photo Point No. 3: Panoramic view looking southeast across channel and emergent vegetation types.

Photo Point No. 7: View looking northwest along channel and adjacent emergent vegetation types.

Photo Point No.8: View looking northwest along mitigation site and adjacent railroad grade. Areas to the left of the view consist of created and enhanced wetlands. Shrub plantings along the outer fringe of the mitigation site.

Photo Point No. 8: View looking southwest across mitigation site towards newly constructed channel, emergent vegetation type and shrub plantings along the outer fringe.

Photo Point No. 8: View looking southeast across the southern end of the mitigation site. Remnant cattail and small stand of black cottonwood within the mitigation area.

Photo Point No. 9: View looking north across mitigation areas on the north side of the railroad grade at emergent wetlands and upland shrub plantings.

Photo Point No. 9: View looking southeast across newly constructed channel, and scrub-shrub and emergent vegetation types.

MISSION CREEK WETLAND MITIGATION SITE 2009

Photo Point 1: View looking southwest across the mitigation site from east side of the highway. Area consists of re-established floodplain of Mission Creek. Mitigation efforts included vegetation enhancement with the planting of woody riparian / wetland species.

Photo Point 1: View looking west across the east side of the site along the restored Mission Creek and adjacent floodplain.

Photo Point 2: View looking southwest along the west side of mitigation site. Area planted with woody vegetation.

Photo Point 2: View looking east under the bridge across the site along the restored channel and floodplain.

Photo Point 3: View looking north along emergent wetlands along the restored channel banks. Vegetation dominated by sedges and mannagrass.

Photo Point 4: View looking north across the mitigation site on the west side of the highway.

Photo Point 5: View looking south across the west side of the mitigation site. Note stream gage on far bank.

Photo Point 5: View looking north along the western side of the mitigation area.

MUD CREEK MITIGATION SITE 2009

Photo Point 1: View looking east across the mitigation site near the southern end.

Photo Point 1: View looking northeast across the site at C.T. 1 dominated Baltic rush.

Photo Point 2: View looking east along the northern boundary of the mitigation site. Area dominated by emergent vegetation type.

Photo Point 2: View looking south along the start of Transect #1.

Photo Point 3: View looking southwest across the site. Emergent vegetation type in the foreground.

Photo Point 4: View looking northwest at the end of Transect # 1.

Photo Point 5: Panoramic view looking north across the Mud Creek site. Site consists of emergent vegetation type and reconstructed Mud Creek.

Photo Point 6: View looking south towards the southern boundary of Mud Creek site.

Photo Point 6: View looking northeast along Mud Creek.

Photo Point 7: View looking southeast at the end of Transect # 1 near the fence boundary in the background view.

Photo Point 8: View looking northwest along Transect # 1. Photo view of C.T. 3 dominated by small-fruited bulrush.

Photo Point 8: View looking southeast along Transect # 1 toward Mud Creek.

Photo Point 9: View looking northwest along Transect # 1.

Photo Point 9: View looking south along Transect # 1 near Mud Creek.

Photo Point 10: View looking east along Mud Creek. Photo view shows an example of the restoration of the Mud Creek. Mud Creek banks were constructed with soil lifts utilizing vegetated coir consisting of sedges, mannagrass, rush and planted woody species.

Photo Point 11: View looking east along the Mud Creek as it flows under the new bridge structure.

Photo Point 12: View looking southwest along the reconstructed Mud Creek and adjacent floodplains. Area beyond the floodplain are considered upland and dominated by mostly aggressive weed y species. Area has been planted with riparian species.

Photo Point 13: View looking east towards the adjacent parcel along Mud Creek before it enters the mitigation site.

PETERSON WETLAND MITIGATION SITE 2009

Photo Point 1: View looking southwest along Transect # 1. Wetland area dominated by emergent vegetation type. Foreground view shows vegetation transition between upland to wetland.

Photo Point 2: View looking northeast along of Transect # 1 and across the mitigation site.

Photo Point 3 View looking northeast at the start of Transect # 1. Large rock represents the starting point.

PETERSON WETLAND MITIGATION SITE 2009

Photo Point 1: Panoramic view looking southwest across the mitigation site. Wetland site consists of draw dominated by emergent vegetation type. Unnamed tributary to Post Creek flows through the site. Mitigation efforts included reconstructing the channel and drainage.

Photo Point 2: View looking northeast across the site and along Transect # 1.

Photo Point 2: View looking southeast along the wetland and upland boundary.

Photo Point 4: View looking north across the site western side of site or lower end of the project.

Photo Point 5: View looking southeast at the end of Transect # 2. Vegetation transition between wetland and upland boundaries.

Photo Point 6: View looking north at the start of Transect # 2.

Appendix D

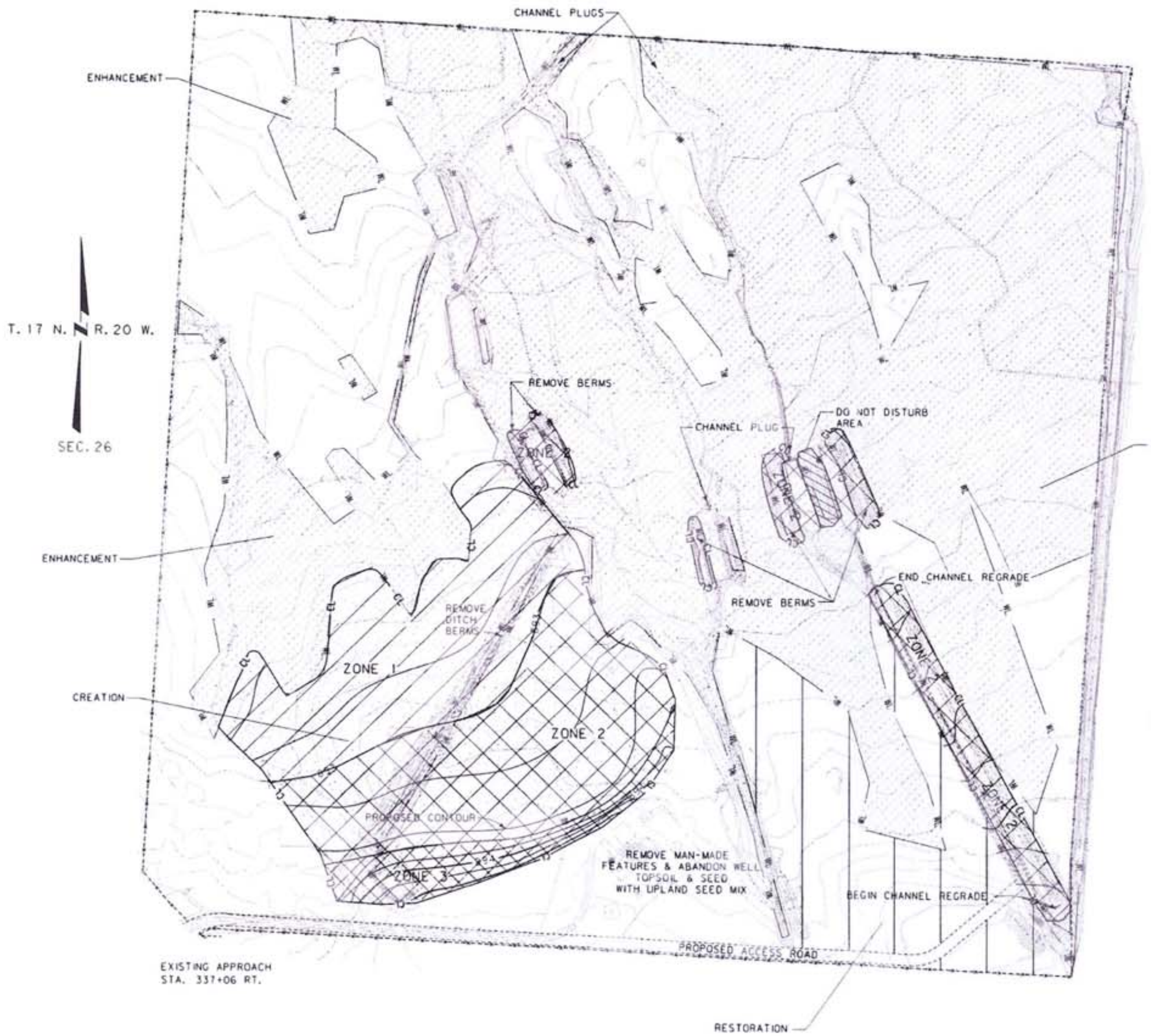
ORIGINAL SITE PLANS

US Highway 93 Onsite: Bouchard, Jocko Spring Creek, Mission Creek, Mud Creek, and Peterson Property

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	NH 5-2(120)20	L-3A

CSF - 0.99926000

DETAIL



PLANTING NOTES:

1. PLANT WOODY & HERBACEOUS MATERIAL IN THE SPECIFIC HYDROLOGIC REGIME LISTED IN THE PLANT LIST (PLANTING ZONES 1-3)
2. USE 64 mm POT PERENNIAL HERBACEOUS PLANT MATERIAL IN WETLAND CREATION AREAS.
3. USE NUMBER ONE CONTAINER SHRUB MATERIAL FOR WETLAND PLANTINGS, EXCEPT FOR THE WILLOW (SALIX) SPECIES.
4. PLANT WILLOW (SALIX) SPECIES WITH 250 mm CYLINDER CONTAINER STOCK.
5. INSTALL SPRING PLANTED PERENNIAL PLANTS AND SHRUBS NO LATER THAN APRIL 15.
6. PLANT FALL PLANTED SHRUBS BETWEEN SEPTEMBER 15 AND OCTOBER 15.
7. SEED BETWEEN OCTOBER 1 AND APRIL 15 PROVIDED THE GROUND IS NOT FROZEN.
8. PLACE WOOD CHIP MULCH AROUND ALL #1 CONTAINER SHRUBS TO A DEPTH OF 150 mm AT THE SURFACE, 0.6 m IN DIAMETER, SURROUNDING THE BASE OF THE PLANT.
9. SEED UPLAND AREAS DISTURBED DURING WETLAND CONSTRUCTION IN THE WETLAND MITIGATION AREA WITH THE FESCUE PRAIRIE MIX DEVELOPED FOR HIGHWAY 93 ROADSIDE SEEDING.
10. PLACE WETLAND CREATION SHRUBS AT 1.2 m ON CENTER. SEE WETLAND PLANTING DETAIL.
11. APPLY SEED BY BROADCAST METHODS. RAKE OR HARROW THE SEED.
12. PLACE WETLAND CREATION HERBACEOUS PLUGS AT 0.5 m ON CENTER.

GENERAL NOTES:

1. PRIOR TO CONSTRUCTION COMMENCING, CONDUCT A PRE-CONSTRUCTION MEETING ON THE SITE BETWEEN THE CONTRACTOR, PROJECT MANAGER, MDT STAFF WETLANDS SPECIALIST AND WETLANDS ECOLOGIST TO DISCUSS THE DESIGN INTENT OF THE WETLANDS.
2. PLANT SCRUB/SHRUB, HERBACEOUS EMERGENT AND HERBACEOUS WET MEADOW SPECIES FOR WETLAND COMMUNITIES TO BE ESTABLISHED IN WETLAND CREATION AREAS.
3. PLACE PLANT MATERIAL IN THE APPROPRIATE ZONE AS DESCRIBED IN THE PLANT TABULATION COLUMN "PLANTING ZONE".
4. PLANT ZONES SHOWN ON THE PLANTING PLAN ARE APPROXIMATE AND MAY CHANGE BASED ON CONDITIONS AFTER FINAL GRADING.

EXISTING WETLAND/ENHANCEMENT (7.70 ha)

ZONE 1

ZONE 2

RESTORATION (1.19 ha)

CREATION (2.09 ha)

CONTOURS:

MAJOR INTERVAL 1.0 m
MINOR INTERVAL 0.2 m

SEE CONSTRUCTION PLANS FOR GRADING, WETLAND CREATION & RESTORATION DETAILS

BOUCHARD WETLAND DEVELOPMENT DETAIL

COE PERMITTING

SCALE = 1:1000

GEOM ENVIRONMENTAL CONSULTING, INC.

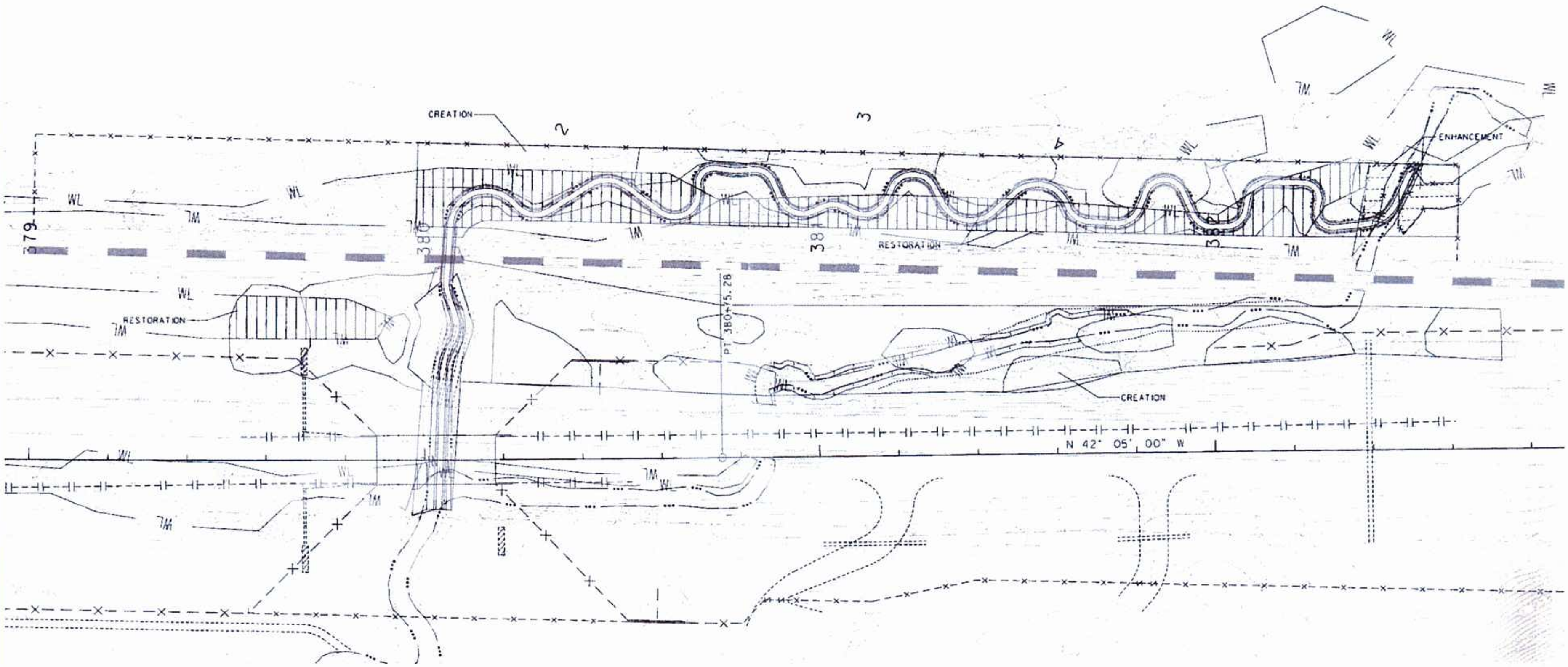
MONTANA DEPARTMENT OF TRANSPORTATION

MONTANA CADD

DETAIL

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	NH 5-2(120)20	L-8A

CSF = 0.99926000



EXISTING WETLAND

RESTORATION (0.24 ha)

ENHANCEMENT (0.02 ha)

CREATION (0.88 ha)

CONTOURS:
MAJOR INTERVAL 2.0 m
MINOR INTERVAL 0.1 m

SPRING CREEK
WETLAND
DEVELOPMENT
DETAIL

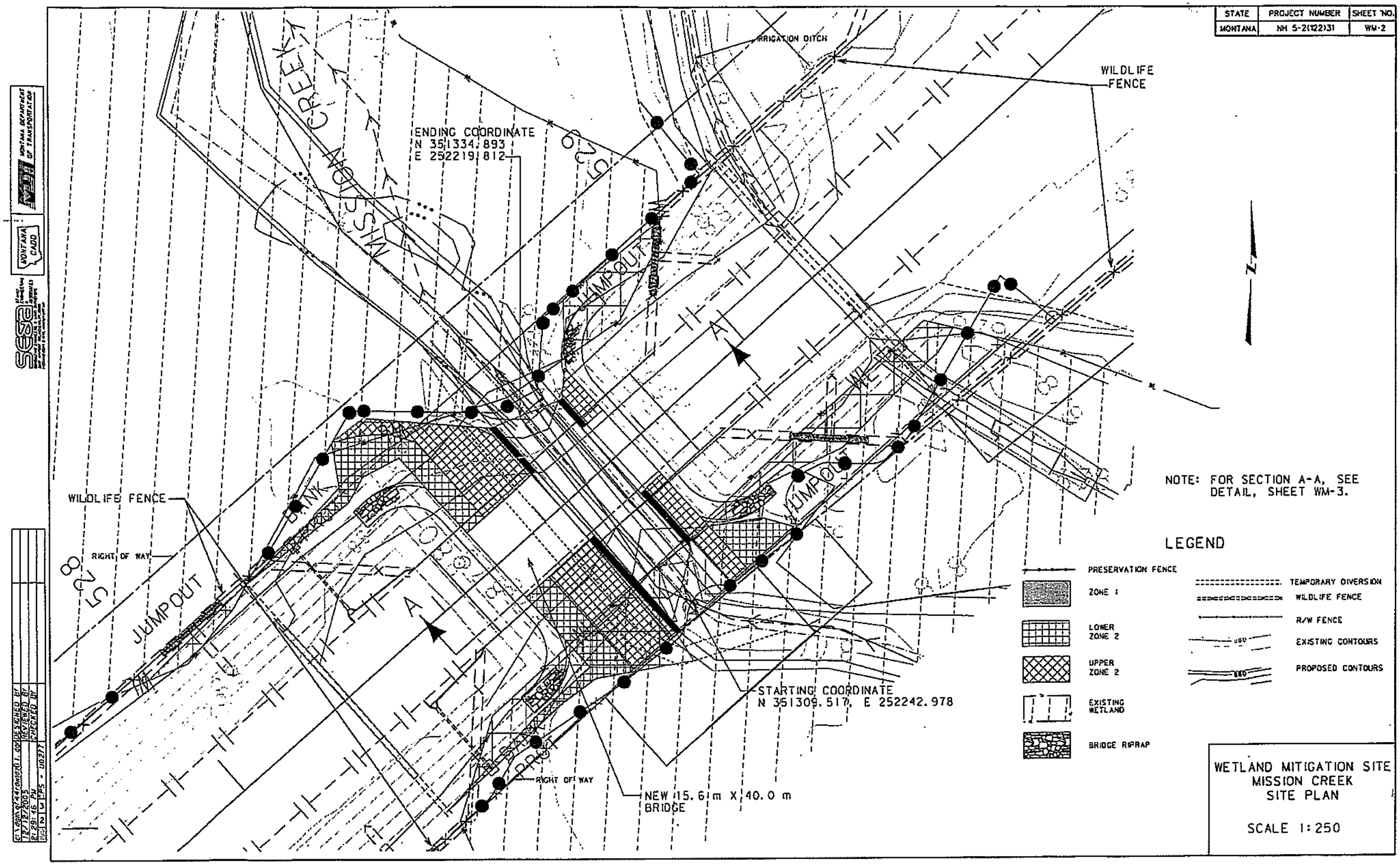
COE PERMITTING

SCALE = 1:500

GEOM ENVIRONMENTAL CONSULTING, INC.

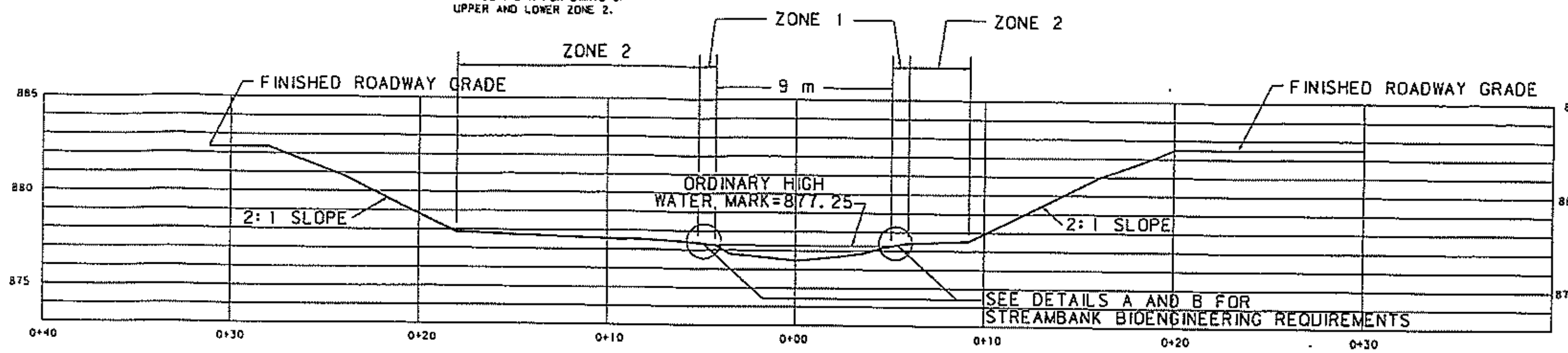
MONTANA DEPARTMENT OF TRANSPORTATION

MONTANA CADD


STATE | PROJECT NUMBER | SHEET NO.
MONTANA | NH 5-2(122)31 | WM-2
IRRIGATION DITCH
WILDLIFE FENCE
ENDING COORDINATE
N 351334.893
E 252219.812
MISSION CREEK
JUMPOUT
BANK
A
NOTE: FOR SECTION A-A, SEE DETAIL, SHEET WM-3.
WILDLIFE FENCE
RIGHT OF WAY
STARTING COORDINATE
N 351309.517, E 252242.978
NEW 15.6 m X 40.0 m BRIDGE
RIGHT OF WAY
LEGEND
PRESERVATION FENCE
ZONE 1
LOWER ZONE 2
UPPER ZONE 2
EXISTING WETLAND
BRIDGE RIPRAP
TEMPORARY DIVERSION
WILDLIFE FENCE
R/W FENCE
EXISTING CONTOURS
PROPOSED CONTOURS
WETLAND MITIGATION SITE
MISSION CREEK
SITE PLAN
SCALE 1:250
MONTANA DEPARTMENT OF TRANSPORTATION
MONTANA CADD
N

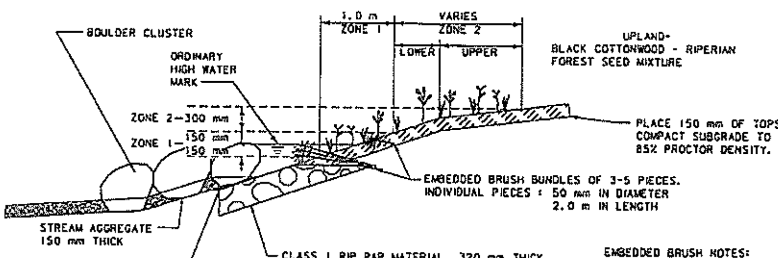
STATE	PROJECT NUMBER	SHEET NO.
MONTANA	NH 5-2(122)31	WM-4

NOTE:
SEE DETAIL A FOR LIMITS OF UPPER AND LOWER ZONE 2.



SECTION A-A
TYPICAL SECTION

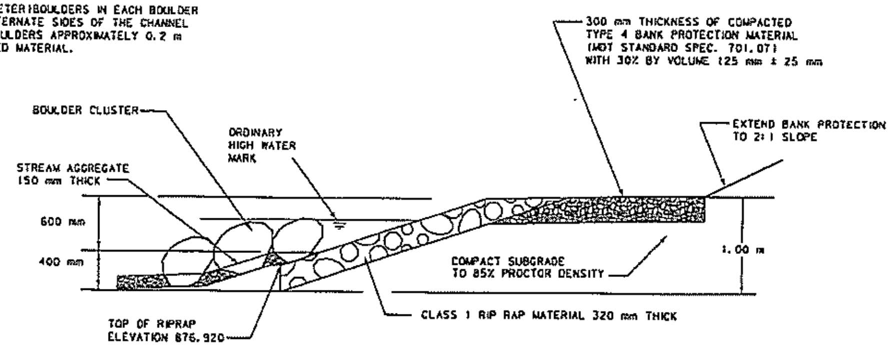
BOULDER CLUSTER NOTE:
1. PLACE NINE (0.6-0.75 m DIAMETER) BOULDERS IN EACH BOULDER GROUP. PLACE GROUPS ON ALTERNATE SIDES OF THE CHANNEL AT 6 m INTERVALS. EMBED BOULDERS APPROXIMATELY 0.2 m INTO THE RIPRAP OR STREAMBED MATERIAL.



NOTE:
1. DETAIL TO BE USED IN DISTURBED BANK AREAS UPSTREAM AND DOWNSTREAM FROM BRIDGE. EXTEND 2.0 m UNDERNEATH THE BRIDGE DRIPLINE.
2. USE DETAIL ON BOTH BANKS OF CREEK IN ZONE ONE.

DETAIL A — STREAM BANK BIOENGINEERING DETAIL- UPSTREAM AND DOWNSTREAM FROM MISSION CREEK BRIDGE
SCALE: NTS

EMBEDDED BRUSH NOTES:
1. INSERT BRUSH PIECES 0.75m INTO SUBGRADE AND BELOW THE ORDINARY HIGH WATER MARK, PRIOR TO PLACEMENT OF TOPSOIL.
2. SPACE PIECES AT 1.0m INTERVALS.
3. COMPACT SUBGRADE AROUND PIECES TO 85% OF PROCTOR.
4. TOPSOIL SHALL BE PLACED SUCH THAT 1.0m OF THE PIECES EXTEND FROM THE FINISHED STREAM BANK.



NOTE:
1. DETAIL TO BE USED IN DISTURBED BANK AREAS UNDER MISSION CREEK BRIDGE. OUTER LIMITS OF DETAIL ARE 2.0 m INSIDE BRIDGE DRIP LINE.
2. USE DETAIL ON BOTH BANKS OF CREEK
3. NO PLANTINGS.

DETAIL B — STREAM BANK BIOENGINEERING DETAIL- UNDER MISSION CREEK BRIDGE
SCALE: NTS

WETLAND MITIGATION SITE
MISSION CREEK
CHANNEL DETAILS

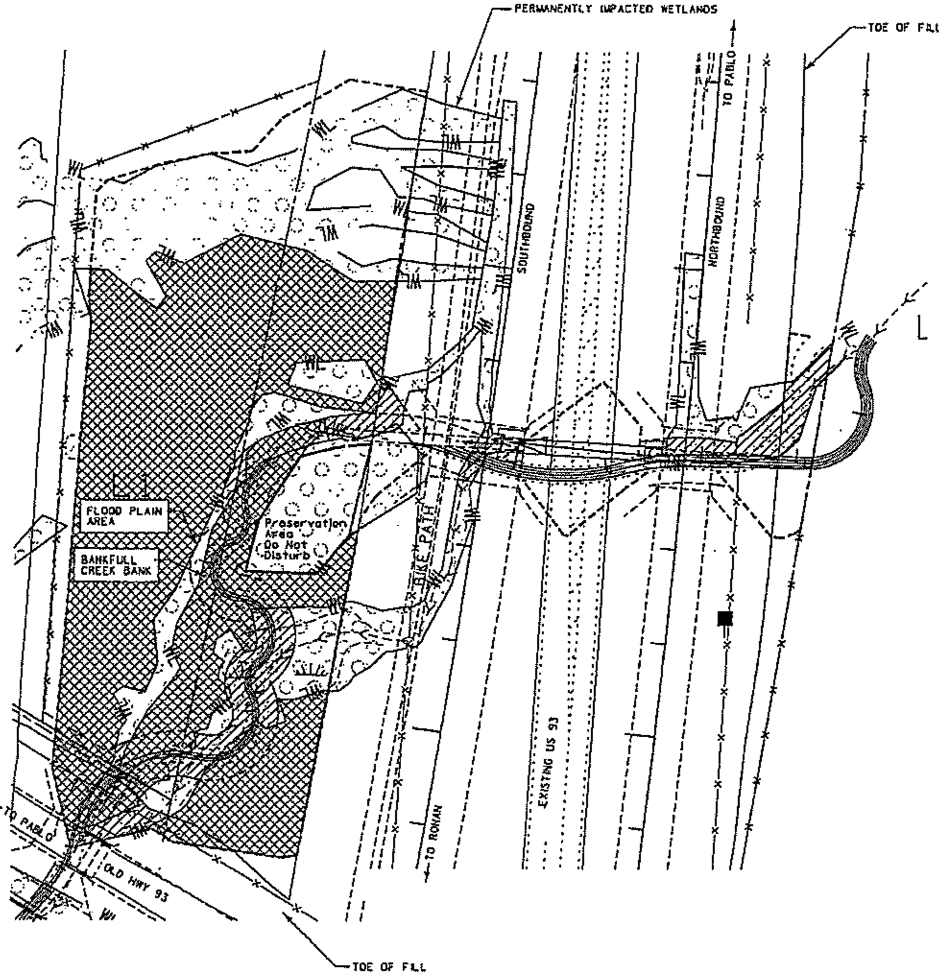
SCALE N.T.S.

MONTANA DEPARTMENT OF TRANSPORTATION
MONTANA CADD

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	NH 5-2(123)48	12

CSF = 0.99930000

DETAIL
MUD CREEK
WETLAND IMPACTS AND MITIGATION AREAS



Types of Compensatory Mitigation	Definition1	Corps Ratio2
Preservation	Protection, in perpetuity.	NA
Creation	Establishment of a wetland or other aquatic resource where one did not formerly exist	1:1
Re-establishment (Corps)	Restoration of wetland characteristics to existing non-wetland areas that were historically wetlands	1:1
Rehabilitaion	Restoration of wetland functions of existing wetland areas that exist in a substantially degraded state.	Based on exspected functional shift. A minimum 1.5:1 ratio applies
Enhancement (Corps)	Altering the physical characteristics (or land management - CSKT) of a jurisdictional wetland such that it permanently modifies and improves on or more specific functions.	Based on expected functional shift. a minimum 3:1 ratio applies
Re-establishment (Corps)	Restoration of wetland functions characteristics to existing non-wetland areas that were historically wetlands	

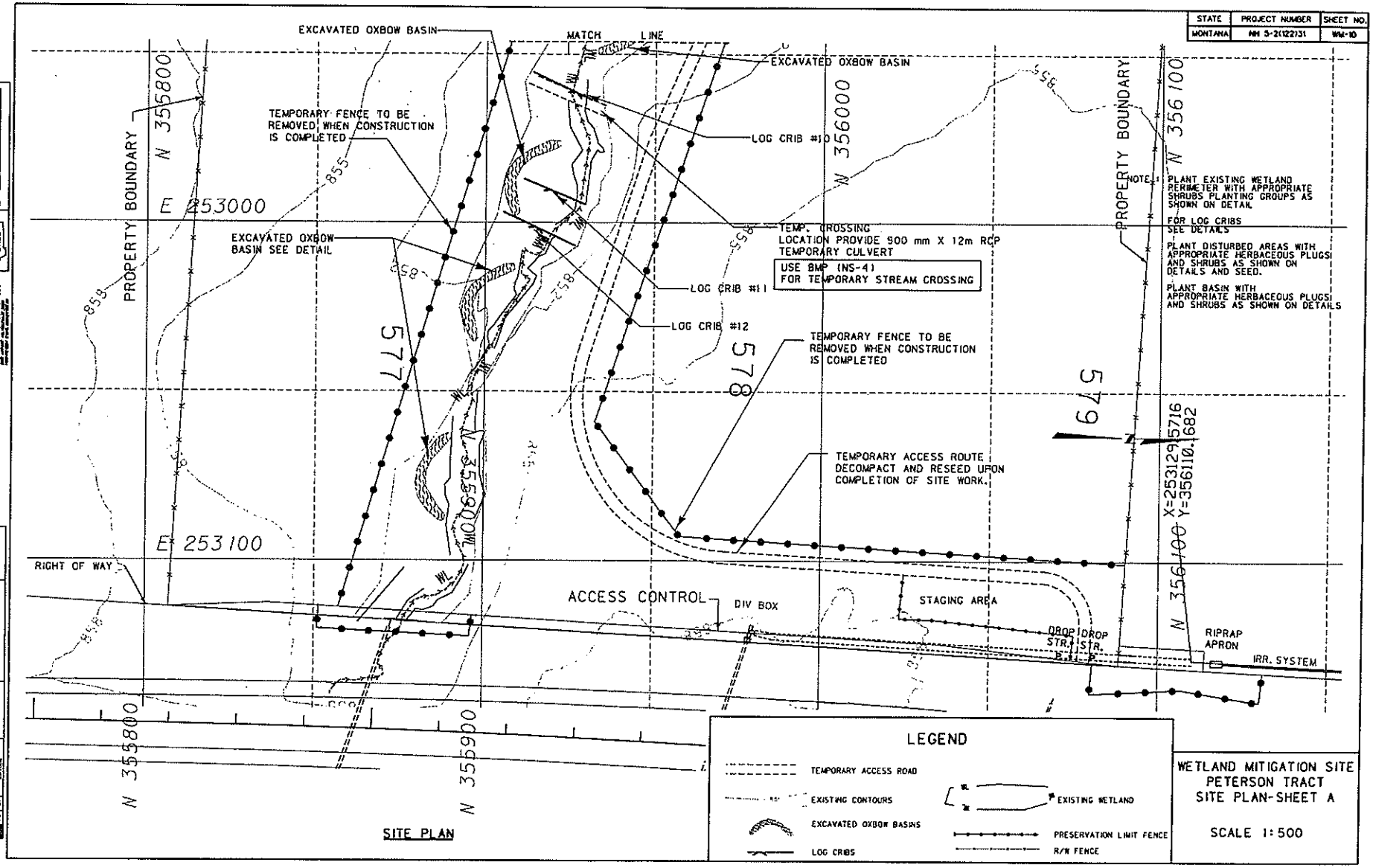
1. Source for Corps: Letter from Todd Tillinger (Corps) to Tom Parker (Herrera) dated December 18, 2002.
2. Ratios based on Memorandum from Herrera Environmental Consultants to US Army Corps of Engineers dated December 3, 2002 and the subsequent response from the Corps in a letter from Todd Tillinger to Herrera Environmental Consultants dated December 18, 2002.

LEGEND

- EXISTING WETLANDS
- WETLAND MITIGATION BOUNDARY
- PERMANENTLY IMPACTED WETLAND = 8647.79 m²
- TEMPORARILY IMPACTED WETLAND
- CREATED WETLAND = 25 017 m²

Total Mitigation Area
Total area = 36072 m²
Existing Wetland area = 11055 m² (Enhancement)
Existing Upland area = 25017 m² (New Wetland)
Wetland area permanently impacted 8647.79 m²

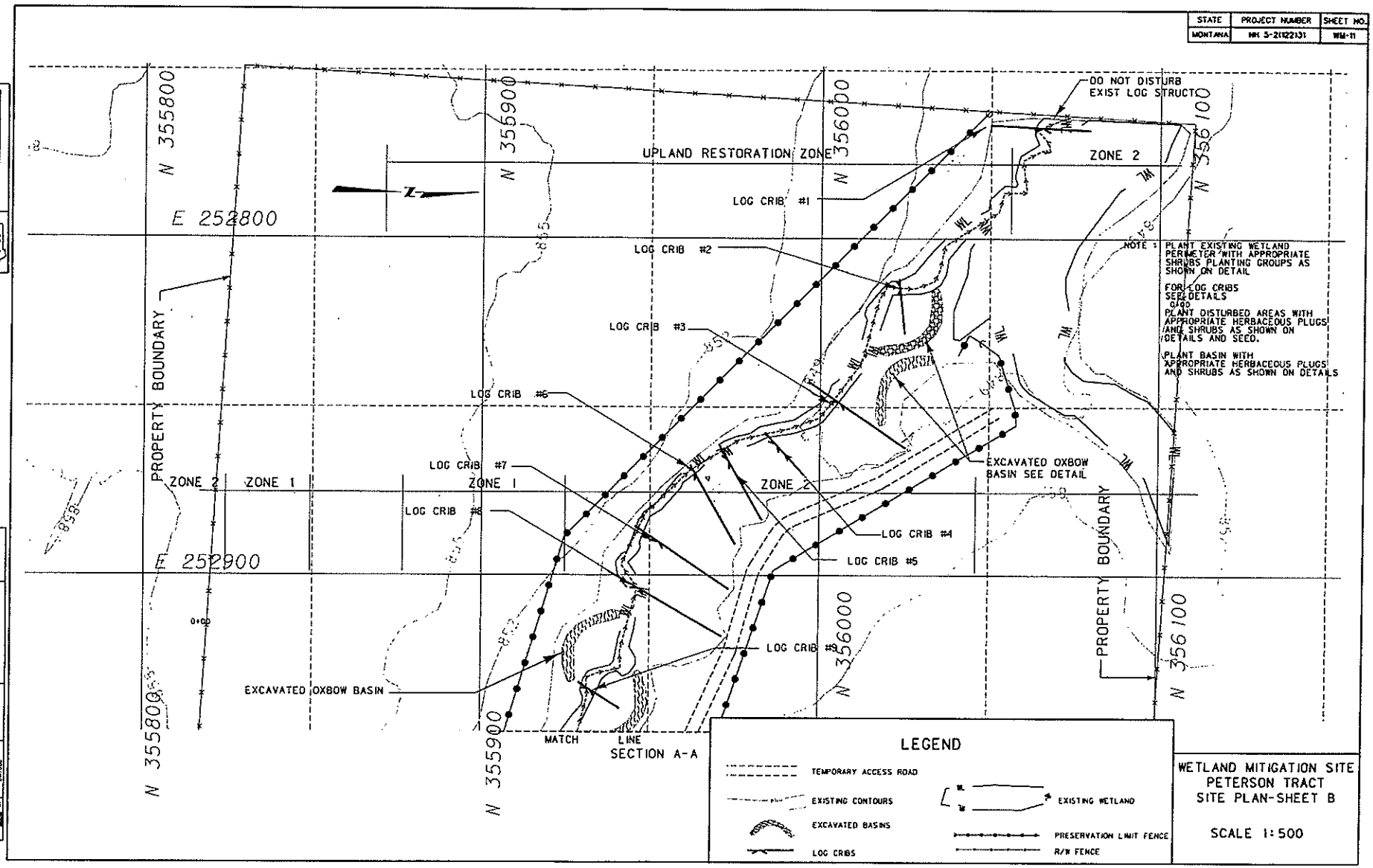
Carter::Burgess
h744\rd\h744rdeld04.dgn



STATE	PROJECT NUMBER	SHEET NO.
MONTANA	NH 5-2(122)31	WM-10

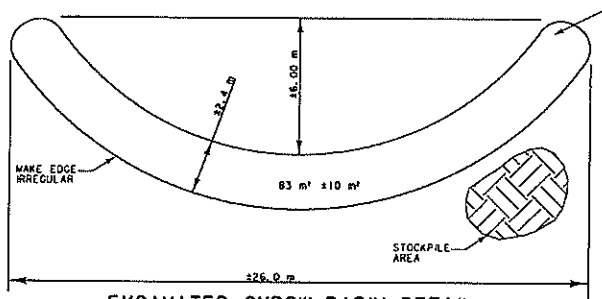
WETLAND MITIGATION SITE
PETERSON TRACT
SITE PLAN-SHEET A

SCALE 1:500


STATE
MONTANA
PROJECT NUMBER
NH 5-2(122)31
SHEET NO.
WM-11
N 355800
N 355900
N 356000
N 356100
E 252800
E 252900
UPLAND RESTORATION ZONE
ZONE 2
ZONE 1
PROPERTY BOUNDARY
DO NOT DISTURB EXIST LOG STRUCTO
LOG CRIB #1
LOG CRIB #2
LOG CRIB #3
LOG CRIB #4
LOG CRIB #5
LOG CRIB #6
LOG CRIB #7
LOG CRIB #8
LOG CRIB #9
EXCAVATED OXBOW BASIN SEE DETAIL
EXCAVATED OXBOW BASIN
NOTE :
PLANT EXISTING WETLAND PERIMETER WITH APPROPRIATE SHRUBS PLANTING GROUPS AS SHOWN ON DETAIL
FOR LOG CRIBS SEE DETAILS 0490
PLANT DISTURBED AREAS WITH APPROPRIATE HERBACEOUS PLUGS AND SHRUBS AS SHOWN ON DETAILS AND SEED.
PLANT BASIN WITH APPROPRIATE HERBACEOUS PLUGS AND SHRUBS AS SHOWN ON DETAILS
MATCH LINE
SECTION A-A
LEGEND
TEMPORARY ACCESS ROAD
EXISTING CONTOURS
EXCAVATED BASINS
LOG CRIBS
EXISTING WETLAND
PRESERVATION LIMIT FENCE
R/W FENCE
WETLAND MITIGATION SITE
PETERSON TRACT
SITE PLAN-SHEET B
SCALE 1:500

PETERSON TRACT WETLAND MITIGATION DETAILS

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	NH 5-2112(33)1	WM-7



EXCAVATED OXBOW BASIN DETAIL

7 LOCATIONS

NOTE:

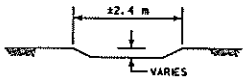
EXCAVATE APPROXIMATELY 12-18 m³ PER SITE AS DIRECTED BY PROJECT MANAGER. INCLUDE 100 mm OF TOPSOIL BELOW FINISHED GRADE

SALVAGE & PLACE 8 m³ OF TOPSOIL PER SITE

VARY DEPTH BETWEEN 150mm AND 300 mm

MINIMUM OF 2 m OF SEPARATION BETWEEN EXCAVATION AREA AND ZONE 1

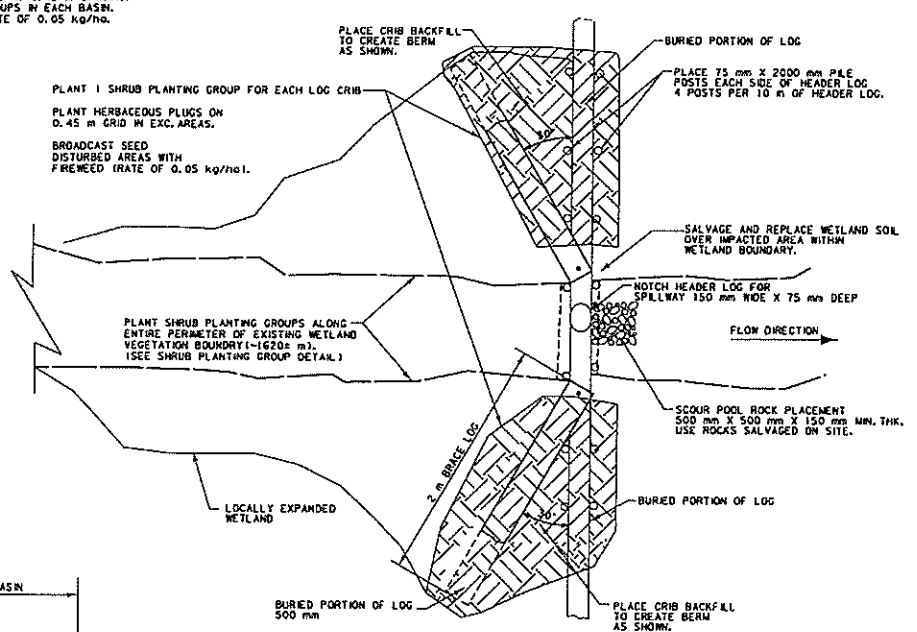
TYPICAL SECTION



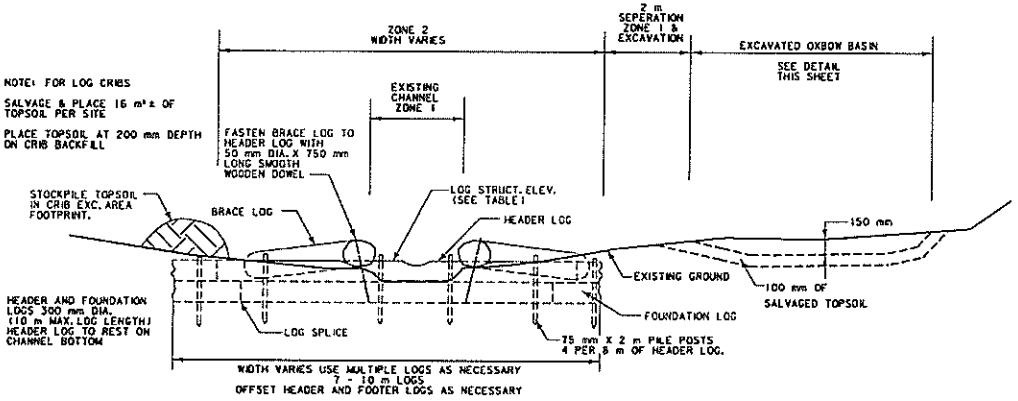
NOTE:

SEE SHEET WM-6 FOR PLANTING GROUP AND PLANTING DETAILS.

SEE SHEET WM-4 FOR LOG CRIB AND OXBOW SUMMARY.



PLAN VIEW - LOG CRIB



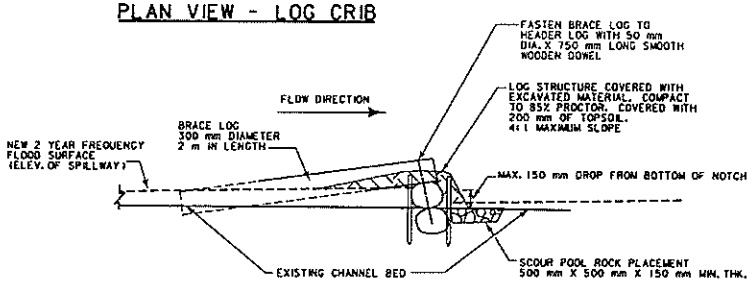
NOTE: FOR LOG CRIBS

SALVAGE & PLACE 16 m³ ± OF TOPSOIL PER SITE

PLACE TOPSOIL AT 200 mm DEPTH ON CRIB BACKFILL

SECTION VIEW - LOG CRIB

LOOKING DOWNSTREAM
SEE SUMMARY INFORMATION ON WM-4



PROFILE VIEW - LOG CRIB

WETLAND MITIGATION SITE
PETERSON TRACT
LOG CRIB AND OXBOW DETAILS

SCALE N. T. S.

Appendix E

BIRD SURVEY PROTOCOL
GPS PROTOCOL

US Highway 93 Onsite: Bouchard, Jocko Spring Creek, Mission Creek, Mud Creek, and Peterson Property

BIRD SURVEY PROTOCOL

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

Survey Area

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

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

Survey Time

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

Data Recording

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

abbreviation at the bottom of the field data sheet. For example, unknown shorebird is UNSB; unknown brown bird is UNBR; unknown warbler is UNWA; and unknown waterfowl is UNWF. For a flyover of a flock of unknown species, use a term that describes the birds' general characteristics and include the approximate flock size in parenthesis; do not fill in the habitat column. For example, a flock of black, medium-sized birds could be coded as UNBB / FO (25).

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

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

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

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

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

Other Fields

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

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

Date: Record the date of the bird survey.

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

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

GPS MAPPING AND AERIAL PHOTO REFERENCING PROCEDURE

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

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

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

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

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

Appendix F

2009 MACROINVERTEBRATE SAMPLING PROTOCOL AND DATA

US Highway 93 Onsite: Bouchard, Jocko Spring Creek, Mission Creek, Mud Creek, and Peterson Property

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 – 2009

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. A total of 229 invertebrate samples have been collected over the study period. Table 1 lists the currently monitored sites at which aquatic invertebrates were collected in 2009, and summarizes the sampling history of each.

METHODS

Sampling and Sample Processing

Aquatic invertebrate samples were collected at mitigated wetland sites in the summer months of 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, and 2009 by personnel of PBS&J. 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 1) tested and recommended by Stribling et al. (1995) in a report to the Montana Department of Health and Environmental Science. In that study, it was determined that some of the metrics were of limited use in some geographic regions, and for some wetland types. Despite that finding, all 12 metrics are used in this evaluation of mitigated wetlands, since detailed geographic information and wetland classifications were unavailable for this report. 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 between 2001 and 2007. Data from a total of 167 sites 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 bioassessment index used in this report may not be universally applicable to all wetland types, and in particular, to constructed wetlands. Scores and impairment classifications derived from the index may not be valid indications of impairment or non-impairment. In addition, 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 [HBI] 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 2009 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 are 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 Arctopsychid 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 sites sampled in 2009 are included. An asterisk indicates lotic sites.

Site identifier	2002	2003	2004	2005	2006	2007	2008	2009
Camp Creek MS-1*	+	+	+	+	+	+	+	+
Camp Creek MS-2*					+	+	+	+
Cloud Ranch Pond			+	+	+	+	+	+
Cloud Ranch Stream (Big Timber)*			+			+	+	+
Jack Creek – McKee Spring Creek*					+	+	+	+
Jack Creek – pond			+	+	+	+	+	+
Rock Creek Ranch				+	+	+	+	+
Wagner Marsh				+	+	+	+	+
Alkali Lake 1					+	+	+	+
West Fork of Charley Creek						+	+	+
Little Muddy Creek						+	+	+
Selkirk Ranch						+	+	+
Jocko Spring Creek MS1							+	+
Jocko Spring Creek MS2							+	+
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 – 2009.

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 – 2009 sampling.

METRIC	Cloud Ranch Pond	Jack Creek Pond	Rock Creek Ranch	Wagner Marsh	Alkali Lake	West Fork of Charley Creek	Little Muddy Creek
Total taxa	15	11	20	18	17	7	18
POET	2	0	2	3	1	0	1
Chironomidae taxa	6	3	3	5	10	2	6
Crustacea + Mollusca	0	5	6	7	1	1	6
% Chironomidae	14.47%	66.67%	43.75%	16.07%	61.00%	2.73%	42.40%
Orthocladiinae/Chir	45.45%	20.00%	57.14%	22.22%	52.46%	0.00%	86.79%
%Amphipoda	0.00%	3.33%	0.00%	1.79%	0.00%	91.82%	4.80%
%Crustacea + %Mollusca	0.00%	23.33%	32.14%	34.82%	1.00%	91.82%	34.40%
HBI	6.026666	9	7.045045	7.981652	6	7.90909	7.448
%Dominant taxon	40.79%	53.33%	23.21%	23.21%	30.00%	91.82%	36.00%
%Collector-Gatherers	21.05%	73.33%	61.61%	43.75%	51.00%	91.82%	37.60%
%Filterers	0.00%	0.00%	7.14%	4.46%	0.00%	0.00%	4.80%
Total taxa	3	1	3	3	3	1	3
POET	1	1	1	3	1	1	1
Chironomidae taxa	3	3	3	3	5	1	3
Crustacea + Mollusca	1	3	5	5	1	1	5
% Chironomidae	5	1	1	5	1	5	1
Orthocladiinae/Chir	5	3	5	3	5	1	5
%Amphipoda	5	5	5	5	5	1	3
%Crustacea + %Mollusca	5	5	5	3	5	1	3
HBI	5	1	3	1	5	1	3
%Dominant taxon	3	1	5	5	5	1	3
%Collector-Gatherers	1	3	3	1	3	5	1
%Filterers	3	3	1	3	3	3	3
Total score	**40**	**30**	**40**	**40**	**42**	**22**	**34**
Percent of maximum score	**66.67%**	**50.00%**	**66.67%**	**66.67%**	**70.00%**	**36.67%**	**56.67%**
Impairment classification	**optimal**	**sub-optimal**	**optimal**	**optimal**	**optimal**	**poor**	**sub-optimal**

Table 4b. Metric values and scores for wetland (lentic) sites in the MDT mitigated wetland study – 2009 sampling.

METRIC	Selkirk Ranch	Sportsman's Campground Site #1	Sportsman's Campground Site #2	Sportsman's Campground Site #3	Lonepine #1	Lonepine #2
Total taxa	17	19	11	23	22	19
POET	1	1	0	2	2	3
Chironomidae taxa	6	10	8	11	11	8
Crustacea + Mollusca	6	4	2	4	4	2
% Chironomidae	27.27%	38.46%	90.00%	41.82%	67.83%	25.86%
Orthocladiinae/Chir	43.33%	37.50%	3.33%	23.91%	7.69%	16.67%
%Amphipoda	5.45%	25.96%	2.00%	4.55%	0.00%	0.00%
%Crustacea + %Mollusca	62.73%	51.92%	5.00%	50.00%	6.96%	18.10%
HBI	8.245455	6.942309	6.9	7.345455	7.196427	7.191304
%Dominant taxon	30.00%	24.04%	45.00%	27.27%	51.30%	15.52%
%Collector-Gatherers	57.27%	50.00%	91.00%	83.64%	86.09%	63.79%
%Filterers	3.64%	25.96%	18.00%	29.09%	1.74%	6.03%
Total taxa	3	3	1	5	5	3
POET	1	1	1	1	1	3
Chironomidae taxa	3	5	5	5	5	5
Crustacea + Mollusca	5	3	1	3	3	1
% Chironomidae	3	3	1	1	1	3
Orthocladiinae/Chir	3	3	1	3	1	1
%Amphipoda	3	1	5	3	5	5
%Crustacea + %Mollusca	3	3	5	3	5	5
HBI	1	3	3	3	3	3
%Dominant taxon	5	5	3	5	1	5
%Collector-Gatherers	3	3	5	5	5	3
%Filterers	3	1	1	1	3	1
Total score	**36**	**34**	**32**	**38**	**38**	**38**
Percent of maximum score	**60.00%**	**56.67%**	**53.33%**	**63.33%**	**63.33%**	**63.33%**
Impairment classification	**sub-optimal**	**sub-optimal**	**sub-optimal**	**sub-optimal**	**sub-optimal**	**sub-optimal**

Table 5. Metric values and scores for stream (lotic) sites in the MDT mitigated wetland study – 2009 sampling.

METRIC	Camp Creek MS-1	Camp Creek MS-2	Cloud Ranch Stream	Jack Creek McKee	Jocko Spring Creek MS-1	Jocko Spring Creek MS-2
E Richness	2	4	1	1	2	1
P Richness	1	0	0	0	0	0
T Richness	2	4	4	1	3	2
Pollution Sensitive Richness	1	1	0	0	1	0
Filterer Percent	11.88%	22.02%	18.18%	25.23%	27.36%	10.91%
Pollution Tolerant Percent	13.86%	12.84%	15.15%	8.41%	12.26%	32.73%
E Richness	1	2	0	0	1	0
P Richness	1	0	0	0	0	0
T Richness	1	2	2	0	2	1
Pollution Sensitive Richness	1	1	0	0	1	0
Filterer Percent	1	1	1	0	0	1
Pollution Tolerant Percent	1	1	1	2	1	1
Total score	**6**	**7**	**4**	**2**	**5**	**3**
Percent of maximum score	**33.33%**	**38.89%**	**22.22%**	**11.11%**	**27.78%**	**16.67%**
Impairment classification	**moderate**	**moderate**	**moderate**	**severe**	**moderate**	**severe**

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Taxa Listing

Project ID: MDT09PBSJ
RAI No.: MDT09PBSJ010

RAI No.: MDT09PBSJ010 **Sta. Name:** Jocko Spring Creek MS 1
Client ID:
Date Coll.: 7/31/2009 **No. Jars:** 1 **STORET ID:**

Taxonomic Name	Count	PRA	Unique	Stage	Qualifier	BI	Function
Non-Insect							
Hyalellidae							
Hyalella sp.	1	0.94%	Yes	Unknown		8	CG
Physidae							
Physa sp.	3	2.83%	Yes	Unknown		8	SC
Ephemeroptera							
Baetidae							
Baetidae	1	0.94%	Yes	Larva	Early Instar	4	CG
Ephemerellidae							
Ephemerellidae	1	0.94%	Yes	Larva	Damaged	1	CG
Trichoptera							
Brachycentridae							
Brachycentridae	2	1.89%	No	Pupa		1	CG
Brachycentrus americanus	1	0.94%	Yes	Larva		1	CF
Brachycentrus occidentalis	7	6.60%	Yes	Larva		2	CF
Lepidostomatidae							
Lepidostoma sp.	7	6.60%	Yes	Larva		1	SH
Coleoptera							
Elmidae							
Optioservus sp.	8	7.55%	Yes	Larva		5	SC
Zaitzevia sp.	2	1.89%	Yes	Larva		5	CG
Diptera							
Simuliidae							
Simuliidae	4	3.77%	No	Pupa		6	CF
Simulium sp.	17	16.04%	Yes	Larva		6	CF
Chironomidae							
Chironomidae							
Cricotopus (Cricotopus) sp.	2	1.89%	Yes	Larva		7	SH
Cricotopus (Nostococladius) sp.	1	0.94%	Yes	Larva		6	SH
Cricotopus bicinctus	2	1.89%	Yes	Larva		7	SH
Eukiefferiella sp.	1	0.94%	No	Pupa		8	CG
Eukiefferiella Brehmi Gr.	6	5.66%	Yes	Larva		8	CG
Eukiefferiella Claripennis Gr.	18	16.98%	Yes	Larva		8	CG
Eukiefferiella Devonica Gr.	1	0.94%	Yes	Larva		8	CG
Orthocladiinae	3	2.83%	No	Larva	Early Instar	6	CG
Orthocladius sp.	2	1.89%	Yes	Larva		6	CG
Pagastia sp.	5	4.72%	Yes	Larva		1	CG
Parametriocnemus sp.	1	0.94%	Yes	Larva		5	CG
Tvetenia Bavarica Gr.	10	9.43%	Yes	Larva		5	CG
Sample Count	**106**						

Metrics Report

Project ID: MDT09PBSJ
RAI No.: MDT09PBSJ010
Sta. Name: Jocko Spring Creek MS 1
Client ID:
STORET ID:
Coll. Date: 7/31/2009

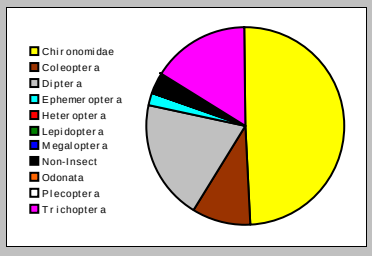
Abundance Measures

Sample Count: 106
Sample Abundance: 795.00 13.33% of sample used

Coll. Procedure:
Sample Notes:

Taxonomic Composition

Category	R	A	PRA
Non-Insect	2	4	3.77%
Odonata			
Ephemeroptera	2	2	1.89%
Plecoptera			
Heteroptera			
Megaloptera			
Trichoptera	3	17	16.04%
Lepidoptera			
Coleoptera	2	10	9.43%
Diptera	1	21	19.81%
Chironomidae	10	52	49.06%

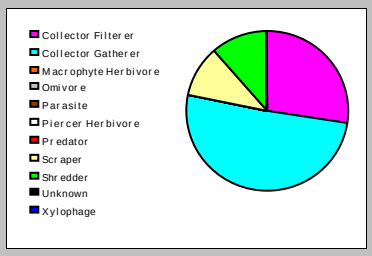


Dominant Taxa

Category	A	PRA
Eukiefferiella Claripennis Gr.	18	16.98%
Simulium	17	16.04%
Tvetenia Bavarica Gr.	10	9.43%
Optioservus	8	7.55%
Lepidostoma	7	6.60%
Brachycentrus occidentalis	7	6.60%
Eukiefferiella Brehmi Gr.	6	5.66%
Pagastia	5	4.72%
Simuliidae	4	3.77%
Physa	3	2.83%
Orthocladiinae	3	2.83%
Zaitzevia	2	1.89%
Orthocladius	2	1.89%
Cricotopus (Cricotopus)	2	1.89%
Brachycentridae	2	1.89%

Functional Composition

Category	R	A	PRA
Predator			
Parasite			
Collector Gatherer	11	54	50.94%
Collector Filterer	3	29	27.36%
Macrophyte Herbivore			
Piercer Herbivore			
Xylophage			
Scraper	2	11	10.38%
Shredder	4	12	11.32%
Omivore			
Unknown			

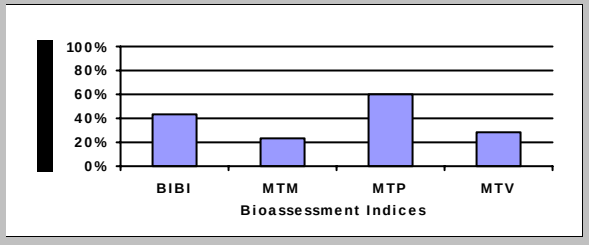


Metric Values and Scores

Metric	Value	BIBI	MTP	MTV	MTM
Composition					
Taxa Richness	20	3	2		1
Non-Insect Percent	3.77%				
E Richness	2	1		1	
P Richness	0	1		0	
T Richness	3	1		2	
EPT Richness	5		1		0
EPT Percent	17.92%		1		0
Oligochaeta+Hirudinea Percent					
Baetidae/Ephemeroptera	0.500				
Hydropsychidae/Trichoptera	0.000				
Dominance					
Dominant Taxon Percent	16.98%		3		3
Dominant Taxa (2) Percent	33.02%				
Dominant Taxa (3) Percent	42.45%	5			
Dominant Taxa (10) Percent	80.19%				
Diversity					
Shannon H (loge)	2.536				
Shannon H (log2)	3.658		3		
Margalef D	4.163				
Simpson D	0.096				
Evenness	0.072				
Function					
Predator Richness	0		0		
Predator Percent	0.00%	1			
Filterer Richness	3				
Filterer Percent	27.36%			0	
Collector Percent	78.30%		2		1
Scraper+Shredder Percent	21.70%		2		0
Scraper/Filterer	0.379				
Scraper/Scraper+Filterer	0.275				
Habit					
Burrower Richness	0				
Burrower Percent	0.00%				
Swimmer Richness	0				
Swimmer Percent	0.00%				
Clinger Richness	9	1			
Clinger Percent	44.34%				
Characteristics					
Cold Stenotherm Richness	1				
Cold Stenotherm Percent	0.94%				
Hemoglobin Bearer Richness					
Hemoglobin Bearer Percent					
Air Breather Richness	0				
Air Breather Percent	0.00%				
Voltinism					
Univoltine Richness	5				
Semivoltine Richness	4	3			
Multivoltine Percent	50.00%		2		
Tolerance					
Sediment Tolerant Richness	0				
Sediment Tolerant Percent	0.00%				
Sediment Sensitive Richness	1				
Sediment Sensitive Percent	0.94%				
Metals Tolerance Index	4.615				
Pollution Sensitive Richness	1	1		1	
Pollution Tolerant Percent	12.26%	5		1	
Hilsenhoff Biotic Index	5.368		2		0
Intolerant Percent	21.70%				
Supertolerant Percent	28.30%				
CTQa	82.833				

Bioassessment Indices

BioIndex	Description	Score	Pct	Rating
BIBI	B-IBI (Karr et al.)	22	44.00%	
MTP	Montana DEQ Plains (Bukantis 1998)	18	60.00%	Slight
MTV	Montana Revised Valleys/Foothills (Bollman 1998)	5	27.78%	Moderate
MTM	Montana DEQ Mountains (Bukantis 1998)	5	23.81%	Moderate



Taxa Listing

Project ID: MDT09PBSJ
RAI No.: MDT09PBSJ011

RAI No.: MDT09PBSJ011 **Sta. Name:** Jocko Spring Creek MS 2
Client ID:
Date Coll.: 7/31/2009 **No. Jars:** 1 **STORET ID:**

Taxonomic Name	Count	PRA	Unique	Stage	Qualifier	BI	Function
Non-Insect							
Nematoda	1	0.91%	Yes	Unknown		5	PA
Enchytraeidae							
Enchytraeus sp.	3	2.73%	Yes	Unknown		4	CG
Naididae							
Naididae (Naidinae)	2	1.82%	Yes	Immature		8	CG
Naididae (Tubificinae) - without capillary setae	1	0.91%	Yes	Immature		11	CG
Nais sp.	3	2.73%	Yes	Unknown		8	CG
Physidae							
Physa sp.	2	1.82%	Yes	Unknown		8	SC
Planorbidae							
Planorbidae	1	0.91%	Yes	Immature		6	SC
Sphaeriidae							
Sphaeriidae	3	2.73%	Yes	Unknown		8	CF
Ephemeroptera							
Leptohyphidae							
Tricorythodes sp.	1	0.91%	Yes	Larva		4	CG
Heteroptera							
Corixidae							
Corixidae	3	2.73%	Yes	Larva		10	PH
Trichoptera							
Brachycentridae							
Brachycentridae	2	1.82%	No	Pupa		1	CG
Brachycentrus occidentalis	7	6.36%	Yes	Larva		2	CF
Lepidostomatidae							
Lepidostoma sp.	4	3.64%	Yes	Larva		1	SH
Coleoptera							
Elmidae							
Cleptelmis addenda	8	7.27%	Yes	Larva		4	CG
Optioservus sp.	32	29.09%	Yes	Larva		5	SC
Diptera							
Simuliidae							
Simulium sp.	1	0.91%	Yes	Larva		6	CF
Chironomidae							
Chironomidae							
Cricotopus (Cricotopus) sp.	1	0.91%	Yes	Larva		7	SH
Cricotopus bicinctus	1	0.91%	Yes	Larva		7	SH
Eukiefferiella Claripennis Gr.	3	2.73%	Yes	Larva		8	CG
Micropsectra sp.	1	0.91%	Yes	Larva		4	CG
Orthocladius sp.	2	1.82%	No	Pupa		6	CG
Orthocladius sp.	17	15.45%	Yes	Larva		6	CG
Pagastia sp.	3	2.73%	Yes	Larva		1	CG
Phaenopsectra sp.	1	0.91%	Yes	Larva		7	SC
Rheotanytarsus sp.	1	0.91%	Yes	Larva		6	CF
Tvetenia Bavarica Gr.	6	5.45%	Yes	Larva		5	CG

Metrics Report

Project ID: MDT09PBSJ
RAI No.: MDT09PBSJ011
Sta. Name: Jocko Spring Creek MS 2
Client ID:
STORET ID:
Coll. Date: 7/31/2009

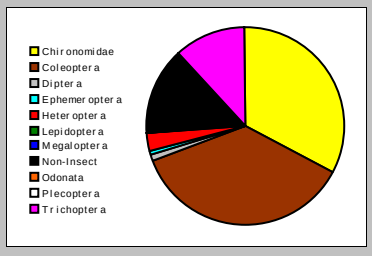
Abundance Measures

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	8	16	14.55%
Odonata			
Ephemeroptera	1	1	0.91%
Plecoptera			
Heteroptera	1	3	2.73%
Megaloptera			
Trichoptera	2	13	11.82%
Lepidoptera			
Coleoptera	2	40	36.36%
Diptera	1	1	0.91%
Chironomidae	9	36	32.73%

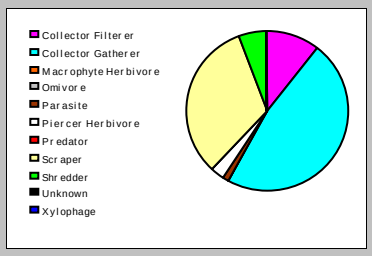


Dominant Taxa

Category	A	PRA
Optioservus	32	29.09%
Orthocladius	19	17.27%
Cleptelmis addenda	8	7.27%
Brachycentrus occidentalis	7	6.36%
Tvetenia Bavarica Gr.	6	5.45%
Lepidostoma	4	3.64%
Sphaeriidae	3	2.73%
Pagastia	3	2.73%
Nais	3	2.73%
Eukiefferiella Claripennis Gr.	3	2.73%
Enchytraeus	3	2.73%
Corixidae	3	2.73%
Physa	2	1.82%
Naididae (Naidinae)	2	1.82%
Brachycentridae	2	1.82%

Functional Composition

Category	R	A	PRA
Predator			
Parasite	1	1	0.91%
Collector Gatherer	11	52	47.27%
Collector Filterer	4	12	10.91%
Macrophyte Herbivore			
Piercer Herbivore	1	3	2.73%
Xylophage			
Scraper	4	36	32.73%
Shredder	3	6	5.45%
Omivore			
Unknown			

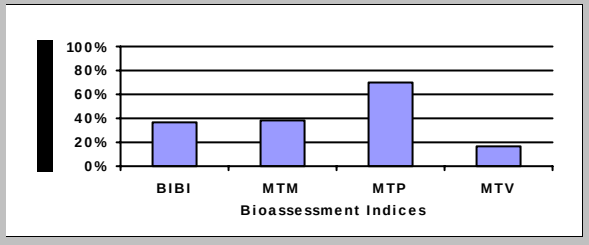


Metric Values and Scores

Metric	Value	BIBI	MTP	MTV	MTM
Composition					
Taxa Richness	24	3	2		2
Non-Insect Percent	14.55%				
E Richness	1	1		0	
P Richness	0	1		0	
T Richness	2	1		1	
EPT Richness	3		1		0
EPT Percent	12.73%		1		0
Oligochaeta+Hirudinea Percent	8.18%				
Baetidae/Ephemeroptera	0.000				
Hydropsychidae/Trichoptera	0.000				
Dominance					
Dominant Taxon Percent	29.09%		3		2
Dominant Taxa (2) Percent	46.36%				
Dominant Taxa (3) Percent	53.64%	3			
Dominant Taxa (10) Percent	80.00%				
Diversity					
Shannon H (loge)	2.511				
Shannon H (log2)	3.622		3		
Margalef D	4.932				
Simpson D	0.130				
Evenness	0.069				
Function					
Predator Richness	0		0		
Predator Percent	0.00%	1			
Filterer Richness	4				
Filterer Percent	10.91%			1	
Collector Percent	58.18%		3		3
Scraper+Shredder Percent	38.18%		3		1
Scraper/Filterer	3.000				
Scraper/Scraper+Filterer	0.750				
Habit					
Burrower Richness	0				
Burrower Percent	0.00%				
Swimmer Richness	1				
Swimmer Percent	2.73%				
Clinger Richness	8	1			
Clinger Percent	49.09%				
Characteristics					
Cold Stenotherm Richness	0				
Cold Stenotherm Percent	0.00%				
Hemoglobin Bearer Richness	2				
Hemoglobin Bearer Percent	1.82%				
Air Breather Richness	0				
Air Breather Percent	0.00%				
Voltinism					
Univoltine Richness	9				
Semivoltine Richness	3	3			
Multivoltine Percent	33.64%		3		
Tolerance					
Sediment Tolerant Richness	2				
Sediment Tolerant Percent	1.82%				
Sediment Sensitive Richness	0				
Sediment Sensitive Percent	0.00%				
Metals Tolerance Index	4.538				
Pollution Sensitive Richness	0	1		0	
Pollution Tolerant Percent	32.73%	3		1	
Hilsenhoff Biotic Index	5.110		2		0
Intolerant Percent	14.55%				
Supertolerant Percent	14.55%				
CTQa	97.294				

Bioassessment Indices

BioIndex	Description	Score	Pct	Rating
BIBI	B-IBI (Karr et al.)	18	36.00%	
MTP	Montana DEQ Plains (Bukantis 1998)	21	70.00%	Slight
MTV	Montana Revised Valleys/Foothills (Bollman 1998)	3	16.67%	Severe
MTM	Montana DEQ Mountains (Bukantis 1998)	8	38.10%	Moderate



Appendix G

REVEGETATION PLANS

US Highway 93 Onsite: Bouchard, Jocko Spring Creek, Mission Creek, Mud Creek, and Peterson Property

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	NH 5-2(120)120	L-2

WETLAND PLANTING SUMMARY

PLANTINGS - BOUCHARD WETLAND Δ

				2.67 ha TREATMENT AREA				
GENUS	SPECIES	COMMON NAME	CODE	SIZE	PLANTING ZONE	SPACING (m)	TOTAL	MULCH (m²)
HERBACEOUS PLUGS								
CALAMAGROSTIS	CANADENSIS	BLUEJOINT GRASS	CALCAN	64 mm POT	1	1.0	1,853	
CAREX	LASIOCARPA	WOOL-FRUITED SEDGE	CARLAS	64 mm POT	1	1.0	1,853	
CAREX	NEBRASCENSIS	NEBRASKA SEDGE	CARNEB	64 mm POT	1	1.0	3,758	
CAREX	UTRICULATA	BEAKED SEDGE	CARUTR	64 mm POT	1	1.0	9,528	
CAREX	VESICARIA	INFLATED SEDGE	CARVES	64 mm POT	1	1.0	2,118	
ELEOCHARIS	PALUSTRIS	COMMON SPIKERUSH	ELOPAL	64 mm POT	1	1.0	1,853	
JUNCUS	BALTICUS	BALTIC RUSH	JUNBAL	64 mm POT	1	1.0	3,441	
SUBTOTAL							24,404	
JUNCUS	BALTICUS	BALTIC RUSH	JUNBAL	64 mm POT	2	1.0	4,234	
CALAMAGROSTIS	CANADENSIS	BLUEJOINT GRASS	CALCAN	64 mm POT	2	1.0	4,234	
CAREX	FLAVA	YELLOW SEDGE	CARFLA	64 mm POT	2	1.0	3,441	
CAREX	LENTICULARIS	LENTIL-FRUITED SEDGE	CARLEN	64 mm POT	2	1.0	4,234	
CAREX	PRATICOLA	MEADOW SEDGE	CARPRA	64 mm POT	2	1.0	4,234	
JUNCUS	LONGISTYLIS	LONGSTYLE RUSH	JUNLON	64 mm POT	2	1.0	3,441	
SUBTOTAL							23,818	
ADDITIONAL PLUGS *							2,500	
TOTAL							50,722	
SHRUBS - CONTAINER								
BETULA	GLANDULOSA	BOG BIRCH	BETGLA	#1 CTN	1	1.8	817	
CORNUS	STOLONIFERA	RED-OSIER DOGWOOD	CORSTO	#1 CTN	1	1.8	408	
RIBES	HUDSONIANUM	BLACK CURRANT	RIBHUD	#1 CTN	1	1.8	245	
SALIX	LUTEA	YELLOW WILLOW	SALLUT	250 mm CYLINDER	1	1.8	408	
TOTAL							1,878	108

* TO BE USED AT THE PROJECT MANAGER'S DISCRETION
Δ INCLUDED IN LUMP SUM BID ITEM "WETLAND SITE"

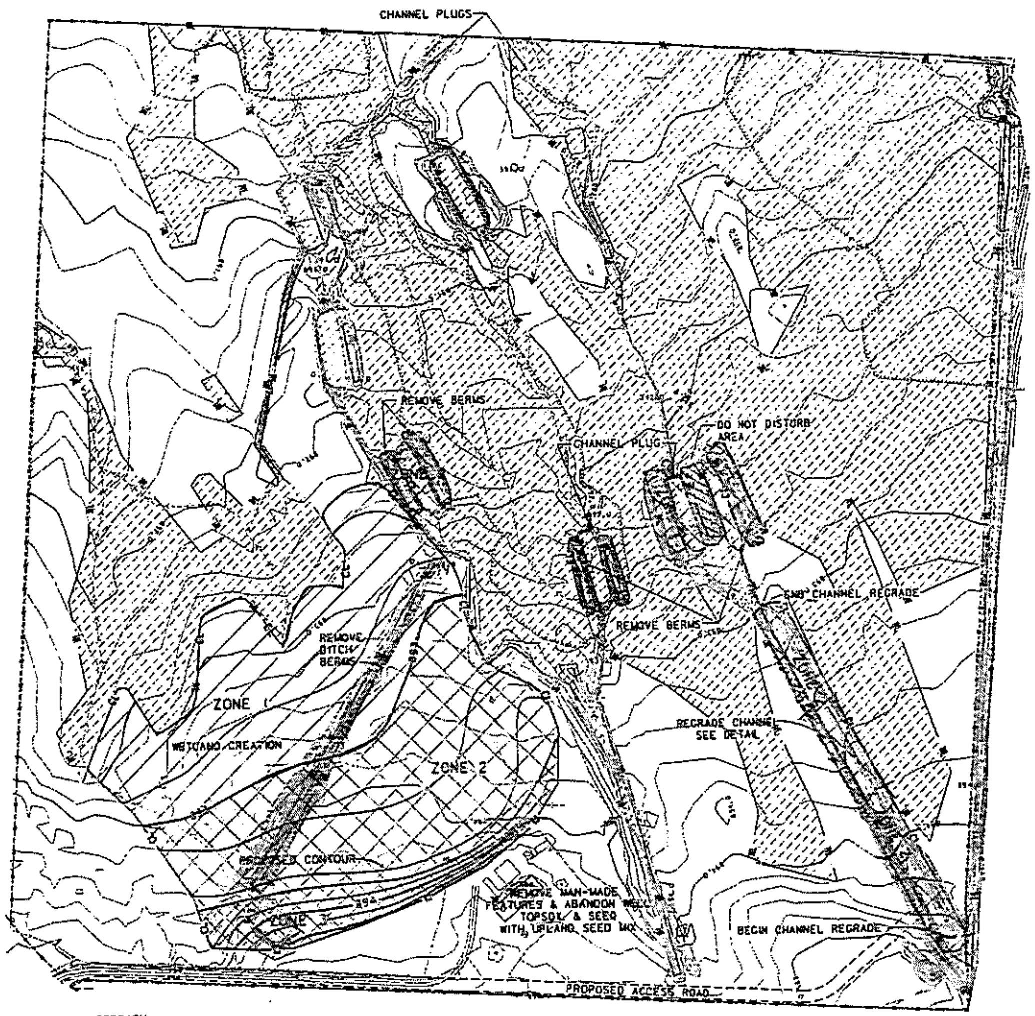
SEEDING - BOUCHARD WETLAND Δ

SCIENTIFIC NAME	COMMON NAME	PLS kg PER ha			kg		
		ZONE 1	ZONE 2	ZONE 3	ZONE 1	ZONE 2	ZONE 3
ACHILLEA MILLEFOLIUM	YARROW		1.1	1.1		1.7	0.3
CALAMAGROSTIS CANADENSIS	BLUEJOINT REEDGRASS	1.1			1.2		
DESCHAMPSIA CESPITOSA	TUFTED HAIRGRASS	1.1	1.1		1.2	1.7	
AGROPYRON TRACHYCAULUM	SLENDER WHEATGRASS			15.9			3.8
TOTAL		2.2	2.2	17.0	2.4	3.4	4.1

DETAIL

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	NH 5-2(120)20	L-5

CSF = 0.99926000



EXISTING APPROACH
STA. 337+06 RT.

PLANTING NOTES:

1. PLANT WOODY & HERBACEOUS MATERIAL IN THE SPECIFIC HYDROLOGIC REGIME LISTED IN THE PLANT LIST (PLANTING ZONES 1-3)
2. USE 64 mm POT PERENNIAL HERBACEOUS PLANT MATERIAL IN WETLAND CREATION AREAS. (ZONES 1 & 2)
3. USE NUMBER ONE CONTAINER SHRUB MATERIAL FOR WETLAND PLANTINGS. EXCEPT FOR THE WILLOW (SALIX) SPECIES.
4. PLANT WILLOW (SALIX) SPECIES WITH 250 mm CYLINDER CONTAINER STOCK.
5. INSTALL SPRING PLANTED PERENNIAL PLANTS AND SHRUBS NO LATER THAN APRIL 15.
6. PLANT FALL PLANTED SHRUBS BETWEEN SEPTEMBER 15 AND OCTOBER 15.
7. SEED BETWEEN OCTOBER 1 AND APRIL 15 PROVIDED THE GROUND IS NOT FROZEN.
8. PLACE WOOD CHIP MULCH AROUND ALL #1 CONTAINER SHRUBS TO A DEPTH OF 102 mm AT THE SURFACE, 0.6 m IN DIAMETER, SURROUNDING THE BASE OF THE PLANT.
9. SEED UPLAND AREAS DISTURBED DURING WETLAND CONSTRUCTION IN THE WETLAND MITIGATION AREA WITH THE FESCUE PRAIRIE MIX DEVELOPED FOR HIGHWAY 93 ROADSIDE SEEDING.
10. PLACE WETLAND CREATION SHRUBS AT 1.8 m ON CENTER. SEE WETLAND PLANTING DETAIL.
11. APPLY SEED BY BROADCAST METHODS. RAKE OR HARROW THE SEED. SEED BERM REMOVAL AREAS WITH ZONE 2 SEED MIX.
12. PLACE WETLAND CREATION HERBACEOUS PLUGS AT 1.0 m ON CENTER.

GENERAL NOTES:

1. PRIOR TO CONSTRUCTION COMMENCING, CONDUCT A PRE-CONSTRUCTION MEETING ON THE SITE BETWEEN THE CONTRACTOR, PROJECT MANAGER, MDT STAFF WETLANDS SPECIALIST AND WETLANDS ECOLOGIST TO DISCUSS THE DESIGN INTENT OF THE WETLANDS.
2. PLANT SCRUB/SHRUB, HERBACEOUS EMERGENT AND HERBACEOUS WET MEADOW SPECIES FOR WETLAND COMMUNITIES TO BE ESTABLISHED IN WETLAND CREATION AREAS.
3. PLACE PLANT MATERIAL IN THE APPROPRIATE ZONE AS DESCRIBED IN THE PLANT TABULATION COLUMN "PLANTING ZONE".
4. PLANT ZONES SHOWN ON THE PLANTING PLAN ARE APPROXIMATE AND MAY CHANGE BASED ON CONDITIONS AFTER FINAL GRADING.

- CL ———— CL - PROPOSED GRADING BOUNDARY/CONSTRUCTION LIMITS

EXISTING WETLAND

SEEDING ZONES:

ZONE 1

ZONE 2

ZONE 3

CONTOURS:
MAJOR INTERVAL 1.0 m
MINOR INTERVAL 0.2 m

SEE CONSTRUCTION PLANS FOR GRADING, WETLAND CREATION & RESTORATION DETAILS

BOUCHARD WETLAND DEVELOPMENT DETAIL

PLANTING PLAN

SCALE = 1:1000

EDAW INC.

MONTANA DEPARTMENT OF TRANSPORTATION

MONTANA CADD

10/3/2005
8:48:23 AM
EPS - 00277

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	NH 5-2(120)20	L-4

DETAIL

PLANTINGS - SPRING CREEK WETLAND Δ

				ZONE 1			ZONE 2A			ZONE 2B			ZONE 3A			ZONE 3B		
			TREATMENT AREA (HA):	0.34			0.32			0.13			0.83			0.46		
GENUS	SPECIES	COMMON NAME	SIZE	PERCENT	SPACING (m)	TOTAL	PERCENT	SPACING (m)	TOTAL	PERCENT	SPACING (m)	TOTAL	PERCENT	SPACING (m)	TOTAL	PERCENT	SPACING (m)	TOTAL
HERBACEOUS PLUGS																		
CAREX	LANUGINOSA	WOOLY SEDGE	50 cm^3 PLUGS	10%	1	340	10%	1	320	0%	0.5	0	5%	1	415	5%	1	230
CAREX	NEBRASCENSIS	NEBRASKA SEDGE	50 cm^3 PLUGS	10%	1	340	30%	1	960	0%	0.5	0	30%	1	2490	30%	1	1380
CAREX	UTRICULATA	BEAKED SEDGE	50 cm^3 PLUGS	30%	1	1020	0%	1	0	0%	0.5	0	5%	1	415	5%	1	230
ELEOCHARIS	PALUSTRIS	COMMON SPIKERUSH	50 cm^3 PLUGS	10%	1	340	0%	1	0	0%	0.5	0	0%	1	0	0%	1	0
JUNCUS	BALTICUS	BALTIC RUSH	50 cm^3 PLUGS	10%	1	340	30%	1	960	0%	0.5	0	10%	1	830	10%	1	460
JUNCUS	EFFUSUS	SOFT RUSH	50 cm^3 PLUGS	10%	1	340	0%	1	0	0%	0.5	0	10%	1	830	10%	1	460
JUNCUS	LONGISTYLIS	LONGSTYLE RUSH	50 cm^3 PLUGS	0%	1	0	20%	1	640	0%	0.5	0	20%	1	1660	20%	1	920
JUNCUS	TENUIS	SLENDER RUSH	50 cm^3 PLUGS	0%	1	0	0%	1	0	0%	0.5	0	20%	1	1660	20%	1	920
SCIRPUS	MICROCARPUS	SMALL-FLOWERED BULRUSH	50 cm^3 PLUGS	20%	1	680	0%	1	0	0%	0.5	0	0%	1	0	0%	1	0
GEUM	MACROPHYLLUM	LARGE-LEAVED AVENS	50 cm^3 PLUGS	0%	1	0	10%	1	320	0%	0.5	0	0%	1	0	0%	1	0
SUBTOTAL						3400			3200			0			8300			4600
ADDITIONAL PLUGS *						170			160			0			415			230
TOTAL						3570			3360			0			8715			4830
SHRUBS - CONTAINER																		
ALNUS	INCANA	THINLEAF ALDER	10X10X36 cm CTN	20%	2.3	129	15%	2.3	91	15%	2.3	37	0%	2.3	0	40%	2.3	348
CORNUS	STOLONIFERA	RED-OSIER DOGWOOD	10X10X36 cm CTN	20%	2.3	129	10%	2.3	60	10%	2.3	25	0%	2.3	0	20%	2.3	174
CRATAEGUS	DOUGLASII	DOUGLAS HAWTHORNE	10X10X36 cm CTN	10%	2.3	64	5%	2.3	30	5%	2.3	17	0%	2.3	0	0%	2.3	0
PRUNUS	VIRGINIANA	COMMON CHOKECHERRY	10X10X36 cm CTN	10%	2.3	64	10%	2.3	60	10%	2.3	25	0%	2.3	0	20%	2.3	174
RHAMNUS	ALNIFOLIA	ALDER BUCKTHORN	10X10X36 cm CTN	0%	2.3	0	5%	2.3	30	5%	2.3	12	0%	2.3	0	0%	2.3	0
ROSA	WOODSII	WOOD'S ROSE	10X10X36 cm CTN	0%	2.3	0	10%	2.3	60	10%	2.3	25	0%	2.3	0	0%	2.3	0
SALIX	BEBBIANA	BEBB WILLOW	10X10X36 cm CTN	20%	2.3	129	20%	2.3	121	20%	2.3	43	0%	2.3	0	10%	2.3	87
SALIX	LUTEA	YELLOW WILLOW	10X10X36 cm CTN	10%	2.3	64	5%	2.3	30	5%	2.3	12	0%	2.3	0	10%	2.3	87
SYMPHORICARPOS	OCCIDENTALIS	WESTERN SNOWBERRY	10X10X36 cm CTN	10%	2.3	64	20%	2.3	121	20%	2.3	49	0%	2.3	0	0%	2.3	0
			TOTAL	100%		643	100%		603	100%		246	0%		0	100%		870

* TO BE USED AT THE PROJECT MANAGER'S DISCRETION
Δ INCLUDED IN LUMP SUM BID ITEM "WETLAND SITE"

BIO-ENGINEERING STREAMBANK TREATMENT PLANT MIXES - SPRING CREEK WETLAND @

GENUS	SPECIES	COMMON NAME	SIZE	PERCENT
PRE-VEGETATED COIR MAT PLANT MIX #				
HERBACEOUS PLUGS				
CAREX	LANUGINOSA	WOOLY SEDGE	50 cm^3 PLUGS	10%
CAREX	UTRICULATA	BEAKED SEDGE	50 cm^3 PLUGS	30%
ELEOCHARIS	PALUSTRIS	COMMON SPIKERUSH	50 cm^3 PLUGS	10%
JUNCUS	EFFUSUS	SOFT RUSH	50 cm^3 PLUGS	20%
SCIRPUS	MICROCARPUS	SMALL-FLOWERED BULRUSH	50 cm^3 PLUGS	30%
				100%
SHRUB PLUGS				
SALIX	BEBBIANA	BEBB WILLOW	50 cm^3 PLUGS	50%
SALIX	EXIGUA	SANDBAR WILLOW	50 cm^3 PLUGS	50%
				100%
VEGETATED SOIL LIFT PLANT MIX				
SALIX	EXIGUA	SANDBAR WILLOW	1 m LONG CUTTINGS	100%

\# ACTUAL SIZE AND SPACING OF PLANTS GROWN IN PRE-VEGETATED COIR MATS WILL BE AT THE DISCRETION OF THE GROWER
@ QUANTITIES INCLUDED IN PLANTINGS FRAME

SEEDING - SPRING CREEK WETLAND Δ

GENUS	SPECIES	COMMON NAME	PLS kg/ha	SEEDS/kg	SEEDS/m^2	SEEDS/ha	% OF MIX
AGROPYRON	RIPARIUM	STREAMBANK WHEATGRASS	4.48	339,500	150	1,520,000	11.[illegible]0%
CALAMAGROSTIS	CANADENSIS	BLUEJOINT REEDGRASS	1.12	5,005,000	560	5,610,000	40.98%
ELYMUS	TRACHYCAULUS	SLENDER WHEATGRASS	7.84	350,000	280	2,750,000	20.09%
ACHILLEA	MILLEFOLIUM	COMMON YARROW	0.28	6,100,000	172	1,710,000	12.49%
EPILOBIUM	ANGUSTIFOLIUM	FIREWEED	0.11	18,740,000	215	2,100,000	15.34%
TOTAL			13.83		1377	13,690,000	100.00%

Δ INCLUDED IN LUMP SUM BID ITEM "WETLAND SITE"

ADDITIONAL ITEMS - SPRING CREEK WETLAND Δ

ITEM	UNIT	QUANTITY	REMARKS
PRE-VEGETATED COIR MATS	EACH	13	INCLUDES WOODEN STAKES
VEGETATED SOIL LIFTS	EACH	6	INCLUDES WOODEN STAKES
BROWSE PROTECTORS	EACH	2363	
WEED MATS	EACH	2363	INCLUDES STAPLES
WILLOW CUTTINGS	EACH	400	

Δ INCLUDED IN LUMP SUM BID ITEM "WETLAND SITE"

MONTANA DEPARTMENT OF TRANSPORTATION
MONTANA CADD
GEUM ENVIRONMENTAL CONSULTING, INC.
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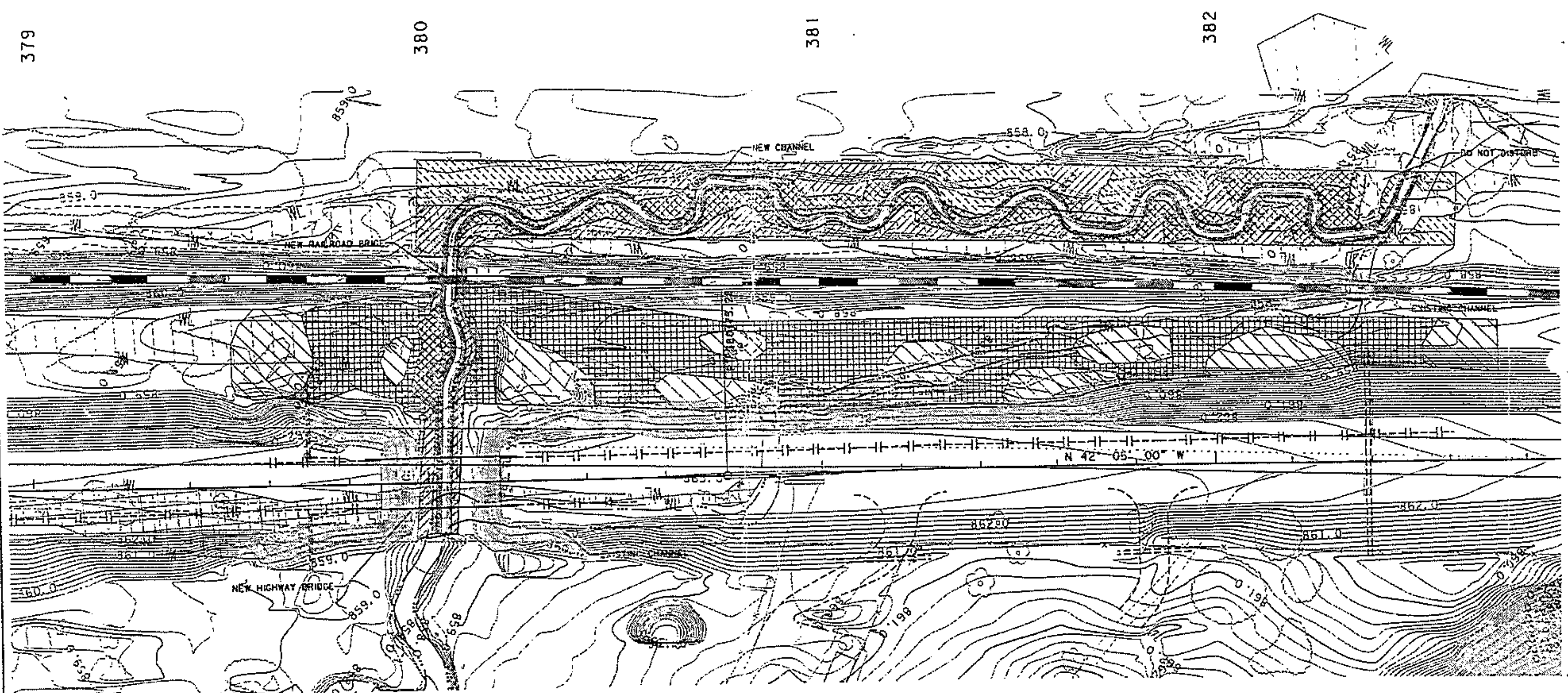
10/3/2005
8:48:21 AM
N W FPS - U0277

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	NH 5-2(120)20	L-8

CSF - 0.99926000

DETAIL



ZONE 1
TOTAL AREA - 0.34 HECTARES

ZONE 2A
TOTAL AREA - 0.32 HECTARES

ZONE 2B
TOTAL AREA - 0.13 HECTARES

ZONE 3A
TOTAL AREA - 0.83 HECTARES

ZONE 3B
TOTAL AREA - 0.46 HECTARES

CONTOURS:
MAJOR INTERVAL 1.0 m
MINOR INTERVAL 0.2 m

SPRING CREEK
WETLAND
DEVELOPMENT
DETAIL

PLANTING PLAN

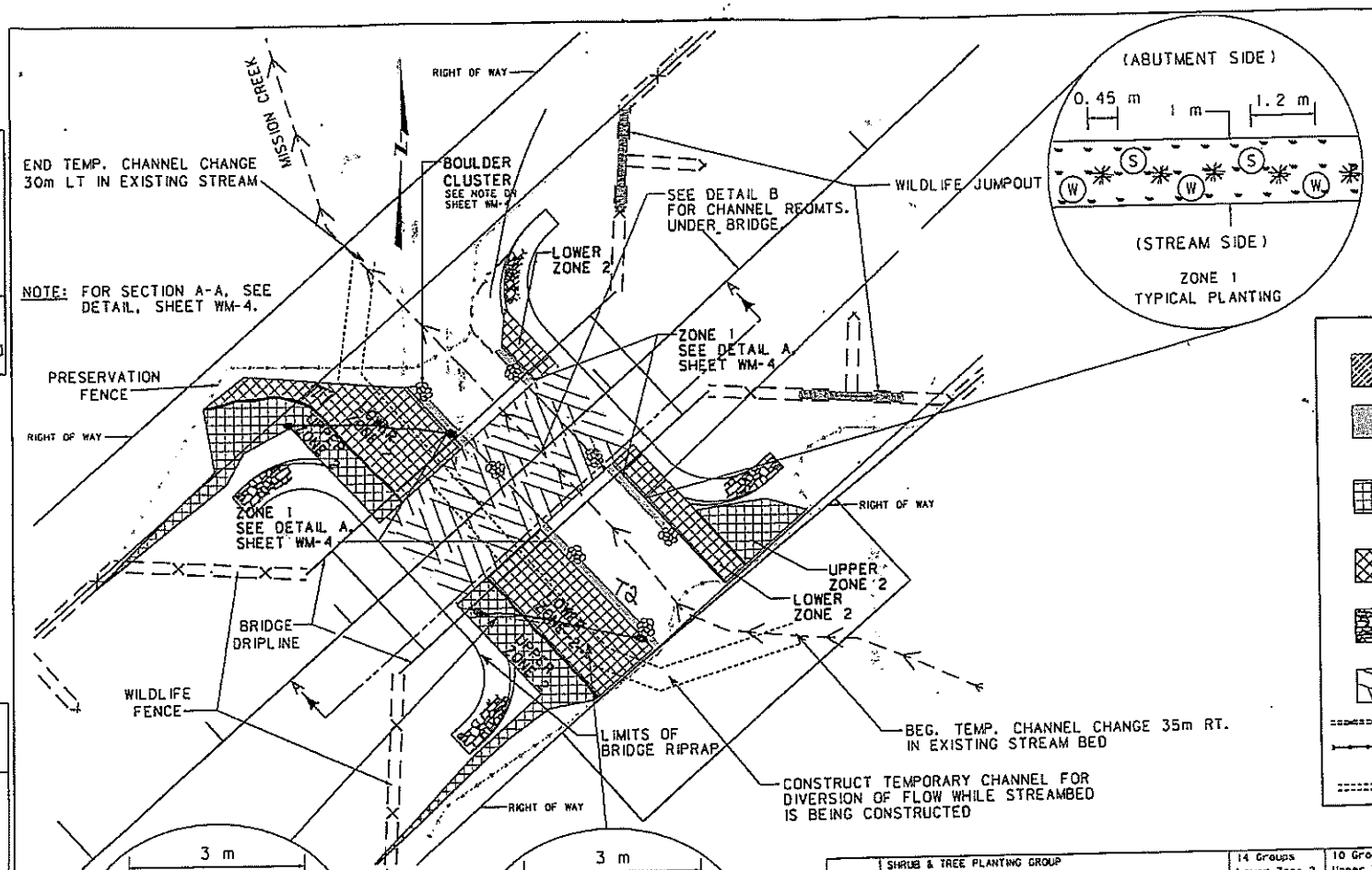
SCALE = 1:500

GEUM ENVIRONMENTAL CONSULTING, INC.

MONTANA CADD

MONTANA DEPARTMENT OF TRANSPORTATION

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	NH 5-2(122)31	WM-3



NOTES:

1. SEE SHEET WM-4 FOR SECTION A-A.
2. SEE SHEET WM-4 FOR DETAILS A & B.

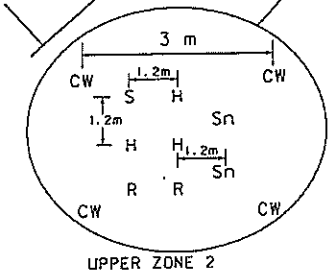
INCLUDE IN ZONE 1 PLANTING:

(W) = SANDBAR WILLOW (5 PLANTS TOTAL)
BEBB WILLOW (5 PLANTS TOTAL)
DRUMMOND WILLOW (8 PLANTS TOTAL)

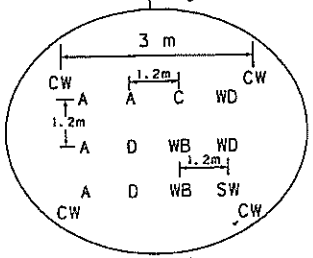
(S) = OTHER SHRUBS INCLUDING:
THINLEAF ALDER (3 PLANTS)
RED-OSIER DOGWOOD (3 PLANTS)
ROSE (3 PLANTS)

LEGEND

- EMBEDDED BRUSH PIECES
- ZONE 1
- ZONE 2 LOWER ZONE 2 (THINLEAF ALDER, RED-OSIER DOGWOOD, BEBB WILLOW, DRUMMOND WILLOW, SANDBAR WILLOW)
- UPPER ZONE 2 (SERVICEBERRY, DOUGLAS HAWTHORNE, CHOKECHERRY, ROSE, SNOWBERRY)
- BRIDGE RIPRAP
- AREA UNDER BRIDGE (NO PLANTINGS)
- WILDLIFE FENCE
- PRESERVATION FENCE
- TEMPORARY DIVERSION CHANNEL



UPPER ZONE 2
Place Shrubs 1.2 m on Center
Place Cottonwood Trees 3 m on Center



LOWER ZONE 2
Place Shrubs 1.2 m on Center
Place Cottonwood Trees 3 m on Center

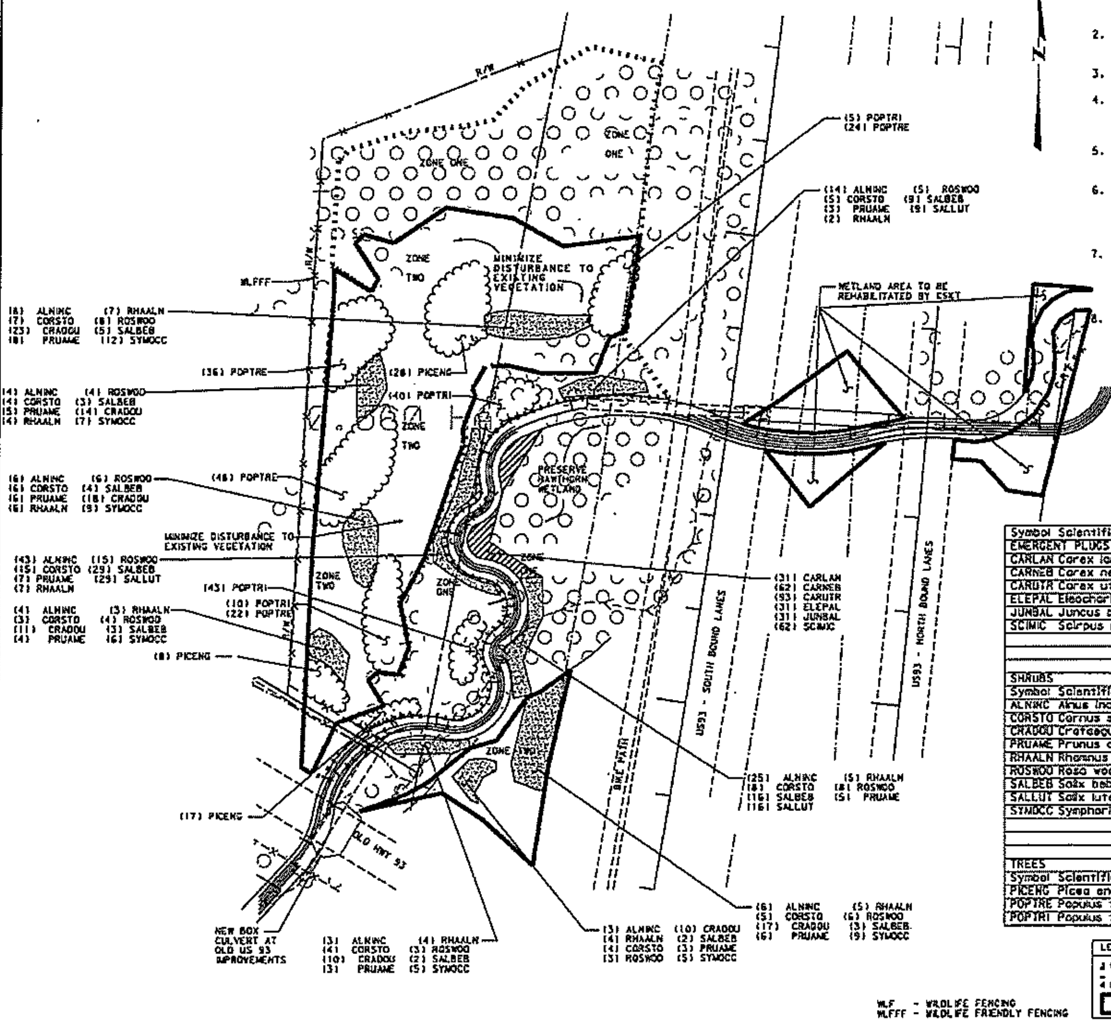
Symbol	SHRUB & TREE PLANTING GROUP (24 Groups) Shrubs		14 Groups Lower Zone 2 # Per Planting Group	10 Groups Upper Zone 2 # Per Planting Group
A	Alnus incana	Thinleaf alder	4	
S	Amelanchier alnifolia	Serviceberry		1
D	Cornus stolonifera	Red-osier dogwood	2	
H	Crataegus douglasii	Douglas hawthorne		3
C	Prunus virginiana	Chokecherry	1	
R	Rosa woodsii	Wood rose		2
WB	Salix bebbiana	Bebb willow	2	
WD	Salix drummondiana	Drummond willow	2	
WS	Salix exigua	Sandbar willow	1	
Sn	Symphoricarpos occidentalis	Western snowberry		2
CW	Populus trichocarpa	Black cottonwood	3	3
	Total		15	11

WETLAND MITIGATION SITE
MISSION CREEK CHANNEL
PLANTING AND
CHANNEL PLAN

SCALE 1:250

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	NH-PLH 5-2(142)51	40

DETAIL
MUD CREEK
WETLAND MITIGATION PLANTING



MUD CREEK WETLAND MITIGATION PLANTING NOTES

1. Sensitive Clearing Areas include Zone One and Zone Two and the relocated Mud Creek alignment. Clearing activities include removal of invasive species such as Yellow Iris and other vegetation or debris as designated by the Engineer and described in Project Weed Control Plan. See project-wide special provision for Subsection 108.03, Prosecution of Work.
2. Apply erosion control measures prior to construction of road, culvert or wetland mitigation as approved by Engineer.
3. Wildlife Fence - see detail and project-wide special provisions.
4. Protection/Sensitive Areas to include existing Hawthorne trees and other areas designated by Engineer. Fence areas with High Visibility Fence for Engineer approval prior to construction.
5. Limit grading activities and equipment to the new Mud Creek alignment and the section of existing Mud Creek to be abandoned.
6. Salvage and place wetland plants, wetland topsoil and riparian topsoil from the abandoned Mud Creek channel and impacted existing wetlands. Place wetland plants, wetland topsoil and riparian topsoil at new Mud Creek channel and in abandoned creek channel not filled by US 93 embankment. See Mud Creek Bank Protection Detail and Mud Creek Section for more information.
7. Seed areas within the Mud Creek wetland site disturbed by construction with Black Cottonwood Riparian Forest seed mix. Hand broadcast seed in areas with wet and saturated soils. It is estimated that seeding will be required for approximately 0.25 hectares of Zone One and 0.25 hectares of Zone Two. Engineer to approval disturbed areas to be seeded.
8. Plant loctaions are approximate. Contractor will stake location of plants for Engineer approval prior to planting.

NOTE:
ZONE 1 IS PRIMARILY ENHANCING EXISTING WETLAND AREAS
ZONE 2 IS PRIMARILY CREATING NEW WETLANDS IN EXISTING UPLAND AREAS

WETLAND PLANTS

Symbol	Scientific Name	Common Name	Size	Quantity Zone 1	Quantity Zone 2	Notes
EMERGENT PLUGS						
CARLAN	Carex lanuginosa	Woolly Sedge	Tubeling	31	0	Spaced Emergent plugs
CARNEB	Carex nebrascensis	Nebraska Sedge	Tubeling	62	0	450 mm on center
CARUTR	Carex utriculata	Beaked Sedge	Tubeling	93	0	
ELEPAL	Eleocharis palustris	Common Spikesedge	Tubeling	31	0	
JUNBAL	Juncus balticus	Baltic Rush	Tubeling	31	0	
SCIMIC	Scirpus microcarpus	Small-fruited Bulrush	Tubeling	62	0	
SHRUBS						
Symbol	Scientific Name	Common Name	Size	Quantity Zone 1	Quantity Zone 2	Notes
ALNINC	Alnus incana	Thinleaf Alder	Tubeling	85	31	All Shrubs Spacing:
CORSTO	Cornus stolonifera	Red-osier Dogwood	Tubeling	32	29	Zone One: 0.91 meter o.c.
CRADOU	Crataegus douglasii	Douglas Hawthorn	Tubeling	10	93	Zone Two: 1.22 meters o.c.
PRUAME	Prunus americana	American Plum	Tubeling	18	32	
RHAALN	Rhamnus alnifolia	Alder Buckthorn	Tubeling	18	29	
ROSWOO	Rosa woodsii	Wood Rose	Tubeling	31	31	
SALBEB	Salix bebbiana	Bebb Willow	1 Gal. Cont.	56	20	
SALLUT	Salix lutea	Yellow Willow	1 Gal. Cont.	54	0	
SYMOCC	Symphoricarpos occidentalis	Western Snowberry	Tubeling	5	48	
TREES						
Symbol	Scientific Name	Common Name	Size	Quantity Zone 1	Quantity Zone 2	Notes
PICENG	Picea engelmannii	Engelmann Spruce	Tubeling	17	36	All Trees Spacing:
POPTRE	Populus tremuloides	Quaking Aspen	1 Gal. Cont.	0	130	Zone One: 1.83 meters o.c.
POPTRI	Populus trichocarpa	Black Cottonwood	Tubeling	83	15	Zone Two: 2.44 meters o.c.

Carter::Burgess

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	NH 5-2112(31)	WM-6

PETERSON TRACT WETLAND MITIGATION SITE
SUMMARY AND CONSTRUCTION NOTES
STATION 576+94.5

QUANTITY SUMMARY *

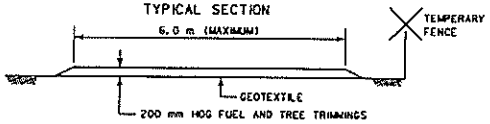
TOPSOIL SALVAGE/PLACE (m³)	EXCAVATION (m³) **	EMB+ (m³)	LOG CRIBS (each)	PRESERVATION FENCE (m)	EROSION CONTROL BLANKETS (m²)	PLANTING		TEMPORARY ROAD CONSTRUCTION AND REMOVAL	SEEDING (kg)	REMARKS
						PLUGS (each)	SHRUBS *** (each)			
280	201	135	12	900	200	4 000	2 750	1	0.05	
Total	0.65 LUMP SUM									

* ESTIMATED QUANTITIES FOR INFORMATIONAL PURPOSES ONLY

** USE UNCLASSIFIED EXCAVATION (102 m³) PLUS EMB+ (91 m³) FOR A TOTAL NEED OF 193 m³ OF EMB+

*** INCLUDES CONTAINERIZED STOCK AND CUTTINGS.

TEMPORARY ACCESS ROAD TYPICAL SECTION



NOTES:

1. CONSTRUCT TEMPORARY ACCESS ROADS ONLY IN LOCATIONS INDICATED ON THE PLANS, OR THE APPROVED SITE ACCESS PLAN, OR AS APPROVED BY THE PROJECT MANAGER.
2. DO NOT EXCEED A MAXIMUM WIDTH OF 6 METERS FOR TEMPORARY ACCESS ROADS.
3. MOW EXISTING VEGETATION, INCLUDING SCHRUBS, TO A HEIGHT OF 100 mm PRIOR TO CONSTRUCTION.
4. PLACE A GEOTEXTILE FOR SEPARATION OVER THE MOWN VEGETATION. PLACE A MINIMUM OF 200 mm OF HOG FUEL AND TREE TRIMMINGS SHALL BE PLACED OVER THE GEOTEXTILE.
5. AT THE COMPLETION OF THE CONSTRUCTION PROJECT, AS INDICATED BY THE PROJECT MANAGER, REMOVE ALL TEMPORARY CONSTRUCTION ROAD MATERIAL AND DISPOSE OF IT LEGALLY OFF SITE.
6. THE PROJECT MANAGER WILL IDENTIFY COMPACTED AREAS AND MAY REQUIRE THE CONTRACTOR TO DETERMINE COMPACTION AT ANY TIME. IF THE COMPACTION IS FOUND TO BE COMPACTED TO A DENSITY GREATER THAN 85% OF THE MAXIMUM DRY UNIT WEIGHT, AS DETERMINED BY ASTM D-1557, PROVIDE THE PROJECT MANAGER WITH A PROPOSED METHOD TO RESTORE THE AREA TO APPROPIATE COMPACTION PRIOR TO SEEDING OR PLANTING AT NO COST TO THE DEPARTMENT.

PLANTING SUMMARY

Scientific Name	Common Name	
Herbaceous Plugs 166 cells		Total*
Carex lanuginosa	Rooly sedge	364
Carex nebrascensis	Nebraska sedge	1 378
Carex utriculata	Beaked sedge	297
Eleocharis palustris	Common spikesedge	77
Juncus balticus	Baltic rush	1 225
Juncus effusus	Soft rush	221
Scirpus microcarpus	Small-fruited bulrush	77
Total		3 639
Shrubs Containerized 13.8L tree		
Alnus incana	Thinleaf alder	1 163
Cornus stolonifera	Red-osier dogwood	226
Crataegus douglasii	Douglas hawthorne	75
Prunus americana	American plum	226
Rhamnus alnifolia	Alder buckthorn	207
Rosa woodsii	Wood rose	450
Salix bebbiana	Bebb willow	394
Salix lutea	Yellow willow	375
Sambucus cerulea	Blue elderberry	19
Symphoricarpos occidentalis	Western snowberry	56
Total		3 191
Shrub Cuttings 1650 - 750 mm long**		
Cornus stolonifera	Red-osier dogwood	188
Salix bebbiana	Bebb willow	375
Salix lutea	Yellow willow	375
Total		938

* SEE HERBACEOUS PLUG PLANTING DETAIL IN PLANTINGS DETAILS (WM-7).

** SEE SHRUB PLANTING DETAIL IN PLANTINGS DETAILS (WM-7).

*** SEE LIVE STAKE CUTTING DETAIL IN PLANTINGS DETAILS (WM-7).

PETERSON TRACT WETLAND MITIGATION

General notes:

1. A MDT Project Manager must be on site prior to the commencement of grading and planting activities.
2. Conduct a survey under the direction of the Project Manager to establish planting and seeding areas log structure and basin locations.
3. Mitigation site work includes installation of log cribs, excavation, seeding and planting.
4. Install protection fencing prior to any construction activity. Construct temporary access road and stream crossing. Remove culvert, road and protection fencing following construction..
5. Minimize impact to existing wetlands through the use of established travelways and wetland crossings routes. Keep vehicles out of wetland areas except at log crib construction areas.
6. Sequence log crib construction down stream to upstream (west to east).

Grading Notes:

1. Prior to crib construction remove yellowflag iris, using a backhoe. Dispose in County woody debris disposal site as directed by the Project Manager. (Excavation estimated at 15 m³.)
2. Install twelve log cribs as shown on the plans at locations surveyed or identified by the Project Manager. Location shall maximize ponding. Use multiple logs as necessary.
3. Wood material used for crib construction will be Douglas-Fir or Western Larch.
4. Excavate seven basins (approximately 20.7 m³) each as shown on the plans or identified by the Project Manager. Utilize excess material from basins on roadway, crib embankments, or crib backfill, as directed by Project Manager.

Planting Notes:

1. Planting will be done under the supervision of the Project Manager.
2. Seed disturbed areas with 0.05 kg. of fireweed (epilobium angustifolium).
3. Place Erosion ControlBlanket as directed by the Project Manager.
4. Plant herbaceous plugs on grid 0.45 m (1.5 ft) on center in all disturbed areas.
5. Plant shrubs in clusters of the same species along existing wetland boundary as shown on plans.
6. Decompact soils to 85% of standard proctor and drill seed access route and staging area with Fescue Prairie Mix.

LOG CRIB SUMMARY *

LOG CRIB NUMBER	SOUTH END		NORTH END		LOG CRIB ELEV. AT TOP OF LOG	meters		cubic meters
	NORTHING	EASTING	NORTHING	EASTING		WIDTH OF LOG CRIB	LENGTH OF LOGS **	EMB+
1	356 049.8833	252 766.1116	356 079.3447	252 767.6773	848.200	30	64	5.5
2	356 023.1540	252 812.0507	356 024.8634	252 828.1484	848.590	16	36	2.7
3	355 996.9310	252 842.7526	356 025.3760	252 862.1991	848.891	34	72	34.8
4	355 984.0754	252 857.9921	355 995.3551	252 870.2482	849.193	17	38	18.9
5	355 970.4899	252 861.4632	355 983.0141	252 883.5058	849.495	25	54	13.0
6	355 961.9700	252 867.4878	355 975.1914	252 890.7674	849.797	27	58	18.3
7	355 945.7019	252 885.4671	355 973.4367	252 904.0584	850.099	34	72	32.7
8	355 937.6148	252 898.7277	355 971.4261	252 918.0648	850.401	39	82	23.5
9	355 929.0536	252 931.6429	355 941.3300	252 939.3417	850.703	15	34	2.1
10	355 913.7509	252 955.3505	355 931.0075	252 963.5216	851.005	19	42	9.0
11	355 911.2928	252 986.8447	355 929.3303	252 994.4639	851.307	20	44	4.8
12	355 905.2450	252 996.8014	355 926.3884	253 006.8130	851.610	23	50	7.5
TOTAL	~	~			~	~	646	169.7

* FIELD VARIFY LOCATIONS.

** LOG LENGTHS, MINIMUM 7 m - MAXIMUM 10 m.

OXBOW BASINS (7 LOCATIONS) *

OXBOW BASIN LOCATION meters		cubic meters
NORTHING	EASTING	EXCAVATION
356 031.234	252 828.603	
356 020.988	252 840.164	
355 928.312	252 911.486	
355 945.702	252 943.482	
355 908.144	252 984.702	
355 856.037	253 021.438	
355 881.489	253 076.323	
TOTAL		145 M³

* BASIN LOCATIONS ARE APPOXIMATE, FIELD VARIFY.

WETLAND MITIGATION SITE
PETERSON TRACT

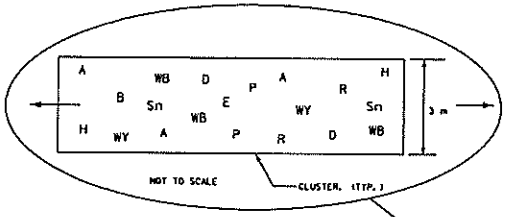
SUMMARIES AND CONSTRUCTION NOTES

PETERSON WETLAND PLANTING DETAIL

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	NH 5-2122(31)	WM-9

SHRUB SPACING - EXISTING WETLAND PERIMETER

PLANT SHRUBS AT 1.2 m ON CENTER

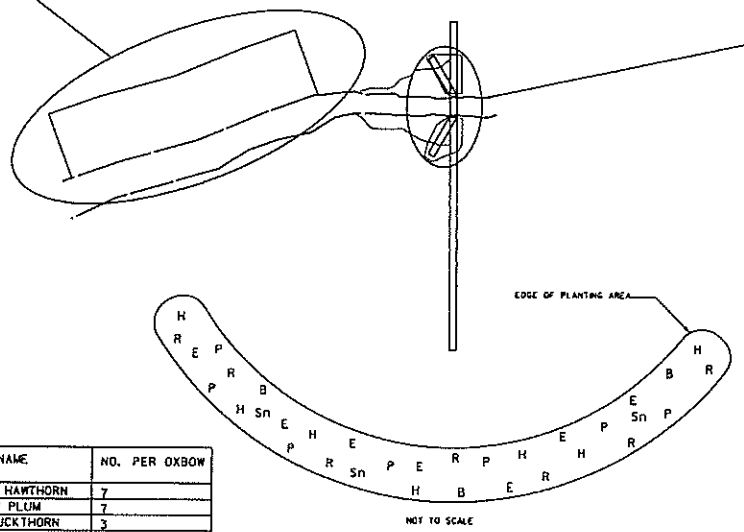


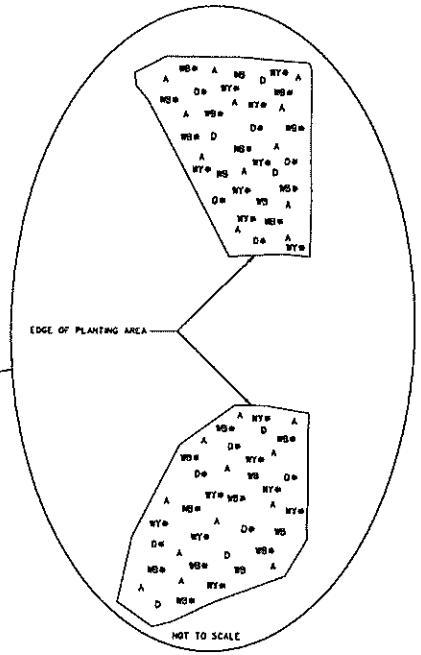
SHRUB PLANTING GROUP *

FOR PERIMETER OF EXISTING WETLAND

SYMBOL	SCIENTIFIC NAME	COMMON NAME	NUM/GROUP
A	Alnus incana	Thinleaf alder	3
D	Cornus stolonifera	Red-osier dogwood	2
H	Crataegus douglasii	Douglas hawthorne	2
P	Prunus americana	American plum	2
B	Rhamnus alnifolia	Alder buckthorn	1
R	Rosa woodsii	Wood rose	2
WB	Salix bebbiana	Bebb willow	3
WY	Salix lutea	Yellow willow	2
E	Sambucus cerulea	Blue elderberry	1
Sn	Symphoricarpos occidentalis	Western snowberry	2
	Total		20

* 101 Planting Groups required.





SYMBOL	SCIENTIFIC NAME	COMMON NAME	NO. PER GROUP
A	ALNUS INCANA	THINLEAF ADER	12
D	CORNUS STOLONIFERA	RED-OSIER DOGWOOD	3/5*
WB	SALIX BEBBIANA	BEBB WILLOW	3/9*
WY	SALIX LUTEA	YELLOW WILLOW	8*
	TOTAL		40

* CUTTINGS USED.

SHRUB SPACING - LOG CRIB

PLANT SHRUBS AT 1.2 m ON CENTER

SYMBOL	SCIENTIFIC NAME	COMMON NAME	NO. PER OXBOW
H	CRATAEGUS DOUGLASII	DOUGLAS HAWTHORN	7
P	PRUNUS AMERICANA	AMERICAN PLUM	7
B	RHAMNUS ALNIFOLIA	ALDER BUCKTHORN	3
R	ROSA WOODSII	WOOD ROSE	7
E	SAMBUCUS CERULES	BLUE ELDERBERRY	7
Sn	SYMPHORICARPUS OCCIDENTALIA	WESTERN SNOWBERRY	3
	TOTAL		34

SHRUB SPACING FOR OXBOW BASINS

PLANT SHRUBS AT 1.5 m ON CENTER

WETLAND MITIGATION SITE
PETERSON TRACT
SITE PLAN-SHEET B

Appendix H

MITIGATION CREDITING SYSTEMS

US Highway 93 Onsite: Bouchard, Jocko Spring Creek, Mission Creek, Mud Creek, and Peterson Property

U.S. ARMY CORPS OF ENGINEERS
HELENA REGULATORY OFFICE
10 WEST 15TH STREET, SUITE 2200
HELENA, MONTANA 59626

December 18, 2002

REPLY TO
ATTENTION OF:

Helena Regulatory Office
(406) 441-1375 Phone
(406) 441-1380 Fax

Subject: Corps File Number 2001-90-416
US Highway 93: Evaro to Polson
Compensatory Wetland Mitigation Crediting

Mr. Tom Parker
Herrera Environmental Consultants, Inc.
101 East Broadway, Suite 610
Missoula, Montana 59802

Dear Mr. Parker:

The purpose of this letter is to outline a compensatory wetland mitigation crediting scheme for the Montana Department of Transportation (MDT) Evaro – Polson US 93 project. The project is being split into at least nine separate segments for the purposes of design and construction, but the corridor was the subject of a single integrated Environmental Impact Statement.

1. Compensatory mitigation must be developed for all unavoidable, non-isolated aquatic impacts on the entire Evaro-Polson project. Unavoidable impacts and a compensatory mitigation package will be reviewed on a watershed and corridor basis for all design segments.

2. All compensatory mitigation sites recognized by the US Army Corps of Engineers (Corps) must be protected by a perpetual conservation easement or similar permanent land use restriction.

3. Use the methods in the 1987 Corps Wetland Delineation Manual to determine whether or not an area is a wetland.

4. All compensatory mitigation for the corridor should be within the limits of the watershed described by USGS Hydrologic Unit Code 17010212, Lower Flathead River, Montana.

5. All wetland impacts must be assessed using the 1999 MDT Montana Wetland Assessment Method.

6. Wetland compensatory mitigation ratios will be based on use of the 1999 MDT Montana Wetland Assessment Method to assign a functional score. The baseline (pre-project) mitigation site assessment score will be compared to the post-project rating, as described in your December 3, 2002 Draft Memorandum to this office. The basis for awarding credit will be the same for on- and off-site mitigation areas. While the crediting method presented was generally acceptable, a review of the proposal has resulted on the following limits on mitigation crediting:

    7.1 **Creation:** The establishment of a wetland or other aquatic resource where one did not formerly exist. Creation of wetlands will result in a mitigation ratio of 1:1, with one acre of satisfactory wetland creation compensating for one acre of unavoidable wetland impact.

7.2 **Restoration:** Re-establishment of wetland and/or other aquatic resource characteristics and function(s) at a site where there were wetlands existed historically, but have been modified so that they are now considered non-wetland or exist in a substantially degraded state.

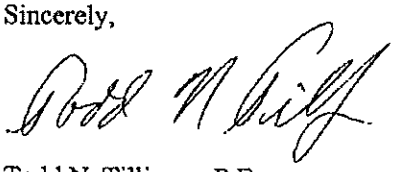
7.2.1 **Restoration (re-establishment)** of wetland characteristics to existing non-wetland areas that were historically wetlands will also result in a mitigation ratio of 1:1, with one acre of satisfactory wetland restoration of this type compensating for one acre of unavoidable wetland impact.

7.2.2 **Restoration (rehabilitation)** of wetland functions at existing wetland areas that exist in a substantially degraded state will result in a mitigation ratio of not less than 1½:1, with a minimum of one and a half acres of satisfactory wetland restoration of this type required to compensate for one acre of unavoidable wetland impact. For example, if the calculated crediting ratio for this type of site was calculated at 1.84:1, that is the ratio that would be used. If the calculation showed 1.34:1, the limit of 1½:1 would be used.

7.3 **Enhancement:** Altering the physical characteristics of an existing jurisdictional wetland such that it permanently modifies and improves one or more specific wetland functions with no corresponding decrease in any other functions. Examples include restoring normal hydrology to a partially drained wetland, or restoring a high level of species diversity to a monotypic plant community. Enhancement of existing wetland areas that are not substantially degraded will result in a mitigation ratio of not less than 3:1, with a minimum of three acres of satisfactory wetland enhancement of this type required to compensate for one acre of unavoidable wetland impact. For example, if the calculated crediting ratio for this type of site was calculated at 4.23:1, that is the ratio that would be used. If the calculation showed 2.23:1, the limit of 3:1 would be used.

This information is provided in response to our recent meeting and the December 3, 2002 Draft Memorandum on US 93 Wetland Mitigation Crediting provided by Herrera, Inc. Additional input from this office will be provided as necessary and as the plan for mitigation crediting matures. If you have questions feel free to call me at (406) 441-1375, and reference Corps File Number 2001-90-416.

Sincerely,



Todd N. Tillinger, P.E.
Project Manager

Cc: Gordon Stockstad – MDT Environmental Services, Helena, Montana
Scott Jackson – U.S. Fish and Wildlife Service, Helena, Montana
Craig Genzlinger – U.S. Federal Highway Administration, Helena, Montana
Steve Potts – U.S. Environmental Protection Agency, Helena, Montana

Herrera Environmental Consultants, Inc.

Memorandum

To	U.S. Army Corps of Engineers, Helena Office
cc	Montana Department of Transportation
From	Tom Parker, Herrera Environmental Consultants
Date	December 3, 2002
Subject	US 93 Wetland Mitigation Crediting

Introduction

Compensatory wetland mitigation, as credited by the Army Corps of Engineers, is often evaluated based on area ratios of mitigated wetlands to impacted wetlands. *Mitigated wetlands* include all wetland areas that are created, enhanced or preserved to compensate for impacted wetlands. Created wetlands are often credited at a 1:1 ratio, while existing wetlands that are enhanced or preserved may be credited at ratios ranging from 3:1 to 10:1.

Many opportunities exist along the US 93 corridor to enhance existing wetlands using combinations of active re-vegetation, land management change, weed management and other restoration actions. Often, it is difficult to determine the appropriate wetland credit ratio that should be assigned for a given wetland enhancement project. A quantitative basis for calculating appropriate enhancement ratios would benefit all participants in the wetland regulatory process. We understand that the regulatory agency has final authority to determine wetland mitigation credits.

Proposed Approach

We propose using the MDT Wetland Functional Assessment Method (MDT 1999) as a tool to measure the projected shift in wetland functions and values based on wetland mitigation activities. This method, which was used to assess functions and values of impacted wetlands along the corridor, evaluates 12 wetland functions and values (Tables 1 and 2). Using the procedure documented in MDT (1999), a wetland specialist assigns scores of 0 or 0.1 (low) to 1.0 (high) to each of the 12 categories at a particular site. These scores are totaled, resulting in a functional score for the site.

An evaluator measures projected shift in wetland functions and values by first assessing existing conditions on the site, then estimating changes in scores that would occur as a result of mitigation activities, and finally calculating the difference between these scores.

The shift in wetland function at a mitigation site could then be used to determine a crediting ratio for enhancement projects. Using this approach, the process for calculating wetland mitigation credits at a given site would have two components. First, a wetland creation component, assuming a 1:1 ratio for created wetlands, would be equal to the number of created wetland acres at a mitigation site. This creation component could be expressed as:

$A_{created}$ = Created wetland acres (1)

Second, an enhancement component would be the number of existing wetland acres to be enhanced, multiplied by an enhancement factor. The enhancement factor represents the ratio of functional shift (the difference between pre-project functional score and projected post-project functional score) to the pre-project functional score. The enhancement factor can be expressed as:

$$\text{Enhancement factor} = \left(\frac{F_{post} - F_{pre}}{F_{pre}} \right) \quad (2)$$

where:

F_{post} = Projected post-mitigation project functional score
F_{pre} = Pre-project functional score

Note: *The enhancement ratio is the inverse* $\left(\frac{1}{X}\right)$ *of the enhancement factor. The enhancement ratio is the term most frequently used to discuss crediting ratios for wetland mitigation projects. For example, an enhancement factor of 0.25 would be equal to an enhancement ratio of 4:1. This means that four enhanced acres at a particular site would be worth one acre of credit to offset wetland acres impacted by the project.*

The enhancement component of the equation can then be expressed as:

$$A_{existing}\left(\frac{F_{post} - F_{pre}}{F_{pre}} \right) \quad (3)$$

where:

$A_{existing}$ = Existing wetland acres to be enhanced
F_{post} = Projected post-mitigation project functional score
F_{pre} = Pre-project functional score

The following equation, which includes both a creation and enhancement component, can then be used to calculate wetland mitigation credits expressed as acres:

$$A_{credited} = A_{created} + A_{existing}\left(\frac{F_{post} - F_{pre}}{F_{pre}}\right) \quad (4)$$

where:

$A_{credited}$ = Wetland mitigation credits expressed as acres
$A_{created}$ = Wetland creation acres
$A_{existing}$ = Existing wetland acres to be enhanced
F_{post} = Projected post-mitigation project functional score
F_{pre} = Pre-project functional score

To demonstrate how these equations can be applied in the context of US 93 wetland mitigation, we have selected two proposed wetland mitigation sites as examples. The Bouchard property (Example 1) is a 40-acre parcel north of Arlee. The Ludwig property (Example 2) includes slightly less than 20 acres and is two miles north of St. Ignatius.

Example 1

The Bouchard property has been acquired recently by MDT. This site is near the headwaters of Spring Creek and supports a mixture of upland, emergent wetland and scrub/shrub wetland. A proposed wetland mitigation project at this site will include approximately 8 acres of wetland creation and up to 20 acres of wetland enhancement. A summary of pre- and post-project wetland functional scores is provided in Table 1.

Table 1. Expected change in wetland functions and values, Bouchard site.

	Functional Points Pre-Project	Functional Points Post-Project	Factors Affecting Score
A. Listed/proposed T&E species habitat	.3	.3	No populations in area, not likely corridor
B. Habitat for S1, S2, or S3 plants or animals	.1	.1	No populations in area
C. General wildlife habitat	.8	1	Decreased disturbance
D. General fish/aquatic habitat	N/A	N/A	Not historic fish habitat
E. Flood attenuation	N/A	N/A	No channel
F. Short- and long-term surface water storage	.8	.8	Seasonal surface water
G. Sediment/nutrient/toxicant retention and removal	N/A	N/A	Does not receive excess sediment, nutrient, toxicant inputs
H. Sediment/shoreline stabilization	N/A	N/A	No channel
I. Production export/food chain support	.9	.9	Vegetation at site already diverse
J. Ground water discharge/recharge	1	1	Discharge/recharge indicators present
K. Uniqueness	.6	.8	Decreased disturbance
L. Recreation/education potential	.1	1	Decreased disturbance
Totals	4.6	5.9	

The following example assumes that 8 ($A_{created}$) new wetland acres are created and the functional score of 20 ($A_{existing}$) existing wetland acres shifts from 4.6 (F_{pre}) to 5.9 (F_{post}). Using Equation (2):

$$\text{Enhancement factor} = \left(\frac{F_{post} - F_{pre}}{F_{pre}}\right) = \left(\frac{5.9 - 4.6}{4.6}\right) = 0.28$$

In this case, the enhancement factor equals 0.28. The corresponding enhancement ratio (1/0.28) would be 3.5 and would be expressed as 3.5 to 1, indicating 3.5 acres of enhancement replaces 1 impacted wetland acre.

Next, applying equation (3), it is possible to calculate the mitigation credits for the 20 acres of existing wetland that would be enhanced at the Bouchard site:

$$A_{existing}\left(\frac{F_{post} - F_{pre}}{F_{pre}}\right) = 20(0.28) = 5.6 \text{ acres of credit for enhancement portion}$$

Finally, applying equation (4), it is possible to calculate total mitigation credits at the Bouchard site.

$$A_{credited} = A_{created} + A_{existing}\left(\frac{F_{post} - F_{pre}}{F_{pre}}\right) = 8 + 20(0.28) = \textbf{13.65 total acres of credit}$$

Example 2

The Montana Department of Transportation has requested an assessment of wetland mitigation potential on the Ludwig property north of St. Ignatius, Montana. Because the decision to acquire this property partly depends upon how many wetland mitigation credits it is feasible to generate there, we decided to use the Ludwig property as an example of how one might use a functional score approach to calculate an appropriate crediting ratio for enhancement projects. Tables 1 and 2 include summaries of functional scores for (1) existing conditions and (2) estimated post-mitigation project conditions at each of the two proposed mitigation projects on the Ludwig property. A tributary to Post Creek runs through the property and was assessed as one wetland site (Table 2). The second wetland site consists of a created stock pond and small adjacent wetlands supported by the pond (Table 3). Both sites are impacted by livestock grazing and altered hydrology.

Stream Site. The Post Creek portion of the site would increase from an estimated 1.3 ($A_{existing}$) acres of wetland to 5.2 acres, resulting in 3.9 ($A_{created}$) created wetland acres. From Table 2, the functional score would shift from 5.4 (F_{pre}) to 9.5 (F_{post}). Using Equation (2):

$$\text{Enhancement factor} = \left(\frac{F_{post} - F_{pre}}{F_{pre}}\right) = \left(\frac{9.5 - 5.4}{5.4}\right) = 0.76$$

Table 2. Expected change in wetland functions and values, Ludwig property, Post Creek Tributary.

MDT Assessment Method Functions and Values	Functional Points Pre-Project	Functional Points Post-Project	Factors Affecting Score
A. Listed/proposed T&E species	.3	.8	Grizzly, Sus/inc. to Doc/secondary
B. Habitat for S1, S2, or S3 plants or animals	.1	.7	Grizzly, Sus/inc. to Doc/secondary
C. General wildlife habitat	.5	.9	Increased cover
D. General fish/aquatic habitat	.1	.3	Increased cover and connectivity, but unlikely fish habitat
E. Flood attenuation	.2	.7	Increased size, woody component
F. Short- and long-term surface water storage	.4	.8	Increased size
G. Sediment/nutrient/toxicant removal	.9	.9	Close to highway, cattle removal
H. Sediment/shoreline stabilization	.7	1	Increase deep binding root mass
I. Production export/food chain support	.9	1	Increased size
J. Ground water discharge/recharge	1	1	
K. Uniqueness	.2	.4	Shift to shrub community
L. Recreation/education potential	.1	1	Not likely site
Total Functional Points	5.4	9.5	

Table 3. Expected change in wetland functions and values, Ludwig property, stock pond and adjacent wetlands.

MDT Assessment Functions and Values	Functional Points Pre-Project	Functional Points Post-Project	Factors Affecting Score
A. Listed/proposed T&E species	.3	.7	Grizzly bear use adjacent areas, increased cover may increase use
B. Habitat for S1, S2, or S3 plants or animals	.2	.2	No known occurrence
C. General wildlife habitat	.3	.9	Increased cover
D. General fish/aquatic habitat	N/A	N/A	No habitat
E. Flood attenuation	N/A	N/A	No overbank flow
F. Short- and long-term surface water storage	.7	.8	
G. Sediment/nutrient/toxicant removal	1	1	Close to highway, cattle removal
H. Sediment/shoreline stabilization	N/A	N/A	
I. Production export/food chain support	.6	.7	Increased structural diversity
J. Ground water discharge/recharge	1	1	
K. Uniqueness	.1	.4	Shift to shrub
L. Recreation/education potential	.1	1	Not likely site
Total Functional Points	4.3	6.7	

In this case, the enhancement factor equals 0.76. The corresponding enhancement ratio (1/0.76) would be 1.32 and would be expressed as 1.32 to 1, indicating 1.32 acres of enhancement replaces 1 impacted wetland acre.

Next, applying equation (3), it is possible to calculate the mitigation credits for the 1.3 acres of existing wetland that would be enhanced at the Ludwig stream channel site:

$$A_{existing}\left(\frac{F_{post}-F_{pre}}{F_{pre}}\right) = 1.3(0.76) \quad = 0.98 \text{ acres of credit for enhancement portion}$$

Finally, applying equation (4), it is possible to calculate total mitigation credits at the Ludwig stream channel site.

$$A_{credited} = A_{created} + A_{existing}\left(\frac{F_{post}-F_{pre}}{F_{pre}}\right) = 3.9 + 1.3(0.76) \quad = \textbf{4.9 total acres of credit}$$

Stock Pond Site. The stock pond portion of the site would increase from an estimated 0.35 ($A_{existing}$) acres of wetland to 1.8 acres, resulting in 1.45 ($A_{created}$) created wetland acres. From Table 3, the functional score would shift from 4.3 (F_{pre}) to 6.7 (F_{post}). Using Equation (2):

$$\text{Enhancement factor} = \left(\frac{F_{post}-F_{pre}}{F_{pre}}\right) \qquad = \left(\frac{6.7-4.3}{4.3}\right) \qquad = 0.56$$

In this case, the enhancement factor equals 0.56. The corresponding enhancement ratio (1/0.56) would be 1.79 and would be expressed as 1.79 to 1, indicating 1.79 acres of enhancement replaces 1 impacted wetland acre.

Next, applying equation (3), it is possible to calculate the mitigation credits for the 0.35 acres of existing wetland that would be enhanced at the Ludwig stock pond site:

$$A_{existing}\left(\frac{F_{post}-F_{pre}}{F_{pre}}\right) = 0.35(0.56) \quad = 0.20 \text{ acres of credit for enhancement portion}$$

Finally, applying equation (4), it is possible to calculate total mitigation credits at the Ludwig stock pond site.

$$A_{credited} = A_{created} + A_{existing}\left(\frac{F_{post}-F_{pre}}{F_{pre}}\right) = 1.45 + 0.35(0.56) = \textbf{1.64 total acres of credit}$$

CSKT Mitigation Ratios from Wetlands Conservation Plan (pre-project only)

Prepared by Tom Parker, Ecologist, Herrera Environmental Consultants, Inc.
May 2, 2002

Impacted Wetland Type	Mitigation Type			
	Preservation	*Restoration*	*Enhancement*	*Creation*
Forested and Shrub	3:1	2.5:1	4:1	4:1
Emergent and Open Water	2:1	1.5:1	3:1	3:1

Equation for calculating required mitigation acres based on CSKT Mitigation Guidelines.

Required mitigation acres = $P(3\ I_{sf} + 2\ I_{oe}) + R(2.5\ I_{sf} + 1.5\ I_{oe}) + E(4\ I_{sf} + 3\ I_{oe}) + C(4\ I_{sf} + 3\ I_{oe})$

Where:
I_{sf} = # of scrub/shrub or forested impact acres = 18
I_{oe} = # of emergent or open water impact acres = 32

P = estimated **Preservation** proportion of mitigation area
R = estimated **Restoration** proportion of mitigation area
E = estimated **Enhancement** proportion of mitigation area
C = estimated **Creation** proportion of mitigation area

Example 1: To find required mitigation acres, assuming that mitigation projects will be distributed as follows based on area: Preservation = 30 percent; Restoration = 50 percent; Enhancement = 10 percent; Creation = 10 percent.

.3 (3*18 + 2*32) + .5(2.5*18+1.5*32) + .1(3*18 + 4*32) + .1(3*18 + 4*32) = 104.2 required acres

Example 2: To find required mitigation acres, assuming that mitigation projects will be distributed as follows based on area: Preservation = 10 percent; Restoration = 90 percent; Enhancement = 0 percent; Creation = 0 percent.

.1 (3*18 + 2*32) + .9(2.5*18+1.5*32) + 0(3*18 + 4*32) + 0(3*18 + 4*32) = 96.0 required acres

Example 3: Given 18 impacted acres (36% of total) of shrub or forested and 32 impacted acres (64 percent of total) of open water or emergent, what is the weighted ratio for restoration projects?

2.5(.36) + 1.5(.64) = 1.86

Therefore: A 20-acre restoration project will mitigate for 20/1.86 =10.75 impacted acres.